User Guide

Saved on 03/14/2025

Table of Contents

This manual contains detailed instructions for using the satellite monitoring system Wialon Local version 2004.

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Version release date: April 20, 2020.

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Introduction

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Basic Definitions and Components

GPS tracking system Wialon Local is a software product that allows the end users to control their units (vehicle fleet, machinery, employees, pets, etc.).

Unit tracking includes:

- detecting units' position and watching their movements on the map;
- observing dynamic changes of various units' parameters such as speed, fuel level, temperature, voltage, etc.;
- managing units (sending commands and messages, assigning jobs and routes, adjusting notifications, etc.) and drivers (phone calls, SMS, work shifts);
- controlling units' movements along the routes;
- interpreting the information derived from unit in various kinds of reports (tables, charts);
- and much more.

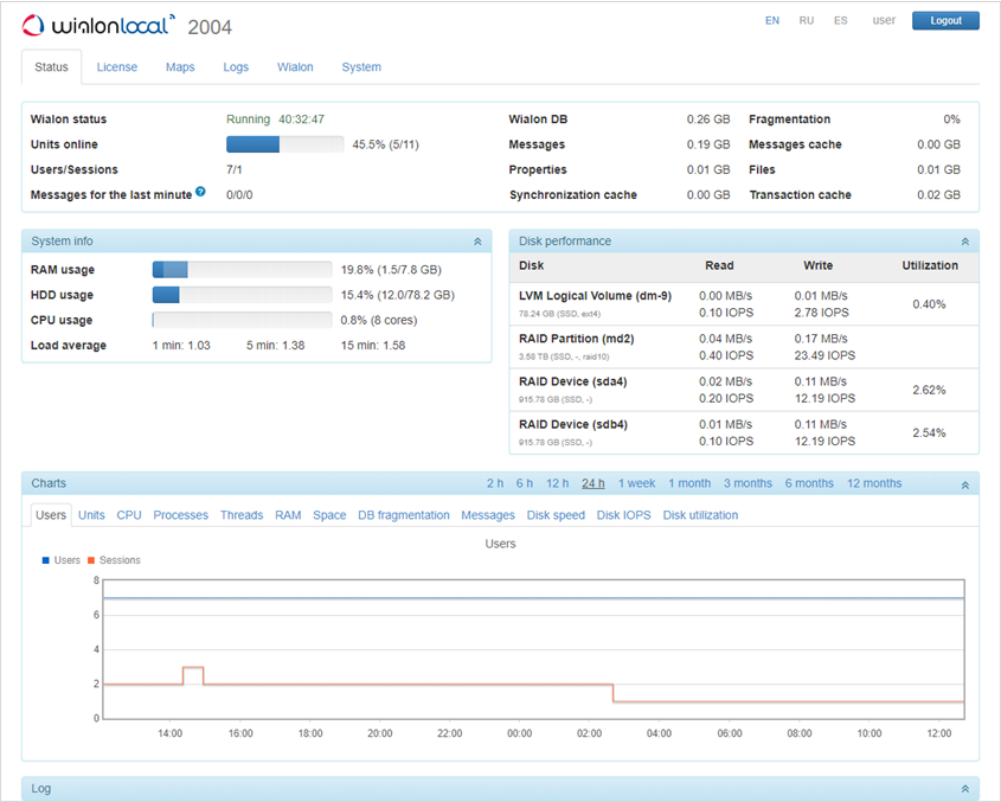
Tracking results can be presented on the computer screen as well as exported to files in different formats.

The main components of Wialon Local are described below.

Administration system

The administrator of Wialon Local can start and stop Wialon, watch its operation, monitor errors, take care of memory consumption and CPU load, etc.

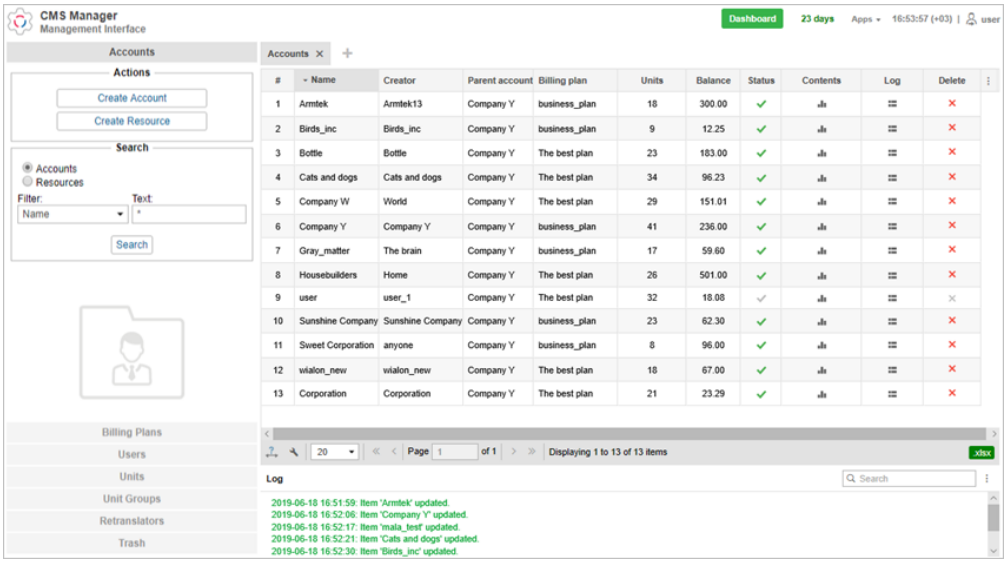
In addition, the configuration of the system is adjusted in the **Administration system** where one can install updates, add maps, sites, and modems, etc. The detailed description of the Administration System can be found in the corresponding section of this guide.



CMS Manager (management system)

CMS Manager is a special interface developed for the managers of Wialon Local. CMS refers to Content Management System. Content in this context is **system macro objects** which are:

- accounts (resources),
- billing plans,
- users,
- units,
- unit groups,
- retranslators.



Macro objects differ from micro objects in several ways:

- They exist independently and are not a part of a bigger object like a resource.
- They can include smaller items as their contents, and those items are deleted together with the macro object they belong to. As mentioned above, a resource can hold geofences, jobs, notifications, drivers, report templates and orders. A unit can contain sensors, commands, custom fields, and service intervals. Users and unit groups can only contain custom fields.
- Access rights are assigned to macro objects, and they affect these objects and their contents. That is why the dialog of macro object properties usually has a special **Access** tab to manage rights.
- Such macro objects as retranslators, accounts (resources), and billing plans can be accessed only through the management interface (that is CMS Manager).

CMS Manager is designed to work with these items: create, configure, update, copy, import, export, delete them, and, what is the most important, distribute access rights to these objects. An access right is a possibility to view some system objects and perform allowed actions over them.

These functions can be also partially fulfilled in the user interface. However, the main difference here is that CMS Manager has a handy easy-to-use interface that allows to work with a great number of items, filter them by different criteria, display them in the form of a table, create tabs with search results, and much more. Besides, the exclusive privilege of CMS Manager is the possibility to work with accounts (that is to control payment, restrict services and adjust their cost) and retranslators.

There is one type of macro object that is not available in CMS Manager — route. Routes can be created only in the user interface of Wialon Local. They store checkpoints and schedules inside and do not depend on any resource. However, it is possible to manage access to routes — through

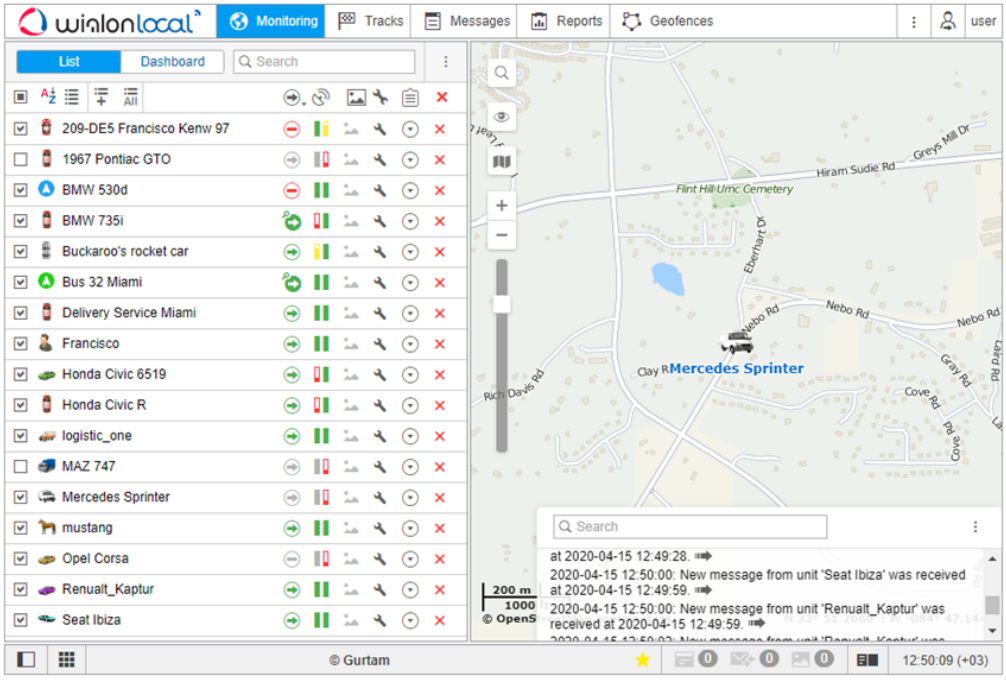
user properties dialog. The detailed description of CMS Manager interface can be found in the Management system section of this guide.

Main interface (tracking system)

The main interface of Wialon Local is an interface where the end users watch their units and create and configure diverse **system micro objects** for their tracking purposes:

- geofences,
- jobs,
- notifications,
- drivers,
- trailers,
- report templates.

These items cannot exist independently and are a part of some resource.



The detailed description of Wialon Local user interface can be found in the Monitoring system section.

Wialon DB

Wialon Local has an embedded data storage system Wialon DB, a proprietary DBMS with stable support for transactional processing and replication features. Physically it is located in the folder

storage of your Wialon Local. All kind of communication with the database is done either via the provided web interfaces or using various development tools.

WebGIS

WebGIS is a cartographic server included in Wialon Local. All the address information used for the tracking of units and for the reports is taken by default from it. The detailed description of WebGIS can be found in the corresponding section.

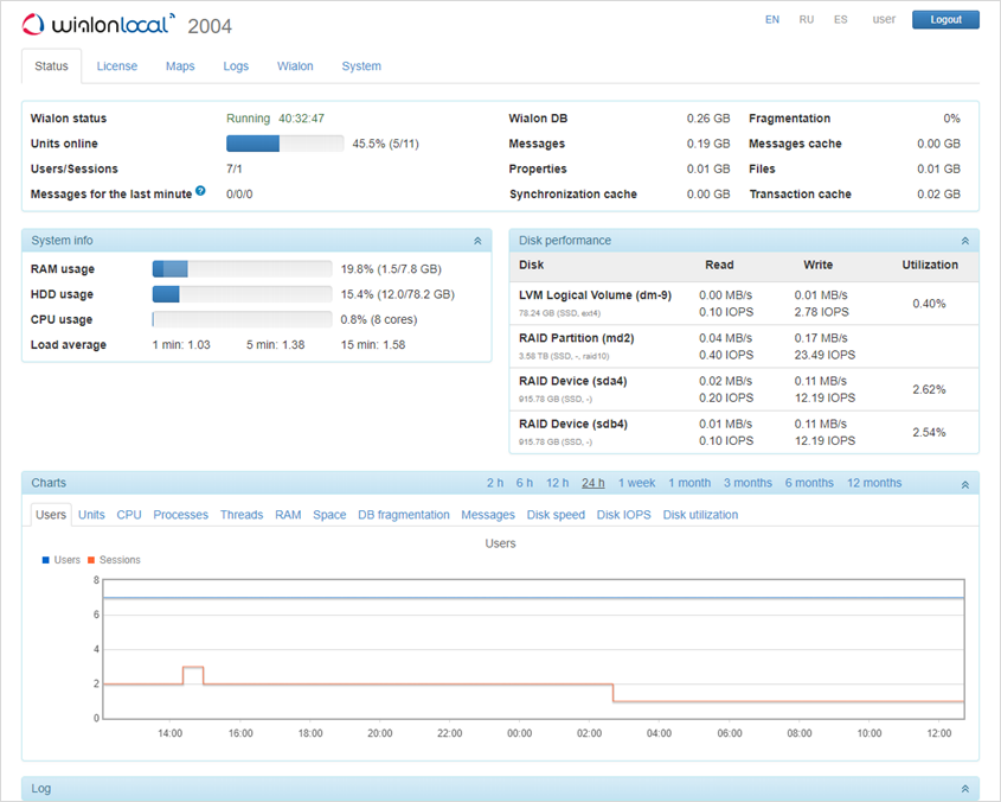
Administration System

The administration system allows you to accomplish the following basic **tasks**:

- get information about the state of the system (used memory, CPU load, errors, and so on) and configure its basic parameters;
- add maps;
- install updates;
- configure, start and stop sites, modems, devices, control connections and sessions;
- delete and restore objects from the trash.

The administration system consists of the following **tabs**:

- Status,
- License,
- Maps,
- Logs,
- Wialon,
- System.



Technical Specification and Requirements

Operating system and accompanying software

Wialon Local is an all-in-one solution installed from an ISO file that includes:

- base operating system Debian GNU/Linux 10 (Buster) in form of an image **netinstall** (the missing files are installed from network package repositories);
- additional software for the proper functioning of the server (nginx, postfix, ntp, openssh, iptables, fail2ban and some other);
- Wialon Local and its components.

Some OS components, hardware drivers and the modules of Wialon Local itself require network access during the installation process.

It is not recommended to install other software packages apart from the ones that are required for the proper operating of Wialon Local.

ISO is developed for downloading and installing software in the BIOS mode. For UEFI, the installation should be carried out in the Legacy mode.

Server requirements

Installation and operation of Wialon Local is possible exclusively on a 64-bit operating system.

The recommended maximum number of messages from one unit **per day**, taking into account periods of decrease and increase in the intensity of messages, is 4100 messages (about 170 messages per hour). By the periods of decrease and increase we mean a periodic decrease and increase in the intensity of sending messages to the server, depending on the time of day and the unit's operation mode. It also includes the possible complete absence of messages from the devices for a certain period of time, followed by intensive unloading of a large number of messages from the device’s memory (the recommended period for recalculating events is no more than 3 days).

The recommended maximum number of messages from one unit **per hour** during the period of the highest intensity of messages is 325 messages. The period of the highest intensity of messages should be understood as the period when all units created on the server are simultaneously connected to it and regularly transmit data.

Below are the minimum server requirements for storing data on it for a period of two years. These requirements are calculated on the basis of typical tasks solved by servers and their configuration.

For a server with **up to 100 units** (with an average daily intensity of message registration of no more than 408 000 messages):

- CPU: Core i7 or Xeon (4+ cores, 4+ threads);
- RAM: 16 GB (Wialon only);
- HDD: software RAID1 from 250 GB;
- Internet bandwidth (from the server): from 25 Mbit/s.

For a server with **up to 500 units** (with an average daily intensity of message registration of no more than 2 040 000 messages):

- CPU: Core i7 or Xeon (4+ cores, 8+ threads);
- RAM: 16 GB (Wialon only);
- HDD: software RAID1 from 250 GB;
- Internet bandwidth (from the server): from 25 Mbit/s.

For a server with **up to 1000 units** with its own WebGIS (with an average daily intensity of message registration of no more than 4 080 000 messages):

- CPU: modern Xeon (6+ cores, 12+ threads);
- RAM: from 32 GB (Wialon + maps);
- HDD: Software RAID10, 4×2 TB or more;
- Internet bandwidth (from the server): from 50 Mbit/s.

For a server with **up to 2000 units** with its own WebGIS (with an average daily intensity of message registration of no more than 8 160 000 messages):

- CPU: modern Xeon (8+ cores, 16+ threads);
- RAM: from 32 GB (Wialon + maps);
- HDD: Software RAID10, 4×2 TB or more;
- Internet bandwidth (from the server): from 50 Mbit/s.

For a server with **up to 4000 units** and its own WebGIS (with an average daily intensity of message registration of no more than 16 320 000 messages):

- CPU: modern Xeon (10+ cores, 20+ threads);
- RAM: from 48 GB (Wialon + maps);
- HDD: software RAID10, 4×2 TB and more;
- Internet bandwidth (from the server): from 75 Mbit/s.

For a server with **up to 10 thousand units** (with an average daily intensity of message registration of no more than 40 800 000 messages):

- CPU: modern Xeon (12+ cores, 24+ threads);
- RAM: from 64 GB;

- HDD: Software RAID10, 8×2 TB and more;
- Internet bandwidth (from the server): from 100 Mbit/s.

For a server with **up to 15 thousand units** (with an average daily intensity of message registration of no more than 61 200 000 messages):

- CPU: modern Xeon (16+ cores, 32+ threads);
- RAM: from 96 GB;
- HDD: Software RAID10, 8×2 TB or more (SSD recommended);
- Internet bandwidth (from the server): from 150 Mbit/s.

For a server with **up to 20 thousand units** (with an average daily intensity of message registration of no more than 81 600 000 messages):

- CPU: 2 modern Xeon or 1 Xeon processors (20+ cores, 40+ threads);
- RAM: from 128 GB;
- HDD: Software RAID10, 8×2 TB or more (SSD recommended);
- Internet bandwidth (from the server): from 175 Mbit/s.

In order for Wialon Local to operate correctly, there should be at least 20% of free disk space.

20 thousand is the maximum number of units possible on one distribution.

⚠ In some cases, the automatic installation can be unavailable.

You should understand that the above-listed requirements are indicative and the choice of the hardware on which Wialon Local is going to be installed is individual in each case and should, first of all, be based on the amount of information you are planning to work with.

Administering Tasks

The maintenance of the Wialon Local server must be performed by a qualified Linux system administrator with competencies that allow performing the tasks stated below.

Primary tasks

- Install, delete, relocate, start and stop the service.
- Backup the database.
- Configure, troubleshoot and maintain the storage system.
- Configure the network subsystem and network interfaces, configure the server to work with domain services (DHCP, DNS, NTP, SSH) and with auxiliary services (postfix/exim,nginx).

When contacting Gurtam technical support on issues related to the server administration, you should provide direct access via SSH.

- Ensure availability of the license server.
- Control the Wialon service status, the operating system, and the devices.
- Check server logs, Wialon logs and device logs, control log rotation using logrotate.
- Manage the global server settings of Wialon.
- Configure and provide the operation of Wialon sites.
- Control free disk space.

Secondary tasks

- Automate routine operations.
- Configure the mail subsystem.
- Configure the security system (iptables,fail2ban, strong passwords, and so on).
- Monitor processes on the server, check for possible viruses regularly.
- Configure modems of the GSM, SMPP gateway and network types.

Installing Wialon Local

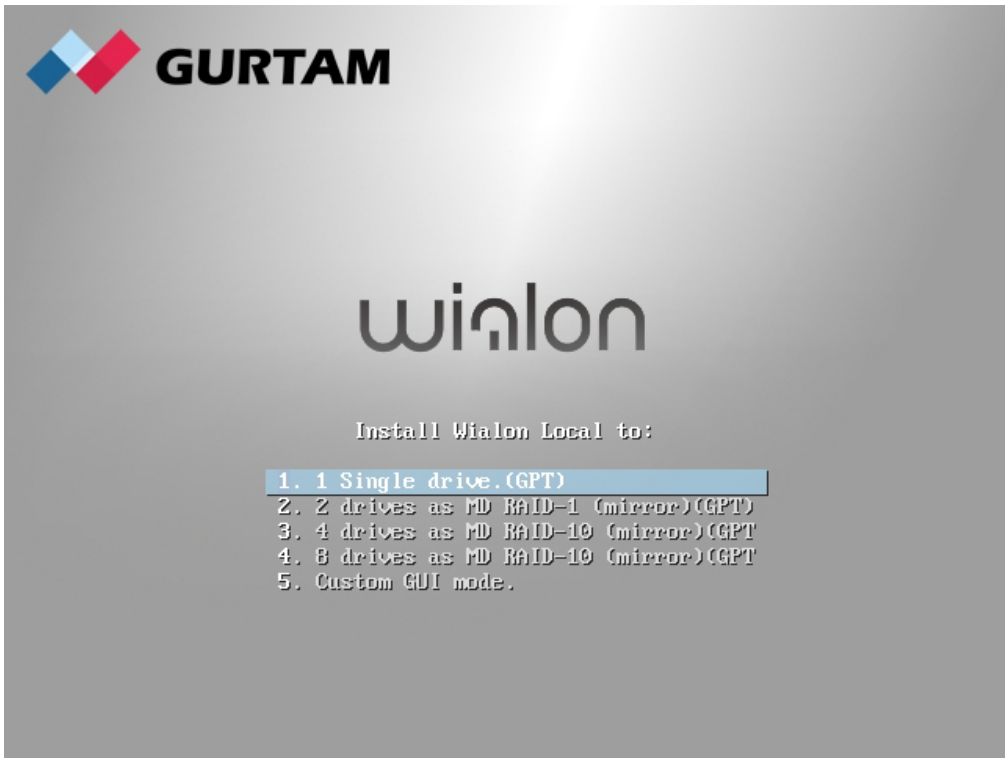
The Wialon Local distribution contains the Debian Linux (Buster) operating system. We recommend installing Wialon Local on a physical server.

To install the distribution on the Windows server, use a virtual machine.

First, download ISO image from the distribution server and record it on a CD, DVD, or USB flash drive.

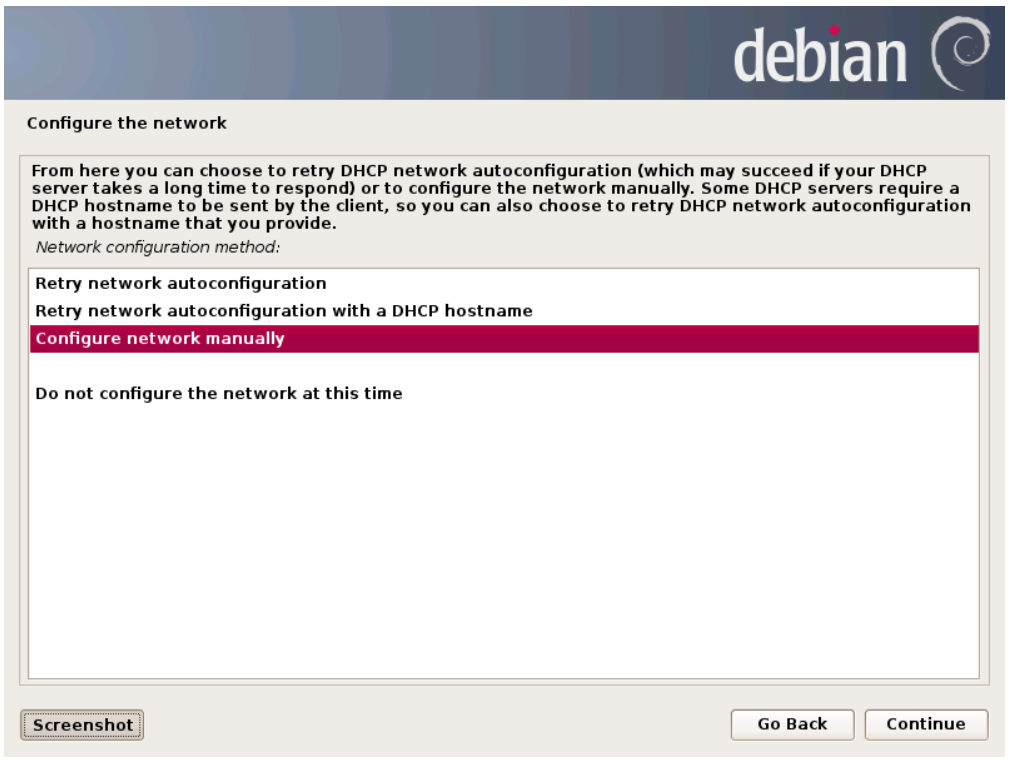
Adjust BIOS configuration so that to boot from the CD/DVD drive. Then follow the instructions on the screen:

1. Select the installation type: one, two (RAID-1), four (RAID-10) or eight (RAID-10) drives.



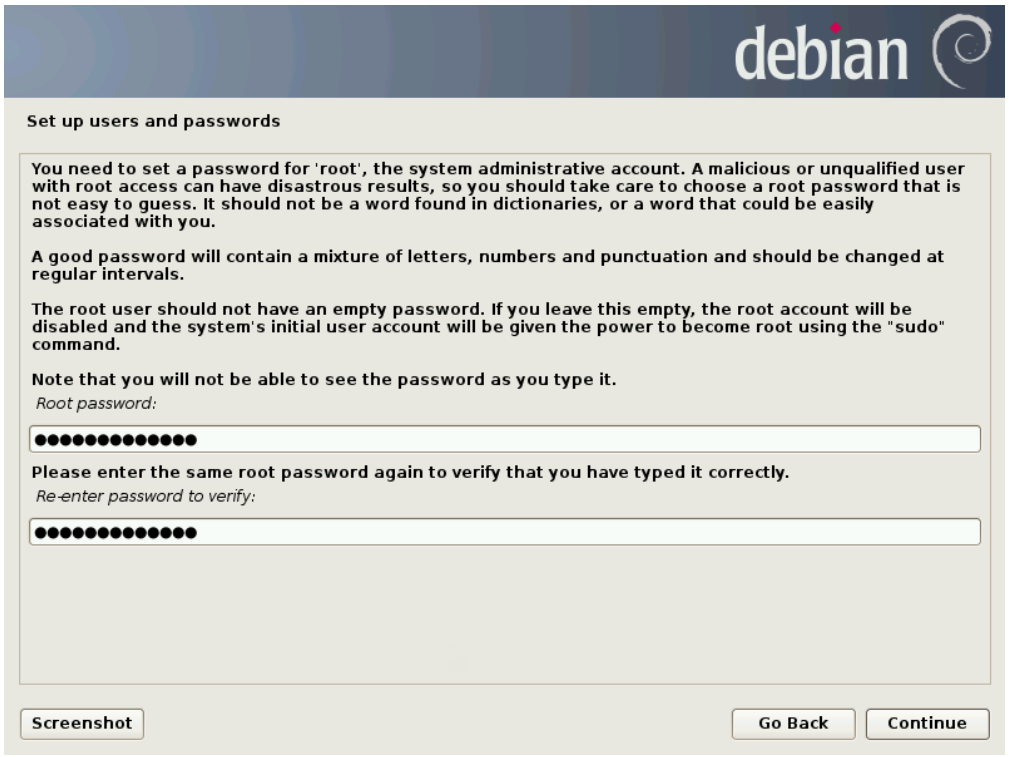
2. If more than one network is detected, you will be asked to select which one should be used during the installation process.

However, if DHCP server is not available during the installation, check network availability and repeat network adjustment or set network parameters manually:

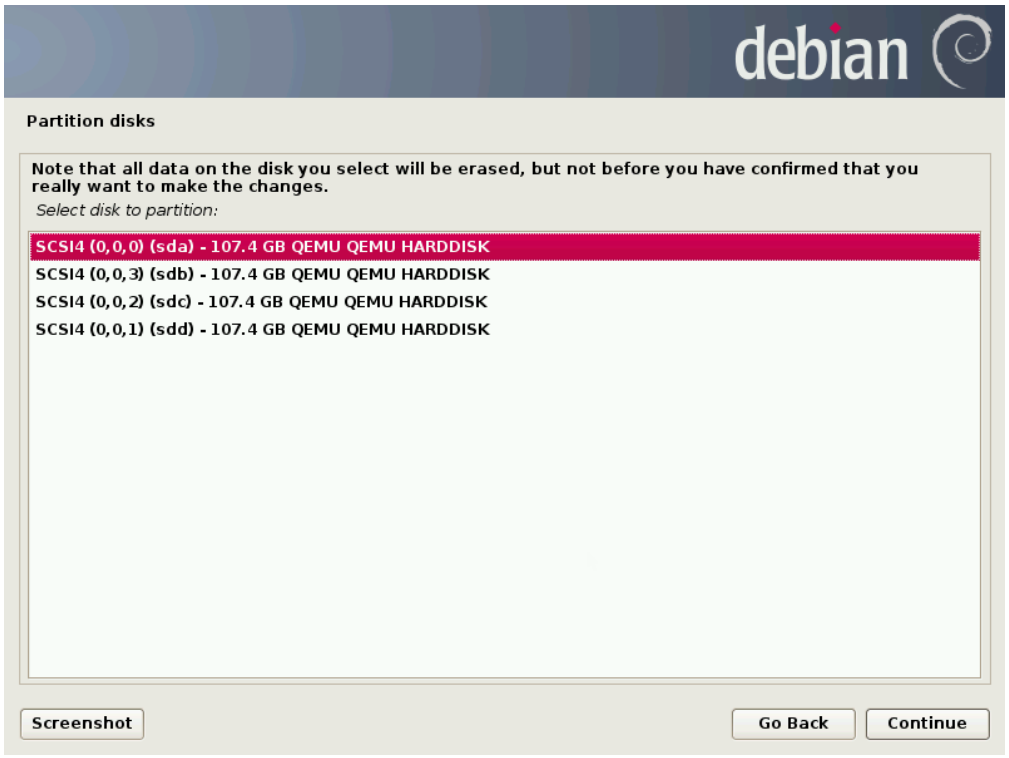

debian
Configure the network
From here you can choose to retry DHCP network autoconfiguration (which may succeed if your DHCP server takes a long time to respond) or to configure the network manually. Some DHCP servers require a DHCP hostname to be sent by the client, so you can also choose to retry DHCP network autoconfiguration with a hostname that you provide.
Network configuration method:
Retry network autoconfiguration
Retry network autoconfiguration with a DHCP hostname
Configure network manually
Do not configure the network at this time
Screenshot
Go Back
Continue


debian
Configure the network
The IP address is unique to your computer and may be:
* four numbers separated by periods (IPv4);
* blocks of hexadecimal characters separated by colons (IPv6).
You can also optionally append a CIDR netmask (such as "/24").
If you don't know what to use here, consult your network administrator.
IP address:
10.10.10.10/18
Screenshot
Go Back
Continue

3. Set up password for the **root** account — main account of your Debian OS.

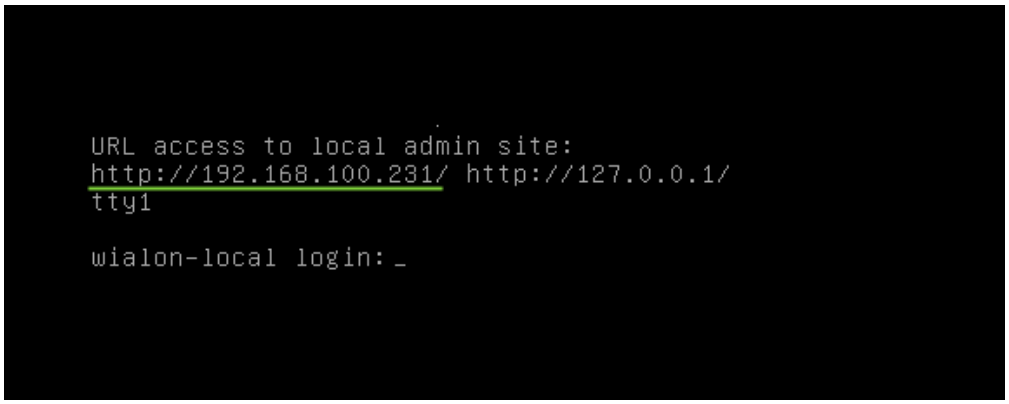


4. If installation on one drive was selected at the beginning, specify a particular drive here.



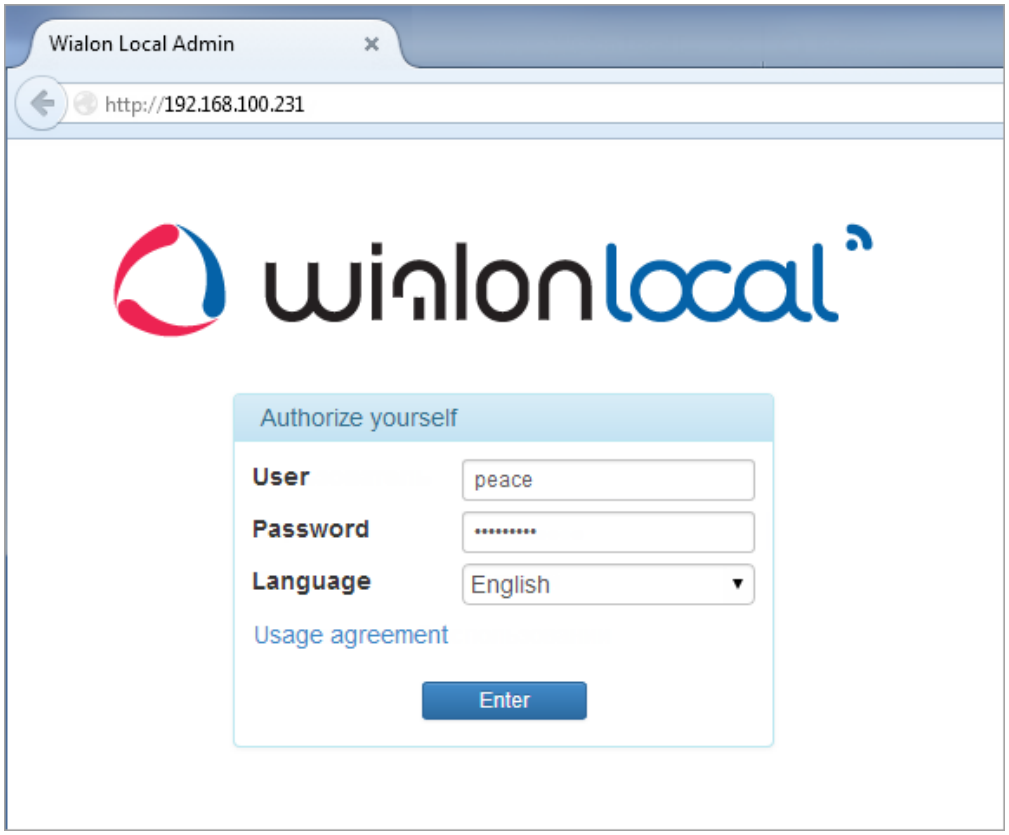
5. When the installation process is complete, the system will reboot automatically (do not forget to readjust BIOS settings back). After the reboot, the URL address of Wialon Local

administration system will be shown.

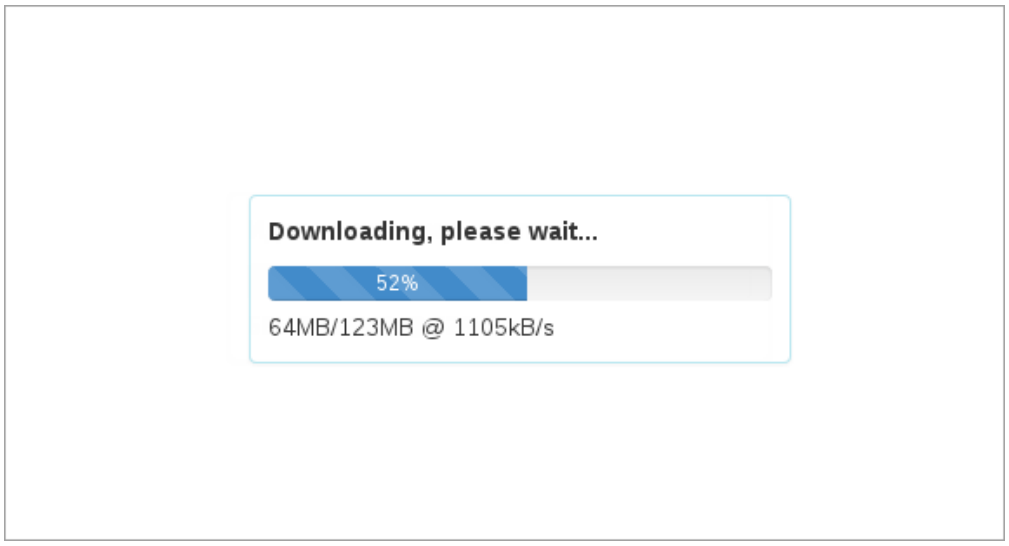


6. Enter this URL in the address bar. To authorize, use the user name and the password given to you when purchasing Wialon Local.

> If you pre-install Wialon Local for the backup server, do not perform this and the following steps.



7. After a successful authorization, Wialon Local will be downloaded and installed. This may take some time.



8. When the process is complete, you log into the Administration system. If needed, configure access to it (see below).

The default interfaces of management and monitoring systems are available on ports **8024** and **8025**, respectively.

> Depending on the configuration of your server, a non-standard installation may be required. In case of difficulties, contact tecnical support.

Configuring access to the administration system

When you first log in to the administration system, you can receive a message that reads: **You are looking for site that is not available here. Please check your DNS configuration.**

In this case, you should register your new address for the administration system in the /etc/nginx/conf.d/lcm.conf file.

For example:

```
server_name      192.168.100.231 127.0.0.1 your-new-name.server;
```

Upgrading Wialon Local

Upgrading the server system is required for the proper functioning of Wialon Local technologies.

> ⚠ Please upgrade Wialon Local strictly according to the steps in the instructions and comply with the requirements for Debian and Node.js versions (see below).
> After the upgrade, it is not possible to revert to a previous version.

Wialon Local versions are upgraded **consecutively**, that is, one after another. For example, if you want to upgrade Wialon Local from version 1504 to 2004, you should upgrade it to version 1604 first, and then to version 1704. After that, you should follow the instructions below successively:

- How to Upgrade Wialon Local from v1704 to v1804,
- How to Upgrade Wialon Local from v1804 to v1904,
- How to Upgrade Wialon Local from v1904 to v2004.

The procedure for upgrading Wialon Local versions varies because they use different versions of the Debian operating system and Node.js packages.

Wialon Local versions	Debian versions	Node.js versions
1504, 1604, 1704	8 (Jessie)	0.10.x
1704, 1804, 1904	9 (Stretch)	6.x
1904, 2004	10 (Buster)	10.x

Range of device ports

Due to the increase in the number of supported hardware, it has become necessary to expand the range of open ports on servers with Wialon Local.

To do this, open ports from 20100 to 30000 (the previous standard range of ports is from 20100 to 21999) in the **iptables** rules following the steps below.

1. If you use the standard **iptables** configuration, open the **/etc/iptables/rules.v4** file and replace the lines:

```
-A INPUT -p udp -m state --state NEW -m udp --dport 20100:21999 -m comment --
comment "HW ports" -j ACCEPT
-A INPUT -p tcp -m state --state NEW -m tcp --dport 20100:21999 -m comment --
comment "HW ports" -j ACCEPT
```

with the lines:

```
-A INPUT -p udp -m state --state NEW -m udp --dport 20100:30000 -m comment --
comment "HW ports" -j ACCEPT
-A INPUT -p tcp -m state --state NEW -m tcp --dport 20100:30000 -m comment --
comment "HW ports" -j ACCEPT
```

You can do the same with one command:

```
sed -i 's/21999/30000/' /etc/iptables/rules.v4
```

2. Next, execute:

```
iptables-restore < /etc/iptables/rules.v4
```

How to Upgrade Wialon Local from v1704 to v1804

This guide describes the sequence of steps you should follow if you want to upgrade Wialon Local from version 1704 to version 1804.

In order for Wialon local version 1704 and above to function correctly, the Node.js 6.x package is required. Support for older versions of Node.js, starting with the release of 1804, is discontinued.

The official Debian 8 and Debian 9 repositories include earlier versions of packages. When installing from our distribution package, the required Node.js version is installed automatically.

1. Upgrade **Node.js** to the version **6.x** if you receive a notification that the version of Node.js that is used on your server is out of date. To do this, follow the steps below.
   - Log in to the terminal on behalf of the main user (root) and run the following commands:

```
cd /home/wialon/wlocal/
service wlocal stop
./adf_script stop
apt-get install -y curl
```

```
curl -sL https://deb.nodesource.com/setup_6.x | bash -
apt-get install -y nodejs
npm -g install forever
npm install
chown -R wialon:wialon /home/wialon/
service wlocal restart
```

- Check the availability of your sites after they restart.

> To update Node.js, you can also contact technical support. In this case, in the letter specify SSH credentials (IP, login and password) to access the server console.
> The instruction is also located on the official site of the Node.js developer.

2. Install the version **1804** of **Wialon Local** .

How to Upgrade Wialon Local from v1804 to v1904

When upgrading Wialon Local from version 1804 to version 1904, follow the steps below.

1. Make sure that the **Debian** operating system has been upgraded to version **9 (Stretch)**.
   - When updating from **Debian 8** to **Debian 9**, add a line “include /etc/nginx/modules-enabled/*.conf” to the file **/etc/nginx/nginx.conf** . Here is an example of the received file:

```
user www-data;
worker_processes  2;
worker_rlimit_nofile 65535;
include /etc/nginx/modules-enabled/*.conf;

error_log  /var/log/nginx/error.log;
pid        /var/run/nginx.pid;

events {
       worker_connections  65535;
}

http {
       include       /etc/nginx/common/*;
       include       /etc/nginx/conf.d/*;
}
```

2. Add additional options (listed below) to the **nginx** configuration files for the admin site (/etc/nginx/conf.d/lcm.conf). Add the options to the **location** element of the **server** section of the **lcm.conf** file and to the configuration of other nginx involved in proxying requests. This is required to activate work using web sockets.

```
proxy_set_header Upgrade $http_upgrade;
proxy_set_header Connection "Upgrade";
```

Example of the **lcm.conf** configuration file:

```
server {
    listen        80;
    server_name    10.10.10.10;
    client_max_body_size 10000m;
    proxy_read_timeout 500;
    location /50x.html {
        root /home/wialon/wlocal/nginx/www/nginx-default;
    }
    location / {
        if ( $args ~* dns-test ) {
            echo 1;
        }
        proxy_set_header Upgrade $http_upgrade;
        proxy_set_header Connection "Upgrade";
        proxy_pass         http://localhost:8080;
    }
    access_log /var/log/nginx/lcm.access.log;
}
```

3. Install the **ripgrep** utility. It is required for quick reading of statistical information about the status of the server.

```
wget --no-check-certificate http://ftp.br.debian.org/debian/pool/main/r/rust-ripgrep/ripgrep_0.10.0-2_amd64.deb -O /tmp/ripgrep.deb
dpkg -i /tmp/ripgrep.deb
```

4. Install the version **1904** of **Wialon Local**.

How to Upgrade Wialon Local from v1904 to v2004

To upgrade Wialon Local from version 1904 to version 2004, follow the steps below.

1. Upgrade the operating system **Debian** to the version **10 (Buster)**.
2. Install the **pigz** and **curl** utilities. To do this, log in to the terminal on behalf of the main user (root) and run the following command:

```
apt-get install pigz curl
```

3. Upgrade **Node.js** to the version **10.x**, by running on behalf of the main user (root) the following commands:

```
cd /home/wialon/wlocal/
service wlocal stop
./adf_script stop
apt-get install -y curl
curl -sL https://deb.nodesource.com/setup_10.x | bash -
apt-get install -y nodejs
npm -g install forever
npm install
chown -R wialon:wialon /home/wialon/
service wlocal restart
```

Check the availability of your sites after they restart. To update Node.js, you can also contact technical support. In this case, in the letter specify SSH credentials (IP, login and password) to access the server console.

The instruction is also located on the official site of the Node.js developer.

4. Install the version **2004** of **Wialon Local** .

Backup Server

Hot Backup installation software is installed to provide online data backup. This installation software is recommended to be installed and activated on the server different from the one where your operating Wialon Local is launched.

The hot backup server provides real-time full replication of Wialon Local database (**storage** directory). There is a possibility of simultaneous usage of several hot backup servers with no additional licensing needed.

Installation

Requirements

The backup server is installed on the 64-bit Debian operating system. The main requirement is the size of the hard drive which should be at least the size of the main server. If you plan to use this server as the primary one in the event of a critical accident, its parameters should be similar to the parameters of the original server.

Installation

Use one of the methods described below to install the backup server.

Method 1 (preferred):

- download the archive and unpack it;
- run **./install.sh** in the directory that was unpacked;
- answer the script's configuration questions;

- execute the **service wlbackup restart** command.

Enter the same parameters (address, port and access key) of your backup server on the Wialon Local administrator site.

Additional scripts:

- **cold_backup.sh** stops the backup module, makes an archive of its database and starts the backup module again. It deletes the oldest archive with data base if there is less than 20% of disk space left or if there are more than 5 storage archive files.
- **add7dayscron.sh** adds **cold_backup.sh** script in cron. As a result, the latter is executed once per week automatically.

Method 2:

- download the archive;
- unpack the archive in the working directory;
- activate a hot backup system. To do this, set the variable in the configuration file (custom/config.txt) as follows:

```
ADF_STORAGE_SYNC_SERVER = server_ip:port:access_key
```

where **server_ip** is the backup server's address (if there are several interfaces, choose the one that will be used for backup); **port** is the port where the backup server will 'listen' for connections; **access key** is the parameter necessary for additional protection of the connection to the port;

- start the service. To do this, go to the directory where the server is installed and run the **./adf_script start** command as root. To stop the service, use the **./adf_script stop** command.

Enter the same parameters (address, port and access key) of your backup server on the Wialon Local administrator site.

Recovery from failure

See below two variants of actions in case of a failure of the main server.

Recovery of the main server's work

The steps that should be followed to use reserve server database copy in case of Wialon Local server failure:

- stop Wialon Local on the main server;
- stop hot backup server;
- recover main server's working capacity;
- reinstall Wialon Local on it;

- move 'storage' directory from backup server to the main one;
- start Wialon Local on the main server.

If AVD maps are used, it is not necessary to restore the contents of the folder **maps** from the backup. However, downloading and readjustment of maps may slow down the process of restoring the service for the end users.

> ⓘ To save as much data as possible, the devices must have a black box. In this case, the messages will be downloaded completely within several hours after launching the service (if there are thousands of units; if there are fewer — the downloading will take less than an hour).

Using backup server as the main one

This alternative allows reducing the time of the server's inaccessibility to the end users.

Since it is supposed that in case of a hardware failure the backup server will become the main one, it is strongly recommended that their characteristics coincide, including the supplementary equipment (backup power supply, modems, etc.).

The action sequence, in this case, is as follows:

- Install Wialon Local on the backup server. The installation steps must be performed up to step 5 inclusive. To avoid accidental or intentional executing of step 6, it is recommended to restrict the access to the administration system to the local IP. To do this, it is necessary to change the line **server_name** in the file **/etc/nginx/conf.d/lcm.conf** leaving only **localhost** (127.0.0.1) in it and restart **nginx**.
- Install backup module to the backup server, define the path for saving **storage** by means of a symlink.
- In case of a failure of the main server stop the backup module and transfer the main IP to the backup server (that is switching the cable or changing the network settings).
- Log on to the administration system of the backup server, enter user name and password, repeat the configuration of the administration system of the main server (sites, maps, skins, restrictions, modems, etc.).
- Start Wialon Local on the backup server.

In order to back up maps, administration system's configuration or other necessary archives you can add **lsyncd** — the utility will instantly synchronize the files' changes on local and remote servers.

Wialon Local License

The license is integrated into your personal build of software.

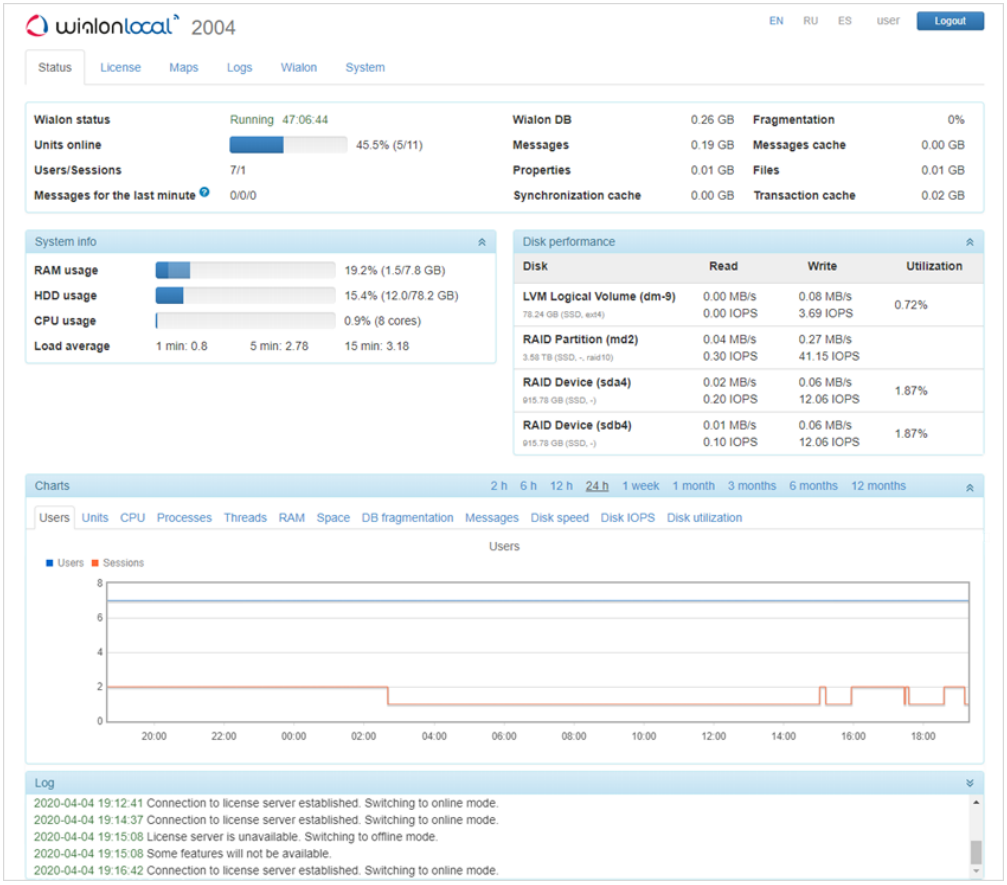
Every day, Wialon Local connects to the license server **lic.gurtam.com** (port 31176) and confirms the usage of the product on one server at a time. If this license check is blocked because of firewall or lack of Internet connection, it will cause a ban to use the program. In this case, you will not be able to create new units and use Gurtam Maps. Some time later, however, all services of Wialon Local get denied except for the administration panel.

> ⚠ The client's server that sends queries to the license server should have a **single** permanent (static) IP address.

If there is a problem with the license, you cannot create any units, and phrases like **Error fetching license: 'avl.unit'** can be found in log files. Several times a day Wialon Local connects to the server **local-api.wialon.com** to fetch updates. This server is also responsible for the authorization of the administrator. A successful authorization of the administrator, as well as successful purchases are possible only with an enabled Internet connection.

Status

The **Status** tab displays information about the main parameters of the service performance in real time.



General Information

The top block displays the general status information about Wialon Local.

The parameters available in the block are described below.

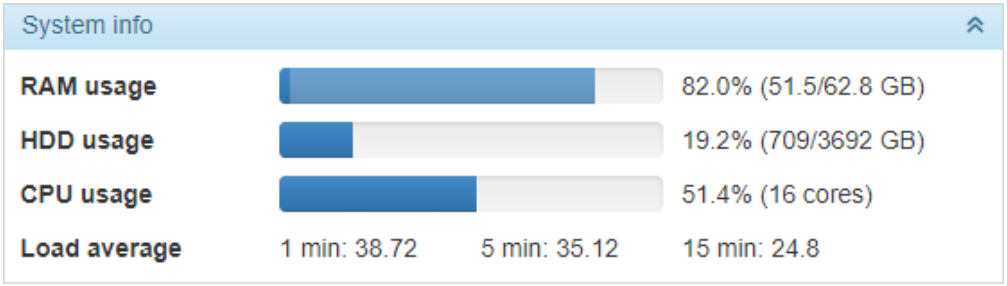
Parameter	Description
Wialon status	The current state of Wialon Local: running or stopped. The duration of the **Running** status is displayed in the **hours:minutes:seconds** format.
Units online	The percentage ratio of the number of units online to the total number of the created units. The value in parentheses is displayed in the **x/y** format, where **x** is the

Parameter	Description
	number of units online and **y** is the number of all created units.
Users/Sessions	The number of users created in the system and the number of active sessions at the moment. ⓘ One user can create multiple sessions.
Wialon DB	The total size of the Wialon database.
Messages	The total size of all messages in the Wialon database.
Properties	The total size of all elements and their properties in the Wialon database.
Synchronization cache	The size of the cache used to synchronize the main database with the backup server (if the server is configured). The worse the connection, the larger the cache size.
Fragmentation	The current level of database fragmentation (expressed as a percentage).
Messages cache	The size of the message cache on the disk. The more intense the flow of messages from the equipment, the higher the readings.
Files	The total size of files (icons, pictures, etc.) that are stored in the database.

Parameter	Description
Transaction cache	Cache size used to collect messages. Messages are uploaded to the database every 10 minutes.

System info

The **System info** block displays the usage of available memory and the average processor load.

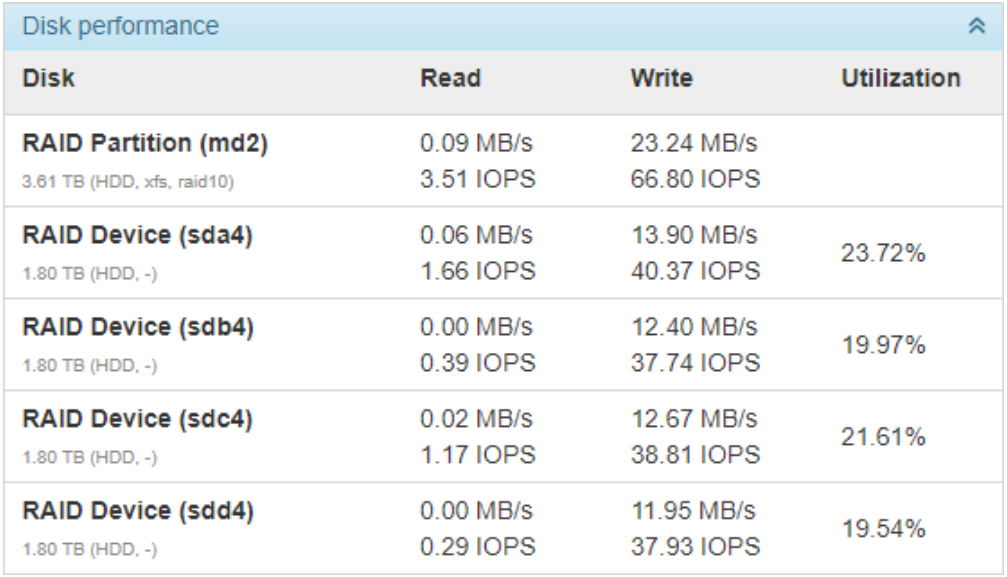


Parameter	Description
RAM usage	The amount of RAM in use. It is shown as a percentage in the **x/y** format, where **x** is the amount of memory used and **y** is its total amount. The process indicator for RAM simultaneously shows the data for the **Used** (darker color) and **Cached** values.
HDD usage	The amount of disk space in use. It is shown as a percentage in the **x/y** format where **x** is the amount of the used space on the disk and **y** is its total volume. If the value of the used disk space reaches 90%, the administrator receives an alert (the administrator's email is specified on the System tab). In addition, if the critical level of free space (5 GB) is reached, the service stops automatically to avoid database corruption. In this case, an email is also sent to the administrator.
CPU usage	The data on CPU usage (expressed as a percentage). The total number of cores of the installed processors is shown in parentheses.

Load average	Server load indicator for the last 1/5/15 minutes.

Disk performance

The **Disk performance** block displays the data on the intensity of reading, writing and the load on hard disks where the Wialon Local database is located.



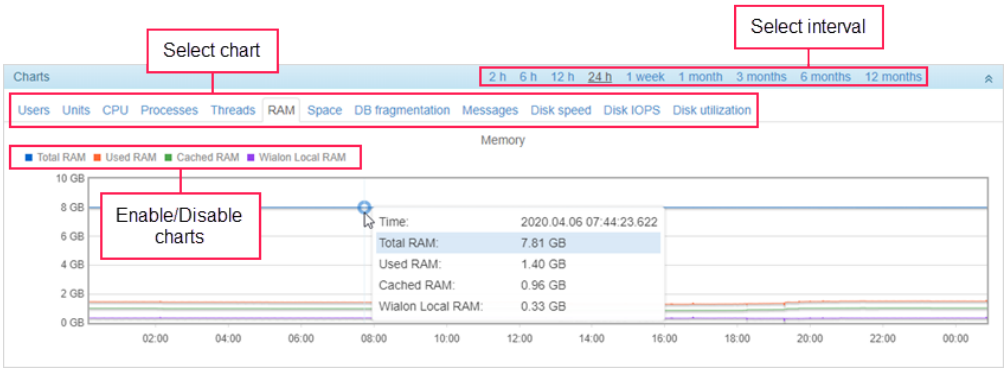
For each disk, the information is displayed according to the following parameters.

Parameter	Description
Read	Read speed in MB/s.
Write	Write speed in MB/s.
Utilization	Disk load as a percentage.

The disks are displayed in the block in accordance with their hierarchy.

Charts

The **Charts** block displays visual information on various characteristics. The time interval is selected in the upper right part of the block.



The table below lists all the charts and the curves available for them.

Chart	**Curves**
Users	Users, Sessions
Units	Units, Units online
CPU	CPU, Load average
Processes	Processes
Threads	Threads (the total number of all threads in the system), Wialon threads (threads occupied by Wialon), Local threads (threads occupied by the **wlocal** service), Wialon active threads
RAM	Total RAM, Used RAM, Cached RAM, RAM Wialon Local
Space	Total space, Used space, DB, Messages, Properties, Files, Messages cache, Logs directory, Synchronization cache, Transaction cash
DB fragmentation	DB Fragmentation
Messages	Read messages, Written messages, Messages requests

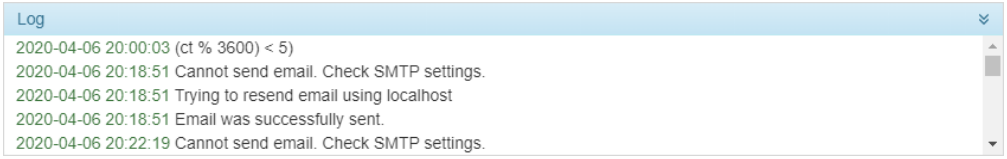
Disk speed	A curve for each disk where the DB is located
Disk IOPS	A curve for each disk where the DB is located
Disk utilization	A curve for each disk where the DB is located

To enable or disable the display of any curve, click on its name above the chart.
The gaps in some sections of the curves indicate that the **wlocal** service was stopped at the time intervals to which the curves correspond (for the **Users/Units** charts, it signals that Wialon was stopped).

When you hover the mouse cursor over the point of the chart, tooltips appear.

Log

A log is displayed at the bottom of each tab in the Administration system. It displays information about current events that take place in Wialon Local. For instance, about its starting or stopping, availability of updates, components installation, etc. When the page is reloaded, all events are removed from the log.



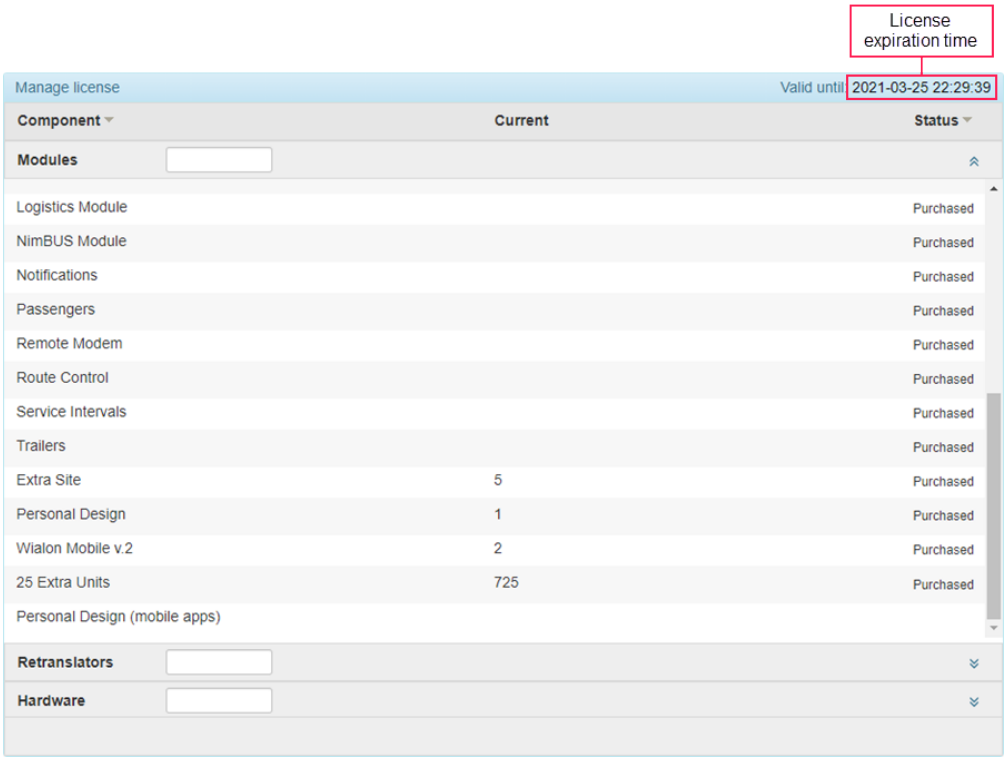
License

On this tab, you can see the activated Wialon Local components and their status.

> ⓘ The amount of available system functionality depends on the configuration of the distributive included in your package.

If you want to activate new components, go to your personal account or write to partners@wialon.com. After purchasing a component, you will receive an update which you have to install on the System tab. To complete the procedure, Wialon Local is automatically restarted. In certain cases, you may need to refresh the page and clear the cache. The activated components receive the **Purchased** status.

In the upper right corner of the block, you can see the time of the **license expiration**. If the license expires in less than 12 hours, a yellow indicator is displayed next to the time. If the license has expired, a red indicator is shown. The red indicator can also denote that there is no Internet connection required for the connection to the license server and correct work of Wialon Local.



Components

Three types of components are available: modules, retranslators, and hardware.

Modules

The main purpose of modules is to extend the possibilities of your service. The modules allow adding new features for the end users (such as Notifications, Fuel control, Advanced reports, etc.) or enhance the general properties of the service (such as Hot backup, Personal design, Extra site, etc.).

ⓘ Besides status, the number of module items is shown for such components as **Units**, **Extra Site**, **Wialon Mobile 2,** and **Personal Design**.

Retranslators

Here you can see a list of retranslation protocols for your service.

Hardware

This block contains a list of the device types used in the system. All hardware is divided into groups according to the manufacturer. This means that if you purchase XYZ hardware, you purchase all types of devices produced by the XYZ company. See GPS hardware for further information and the full list of the supported devices.

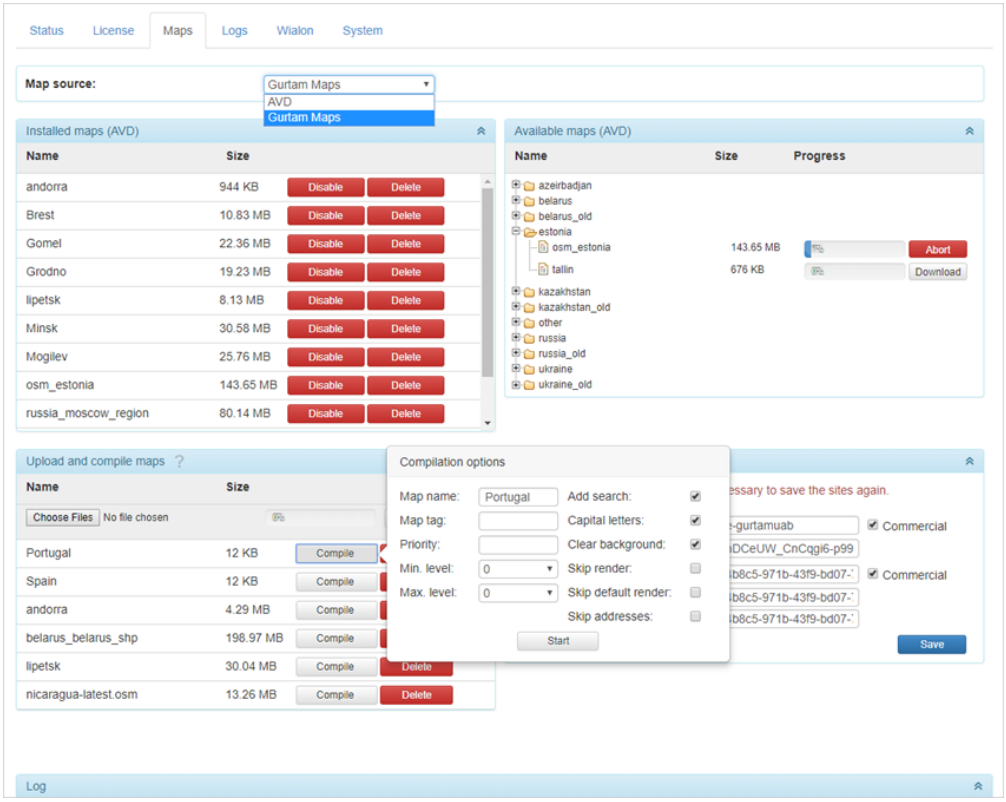
Components list management

In all the blocks, the items are sorted alphabetically, however, the purchased items are placed above forming an additional list. You can change the type of sorting: by current usage or purchase status. To do this, click on the title of the corresponding column once (for direct sorting order) or twice (for reverse sorting order). To quickly find a certain item, use the filter to the right of the header of each block.

You can disable the division of the items by status. To do this, click on **Status** in the header twice (unlike other titles, this one has three states: up, down, and none, when the sorting is disabled). With the sorting by status disabled, you can sort the list of items alphabetically or by other criteria.

Maps

On the **Maps** tab, the cartographic system is being configured. The maps are important for the end users in two ways. First, they serve as a background to place tracking units on it, build tracks of movements, draw geofences, etc. In addition, maps define the accuracy of the address information that appears during online tracking, as well as in reports.



Map source

Select the map source: AVD or Gurtam Maps (they cannot be used together).

Choosing Gurtam Maps means that Gurtam is responsible for maintaining the map server and updating cartographic data. That is why if you select Gurtam Maps, other sections on this page collapse indicating that they are not required.

Select AVD if you prefer to create and manage your own WebGIS server. The process is described below.

Configuring AVD maps

Installed maps (AVD)

Here you see the list of the installed maps. Maps can get here either from the section on the right or from the section below. A new map is added as enabled, however, you can disable it. In this case, it still stays on your server but is invisible to the users. A map can be also deleted permanently, that is erased from the server.

Available maps (AVD)

This is the list of the ready-to-use AVD maps provided by Gurtam. To install one of them, select it in the list and download it. The map appears in the **Installed maps** section immediately after downloading. For a quicker search, all available maps are sorted into folders by country.

Upload and compile maps

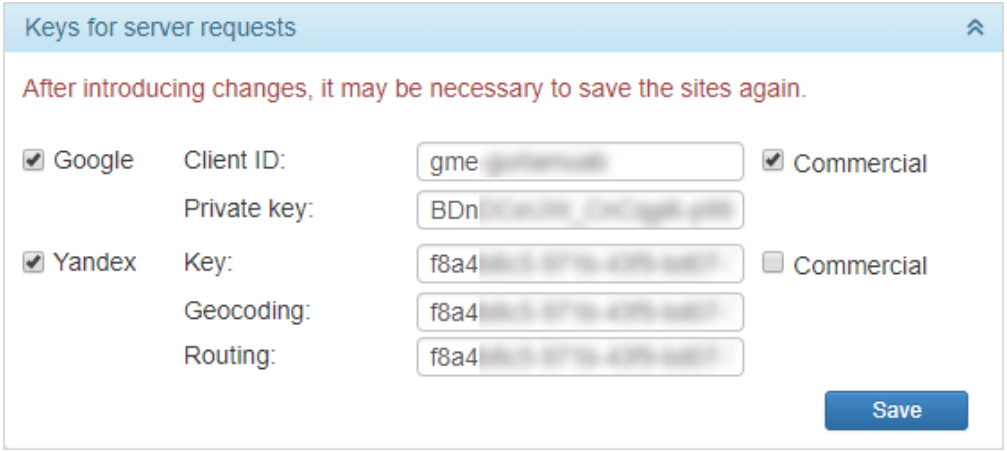
If you have your own maps, you can upload them and then install on your server. If an uploaded map is in AVD format, it gets into the **Installed maps** section at once. If you have another kind of source map, it needs compilation after uploading. Press the **Compile** button, adjust the compilation parameters, and press **Start**. More information about how to create maps can be found here.

> ⚠ The map files should be uploaded as an archive (TAR, RAR or ZIP) and contain no nested folders.

Keys for server requests

Requests for geocoding and routing using Google and Yandex maps can go not only directly to the cartographic server, but also firstly be sent to the server where Wialon Local is installed.

In this section of administrative settings, you can specify the keys required for server requests. For each of the cartographic services, you can specify a free or commercial key. This is regulated by enabling or disabling the **Commercial** option.



Check the required cartographic server, specify the key for it and click on the **Save** button. The fields for free and commercial Google keys differ (**Key** is replaced with the **Client ID** and **Private key** fields).

The settings from this section are automatically inserted into the Maps tab in the settings of the websites of Wialon Web type.

⚠ When making changes in this section, you may need to save the site settings again on the **Wialon** tab.

WebGIS

Standard WebGIS server is included to the Wialon local. By default, any address information used for online tracking and reports is taken directly from it.

AVD format files are used in WebGIS. Files of such a format could be created from other vector data formats, such as MP, MapInfo, ESRI Shape, OSM (OpenStreetMap). Note that the source map should be done in the WGS-84 coordinate system (in grades).

Source maps in the supported vector format should be downloaded to the server. The source maps files should be given as data archive (TAR, RAR, ZIP) including a set of configuration files. Depending on the source map format, the archive should include a particular set of files.

⚠ To successfully unpack the archive on the server, the first one should not contain subfolders.

Compilation parameters

Parameter	Description
Map name	Map name, for example, the name of the city for which the map is created.
Map tag	Map tag like city, country, etc. Could be used for a search or as a drawing filter.
Priority	Map priority; 100 by default. Bigger priority means earlier map render. Maps with minor priority are rendered later and are situated above those with bigger priority.
Min level	The minimum desired level at which to draw a map (0-16).

Parameter	Description
Max level	The maximum desired level at which to draw a map (0-16).
Add search	Add information for search to the map.
Capital letters	Consider letter case (lower/upper) in the MP file address info (cities, regions, countries).
Clear background	Clear background on render map option is used for combining multiple maps. Maps with higher priority situated in lower layers are not displayed. If maps overlay, the top (more detailed) map is displayed. The background is white. The flag is highly recommended to be used.
Skip render	Skip map rendering is used when you do not want to add drawing information to the file (in this case, the map is used for a search only).
Skip default render	Not to include the drawing information for the map into the file by default. Map rendering is available only for the billing plans with the corresponding map tags.
Skip addresses	Not to add information to the file for reverse geocoding (determining the address by coordinates) on the map (it is used only for rendering).

Creating a map from MP format

To create a map from the Polish MP format, you have to use a special XML configuration file. To download it on the server, an archive consisting of a source map in MP format and of a configuration XML file should be created.

⚠ The names of the configuration XML file and of the archive must be the same.

Standard configuration file transforming MP files to AVD files (pfm.xml) can be downloaded here: http://distro.gurtam.com/maps_cfg/. You can create your own configuration file according to your requirements.

Example:

```
<pfm>
<feature type="0x0001" shape="PL" avd_type="1" max_level="2" name="A restricted
access major divided highway, normally with 2 or more running lanes plus emergency
hard shoulder. Equivalent to the Freeway, Autobahn, etc." use_addr="1" is_street="1"/
>

<feature type="0x0002" shape="PL" avd_type="3" max_level="2" name="     Important
roads that aren't motorways. Typically maintained by central, not local government.
Need not necessarily be a divided highway." use_addr="1" is_street="1"/>

<feature type="0x0003" shape="PL" avd_type="5" max_level="2" name="Roads generally
linking larger towns." use_addr="1" is_street="1"/>

<feature type="0x0004" shape="PL" avd_type="7" max_level="2" name="Roads generally
linking smaller towns and villages." use_addr="1" is_street="1"/>

<feature type="0x0000" shape="PL" avd_type="9" max_level="2" name="Minor roads."
 use_addr="1" is_street="1"/>
<feature type="0x000a" shape="PL" avd_type="11" max_level="1" name="Unclassified
roads typically form the lowest form of the interconnecting grid network." use_addr="
1" is_street="1"/>
<feature type="0x0042" shape="PL" avd_type="12" max_level="1" name="Unpaved roads."
 use_addr="1"/>

<feature type="0x3008" shape="POI" avd_type="59" max_level="0" name="A fire station."
 use_addr="1" is_house="1"/>
<feature type="0xf001" shape="POI" avd_type="60" max_level="0" name="Bus station."
 use_addr="1" is_house="1"/>
<feature type="0x2f06" shape="POI" avd_type="61" max_level="0" name="A bank."
 use_addr="1" is_house="1"/>
<feature type="0x2b00" shape="POI" avd_type="62" max_level="0" name="A hotel."
 use_addr="1" is_house="1"/>
</pfm>
```

The following parameters are used in the configuration XML file.

Parameter	Description
use_addr	Use this element when searching an address by coordinates.
is_city	Use this element when searching a place by name (city).

Parameter	Description
is_street	Use this element when searching a street by name (street). Locking (snap) to roads function can also use this element.
is_house	Use this element when searching a house by name or number (house).
is_road	The road. This element can also be used to lock the unit's movements to existing roads.
type	Source type from MP file (Polish format).
shape:	PG — polygon, PL — polyline, POI — point.
avd_type	Resulting map type in AVD file (0—255).
max_level	Maximum level to store map data in AVD format. Levels depend on meterage: o level — from 10 to 250 meters, 1 level — from 250 m to 20 km, 2 level — from 20 to 500 km.
name	The name of an object, area, point, that is a custom mark.

The following **conditions** should be met in order to store map inscriptions properly:

- source MP file must be encoded in Win 1251, and the inscription (IMG ID) must contain the string **CodePage=1251**;
- source MP file must be encoded in Win UTF-8, and the inscription (IMG ID) must contain the string **CodePage=1252** or other value different from 1251.

Creating maps from OSM format

To create maps from OSM format files, a configuration XML file or allCountries.txt are used. To download on the server, an archive containing OSM format source map, configuration XML file, and allCountries.txt should be formed. The last one (allCountries.txt) is an additional file for address binding. The document consists of world cities list in which the population size is indicated. An

approximate radius of a city is calculated on the basis of the special algorithm and depends on the population size.

osm.xml is a configuration file transferring OSM files to the standard AVD files.

Standard configuration file transferring OSM files to AVD files (osm.xml) and allCountries.txt could be downloaded here: http://distro.gurtam.com/maps_cfg/.

Maps from other vector formats

To create maps from other vector formats such as MapInfo, ESRI shapefile, etc., it is necessary to download an archive consisting of the source map layers in a corresponding format and of a configuration XML file.

XML file should be encoded in UTF-8 without BOM:

```
<conv name="cheljabinskaja" encoding="utf8">
    <layer file="chel-roads-l.shp">
                <features max_level="1" name="$NAME" use_addr="1" is_street="1"
 region="$ADDR_REGIO" street="$NAME">
                        <mod filter="(highway ='bridleway') or (highway
='living_street')" type="14"/>
            <mod filter="(highway ='path') or (highway ='steps')" type="16"/>
        </features>
    </layer>
    <layer file="chel-buildings-a.shp">
        <features type="210" max_level="1" name= "$ADDR_HOUSE" is_house="1" region="$
ADDR_REGIO" street="$ADDR_STREET" house="$ADDR_HOUSE" use_addr="1"/>
    </layer>
    <layer file="chel-city-p.shp">
        <features type="64" max_level="2" name="$NAME" address="$NAME">
            <mod filter="PLACE ='village'" type="66" is_city="1" region="$ADDR_REGIO"
 max_level="1" name="$NAME" address="$NAME"/>
            <mod filter="PLACE = 'town'" type="65" is_city="1" region="$ADDR_REGIO"
 max_level="1" name="$NAME" address="$NAME"/>
            <mod filter="PLACE = 'city'" type="64" is_city="1" region="$ADDR_REGIO"
 max_level="1" name="$NAME" address="$NAME"/>
        </features>
    </layer>
    <layer file="chel-landuse-a.shp">
        <features type="166" max_level="1" name="$NAME">
            <mod filter="LANDUSE ='Military'" type="173" max_level="1" name="$NAME"/>
            <mod filter="LANDUSE ='cemetery'" type="147" max_level="1" name="$NAME"/>
            <mod filter="LANDUSE ='commercial'" type="151" max_level="1" name="$NAME"
/>
            <mod filter="LANDUSE ='forest'" type="165" max_level="1" name="$NAME"/>
            <mod filter="LANDUSE ='nature_reserve'" type="184" max_level="1" name="$N
AME"/>
            <mod filter="LANDUSE ='residential'" type="166" max_level="1" name="$NAME
"/>
        </features>
```

```
    </layer>
    <layer file="chel-admin-a.shp">
        <features type="0x004a" shape="PG" avd_type="0" max_level="0"/>
    </layer>
</conv>
```

The file starts and ends with the **conv** tag. The following keys can be used inside this tag: **name** — map name, **encoding** — file encoding for a conversion.

The main part of a map conversion is the description of the layers used to receive data. The **layer** tag allows to describe each layer individually and, if provided by different attributes, converse a map according to them.

The **file** key is used to define the layer file.

Then you should indicate the **features** layer properties. In the **type** key, it is necessary to indicate the elements' type value from the map in the format **.avd** (see it in **pfm.xml** or **osm.xml**). The **name** parameter is used to display any properties of a converted object. This parameter will be used as a caption for objects on the map. Only Latin letters and $ sign are accepted. In the above-mentioned example, the names for the used fields could be found in the files indicated there,i.e., in **.shp**. If other symbols are used, the file may be converted with errors or not converted at all. If you would like to convert such files, you should change the fields' names for the Latin ones.

It is also necessary to indicate the level on which the maps from the file will be situated. The **max_level** parameter is in charge of it. Depending on your preferences, you can vary these parameters from 0 to 2 or leave them as in **pfm.xml** or **osm.xml**.

The following parameters are optional.

Parameter	Description	Example
data_type	Object type: polygon (pg), polyline (pl), point (poi).	data_type="pg"
address	Define address by the indicated value.	
region	Define region name by the indicated value.	region="$Region"
street	Define street name by the indicated value.	street="$st"

Parameter	Description	Example
street_type	Define street type by the indicated value.	street_type="$sts_type"
house	Define house number by the indicated value.	house="$number"
is_city	Define if this object is a city. If it is not, do not use this parameter.	is_city="1"
is_street	Define if this object is a street. If it is not, do not use this parameter.	is_street="1"
is_house	Define if this object is a house. If it is not, do not use this parameter.	is_house="1"
dump_attr	It is responsible for displaying particular object properties (in **stdout**). It works in the same way as the **name** parameter, but it displays information for a user who is converting the map.	

The dollar sign in quotes (**"$"**) means that letters which follow will be used as a variable and substituted with this variable value. To use a usual text together with a variable, it is necessary to mark it with '|' sign from both sides. To retrieve data from some other layer, use the hash sign (**#**). After '#', set three parameters. In the first parameter, indicate the field from which the value should be taken, and then put a dot (**.**). The second parameter indicates the layer (filename without extension) to be used to get data, put a dot again. The third parameter indicates which field from the indicated layer should be used. The fourth parameter can be used if the value is hidden in a string field or among a number of values — enter a field, the equal sign (**=**), and '%' sign in single quotes (**'%'**). Do not forget to separate all parameters with dots.
Here is an example.

Let us assume, that we have two layers:

- the **cities** layer with the fields **ID, Name**, **Region**;
- the **streets** layer with fields **ID**, **City**, **CityID**, **Name**.

Then,

- to get street name and the city, use **$Name|, |#CityID.Cities.Name**;
- to get the city and region while searching by another field, use **$Name|, |#City.Cities.Region.Name='%'**.

If you have noticed that the layer file contains objects of different types (you can check it with the **dump_attr** parameter), and you want to display them as different types, use the '**mod**' tag. There you set filtration conditions and object type expected as the result of the conversion process. In the **filter** parameter enter the condition as SQL query. The **type** parameter is set in the same manner as it was described above.

In one **layer** there can be any number of **features**. In one **feature** there can be any number of **mod**.

If there is an error when reading the file, try to open it in another program, for example, Internet Explorer: if there are any errors in file body, IE displays only the correct part of the file. However, note that the check is performed only for opening/closing tags.

Use comments to make further editing and usage of the file easier.

Specifying Format

Vector maps in the closed AVD format allow rendering map images in various projections, fulfil the search of named objects, and detect location by given coordinates.

Conversion table: polyline

.MP	.OSM				.AVD					
Code	**Key**	**Value**	**Keys**	**Key_values**	**Type**	**AVD Type (0-255)**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
0x0001	highway	motorway			PL	1	2	A restricted access major divided		

.MP	.OSM				.AVD					
Code	**Key**	**Value**	**Keys**	**Key_values**	**Type**	**AVD Type (0-255)**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
								highway, normally with 2 or more running lanes plus emergency hard shoulder. Equivalent to the Freeway, Autobahn, etc.		
	highway	motorway_link			PL	2	2	The link roads (sliproads/ ramps) leading to/ from a motorway from/to a motorway or lower class highway.		

.MP	.OSM				.AVD					
Code	**Key**	**Value**	**Keys**	**Key_values**	**Type**	**AVD Type (0-255)**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
								Normally with the same motorway restrictions.		
0x0002	highway	trunk			PL	3	2	Important roads that are not motorways. Typically maintained by central, not local government. Need not necessarily be a divided highway.		
	highway	trunk_link			PL	4	2	The link roads (sliproads/ ramps)		

.MP	.OSM				.AVD					
Code	**Key**	**Value**	**Keys**	**Key_values**	**Type**	**AVD Type (0-255)**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
								leading to/from a trunk road from/to a trunk road or lower class highway.		
0x0003	highway	primary			PL	5	2	Roads generally linking larger towns.		
	highway	primary_link			PL	6	2	The link roads (sliproads/ramps) leading to/from a primary road from/to a primary road or		

.MP	.OSM				.AVD					
Code	**Key**	**Value**	**Keys**	**Key_values**	**Type**	**AVD Type (0-255)**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
								lower class highway.		
0x0004	highway	secondary			PL	7	2	Roads generally linking smaller towns and villages.		
	highway	secondary_link			PL	8	2	The link roads (sliproads/ ramps) leading to/ from a secondary road from/ to a secondary road or lower class highway.		

.MP	.OSM				.AVD					
Code	**Key**	**Value**	**Keys**	**Key_values**	**Type**	**AVD Type (0-255)**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
0x0000	highway	tertiary			PL	9	2	Minor roads.		0-6 7-8
	highway	tertiary_link			PL	10	2	The link roads (sliproads/ ramps) leading to/ from a tertiary road from/ to other minor roads.		
0x000a	highway	unclassified			PL	11	1	Unclassified roads typically form the lowest form of the interconne		0-6 7-8

.MP	.OSM				.AVD					
Code	**Key**	**Value**	**Keys**	**Key_values**	**Type**	**AVD Type (0-255)**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
								cting grid network.		
0x0042	highway	unsurfaced			PL	12	1	Unpaved roads.		
	highway	track			PL	13	1	Roads for agricultural use, gravel roads in the forest etc., usually unpaved/ unsealed but may occasionally apply to paved tracks as well.		
0x0005	highway	residential			PL	14	1	Roads accessing or around residential		0-6 (7-

.MP	.OSM				.AVD					
Code	**Key**	**Value**	**Keys**	**Key_values**	**Type**	**AVD Type (0-255)**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
								areas but which are not a classified or unclassified highway. Streets.		9)
0x0006 0x000b 0x0008 0x0009 0x0049	highway	living_street			PL	15	1	A street where pedestrians have priority over cars, children can play on the street, maximum speed is low. Sometimes called 'Home Zone'.		(0-5) (6)

.MP	.OSM				.AVD					
Code	**Key**	**Value**	**Keys**	**Key_values**	**Type**	**AVD Type (0-255)**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
0x0007	highway	service			PL	16	1	Generally for access to a building, motorway service station, beach, campsite, industrial estate, business park, etc. This is also commonly used for access to parking and trash collection.		(0-5) (6)
	highway	bridleway			PL	17	1	Roads for horses, cartage.		

.MP	.OSM				.AVD					
Code	**Key**	**Value**	**Keys**	**Key_values**	**Type**	**AVD Type (0-255)**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
	highway	cycleway			PL	18	1	Cycleways for bicycles.		
	cycleway	lane			PL	18	1	A lane is a route for bicycles that lies within the roadway.		
	cycleway	track			PL	18	1	A route for bicycles that is separate from the road.		
	highway	footway			PL	19	1	Footpaths for pedestrians, e.g. walking tracks and		

.MP	.OSM				.AVD					
Code	**Key**	**Value**	**Keys**	**Key_values**	**Type**	**AVD Type (0-255)**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
								gravel paths.		
0x0048 0x0016	highway	pedestrian			PL	19	1	For roads used mainly/ exclusively for pedestrians/shopping areas. Also for tagging squares and plazas.		
	highway	bus_guideway			PL	20	1	A busway where the vehicle guided by the way (though not a railway) and is not suitable for		0-6 (7-9)

.MP	.OSM				.AVD					
Code	**Key**	**Value**	**Keys**	**Key_values**	**Type**	**AVD Type (0-255)**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
								other traffic.		
	junction	roundabout			PL	21	1	Circle movement.		
0x0014	railway	rail			PL	25	1	Full sized passenger or freight trains in the standard gauge for the country or state.		
	railway	tram			PL	25	1	One or two carriage rail vehicles, usually sharing motor road for trams.		

.MP	.OSM				.AVD					
Code	**Key**	**Value**	**Keys**	**Key_values**	**Type**	**AVD Type (0-255)**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
0x003f	railway	subway			PL	26	1	A city passenger rail service running mostly grade separated. Metro/ underground/subway lines.		
	railway	disused			PL	25	1	A section of railway which is no longer used but where the track and infrastructure remains in place.		

.MP	.OSM				.AVD					
Code	**Key**	**Value**	**Keys**	**Key_values**	**Type**	**AVD Type (0-255)**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
	railway	monorail			PL	27	1	A railway with only a single rail.		
0x001f	waterway	river			PL	30	2	For narrow rivers which will be rendered as a line.		
0x0018	waterway	canal			PL	30	1	An artificial open waterway used for transportation, waterpower, or irrigation.		
0x0026	waterway	stream			PL	30	1	A naturally-formed waterway that is too thin to be		

.MP	.OSM				.AVD					
Code	**Key**	**Value**	**Keys**	**Key_values**	**Type**	**AVD Type (0-255)**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
								classed as a river. An active, able-bodied person should be able to jump over it if trees along it are not too thick.		
0x0044	waterway	drain			PL	30	1	An artificial waterway for carrying storm water or industrial discharge.		
	waterway	weir			PL	30	1	A barrier built across a river,		

.MP	.OSM				.AVD					
Code	**Key**	**Value**	**Keys**	**Key_values**	**Type**	**AVD Type (0-255)**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
								sometimes to divert water for industrial purposes. Water can still flow over the top.		
	waterway	dam			PL	31	1	A wall built across a river or stream to impound the water. A dam normally does not have water flowing over the top of it.		

.MP	.OSM				.AVD					
Code	**Key**	**Value**	**Keys**	**Key_values**	**Type**	**AVD Type (0-255)**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
	aeroway	runway			PL	35	1	A strip of land kept clear and set aside for aeroplanes to take off from and land on.		
0x0045 0x001d	boundary	administrative	admin_level	8	PL	191	1	State, county, local council.		
0x001c					PL	192	1	Region boundary.		
0x001e	boundary	administrative	admin_level border	2 nation	PL	193	2	National boundary.		

.MP	.OSM				.AVD					
Code	**Key**	**Value**	**Keys**	**Key_values**	**Type**	**AVD Type (0-255)**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
			_type							

Conversion table: POI

.MP	.OSM		.AVD					
Code	**Key**	**Value**	**Type**	**AVD Type (0-255)**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
0xf201	highway	traffic_signals	POI	50	0	Lights that control the traffic.		
0xf002 0x2f08 0x2f17 0xf001 0xf003	highway	bus_stop	POI	51	0	A small bus stop.		

.MP	.OSM		.AVD					
Code	**Key**	**Value**	**Type**	**AVD Type (0-255)**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
0xf004								
0x2f03	highway	services	POI	52	0	A service station to get food and eat something, often found at motorways.		
0xf007	railway	station	POI	53	0	A railway station.		
0xf006	railway	halt	POI	53	0	A small railway station, may not have a platform, trains may only stop on request.		

.MP	.OSM		.AVD					
Code	**Key**	**Value**	**Type**	**AVD Type (0-255)**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
0x4600	amenity	pub	POI	55	0	A place selling beer and other alcoholic drinks; may also provide food or accommodation.		
0x2d02 0x2d00	amenity	nightclub	POI	55	0	A nightclub.		
0x2a0e	amenity	cafe	POI	55	0	A cafe.		
0x4500	amenity	restaurant	POI	55	0	A restaurant.		
0x2a0d	amenity	fast_food	POI	55	0	An area with several different restaurant		

.MP	.OSM		.AVD					
Code	**Key**	**Value**	**Type**	**AVD Type (0-255)**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
						food counters and a shared eating area. Commonly found in malls, airports, etc.		
0x2f0b	amenity	parking	POI	56	0	Car park or a parking.		
0x2f02	amenity	car_rental	POI	56	0	A place to rent a car.		
	amenity	taxi	POI	56	0	A place where taxis wait for passengers.		
0x2f01	amenity	fuel	POI	57	0	Petrol station, gas station,		

.MP	.OSM		.AVD					
Code	**Key**	**Value**	**Type**	**AVD Type (0-255)**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
0x4400						marine fuel, etc.		
0x2e05	amenity	pharmacy	POI	58	0	A pharmacy.		
	amenity	hospital	POI	58	0	A hospital.		
0x3001	amenity	police	POI	59	0	A police station.		
0x3008	amenity	fire_station	POI	59	0	A fire station.		
0xf001	amenity	bus_station	POI	60	0	Bus station.		
0x2f06	amenity	bank	POI	61	0	A bank.		
	amenity	bureau_de_change	POI	61	0	Currency exchange, a place to change foreign banknotes and		

.MP	.OSM		.AVD					
Code	**Key**	**Value**	**Type**	**AVD Type (0-255)**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
						travellers cheques.		
	amenity	atm	POI	61	0	An ATM or cash point.		
0x2b00	tourism	hotel	POI	62	0	A hotel.		
0x2b01	tourism	motel	POI	62	0	A motel.		
0x2b02	tourism	guest_house	POI	62	0	Guest house.		
	tourism	hostel	POI	62	0	A hostel.		
0x0100 0x0200			POI	63	2	A megalopolis over 5 million people.		
0x0300	place	city	POI	64	2	A city of 1-5 million people (MP).		

.MP	.OSM		.AVD					
Code	**Key**	**Value**	**Type**	**AVD Type (0-255)**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
0x0400						A city over 100 thousand people (OSM).		
0x0500 0x0600 0x0700 0x0800 0x0900 0x0a00 0x0006 0x0004	place	town	POI	65	1-2	A town from 10 to 100 thousand people.		
0x0b00 0x0c00 0x0d00	place	village_greenhamlet	POI	66	1	A village below 10 thousand people.		

.MP	.OSM		.AVD					
Code	**Key**	**Value**	**Type**	**AVD Type (0-255)**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
0x0e00 0x0f00 0x1000 0x1100 0x0010								
0x640a			POI	67	0	Captions.		
0x3002 0x6408			POI	149	0	A hospital.		
	place	continent	POI	195	2	A continent.		
0x6602	place	state	POI	196	2	A state.		
0x1e00	place	region	POI	197	1	A region.		

.MP	.OSM		.AVD					
Code	**Key**	**Value**	**Type**	**AVD Type (0-255)**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
0x1f00	place	country	POI	198	1	A country, area.		

Conversion table: polygon

.MP	.OSM		.AVD					
Code	**Key**	**Value**	**Type**	**AVD Type (0-255)**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
0x0047 0x003b 0x0045 0x0049 0x0040 0x0041	waterway	riverbank	PG	130	2	Used for large rivers, to define an area between the opposite riverbanks.		

.MP	.OSM		.AVD					
Code	**Key**	**Value**	**Type**	**AVD Type (0-255)**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
divided by size	natural	water	PG	131	2	Lakes, water bodies, etc.		
divided by size	landuse	reservoir	PG	131	2	An artificial reservoir.		
0x0028			PG	132	2	Sea, ocean.		
	waterway	riverbank	PG	133	2	A large river.		
	leisure	park	PG	140	1	A park, open green area for recreation.		
	leisure	common	PG	140	1	An area where the public can walk anywhere.		
0x004e 0x004f 0x008	leisure	garden	PG	141	1	A garden.		

.MP	.OSM		.AVD					
Code	**Key**	**Value**	**Type**	**AVD Type (0-255)**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
e 0x0086 0x0087 0x0088								
0x006d	amenity	townhall	PG	146	1	A town hall building (mayor's office).		
0x001a	amenity	grave_yard	PG	147	1	A graveyard.		
	landuse	cemetery	PG	147	1	A cemetery.		
0x000a	amenity	school	PG	148	1	A school.		(0-5) (6)
	amenity	university	PG	148	1	A university.		(0-5)

.MP	.OSM		.AVD					
Code	**Key**	**Value**	**Type**	**AVD Type (0-255)**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
								(6)
	amenity	college	PG	148	1	A college.		(0-5) (6)
0x3002	amenity	hospital	PG	149	1	A hospital.		(0-5) (6)
	amenity	pharmacy	PG	149	1	A pharmacy.		(0-5) (6)
0x6408	building	clinic	PG	149	1	A clinic.		(0-5) (6)

.MP	.OSM		.AVD					
Code	**Key**	**Value**	**Type**	**AVD Type (0-255)**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
0x000b	building	hospital	PG	149	1	A hospital.		(0-5) (6)
	shop building	supermarket	PG	151	1	A supermarket.		
	building	shopping	PG	151	1	A shop.		
	tourism	camp_site	PG	153	0	Camping, a place where you can pitch a tent.		
	tourism	caravan_site	PG	153	0	A place where you can park a caravan overnight or for longer periods.		
	tourism	picnic_site	PG	154	0	A place where you can have an outdoor picnic. May have		

.MP	.OSM		.AVD					
Code	**Key**	**Value**	**Type**	**AVD Type (0-255)**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
						facilities such as tables and benches.		
	tourism	theme_park	PG	155	1	Theme park, amusement park.		
	tourism	attraction	PG	156	0	A general tourism attraction.		
	tourism	zoo	PG	157	1	A zoo.		
	tourism	artwork	PG	158	1	A tag for public pieces of art.		
	historic	archaeological_site	PG	159	0	Archaeological museum.		
0x0050 0x0081 0x0082 0x008	landuse	forest	PG	165	2	Managed forest or woodland plantation.		

.MP	.OSM		.AVD					
Code	**Key**	**Value**	**Type**	**AVD Type (0-255)**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
30x0084 0x0085 0x0052 0x008f 0x0090 0x0091								
0x0001 0x0002 0x0003	landuse	residential	PG	166	1	Predominantly houses or apartment buildings.		
	landuse	retail	PG	167	1	Predominantly shops.		

.MP	.OSM		.AVD					
Code	**Key**	**Value**	**Type**	**AVD Type (0-255)**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
	landuse	commercial	PG	168	1	Predominantly office buildings, business parks, etc.		
0x000c	landuse	industrial	PG	169	1	Predominantly workshops, factories, warehouses.		
0x0006			PG	169	0	Garages, vehicle sheds.		
	landuse	blownfield	PG	170	1	A district to be developed, an empty area.		
	landuse	greenfield	PG	170	1	Describes land scheduled for new development where there have been no buildings before .		
	landuse	railway	PG	171	1	Area for railway use, generally off-limits to the general public.		

.MP	.OSM		.AVD					
Code	**Key**	**Value**	**Type**	**AVD Type (0-255)**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
	landuse	construction	PG	172	1	Something under construction.		
0x0004	landuse	millitary	PG	173	1	For land areas owned/used by the military for whatever purpose.		
0x0014 0x000d 0x0015 0x0016 0x0017 0x001e 0x001f 0x0020 0x0098	natural	wood	PG	184	2	Natural woodland (trees). Only for completely unmanaged/wild areas.		

.MP	.OSM		.AVD					
Code	**Key**	**Value**	**Type**	**AVD Type (0-255)**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
0x0051 0x0096 0x008b	natural	marsh	PG	185	1	Low poorly drained land that is sometimes flooded and often lies at the edge of lakes, streams, etc.		
0x0018	sport	golf	PG	194	1	Golf course.		
	sport	horse_racing	PG	194	1	Hippodrome, racecourse.		
	sport	multi	PG	194	1	Sports ground, playing field.		
	sport	football	PG	194	1	Football.		
	sport	soccer	PG	194	1	Football or soccer.		
	building	stadium	PG	194	1	A stadium, a major sports arena with substantial tiered seating.		

.MP	.OSM		.AVD					
Code	**Key**	**Value**	**Type**	**AVD Type (0-255)**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
	leisure	golf_course	PG	194	1	Golf course.		
	leisure	stadium	PG	194	1	A stadium.		
	leisure	track	PG	194	1	A track, e.g. running, cycle-racing, greyhound, horses.		
	leisure	pitch	PG	194	1	A field for playing football/soccer, cricket, baseball sports, etc.		
	building	palace	PG	207	1	A palace.		(0-5) (6)
	building	postoffice	PG	208	1	A post office.		(0-5)

.MP	.OSM		.AVD					
Code	**Key**	**Value**	**Type**	**AVD Type (0-255)**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
								(6)
	building	restaurant	PG	209	1	A restaurant.		(0-5) (6)
0x006f 0x006f	amenity	public_building	PG	210	1	Public building.		(0-5) (6)
0x0013 0x006c	building	yes	PG	210	1	General tag for buildings.		(0-5) (6)
0x006e	building	terminal	PG	210	1	A building.		(0-5) (6)

.MP	.OSM		.AVD					
Code	**Key**	**Value**	**Type**	**AVD Type (0-255)**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
	denomination	baptist catholic christian evangelical lutheran Roman Catholic roman_catholic	PG	211	0	A church.		(0-5) (6)
0x9999	surface		PG	212	2	Ground surface.		(0-5) (6)

Scale (AVD)

Scale (km)	Scale (m)	Data level	Zoom level	Value
0,02	20	0	0	2000
0,05	50	0	1	5000
0,1	100	0	2	10000
0,1	100	0	3	10000
0,2	200	0	4	20000
1	1000	1	5	100000
1	1000	1	6	100000
2	2000	1	7	200000
5	5000	1	8	500000
10	10000	1	9	1000000
20	20000	1	10	2000000
50	50000	2	11	5000000
100	100000	2	12	10000000
100	100000	2	13	10000000
200	200000	2	14	20000000

Gurtam Maps

By choosing Gurtam Maps as a map source all the address information used for online tracking and reports will be taken from Gurtam Maps.

Conversion table: polyline

.MP	.OSM				Gurtam Maps					
Code	**Key**	**Value**	**Keys**	**Key_values**	**Type**	**GM Type**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
0x00001	highway	motorway			PL	1	2	A restricted access major divided highway, normally with 2 or more running lanes plus emergency hard shoulder. Equivalent to the Freeway, Autobahn, etc.		0-4 5-9 10-12
	highway	motorway_link			PL	2	2	The link roads (sliproads/ ramps) leading to/from a motorway from/to a motorway or lower class highway. Normally with the		0-4 5-7

.MP	.OSM				Gurtam Maps					
Code	**Key**	**Value**	**Keys**	**Key_values**	**Type**	**GM Type**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
								same motorway restrictions.		
0x00002	highway	trunk			PL	3	2	Important roads that are not motorways. Typically maintained by central, not local government. Need not necessarily be a divided highway.		0-4 5-9 10-12
	highway	trunk_link			PL	4	2	The link roads (sliproads/ ramps) leading to/from a trunk road from/to a trunk road or lower class highway.		0-4 5-7

.MP	.OSM				Gurtam Maps					
Code	**Key**	**Value**	**Keys**	**Key_values**	**Type**	**GM Type**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
0x00003	highway	primary			PL	5	2	Roads generally linking larger towns.		0-5 6-12
	highway	primary_link			PL	6	2	The link roads (sliproads/ ramps) leading to/from a primary road from/to a primary road or lower class highway.		0-5 6-7
0x00004	highway	secondary			PL	7	2	Roads generally linking smaller towns and villages.		0-5 6-9

.MP	.OSM				Gurtam Maps					
Code	**Key**	**Value**	**Keys**	**Key_values**	**Type**	**GM Type**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
	highway	secondary_link			PL	8	2	The link roads (sliproads/ramps) leading to/from a secondary road from/to a secondary road or lower class highway.		0-5 6-7
0x000000	highway	tertiary			PL	9	2	Minor roads.		0-5 6-8
	highway	tertiary_link			PL	10	2	The link roads (sliproads/ramps) leading to/from a tertiary road from/to other minor roads.		0-5 6

.MP	.OSM				Gurtam Maps					
Code	**Key**	**Value**	**Keys**	**Key_values**	**Type**	**GM Type**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
0x0000a	highway	unclassified			PL	11	1	Unclassified roads typically form the lowest form of the interconnecting grid network.		0-3 4-7
0x00042	highway	unsurfaced			PL	12	1	Unpaved roads.		0-3 4-7
	highway	track			PL	13	1	Roads for agricultural use, gravel roads in the forest etc., usually unpaved/ unsealed but may occasionally apply to paved tracks as well.		---

.MP	.OSM				Gurtam Maps					
Code	**Key**	**Value**	**Keys**	**Key_values**	**Type**	**GM Type**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
0x00005	highway	residential			PL	14	1	Roads accessing or around residential areas but which are not a classified or unclassified highway. Streets.		0-4 5-7
0x00006 0x00000b 0x00008 0x00009 0x00049	highway	living_street			PL	15	1	A street where pedestrians have priority over cars, children can play on the street, maximum speed is low. Sometimes called 'Home Zone'.		0-2 3-5

.MP	.OSM				Gurtam Maps					
Code	**Key**	**Value**	**Keys**	**Key_values**	**Type**	**GM Type**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
0x00007	highway	service			PL	16	1	Generally for access to a building, motorway service station, beach, campsite, industrial estate, business park, etc. This is also commonly used for access to parking and trash collection.		0-2 3-5
	highway	bridleway			PL	17	1	Roads for horses, cartage.		---
	highway	cycleway			PL	18	1	Cycleways for bicycles.		---
	cycleway	lane			PL	18	1	A lane is a route for bicycles that lies within the roadway.		---

.MP	.OSM				Gurtam Maps					
Code	**Key**	**Value**	**Keys**	**Key_values**	**Type**	**GM Type**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
	cycleway	track			PL	18	1	A route for bicycles that is separate from the road.		---
	highway	footway			PL	19	1	Footpaths for pedestrians, e.g., walking tracks and gravel paths.		.....
0x0048 0x0016	highway	pedestrian			PL	19	1	For roads used mainly/ exclusively for pedestrians/ shopping areas. Also for tagging squares and plazas.		.....
	highway	busway			PL	20	1	A busway where the vehicle guided by the way (though not a railway) and is not suitable for other traffic.		0-3 4-7

.MP	.OSM				Gurtam Maps					
Code	**Key**	**Value**	**Keys**	**Key_values**	**Type**	**GM Type**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
	junction	roundabout			PL	21	1	Circle movement.		0-3 4-6
0x0014	railway	rail			PL	25	1	Full sized passenger or freight trains in the standard gauge for the country or state.		
	railway	tram			PL	26	1	One or two carriage rail vehicles, usually sharing motor road for trams.		
0x001f	waterway	river			PL	30	2	For narrow rivers which will be rendered as a line.		

.MP	.OSM				Gurtam Maps					
Code	**Key**	**Value**	**Keys**	**Key_values**	**Type**	**GM Type**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
0x0018	waterway	canal			PL	30	1	An artificial open waterway used for transportation, waterpower, or irrigation.		
0x0026	waterway	stream			PL	30	1	A naturally-formed waterway that is too thin to be classed as a river. An active, able-bodied person should be able to jump over it if trees along it are not too thick.		
0x0044	waterway	drain			PL	30	1	An artificial waterway for carrying storm water or industrial discharge.		
	waterway	weir			PL	30	1	A barrier built across a river, sometimes to divert water for industrial		

.MP	.OSM				Gurtam Maps					
Code	**Key**	**Value**	**Keys**	**Key_values**	**Type**	**GM Type**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
								purposes. Water can still flow over the top.		
	waterway	dam			PL	31	1	A wall built across a river or stream to impound the water. A dam normally does not have water flowing over the top of it.		
	aeroway	runway			PL	35	1	A strip of land kept clear and set aside for aeroplanes to take off from and land on.		
0x0045 0x001d	boundary	administrative	admin_level	8	PL	191	1	State, county, local council.		-----

.MP	.OSM				Gurtam Maps					
Code	**Key**	**Value**	**Keys**	**Key_values**	**Type**	**GM Type**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
0x001c					PL	192	1	Region boundary.		--
0x001e	boundary	administrative	admin_level border_type	2 nation	PL	193	2	National boundary.		-----

Conversion table: POI

.MP	.OSM		Gurtam Maps					
Code	**Key**	**Value**	**Type**	**GM Type**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
0xf201	highway	traffic_signals	POI	50	0	Lights that control the traffic.		
0xf002 0x2f08 0x2f17 0xf001 0xf003 0xf004	highway	bus_stop	POI	51	0	A small bus stop.		
	highway	metro	POI	500		Metro.		
	highway	tram	POI	501		A tram stop.		
0x5900	highway	airport	POI	503		Airport.		

.MP	.OSM		Gurtam Maps					
Code	**Key**	**Value**	**Type**	**GM Type**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
0x5901								
0x2f03	highway	services	POI	52	0	A service station to get food and eat something, often found at motorways.		
0xf007	railway	station	POI	53	0	A railway station.		
0x4600	amenity	pub	POI	55	0	A place selling beer and other alcoholic drinks; may also provide food or accom		

.MP	.OSM		Gurtam Maps					
Code	**Key**	**Value**	**Type**	**GM Type**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
						modation.		
0x2d02 0x2d00	amenity	nightclub	POI	55	0	A nightclub.		
0x2a0e	amenity	cafe	POI	55	0	A cafe.		
0x4500	amenity	restaurant	POI	55	0	A restaurant.		
0x2a0d	amenity	fast_food	POI	55	0	An area with several different restaurant food counters and a shared eating area. Commonly found in malls,		

.MP	.OSM		Gurtam Maps					
Code	**Key**	**Value**	**Type**	**GM Type**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
						airports, etc.		
0x2f0b	amenity	parking	POI	56	0	Car park or a parking.		
0x2f02	amenity	car_rental	POI	56	0	A place to rent a car.		
	amenity	taxi	POI	56	0	A place where taxis wait for passengers.		
0x2f01 0x4400	amenity	fuel	POI	57	0	Petrol station, gas station, marine fuel, etc.		
0x2e05	amenity	pharmacy	POI	58	0	A pharmacy.		

.MP	.OSM		Gurtam Maps					
Code	**Key**	**Value**	**Type**	**GM Type**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
	amenity	hospital	POI	58	0	A hospital.		
0xf001	amenity	bus_station	POI	60	0	Bus station.		
0x2f06	amenity	bank	POI	61	0	A bank.		
	amenity	bureau_de_change	POI	61	0	Currency exchange, a place to change foreign bank notes and travellers cheques.		
	amenity	atm	POI	61	0	An ATM or cash point.		

.MP	.OSM		Gurtam Maps					
Code	**Key**	**Value**	**Type**	**GM Type**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
0x2b00 0x2b01 0x2b02	tourism	hotel	POI	62	0	A hotel, a motel, a guest house		
	tourism	hostel	POI	62	0	A hostel.		
0x0100			POI	302		Capital.		
0x0200			POI	63	2	A megalopolis over 5 million people.		
0x0300 0x0400	place	city	POI	64	2	A city of 1-5 million people (MP). A city over 100 thousan		

.MP	.OSM		Gurtam Maps					
Code	**Key**	**Value**	**Type**	**GM Type**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
						d people (OSM).		
0x0500 0x0600 0x0700 0x0800 0x0900 0x0a00 0x0006 0x0004	place	town	POI	65	1-2	A town from 10 to 100 thousand people.		
0x0b00 0x0c00 0x0d00 0x0e00 0x0f00	place	village_greenhamlet	POI	66	1	A village below 10 thousand people.		

.MP	.OSM		Gurtam Maps					
Code	**Key**	**Value**	**Type**	**GM Type**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
0x1000 0x1100 0x0010								
0x640a			POI	67	0	Captions.		
	place	continent	POI	195	2	A continent.		
0x6602	place	state	POI	196	2	A state.		
0x1e00	place	region	POI	197	1	A region.		
0x1f00	place	country	POI	198	1	A country, area.		

Conversion table: polygon

.MP	.OSM		Gurtam Maps					
Code	**Key**	**Value**	**Type**	**GM Type**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
0x0047 0x003b 0x0045 0x0049 0x0040 0x0041	waterway	riverbank	PG	130	2	Used for large rivers, to define an area between the opposite riverbanks.		
divided by size	natural	water	PG	131	2	Lakes, water bodies, etc.		
divided by size	landuse	reservoir	PG	131	2	An artificial reservoir.		
0x0028			PG	132	2	Sea, ocean.		
	waterway	riverbank	PG	133	2	A large river.		

.MP	.OSM		Gurtam Maps					
Code	**Key**	**Value**	**Type**	**GM Type**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
	leisure	park	PG	140	1	A park, open green area for recreation.		
0x004e 0x004f 0x008e 0x0086 0x0087 0x0088	leisure	garden	PG	141	1	A garden.		
0x006d	amenity	townhall	PG	145-146	1	A town hall building (mayor's office), administrative building.		0-2 3
0x001a	landuse	grave_yard	PG	147	1	A graveyard, a cemetery		

.MP	.OSM		Gurtam Maps					
Code	**Key**	**Value**	**Type**	**GM Type**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
0x000a	amenity	school	PG	148	1	A school.		
	amenity	university	PG	148	1	A university.		
	amenity	college	PG	148	1	A college.		
0x3002	amenity	hospital	PG	149	1	A hospital.		
	shop building	supermarket	PG	151	1	A supermarket.		0-2 3
	tourism	camp_site	PG	153	0	Camping, a place where you can pitch a tent.		
	tourism	caravan_site	PG	153	0	A place where you can park a caravan overnight		

.MP	.OSM		Gurtam Maps					
Code	**Key**	**Value**	**Type**	**GM Type**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
						or for longer periods.		
	tourism	picnic_site	PG	154	0	A place where you can have an outdoor picnic. May have facilities such as tables and benches.		
	tourism	theme_park	PG	155	1	Theme park, amusement park.		
	tourism	attraction	PG	156	0	A general tourism attraction.		
	tourism	zoo	PG	157	1	A zoo.		

.MP	.OSM		Gurtam Maps					
Code	**Key**	**Value**	**Type**	**GM Type**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
	tourism	artwork	PG	158	1	A tag for public pieces of art.		
	historic	archaeological_site	PG	159	0	Archaeological museum.		
0x0050 0x0081 0x0082 0x0083 0x0084 0x0085 0x0052 0x008f 0x0090 0x0091	landuse	forest	PG	165	2	Managed forest or woodland plantation.		
0x0001 0x0002 0x0003	landuse	residential	PG	166	1	Predominantly houses or apartment buildings.		0-3 4-7

.MP	.OSM		Gurtam Maps					
Code	**Key**	**Value**	**Type**	**GM Type**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
	landuse	retail	PG	167	1	Predominantly shops.		0-3 4-7
	landuse	commercial	PG	168	1	Predominantly office buildings, business parks, etc.		0-3 4-7
0x000c	landuse	industrial	PG	169	1	Predominantly workshops, factories, warehouses.		0-3 4-7
0x0006			PG	169	0	Garages, vehicle sheds.		0-3 4-7
	landuse	brownfield	PG	170	1	A district to be develope		

.MP	.OSM		Gurtam Maps					
Code	**Key**	**Value**	**Type**	**GM Type**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
						d, an empty area.		
	landuse	greenfield	PG	170	1	Describes land scheduled for new development where there have been no buildings before.		
	landuse	railway	PG	171	1	Area for railway use, generally off-limits to the general public.		
	landuse	construction	PG	172	1	Something under construction.		

.MP	.OSM		Gurtam Maps					
Code	**Key**	**Value**	**Type**	**GM Type**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
0x0004	landuse	military	PG	173	1	For land areas owned/ used by the military for whatever purpose.		
	landuse	airport	PG	401	1	Airport area.		
0x0014 0x000d 0x0015 0x0016 0x0017 0x001e 0x001f 0x0020 0x0098	natural	wood	PG	184	2	Natural woodland (trees). Only for completely unmanaged/wild areas.		
0x0051 0x0096 0x008b	natural	marsh	PG	185	1	Low poorly drained land that is sometimes		

.MP	.OSM		Gurtam Maps					
Code	**Key**	**Value**	**Type**	**GM Type**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
						flooded and often lies at the edge of lakes, streams, etc.		
0x0018	sport	golf	PG	194	1	Golf course, football, stadium.		
	building	palace	PG	207	1	A palace.		0-2 3
	building	postoffice	PG	208	1	A post office.		0-2 3
	building	restaurant	PG	209	1	A restaurant.		0-2 3

.MP	.OSM		Gurtam Maps					
Code	**Key**	**Value**	**Type**	**GM Type**	**Data level (0-2)**	**Comment**	**Image**	**Icon**
0x006f 0x006f	amenity	public_building	PG	210	1	Public building.		0-2 3
0x0013 0x006c	building	yes	PG	210	1	General tag for buildings.		0-2 3
	denomination	baptist catholic christian evangelical lutheran roman_catholic	PG	211	0	A church.		0-2 3
0x9999	surface		PG	212	2	Bottom surface.		

Scale (Gurtam Maps)

Scale (km)	Scale (m)	Data level	Zoom level	Value
0,02	20	0	0	2000

Scale (km)	Scale (m)	Data level	Zoom level	Value
0,05	50	0	1	5000
0,1	100	0	2	10000
0,1	100	0	3	10000
0,2	200	0	4	20000
1	1000	1	5	100000
1	1000	1	6	100000
2	2000	1	7	200000
5	5000	1	8	500000
10	10000	1	9	1000000
20	20000	1	10	2000000
50	50000	2	11	5000000
100	100000	2	12	10000000
100	100000	2	13	10000000
200	200000	2	14	20000000

Logs

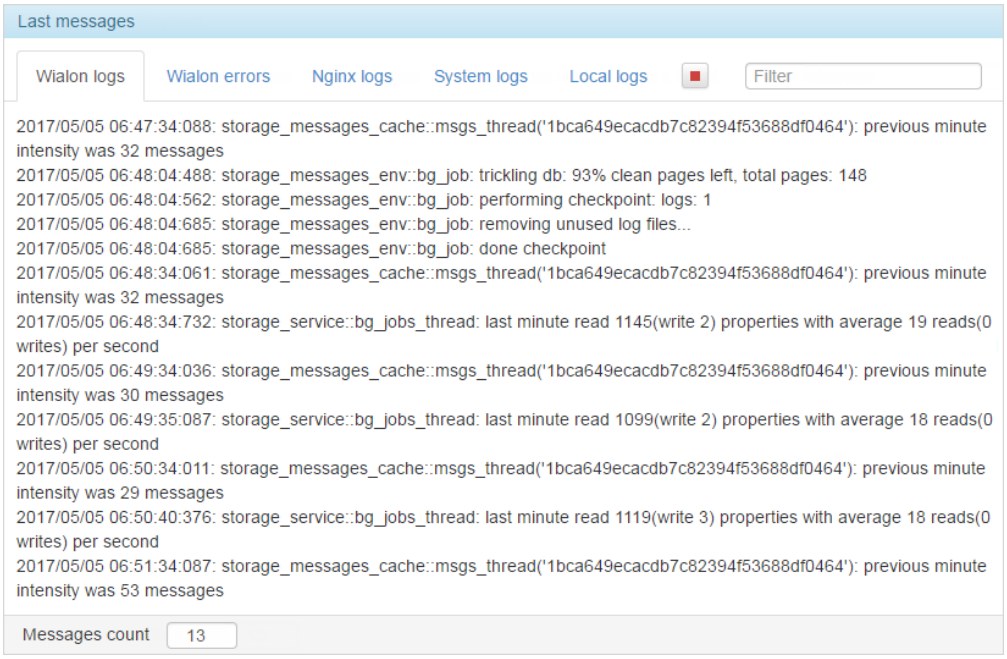
On this page, you can observe different kinds of logs kept in the system. The last hundred messages are available for (in parentheses you can see their physical location on your server):

- Wialon Local logs (/home/wialon/wlocal/logs/trace.log*);
- Wialon Local errors (/home/wialon/wlocal/logs/error.log*);
- Nginx logs (/var/log/nginx/error.log*);
- System logs (/home/wialon/wlocal/logs);
- Wialon Local logs of the administration site (/home/wialon/wlocal/logs/lcm/lcm.log*).

New messages are added to the bottom.

In the upper right corner, there is a dynamic filter that allows sorting the log's contents according to the introduced value (corresponds to the **grep** utility).

You can also adjust the number of lines shown in the log. To do this, enter the necessary number in the line **Messages cont** below (corresponds to the **tail** utility).



It is possible to stop or start the log using the buttons  and  , respectively. If the log is stopped, the two options described above cannot be applied to it.

The system checks for errors once an hour, and if there are any, a report is sent to the administrator (whose email is adjusted on the System tab).

A system administrator also has access to the following additional logs in the console:

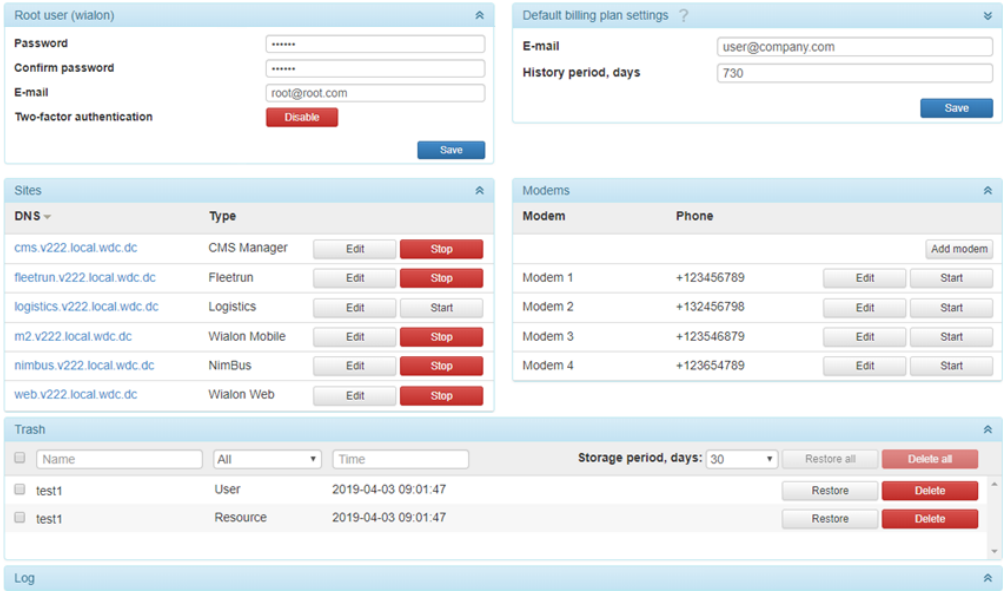
- Logs of the access to web and cms (/var/log/nginx/*).
- Logs of the mail system if the SMTP is not adjusted (/var/log/mail.log*).

- Wialon Local logs without users' work, that is automatic processes only (/home/wialon/wlocal/logs/service.log*).
- Logs of working with the hardware (/home/wialon/wlocal/logs/). You can see the contents of a log using the command **cat**. As a rule, you can understand which log to what type of hardware belongs. For example, from the contents of the log **2016/05/02 06:25:13:284: Received GPRS message from unknown unit (Wialon Retranslator): ID: 123456789000121** you can see that Wialon Retranslator is used as a hardware type.
- Logs of the administrator of the website (/home/wialon/wlocal/logs/lcm/*). These logs are divided into general, errors and messages about restarts and sessions.

All the logs are rotated by means of the preinstalled and adjusted logrotate. By default, the previous 10 days of logs are stored, but it is possible to enlarge this period by means of changing the corresponding configuration file in the directory **/etc/logrotate.d/** (replace rotate 10 with the value you need). For instance, for Wialon Local logs that is **/etc/logrotate.d/wlocal**. After you have changed the file, update the configuration using the command **logrotate -f -v /etc/logrotate.d/$filename$**, where **$filename$** is the name of the file you have changed.

Wialon

This page is accessible only when Wialon Local is operating. Here you configure sites and modems, manage recycle bin, etc.



Root User

The root user is **wialon**. With this username and initially the same password, you can log in to the main tracking interface (Wialon Local Web), CMS Manager, and other Wialon Local services (sites).

> To prevent unauthorized access to the features available to the top user, it is recommended to change the password immediately after installing Wialon Local.

On the Wialon page, you can enter the email address and password for the root user. Email is required when you want to reset the password, the password is necessary when you want to log in. If required, here you can also disable two-factor authentication for the root user.

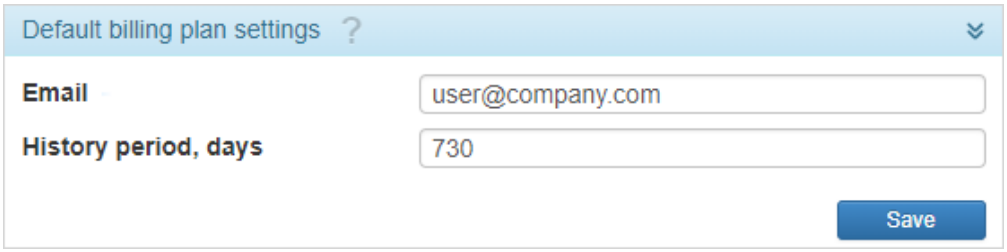
Note that only the root user can create and manage billing plans, apps, and perform conversion.

Default Billing Plan Settings

In this section, you can configure the root user's billing plan.

Email. The root user's email (**wialon**). It is used for sending system messages.

History period, days. The data storage period of the root user's billing plan (that is, of the whole server). The messages deleted at the expiration of the indicated period cannot be restored. If the specified value is 0, the history period is unlimited.



Sites

By default, two sites are available: one is of the Wialon Web type and the other is of the CMS Manager type. You can find the list of the purchased modules on the License tab.

> To log in for the first time, use the root user's login and password.

There are seven types of sites:

- CMS Manager (the management system where accounts, users, units, retranslators are created);
- Wialon Web (the main monitoring interface where the end users monitor their units, generate reports, and so on);
- Wialon on Mobile (a simplified monitoring interface for mobile devices);
- Fleetrun (the service for managing vehicle maintenance);
- NimBus (the service for monitoring passenger transportation);

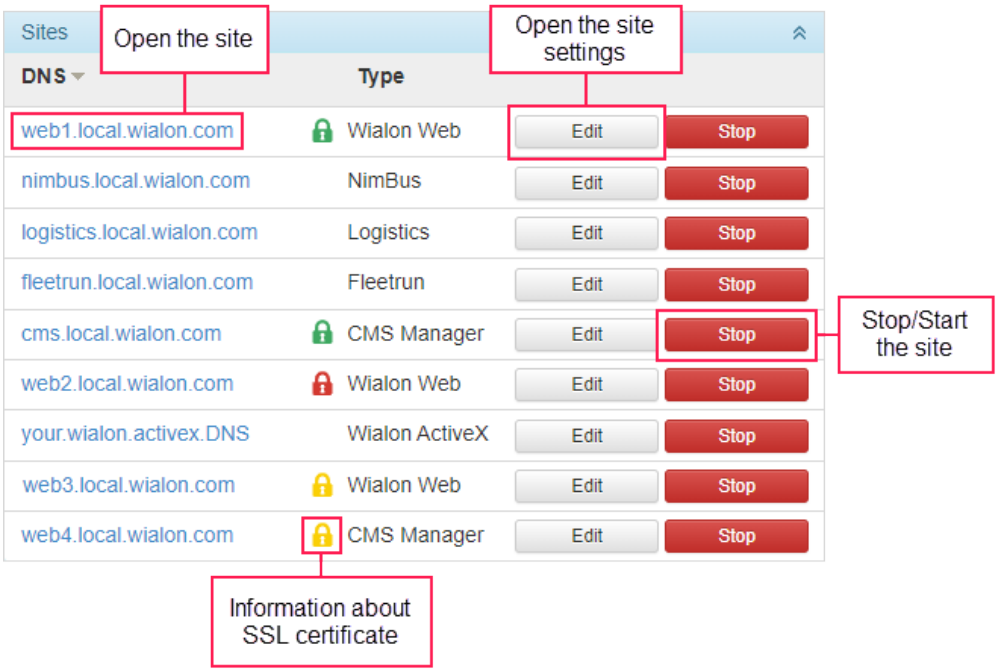
- Logistics (the service for working with orders);
- Hecterra (the service for controlling agricultural works).

If you activate additional **Wialon Web** sites (the **Extra site** module), you can change their type to **CMS Manager**. You can also add several **Wialon Mobile** sites. Each of the additional sites should have its own DNS. The sites of the **Wialon Web** type can have a personal design (paid option).

ⓘ For running the applications of the **Nimbus**, **Hecterra**, and **Fleetrun** type, access to https://app-local.wialon.com (port 443) should be provided on the side of Wialon Local.

ⓘ When creating DNS records for sites, take into account the following requirements:
- DNS records must be of type A;
- they must be pointed to the external IP of the server.

The **Sites** section is a table where the DNS and type of each site are specified. To open the required site, click on its DNS link.



To open the site settings, click on the **Edit** button next to its name.

To the right of the **Edit** button, there is a button to start/stop the site. If you stop the site, the users cannot log in to the system.

After starting (restarting) Wialon Local, all sites are loaded (reloaded) regardless of their previous state.

If a site works using the **https** protocol, a lock icon is displayed next to its name. In the tooltip of the icon, you can see the information about meeting the requirements for the certificate parameters and the name of the certificate authority (the **Issuer** line). The colour of the icon depends on the reliability of the SSL certificate.

Colour	Description
	The SSL certificate is valid because the requirements for all the parameters are fulfilled: the SSL certificate corresponds to the key, the MD5 hash of the certificate and the key is the same, the DNS of the certificate corresponds to that of the site, the validity period has not expired, the chain is complete.
	The SSL certificate is self-signed (that is, not received from a certificate authority and loaded by the user, but generated by the server) or the certificate chain is not complete while the other requirements are fulfilled. In the latter case, you can try to restore the chain using the **Fix** button displayed in the **SSL certificate** line in the advanced settings.
	The SSL certificate is invalid for one or several reasons: the SSL certificate does not correspond to the key, the MD5 hash of the certificate and the key is not the same, the DNS of the certificate does not correspond to that of the site, the validity period has expired.

Site settings

The settings available in this block differ depending on the type of the site. Here you can connect maps, set such parameters as DNS, basic URL, and parameters related to the personalization of the sites.

To open the site settings window, press the **Edit** button near the site name.

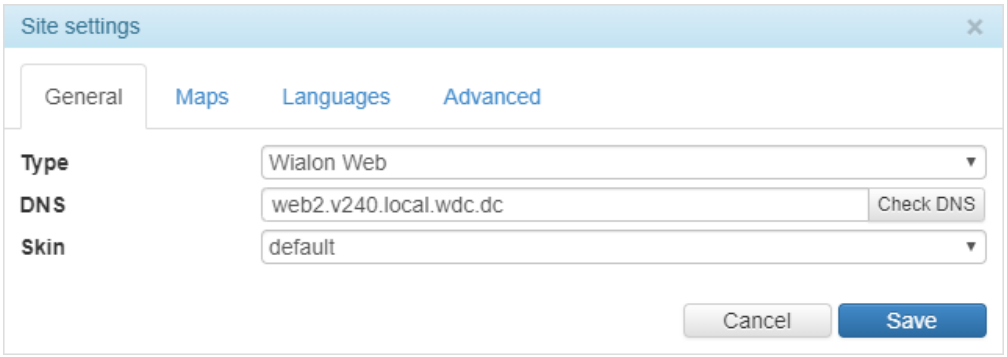
Up to 4 tabs are available in the site settings:

- General;

- Maps;
- Languages;
- Advanced.

General

On this tab, you can change the general settings of sites: specify their type, DNS, etc.



The table below shows the settings that can be available depending on the type of the site.

Setting	Description
Type	The type of the site. Depending on the available components of the license, the following basic types of sites are possible: Wialon Web, CMS Manager, Logistics, Nimbus, Fleetrun, Hecterra. If there are additional sites of the Wialon Web type in your license, you can change their type to CMS Manager if needed.
DNS	The domain name of the site is specified in this field. You can make sure the site is available using the **Check DNS** button.
Skin	This setting is used only for the sites of the Wialon Web type for changing the design of the monitoring system. In the drop-down list, you can select and apply the personal design previously bought in your personal account (my.gurtam.com), or through a request to the manager. The personal design is created on the basis of the provided materials and/or layouts and the wishes of the client. The **Personal design** package does not include creating a logo or several final versions of

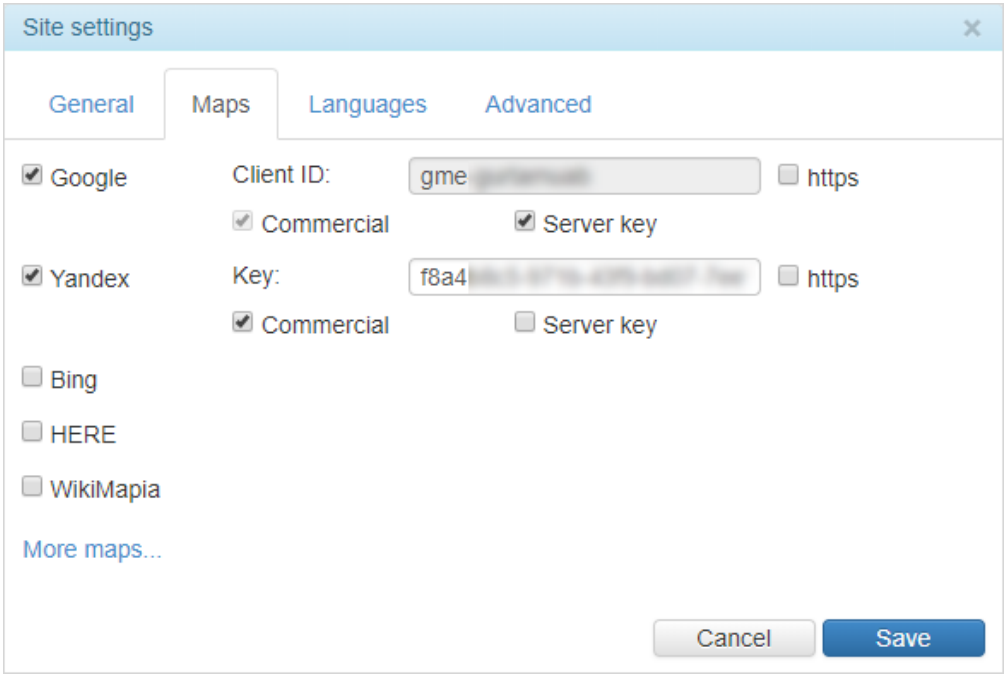
Setting	Description
	the design. Besides, the arrangement of the functional blocks and the way the icons look like cannot be changed in the personal design.
Base URL	This setting is required for the applications using SDK: NimBus, Fleetrun, Logistics, Hecterra. The sites which provide SDK are Wialon Web and CMS Manager. For the correct work of the application, you should select the SDK site with the corresponding protocol: http or https (the SDK site should have the same protocol or a more strict one).

Maps

Maps are connected for each site individually. By default, users get access to WebGIS Maps and OpenStreetMap. You can also use other maps: Google, Yandex, Bing, HERE, WikiMapia, OpenStreetMap, Visicom, Regio, 2GIS, Luxena, MyIndia, Kosmosnimki, ArcGIS, Geoserver, GoMap.Az, OpenSeaMap, Mapbox, what3words, OpenWeatherMap, AerisWeather, AMap, Namaa. Most of them require an activation key.

⚠ Verify that you have activated the maps in the user settings in the monitoring system.

Specify the required maps. Depending on the type of a selected map, you may need to set up additional parameters.



Google

Indicate the activation **key**. For Google Maps, you can specify a personal or a commercial key (the **Commercial** option). If the settings of the keys for server requests have already been specified, the **Client ID** field is automatically filled in once you activate the **Server key** option. To make the map operate using a secure protocol, activate the **https** option.

Yandex

Indicate the activation **key**. For Yandex Maps, you can specify a personal or a commercial key (the **Commercial** option). If the settings of the keys for server requests have already been specified, the **Client ID** field is automatically filled in once you activate the **Server key** option. The Yandex key for the Logistics application is sent from the site specified in the **Base URL** field of the general settings. To make the map operate using a secure protocol, activate the **https** option.

Bing

To make the map operate using a secure protocol, activate the **https** option.

HERE

Indicate the activation **key** (you can get it on the site of the service). The **App_Id** and **App_Code** keys are generated for the HERE service. Add the keys separating them by a comma without spaces. To make the map operate using a secure protocol, activate the **https** option.

WikiMapia

WikiMapia does not require additional settings.

OpenStreetMap

To make the map operate using a secure protocol, activate the **https** option.

Visicom

Indicate the activation **key** (you can get it on the site of the service). To make the map operate using a secure protocol, activate the **https** option.

Regio

Indicate the activation **key** (you can get it on the site of the service). To make the map operate using a secure protocol, activate the **https** option.

2GIS

To make the map operate using a secure protocol, activate the **https** option.

Luxena

Luxena does not require additional settings.

MyIndia

Indicate the activation **key** (you can get it on the site of the service). You can use any of the generated keys.

Kosmosnimki

Indicate the activation **key** (you can get it on the site of the service).

ArcGIS

Key. The activation key. When generating a request to the server, the key specified in this field is automatically added to the URL as **token=<key>**.

Servers. The required field in which the URL of the ArcGIS server is indicated. The URL must include a keyword (http://services.arcgisonline.com/arcgis/rest/services/World_Street_Map/MapServer**/export/**). The following keywords and formats are supported: **/export/**, **/WMSServer/**, **/wms/**, **/{x}/{y}/{z}**, **/tile/**, **/{gs.x}/{gs.y2}/{gs.z}**.

Base layers. If this field is empty, the layers are added as base ones by default. If you indicate a value of **0**, the layer is added as an additional one on top of the base layer. If you indicate a value of **1**, the layer becomes a base one. For example, when adding three layers, you can type **1;0;0** in the field. This means that the first layer will be base, whereas the second and the third will be displayed on top of it.

Layers. The required field in which the names of the added layers are indicated.

Names. The names for each of the layers that are shown when you select a map.

Zoom levels. The range of possible zoom levels. For each map layer, indicate the first and last values using a hyphen, for example: **0-19;4-9;1-10**. The values from **0** to **19** are allowed.

Hide map prefix. This option allows hiding the ArcGIS name for each layer.

> When indicating several items in the fields, separate them with a semicolon without spaces.

Geoserver

Indicate the **map server** addresses, **base layers**, and **map names**. Separate each item on the list by a semicolon.

> In the URL of the server indicate the values of **zoom**, **x**, **y** in braces. For example, ...?zoom={2}&x={0}&y={1}.

GoMap.Az

To make the map operate using a secure protocol, activate the **https** option.

OpenSeaMap

Indicate map **layers**. The following layers are available (should be separated by a comma without spaces):
depth_contours, marine_traffic, water_depth_10, water_depth_100, seamarks, marine_profile, elevation_profile.

Mapbox

Indicate the activation **key** and **layers**. To make the map operate using a secure protocol, activate the **https** option.

what3words

Indicate the activation **key** (you can get it on the site of the service).

OpenWeatherMap

Indicate the activation **key** (you can get it on the site of the service) and for the **Layers** field, enter the value **all**.

AerisWeather

Indicate the activation **key** (you can get it on the site of the service) in the **id_secret** format. Specify **map layers** in the following format: **code:name** or **code:name:transparency** (for

transparency, values from 0 to 1 are allowed). For example: radar:Radar;ftemperatures:Temperatures:0.25. Use a semicolon when listing the layers.

AMap

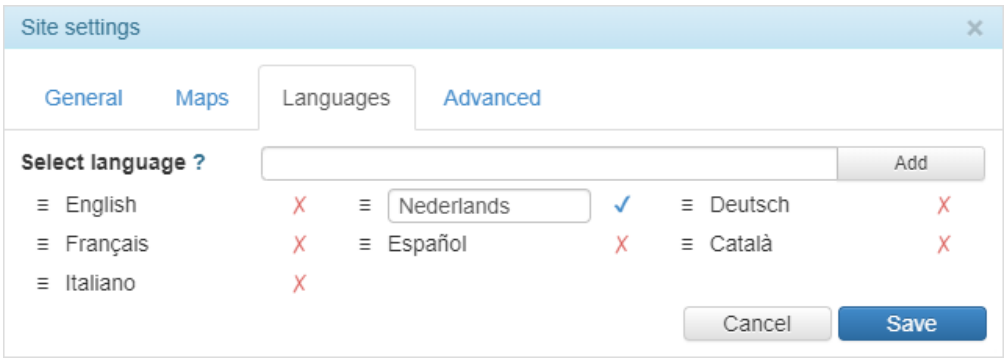
Indicate the activation **key** (you can get it on the site of the service).

Namaa

Indicate the activation **key** (you can get it on the site of the service).

Languages

On this tab, you can select the languages you want to be available in the **Language** field in the user settings of the management and monitoring systems.



To add a language, select it in the drop-down list and click **Add**. Repeat for other languages if necessary.

In the user settings, the languages are displayed in the same order as in the list you have made. To change this **order**, drag the language to the required place using the icon ☰.

To **rename** a language, click on it, enter a new name, and click on the icon ✓. To **remove** a language from the list, click on the icon ✗.

Save the changes.

ⓘ If no language is selected, all of them are available.

Advanced

On this tab, depending on the type of the site, you can configure different parameters related mainly to the **personalization** of the sites. The settings of different types of sites are described below.

Wialon Web

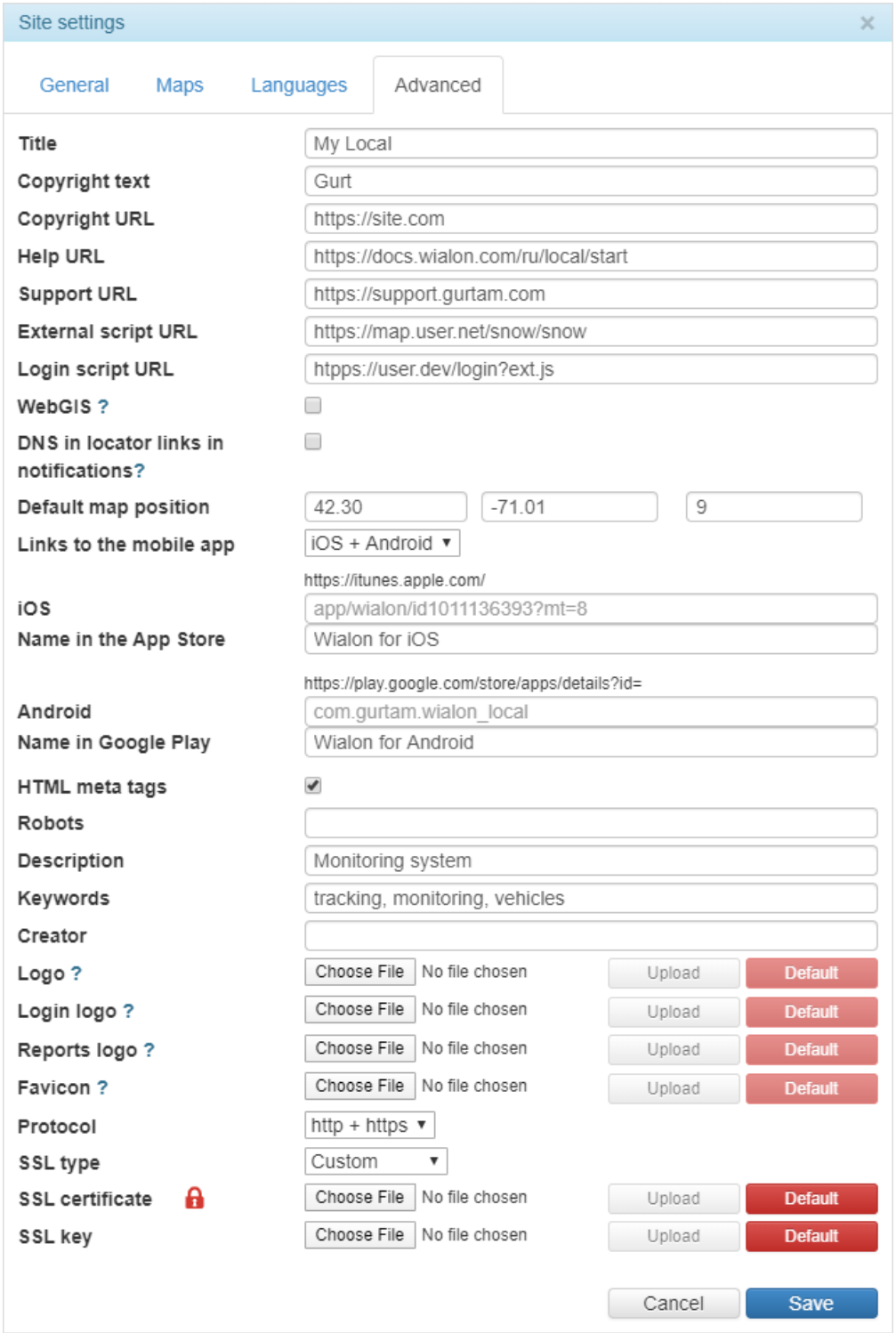
For the sites of this type, you can change the parameters specified below.

Parameter	Description
Title	The title of the site.
Copyright text	The text that is displayed as copyright. It is applied only if you fill in the **Copyright URL** field.
Copyright URL	The address of the site where the copyright link leads. It is applied only if you fill in the **Copyright text** field.
Help URL	The address of the site with the documentation. If the field is empty, there is no documentation.
Support URL	The address of the technical support site.
External script URL	The address of a third-party script that should be connected to the monitoring site.
Login script URL	The address of the script that should be used at login.
WebGIS	The option that allows renaming Gurtam Maps to WebGIS.
DNS in locator links in notifications	The option that allows using the DNS of the site in locator links ("%LOCATOR_LINK%" tag) which are used in the notifications of the Wialon monitoring system and Logistics. You can select only one DNS at a time. Restart Wialon Local to apply the setting.
Default map position	The position of the map after logging in to the monitoring system. You can indicate the latitude and the longitude of the point on which the map should be centered and the scale (from 1 to 18).

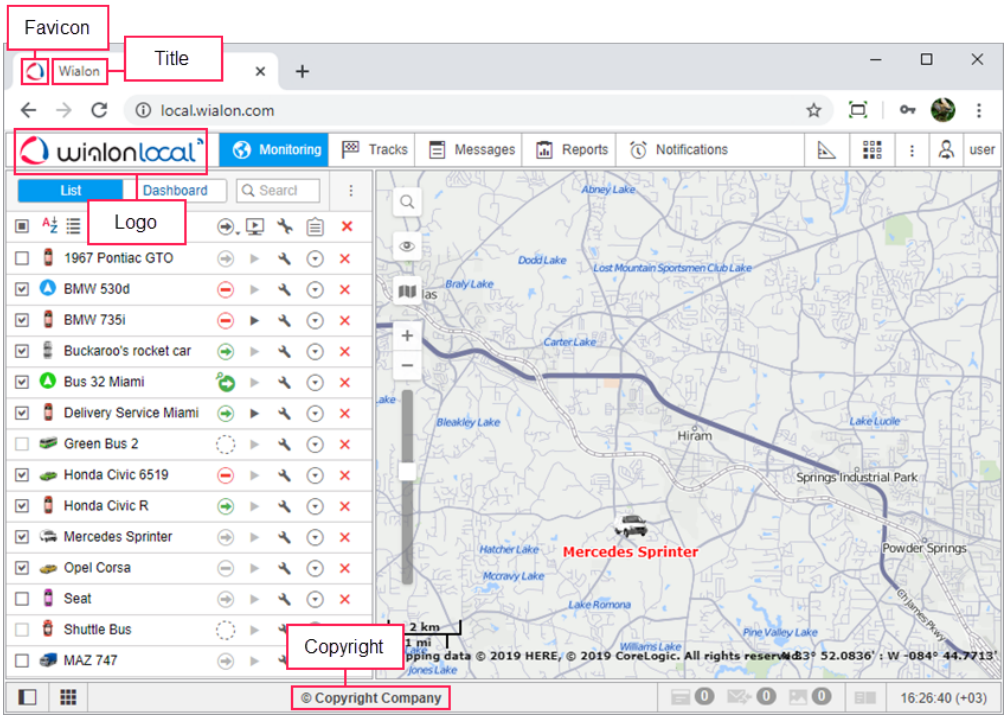
Parameter	Description
Link to the mobile app	The option that enables the display of the buttons that lead to the download page of the mobile application. Available options: No, iOS + Android, iOS, Android. Further, in accordance with the selected option, you can specify the link (links) to your application (applications) and the name of the application in AppStore and/or Google Play.
HTML meta tags	The option that enables using HTML meta tags. You can add the information for the following meta tags: Robots, Description, Keywords, Creator.
Logo	The logo of the monitoring site. You can use a PNG or SVG image which does not exceed 172×30 pixels in size.
Login logo	The logo that is displayed on the login page. You can use a PNG or SVG image which does not exceed 314×80 pixels in size.
Report logo	The logo that is displayed in the exported report (files in HTML, PDF). You can use a PNG image which does not exceed 140×30 pixels in size. ⚠ This option allows applying only one logo (the last uploaded one) to all sites of the Wialon Web type, if there are several of them. It is advisable to set logos for reports and assign them to billing plans in the **Logos in reports** section.
Favicon	The icon of the site, which is shown next to the title. You can use an ICO image which does not exceed 16×16 pixels in size.

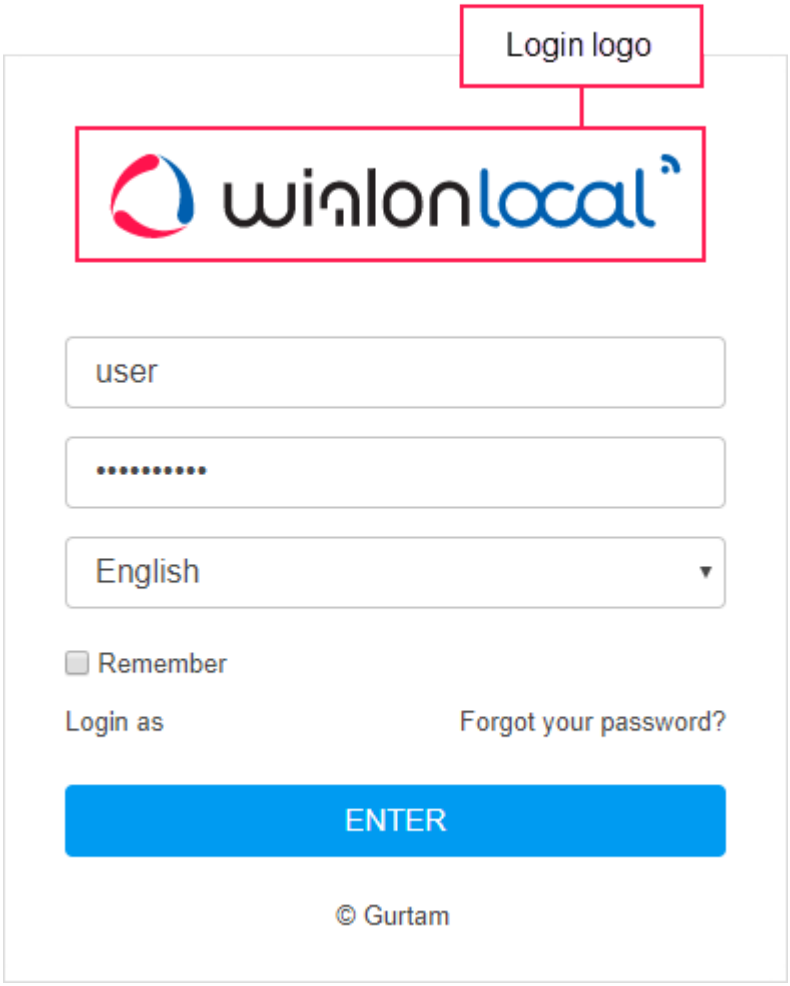
Parameter	Description
Protocol	The protocol used (http, http + https, https). For the https protocol, you can optionally add an SSL certificate and an SSL key. For an SSL certificate, indicate its type (**Custom**, **Let's Encrypt**, or **Self-signed**). In case of selecting **Let's Encrypt** or **Self-signed**, you do not have to upload the certificate yourself because it is generated automatically.

To return to the original view of the monitoring site, clear all the text fields on this tab and reset the settings of the images by clicking on the **Default** button.



Certain elements of the interface are displayed below.

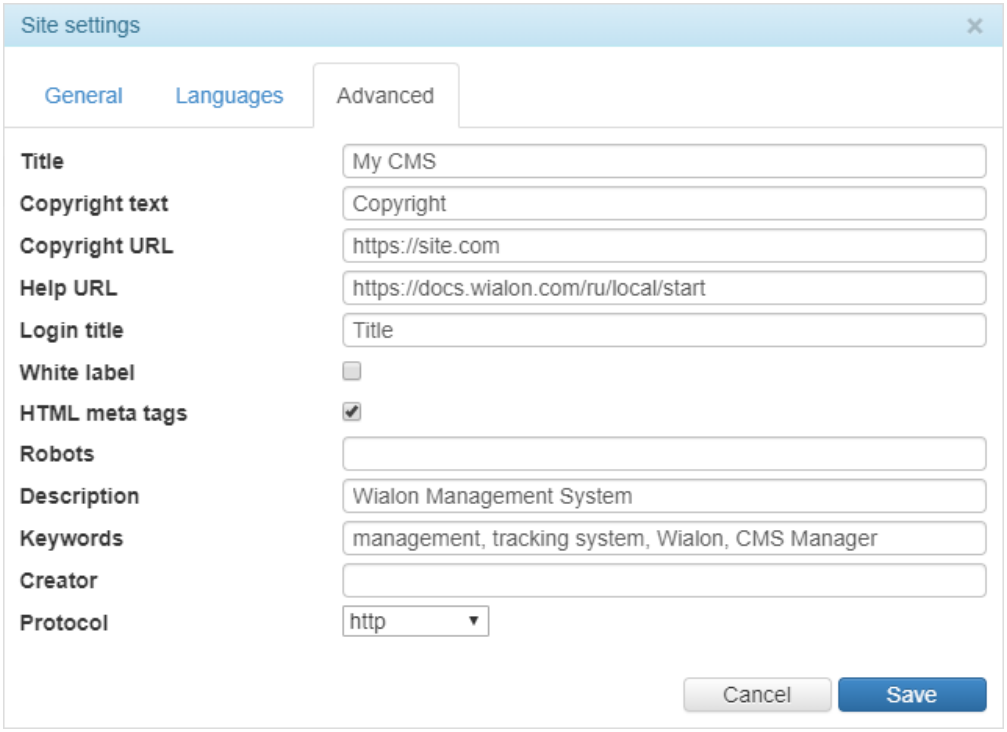

Favicon
Title
Wialon
local.wialon.com
wialonlocal
Monitoring
Tracks
Messages
Reports
Notifications
user
List
Dashboard
Search
Logo
1967 Pontiac GTO
BMW 530d
BMW 735i
Buckaroo's rocket car
Bus 32 Miami
Delivery Service Miami
Green Bus 2
Honda Civic 6519
Honda Civic R
Mercedes Sprinter
Opel Corsa
Seat
Shuttle Bus
MAZ 747
Abney Lake
Dodd Lake
Lost Mountain Sportsmen Club Lake
Braly Lake
Carter Lake
Bleakley Lake
Hiram
Lake Lucile
Springs Industrial Park
Mercedes Sprinter
Hatcher Lake
Mccravy Lake
Lake Romona
Powder Springs
Pine Valley Lake
Williams Lake
Jones Lake
2 km
1 mi
Copyright
© 2019 HERE, © 2019 CoreLogic. All rights reserved
N 33° 52.0836' : W -084° 44.7713'
© Copyright Company
16:26:40 (+03)


Login logo
wialonlocal
user
English
Remember
Login as
Forgot your password?
ENTER
© Gurtam

CMS Manager

The parameters available in the advanced settings of the CMS Manager site are described below.

Parameter	Description
Title	The title of the site.
Copyright text	The text that is displayed as copyright. It is applied only if you fill in the **Copyright URL** field.
Copyright URL	The address of the site where the copyright link leads. It is applied only if you fill in the **Copyright text** field.
Help URL	The address of the site with the documentation. If the URL is not specified, CMS Manager is redirected to the documentation in accordance with the language of the application interface. To disable the link to the documentation, enter the value **skip** in the field.
Login title	The title that is shown on the login page (it is required to additionally activate the **White label** option).
White label	The option that removes the logo from the login page.
HTML meta tags	The option that enables using HTML meta tags. You can add the information for the following meta tags: Robots, Description, Keywords, Creator.
Protocol	The protocol used (http, http + https, https). For the https protocol, you can optionally add an SSL certificate and an SSL key. For an SSL certificate, indicate its type (**Custom**, **Let's Encrypt**, or **Self-signed**). In case of selecting **Let's Encrypt** or **Self-signed**, you do not have to upload the certificate yourself because it is generated automatically.

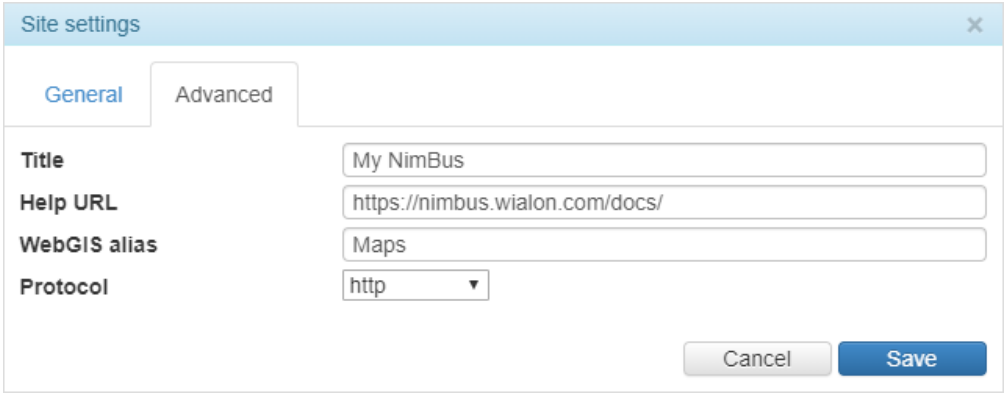


After making changes, it is recommended to clear the cache and restart the site.

NimBus

The parameters available in the advanced settings of the NimBus site are described below.

Parameter	Description
Title	The title of the site.
Help URL	The address of the site with the documentation.
WebGIS alias	WebGIS name within the application.
Protocol	To work using the https protocol, the site (Wialon Web or CMS Manager) indicated in the **Base URL** field on the General tab is also required to work with it (i.e. in the **Protocol** field, either **http + https** or **https** should be selected).

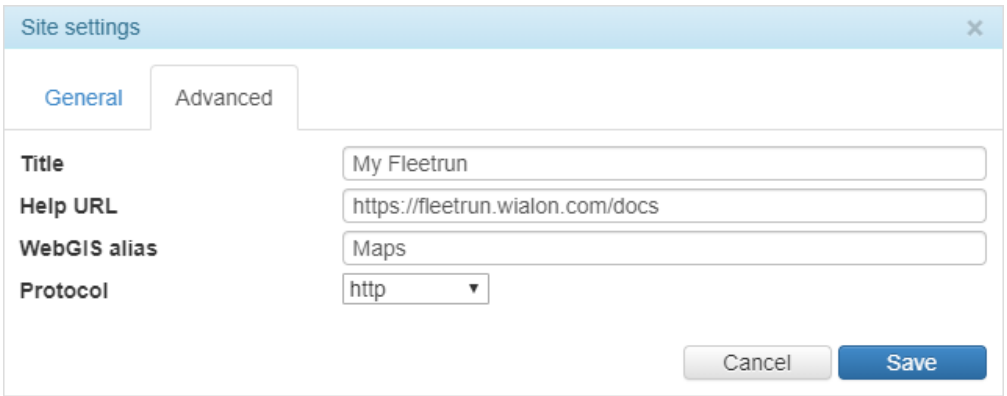


After making changes, the site becomes unavailable for a period of up to 10 minutes.

Fleetrun

The parameters available in the advanced settings of the Fleetrun site are described below.

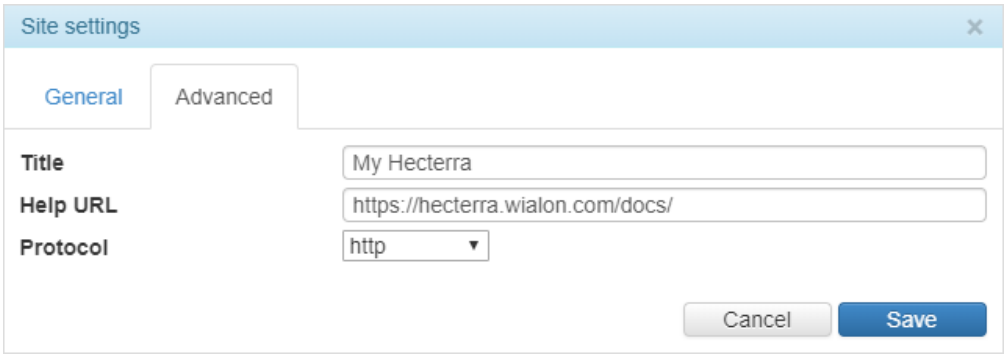
Parameter	Description
Title	The title of the site.
Help URL	The address of the site with the documentation.
WebGIS alias	WebGIS name within the application.
Protocol	To work using the https protocol, the site (Wialon Web or CMS Manager) indicated in the **Base URL** field on the General tab is also required to work with it (i.e. in the **Protocol** field, either **http + https** or **https** should be selected).



Hecterra

The parameters available in the advanced settings of the Hecterra site are described below.

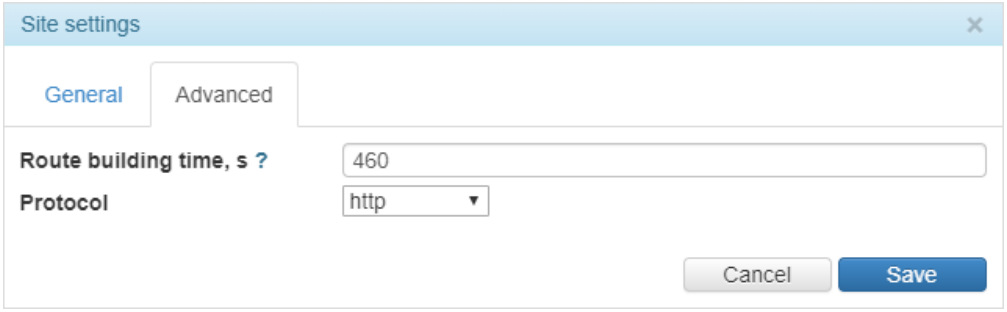
Parameter	Description
Title	The title of the site.
Help URL	The address of the site with the documentation.
Protocol	To work using the https protocol, the site (Wialon Web or CMS Manager) indicated in the **Base URL** field on the General tab is also required to work with it (i.e. in the **Protocol** field, either **http + https** or **https** should be selected).



Logistics

The parameters available in the advanced settings of the Logistics site are described below.

Parameter	Description
Route building time, s	The timeout of executing requests for creating and optimization of routes in the application.
Protocol	To work using the https protocol, the site (Wialon Web or CMS Manager) indicated in the **Base URL** field on the General tab is also required to work with it (that is, either **http + https** or **https** should be selected in the **Protocol** field).



The presence of a logo on the login page depends on the setting of the **White label** option on the CMS Manager site. If it is activated, the logo on the login page of the Logistics site is not displayed.

Modems

ⓘ This component requires separate licensing.

To create a new modem, press the **Add modem** button at the top of the section. Three types of modems are supported: GSM modem, SMPP gateway, and network modem. Some of the parameters of their configuration are common and others differ.

To delete a modem, open its settings and press **Delete** at the bottom of the dialog.

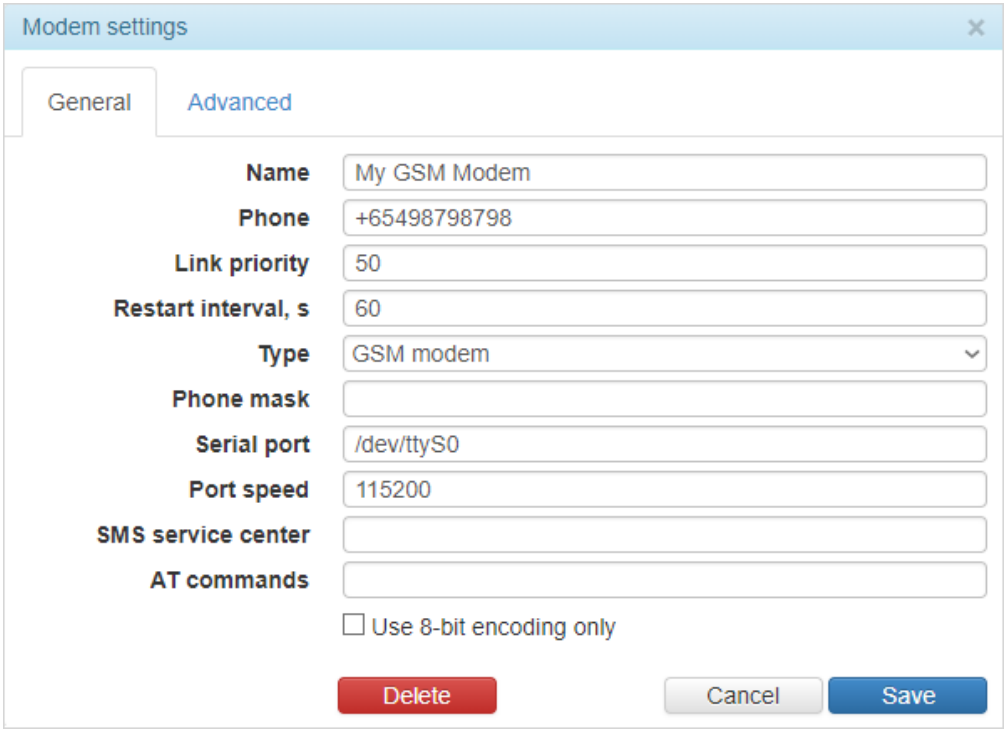
Modem common parameters

Parameter	Description
Name	Enter a name for the modem.
Phone	Enter the phone number of the SIM card installed in the modem.
Link priority	Define communications channel priority. The first is selected the modem with the highest priority (the higher the number, the higher the priority).
Restart interval	Indicate restart interval in seconds. If the connection with the modem is broken for any reason, after the time it will be

Parameter	Description
	automatically restarted. Note that if the restart interval is zero, the modem is not started when restarting the service.
Phone mask	Use this field if you want the messages to the phone numbers that correspond to the indicated mask to be sent from this particular modem. Otherwise, the messages will be sent via another modem or will not be sent at all. If the same mask is indicated for several modems, the values of the **Priority** field are taken into consideration. When entering the phone number mask, you can use the special characters * (replaces several characters), ? (replaces one character) and ! (excludes the symbols specified after it from the search) or their combinations. For instance, a phone mask may look as follows: • *372* — all numbers that contain **372**, • +44* — numbers that start with **+44**, • ?31* — numbers in which the second and the third characters are **31**, • !*116 — all numbers, except for those that end with **116**.

GSM modem parameters

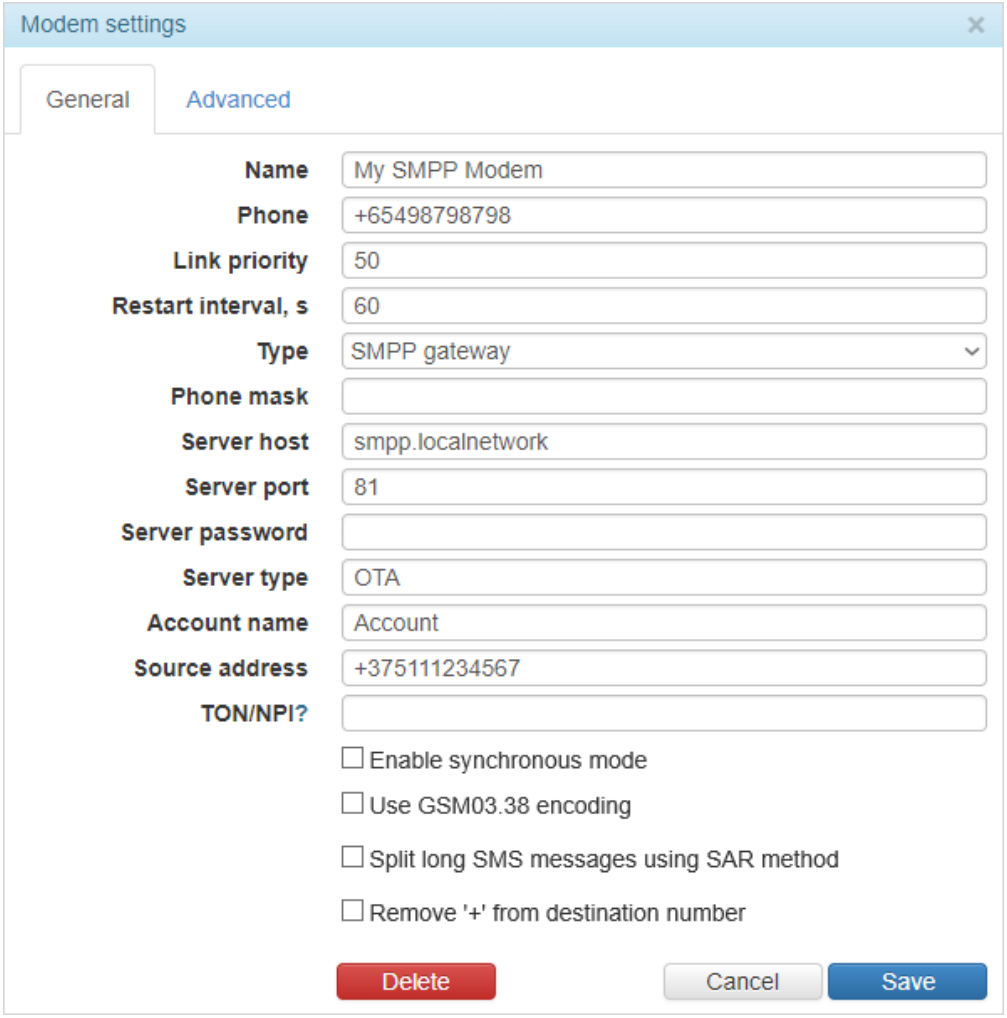
ⓘ To use a GSM modem, execute the **addgroup wialon dialout** command in the server's console. After that, restart the operating system.



Parameter/Option	Description
Serial port	For GSM-modem, you can specify the physical port of the server to which it is connected.
Port speed	The speed of the GSM-modem port. If any errors appear while operating, reduce this value.
SMS service center	Usually, the SMS service center is strictly indicated on the SIM card, and you do not need to enter it here.
AT commands	Indicate additional initialization AT commands if they are required according to the modem instructions manual. If you need to indicate several commands, use commas to separate them from each other.
Use 8-bit encoding only	Check this option if you want to exclude other kinds of encoding (if you are going to receive information that includes only Latin letters and special characters).

SMPP gateway parameters

ⓘ The SMPP API v3.4 protocol is used.

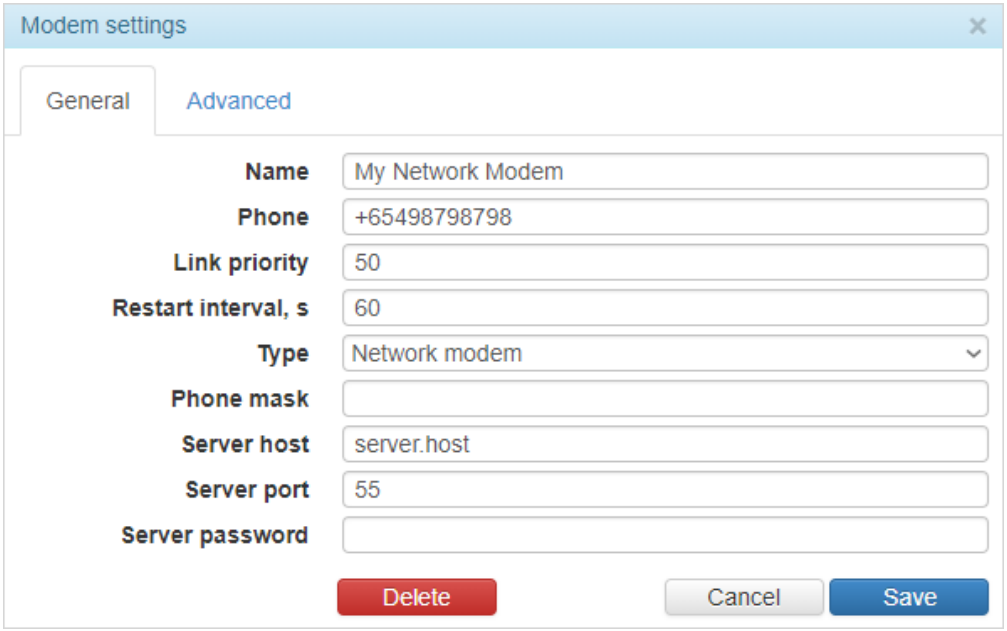


Parameter/Option	Description
Server ...	Indicate server host (IP address or DNS name), server port, and password to connect to the server. If needed, indicate server type, which can be **VMS** (voice mail system), **OTA** (over-the-air activation system), or other.

Parameter/Option	Description
Account name & Source address	Enter account name (login) and the source address to recognize the sender (like phone number, company name or both).
TON/NPI	Define format if necessary.
Enable synchronous mode	SMPP synchro mode may be useful to make hardware diagnostics. This works by the following algorithm: while there is no notification that the first SMS was delivered, the second one will not be sent.
Use GSM03.38 encoding	Check this option if you want to exclude other kinds of encoding.
Split long SMS messages using SAR method	By default, SMS messages are transmitted with UDH method (User Data Header) where system information is placed at the beginning. SAR method (segmentation and reassembly) allows placing this information at the end in TLV format, which is essential for several languages that have characters which cannot be transmitted in 8-bit encoding. In these cases, enable the **Split long SMS messages using SAR method** option to solve the problem.
Remove '+' in destination number	Check the option to eliminate the plus symbol from destination phone numbers.

Parameters for network modem

ⓘ To connect a remote physical modem, send a request for the installation of a special utility to the technical support.

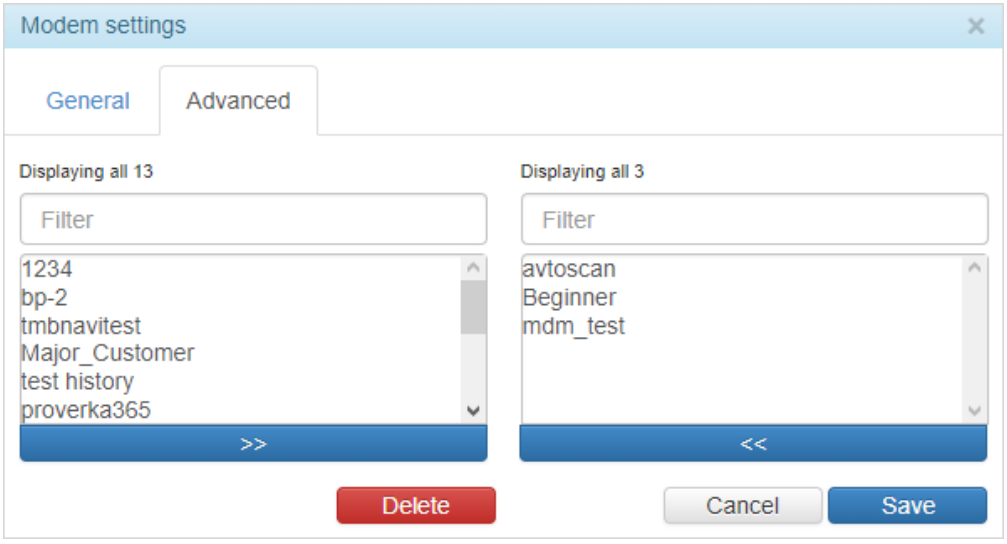


Indicate the server host, server port, and password to connect to the server.

Parameter	Description
Server host	An IP address or a DNS name where the utility is installed.
Server port	A port where the utility is waiting for a connection.
Server password	An optional field that is adjusted in the configuration file of the utility.

Advanced parameters

Modem activity can be restricted to selected billing plans. The modem is unavailable for all billing plans by default. To use a modem for a billing plan it is necessary to move the corresponding billing plan from the right column to the left one.



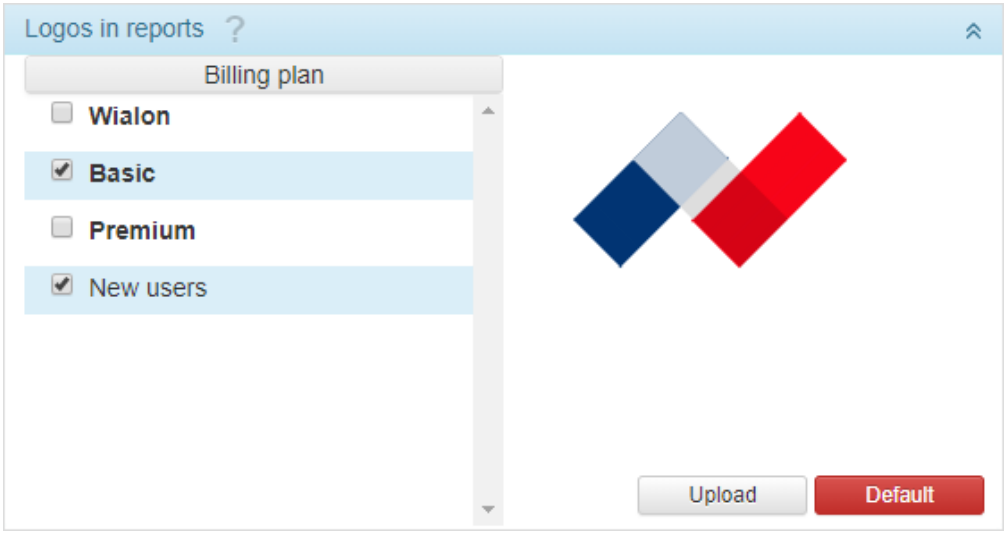
SMS sending

The mechanism of the selection of the channel for sending SMS is as follows.

1. The billing plan from the account from which an SMS is sent (which belongs to the resource with a job/driver/notification or where a unit has been created) is checked.
2. All the available modems in this billing plan are found.
3. The modems are organized according to their priority from the highest to the lowest.
4. A search of the phone number according to the mask is realized, and the modem that corresponds to it receives the highest priority. If there are several such modems, the values of the **Priority** field from their properties are taken into consideration.
5. If the current found modem is stopped, the following one is selected for sending SMS.

Logos in Reports

In this block, you can upload an image which should be displayed in the upper part of the executed and exported reports.



Follow the steps below to upload an image:

1. Click on the empty square, to select in image.

   > To install a logo, you can use a PNG image which does not exceed 200×200 pixels in size or an SVG image.

2. Select the billing plans in which this logo should be used.
3. Click **Upload**.

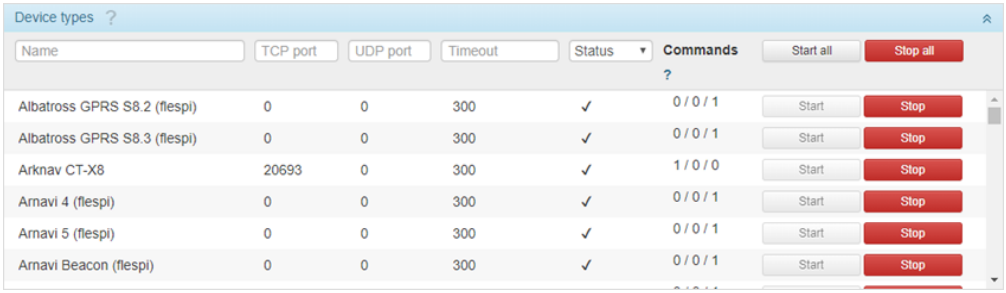
To cancel the changes, click **Default**.

If you have already chosen a logo in the advanced settings of the site, the logo that is chosen for the billing plan is displayed in reports instead.

Device Types

In this block, you can see a table of available device types. You can add new device types in your personal account or via a request to partners@wialon.com.

There is a dynamic search in the table columns. After you enter the first character, the system starts to offer possible options automatically.



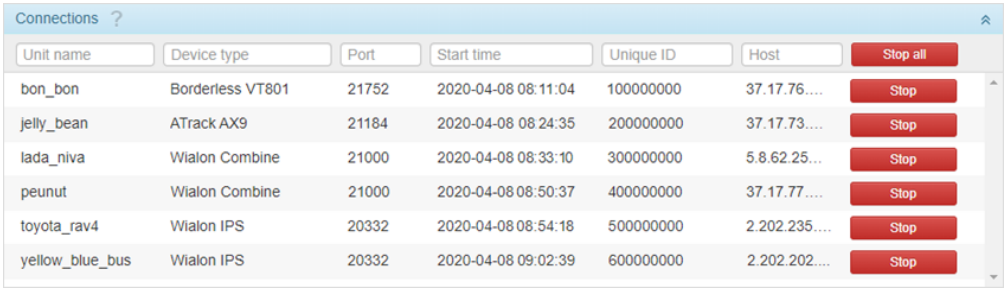
The columns available in the **Device types** section are described below.

Column	Description
Name	This column displays the device type. You can rename it individually for one or several billing plans. To do this, click on the name in the list and enter a new one. Next, select the billing plans for which this name should be used.
TCP port	The number of the TCP port to which the devices of this type send the data.
UDP port	The number of the UDP port to which the devices of this type send the data.
Timeout	The number of seconds for which the server keeps the connection open if there is no data from the devices of this type.
Status	✓ : the reception of data is activated for the devices of this type, ✗ : the reception of data is stopped.
Commands	This column displays the number of commands available for the devices of this type and transferred using the TCP, UDP, o Virtual channels. The tooltip contains detailed information with the names of all commands for each channel.

Using the **Stop** and **Start** buttons, you can interrupt and restart the reception of data from the devices of the selected type respectively.

Connections

In this block, you can see a table of all units which have a connection at the moment.

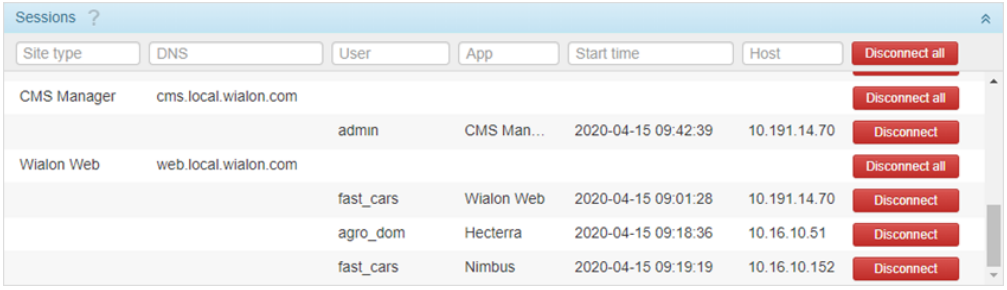


Column	Description
Unit name	The name of the unit.
Device type	The type of device used by the unit.
Port	The port to which the data from the unit is sent.
Start time	The time of establishing the connection.
Unique ID	The unique ID of the unit.
Host	The IP address from which the unit data is sent.

After clicking on the **Stop** and **Stop all** buttons, the server breaks the connection with the unit.

Sessions

This block displays active user sessions on all sites.

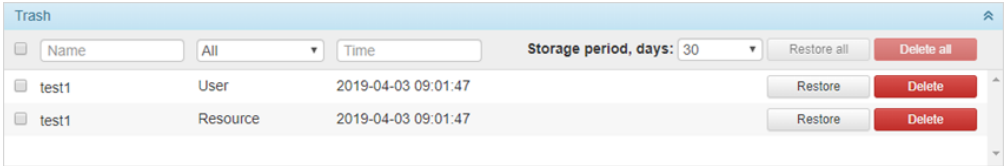


Column	Description
Site type	The type of the site for which the session is created.
DNS	The domain name of the site.
User	The name of the user who has started the session.
App	The name of the application the user is working with. These can be niche solutions which use the SDK of the site from the **Site type** column as well as the sites that provide SDK (Wialon Web and CMS Manager).
Start time	The start time of the session.
Host	The IP address from which the user has connected to the site.

The **Disconnect** and **Disconnect all** buttons stop the selected session or all the sessions respectively.

Trash

The units deleted from the system are placed in trash. It means that they can be restored. A required term of storage should be chosen from the dropdown list in the header of a trash block (30 days by default).



On the list, you can see unit's name, type, and date and time of deletion. Unit types are the following:

- avl_unit — unit;
- storage_user — user;
- avl_resource — resource;
- avl_unit_group — unit group;
- avl_retranslator — retranslator;

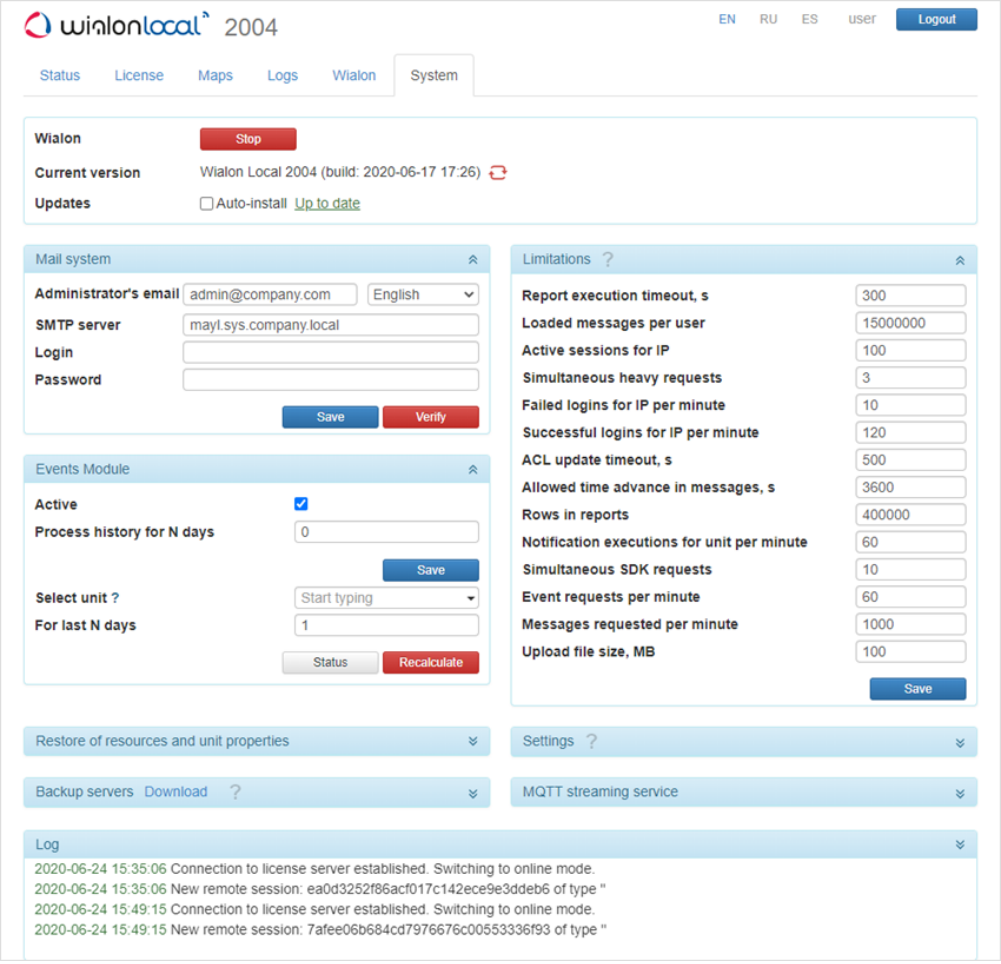
- avl_route — route.

Any unit from the list can be restored or deleted from the system completely. To restore/delete multiple units at once, select them with a mouse click and then click **Restore all** or **Delete all** in the header.

> ⚠ Deleted units are **always** restored into the root account **wialon**. If needed, you can transfer them later to the accounts that stay lower in the hierarchy. Moreover, you should take into consideration that restoring units is, in fact, their re-creation, which means that it requires free slots.

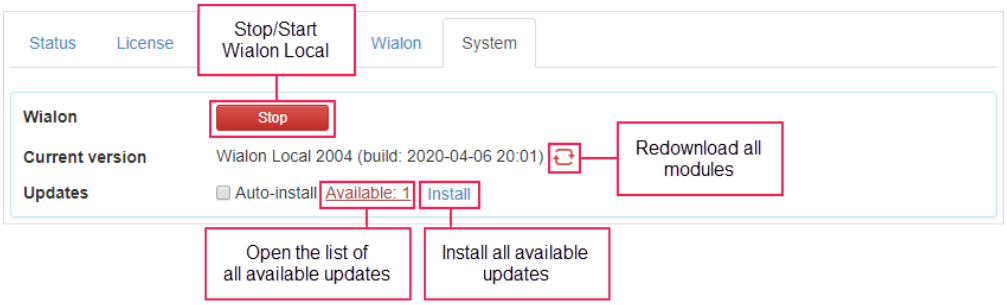
System

On this page, you can start/stop Wialon Local manually, install updates, adjust mail server, and set important limitations.



Start and Updates

In this block, you can manually start and stop Wialon Local and install updates.

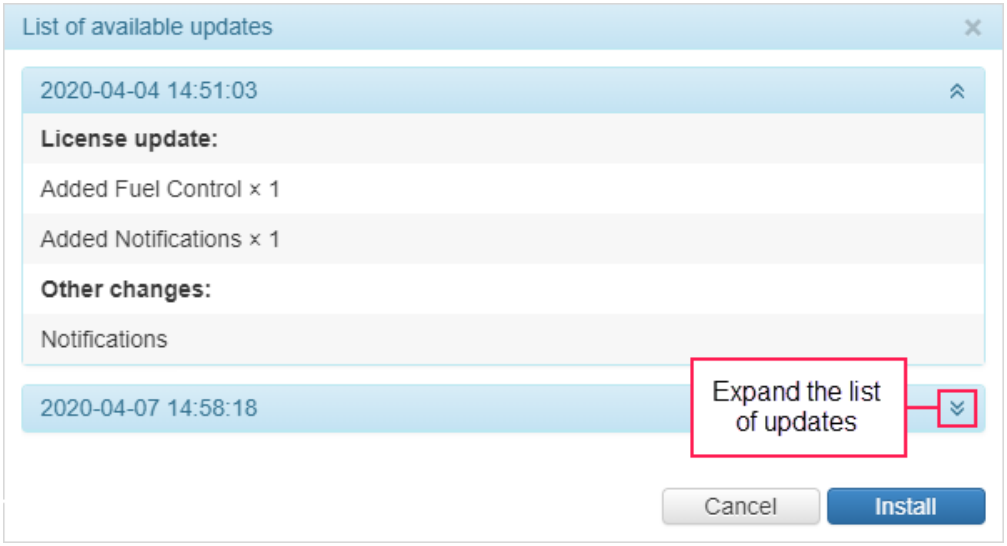


The lines available in the block are described below.

Line	Description
Wialon	This line contains a button to stop and start Wialon Local.
Current version	The current version of Wialon Local is specified here. In case the modules work incorrectly, you can reinstall them. To do this, click on the icon (**Redownload all modules**) located next to the version of Wialon Local and install the downloaded update.
Updates	Two sources of updates are available: a purchase of components or a release of Wialon Local. If the **Auto-install** option is enabled, the system detects available updates automatically and installs them immediately. If the option is disabled, you will be informed about the updates in the log. Besides, a corresponding phrase is displayed in the **Updates** line (for example, **Available: 3** instead of **Up to date**).

Installing updates

To install the available updates, click **Install**. To open the **list of available updates**, click on the **Available** link.



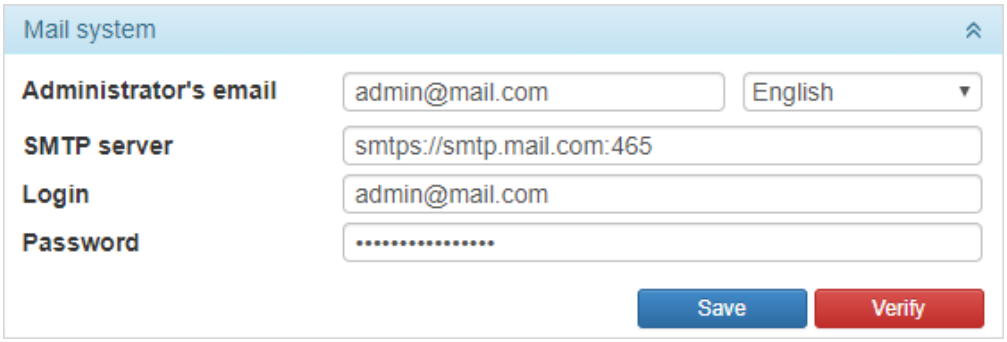
After installing the updates, you can click **Up to date** to see the list of the applied updates.

> ⚠ When installing the updates, Wialon Local always restarts, that is, all sites, modems, etc. restart and all active sessions are forcibly terminated.

Mail System

In the **Administrator's email** field of this block, enter an email address where you want to receive system notifications about available updates, occurring errors, insufficient disk space, and so on.

In the drop-down list to the right of the email, select the **language** in which system notifications to the administrator should be sent (English, Russian, or Spanish).



The additional software installed together with the Debian operational system includes the **Postfix** email agent configured specially for Wialon Local. It is used for sending email messages from the system (sending notifications about Wialon Local operation to the administrator, sending reports to the end users, resetting passwords, and so on).

If you want to use Postfix, it is advisable to leave blank all fields except the **Administrator's email** and then configure the required settings in Postfix.

If you want to use an SMTP server other than Postfix, fill in the **SMTP server**, **Login**, and **Password** fields.

> You can also configure the SMTP server in the billing plan properties. The SMTP server settings in the billing plan have priority over the settings in the administration system.

For **notifications to the administrator**, **noreply@gurtam.com** is used as the **sender address**. If the SMTP server is configured, the email address indicated in the **Login** field of the **Mail system** block is used as the sender address.

For **emails to Wialon Local users** (notifications, sending reports by email as a job, and so on), the sender address is chosen in the following order (if a field is empty, the following is taken):

- email address from the billing plan properties;
- administrator's email;
- noreply@gurtam.com.

Custom SMTP server

If you want to send emails (notifications to the administrator or messages to Wialon Local users) through another SMTP server, follow the steps below.

1. In the **SMTP server** field, enter your SMTP server address. When using a non-standard port, enter it in the **host:port** format. It might be enough if you have your own SMTP server. However, if you use an external server for sending emails, authorization is required. In this case, complete the **Login** and **Password** fields with the login and password obtained in this mail system.
2. Click **Save** to confirm the changes. Do not restart Wialon Local. In this case, the settings are applied only to the notifications for the administrator.
3. Click **Verify** to make sure the mail system is configured properly. After that, a test message is sent to the administrator's email. You can see the verification results in the log below.
4. If the verification is successful, restart Wialon Local (click **Stop** and then **Start**) to apply new settings to all emails.

> Most mail systems check messages for spam. They compare the original IP address from which the message is sent with the MX record of the sender's domain. If the MX record is not found, sending messages might be suspended, or the address is added to the grey list

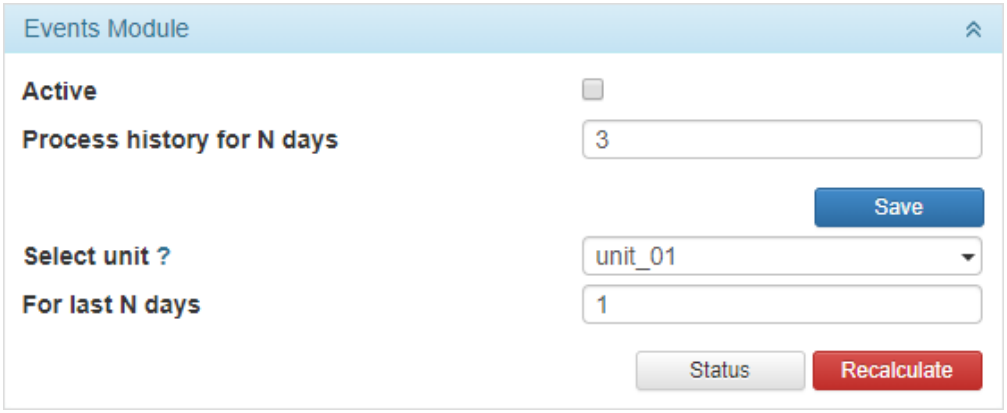
(this might result in a failure to process messages from the system). Therefore, when registering Wialon Local sites, make sure that the external IP address of the server is included in the MX records of the domain.

Below is a guide that will help you to configure sending email through the **smtps://smtp.gmail.com** server.

1. In the **Administrator's email** field of the **Mail system** block, enter an email address to which notifications for the administrator should be sent.
2. In the **SMTP server** field, enter **smtps://smtp.gmail.com:465**.
3. In the **Login** field, specify the email address of a Google account.
4. In the Google account settings (**Manage your Google Account** → **Security** → **Signing in to Google**), enable 2-step verification if it is not activated.
5. In the Google account settings, create a password for the **Mail** app in the **Manage your Google Account** section (**App passwords** → **Select app** → **Mail** → **Generate**).
6. In the **Mail system** block in the administration system of Wialon Local, complete the **Password** field with the password created in the Google account for the **Mail** app.
7. Click **Save** without restarting Wialon Local. In this case, the settings are applied only to the notifications for the administrator.
8. Click **Verify** and make sure that a test message has been sent to the email address indicated in step **1**.
9. If the verification is successful, restart Wialon Local (click **Stop** and then **Start**) to apply new settings to all emails.

Events Module

In this block of the **System** tab, you can enable real-time data processing and configure its parameters as well as recalculate this data for any unit.



Module configuration

Option	Description
Active	Activate this option to allow real-time data processing. If the option is disabled, only the mechanism of processing messages from the database is used.
Process history for N days	In this field, you should indicate how old should be the messages valid for the mechanism of real-time data processing. That is, the messages coming from the black box should not be older than the indicated value. Otherwise, the data is not formed on the basis of these messages. The maximum allowed value is 365 days. However, we do not recommend indicating a period that exceeds several days to avoid high load related to processing a large amount of data.

Data recalculation for a unit

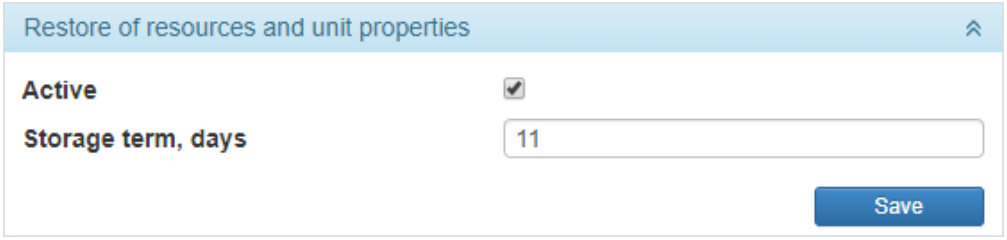
If the module is activated, you can manually start the recalculation of the unit data for the past period. To do this, select a unit, indicate the period, and click **Recalculate**.

Option	Description
Select unit	To find the required unit, start typing its name, device type, unique ID, or telephone number. You should enter at least three characters in order for the search to work.

Option	Description
For the last N days	The number of days for which the data should be recalculated. The allowed values are from 1 to 366.
Status	If you click on this button when any unit is selected, the status of the unit is shown. If there is no selected unit, the number of active recalculations is shown.

Restoring Resources and Unit Properties

In this block, you can enable the function of restoring resource contents and unit properties in the management system in case they are changed or deleted.

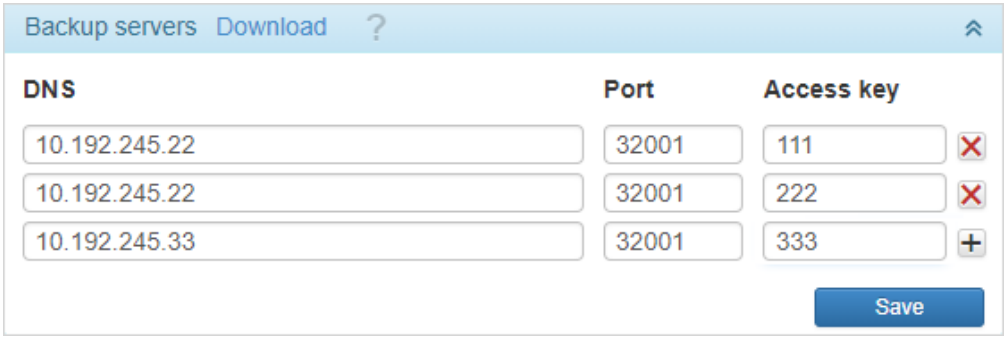


Active. If the option is enabled, the **Restore contents** button becomes available in the resource and account properties.

Storage term, days. In this field, you should indicate the number of days within which the user can restore the data after it has been changed. The maximum allowed value is 90, the recommended value is 15.

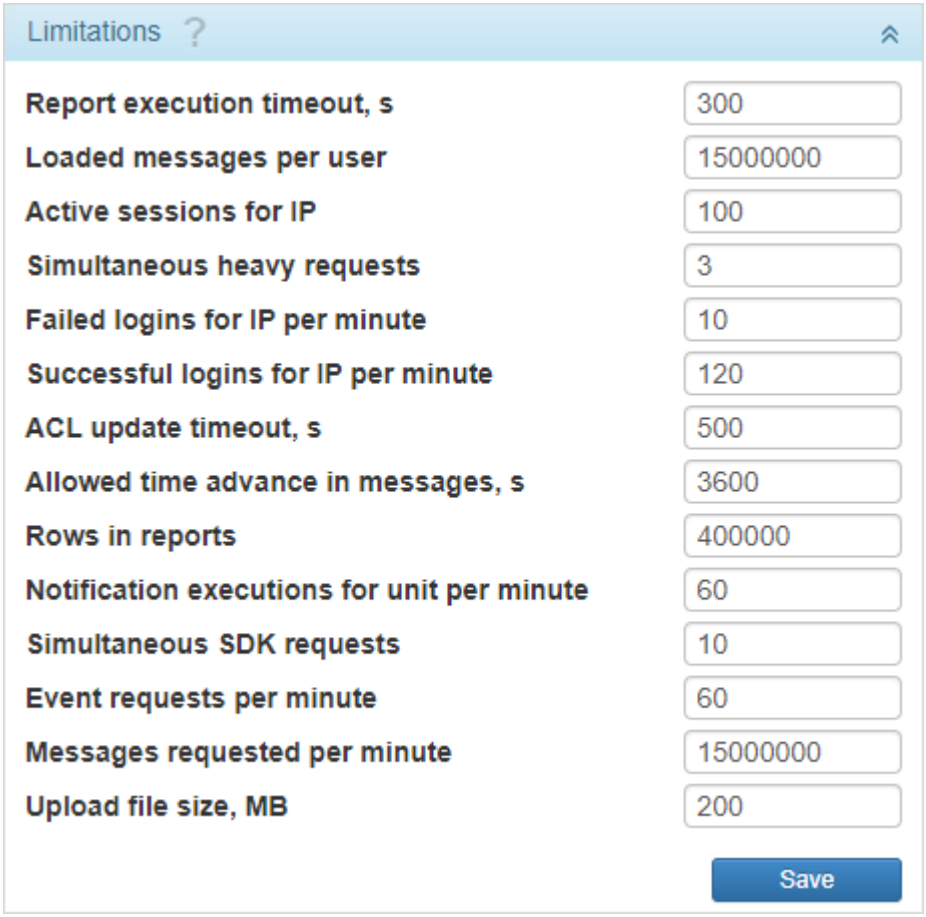
Backup Servers

In this section, for each backup server, specify the DNS, port, and access key. These parameters are checked with the ones specified in the config.txt file of the backup server.



Limitations

To ensure stable server performance and avoid overloading, you can adjust the limitations listed below.

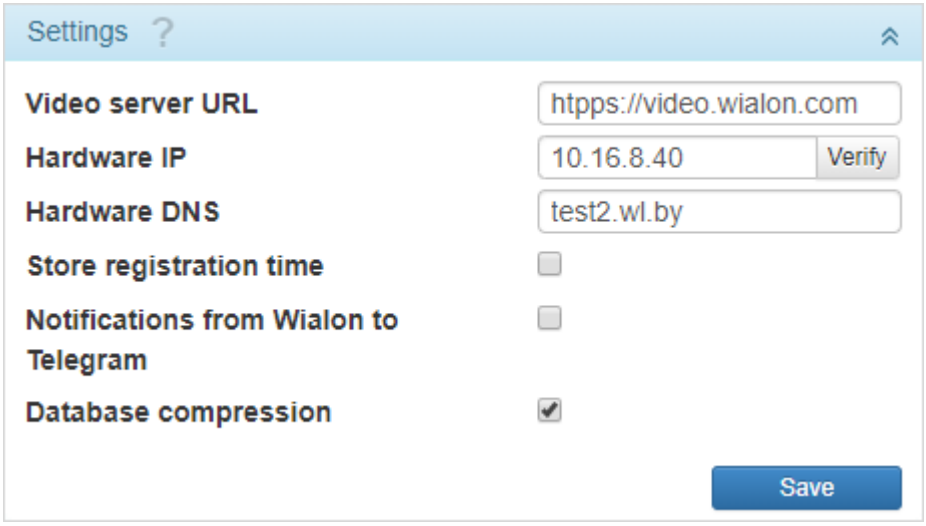


Limitation	Description	Recommended value
Report execution timeout, s	If the execution of a report on the server exceeds the value indicated here, it is aborted.	300
Loaded messages per user	The number of messages that a user can load in all sessions. If this limit is reached, the user may have difficulties executing reports, viewing tracks, importing messages, and so on.	15 000 000
Active sessions for IP	The maximum number of active sessions of one user from one IP address.	100
Simultaneous heavy requests	By heavy requests, we mean message loading, report execution, etc. In this field, you should indicate how many heavy requests can be processed simultaneously in a session.	3
Failed logins for IP per minute	The maximum number of unsuccessful logins from one IP address in a minute. If the recommended value is exceeded, the IP address of the user is blocked for one minute.	10
Successful logins for IP per minute	The allowed number of successful logins from one IP address in a minute. If the recommended value is exceeded, the IP address of the user is blocked for one minute.	120

Limitation	Description	Recommended value
ACL update timeout, s	The interval of the recalculation of the users' access rights to system objects. The smaller the interval is, the higher is the load on the server.	500
Allowed time advance in messages, s	The allowed time advance in messages with which their delayed registration is carried out (values from 0 to 84,600 are available). Applicable in cases when the device time is ahead of the server time.	3600 (no more)
Rows in reports	The maximum number of rows in reports. Values from 20 to 4,000,000 are available.	400 000
Notification executions for unit per minute	The maximum number of notification executions for one unit per minute.	60
Simultaneous SDK requests	The maximum number of simultaneous SDK requests.	10
Event requests per minute	The maximum number of event requests per minute in a session.	60
Messages requested per minute	The maximum number of messages requested per minute.	15 000 000
Upload file size, MB	The maximum size of the uploaded files (the default value is 200 MB, the maximum allowed value is 2 GB).	200

Settings

This block contains settings associated with receiving and saving data from the hardware.



The table below shows the parameters and options available in the block.

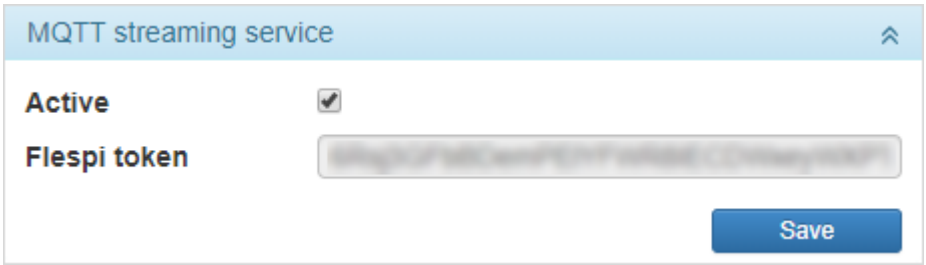
Option	Description
Video server URL	The address of the service for processing and storing video files from devices.
Hardware IP	The IP-address of the server to which the data from the units should be sent. It is displayed in the properties of all units in the Server address field.
Hardware DNS	The domain name of the server to which the data from the units should be sent. It is displayed in the properties of all units in the Server address field.
Store registration time	The option that allows storing the time of the message registration in addition to the time of the message itself. To see this data in the monitoring system, add the **Registration time** column to the table after you request messages.

Option	Description
Notifications from Wialon to Telegram	The option that allows enabling the sending of notifications from Wialon to Telegram. If you activate it, the Send notification to Telegram option becomes available as a notification action when you create and edit notifications in the monitoring system. ⚠ In order for such notifications to work, the server with Wialon Local installed should have access to api.telegram.org.
Database compression	If this option is activated, all the messages older than 10 days are compressed and transferred to a separate directory. However, you can still access the messages when executing reports or requesting messages. This allows you to save space and store the most recent messages and the historical ones on storage devices which are different in speed and size (SSD and HDD).

MQTT Streaming Service

The section is displayed if the applications that use flespi are purchased.

Enable the **Active** checkbox to work with such applications.

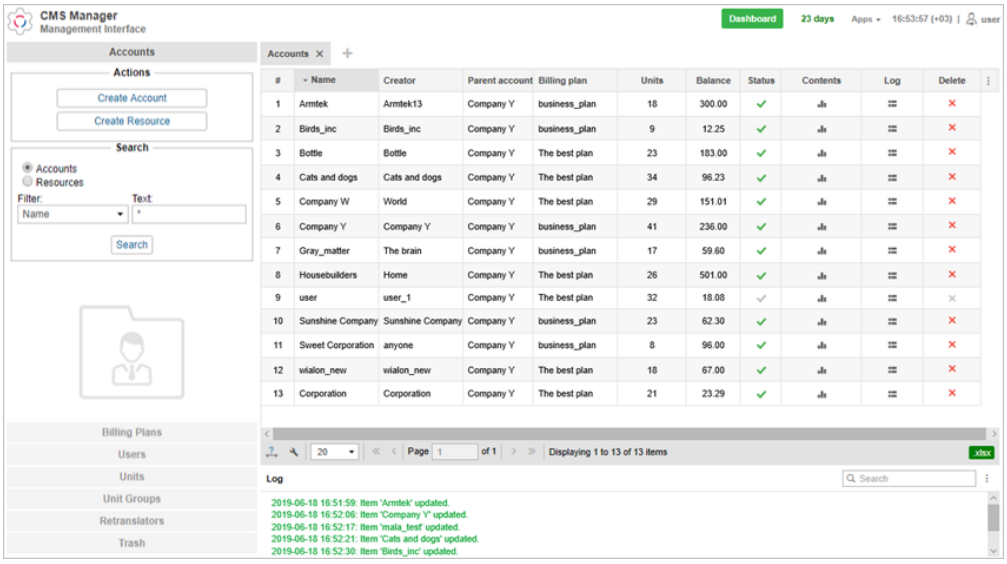


Flespi token is a key designed to connect to the flespi services and transfer the data of applications that use it. Flespi token is created automatically and provided free of charge, that is, there is no need to register it yourself. Token renewal is also automatic.

Management System

The management of GPS tracking system Wialon is realized through a specialized interface designed for Wialon managers — CMS Manager. CMS Manager allows you to manage your tracking service by means of such system macro objects as accounts, billing plans, users, units, retranslators, and others.

CMS Manager allows you to create, configure and remove these objects, manage access rights, copy and export their contents and properties.



Service Structure

A **service** is the Wialon software product consisting of the administration, management and monitoring systems as well as additional functions.

For efficient work with the service, you should organize its structure properly and configure the hierarchy of accounts correctly. The type of account depends on the role (or roles) that a user performs within the service.

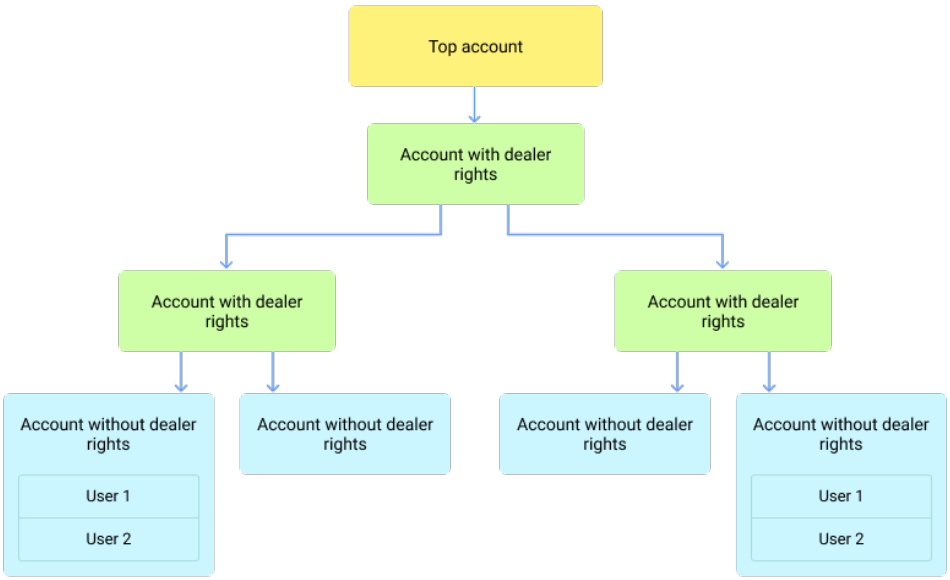
Account types

There are the following types of accounts in Wialon:

- top account,
- account with dealer rights,
- account without dealer rights.

Top account

The top account is named **wialon** and is available to the service owner from the moment of activating Wialon. The same-name **billing plan** available to the service owner includes all the purchased functions. These are a **system** account and plan, therefore, the service owner cannot edit them.



Special **features** are available for the top account:

- creating billing plans,
- adding and configuring Apps,
- restoring the deleted objects from the trash.

⚠ You cannot create units in the top account.

Account with dealer rights

A user of an account with dealer rights can create and manage subordinate accounts (block them, change rights, control payments, and so on). All the features of an account without dealer rights are available to this user as well (see below).

ⓘ It is not recommended to create units in an account with dealer rights.

Account without dealer rights

A user of an account without dealer rights cannot create subordinate accounts. However, they can create other users and give them access to the required objects in the account.

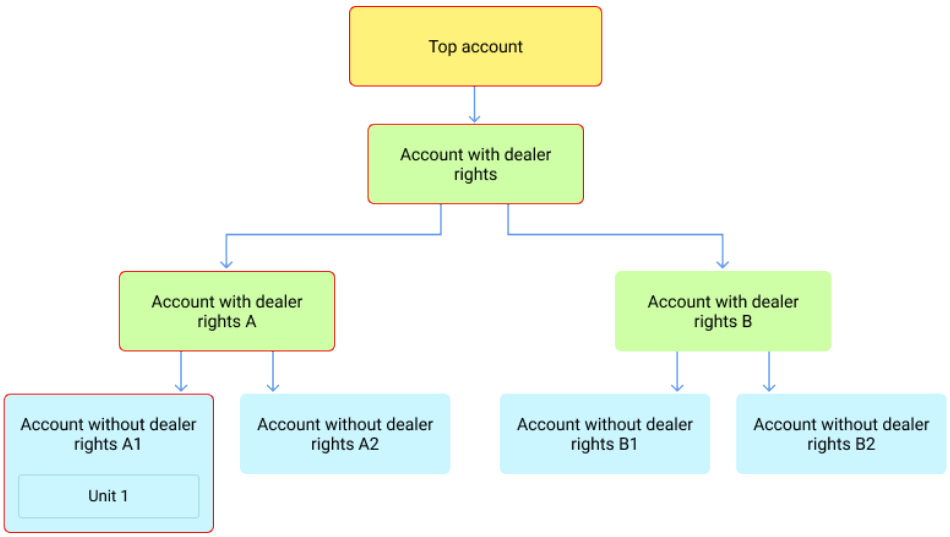
Like other users, the user of such an account works with the system in accordance with their rights: controls the movement of units, monitors drivers and trailers, executes reports, and so on. Besides, the user without dealer rights can **create units in their account**, which is not recommended in an account with dealer rights and not available in the top account.

Configuring the hierarchy

It is recommended to configure a hierarchy of at least three levels (top account, account with dealer rights, accounts without dealer rights). Depending on the specifics of your business, you may need a deeper and more extensive service structure.

When organizing the structure, take into account the following **rules**:

- A subordinate account cannot have more rights and features than a parent one.
- When objects are created in a subordinate account, the rights to them are automatically given to the users indicated as creators in the vertical hierarchy. For example, in the image below, a unit has been created in the account without dealer rights A1. All the users who are indicated as creators and whose accounts have a red outline have received access rights to the unit.



- It is recommended to create a separate account for each client.
- It is not recommended to give access to the top account to all employees.

- It is not recommended to increase the number of levels and branches in the hierarchy unless it is necessary, because it slows down the system.

ⓘ The access rights to the system objects are granted in accordance with certain principles.

To see how the objects subordinate to your account are organized, select Service hierarchy in the user menu in the management system (available for users with dealer rights).

Hierarchy configuration examples

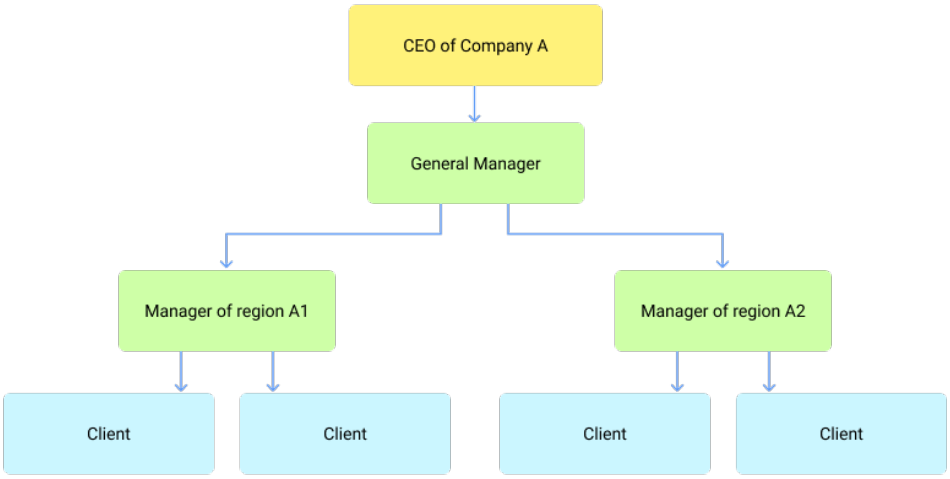
Below are two examples of configuring the hierarchy for different purposes.

Example 1

Company A provides satellite monitoring software to logistics organizations in regions A1 and A2. Separate managers deal with clients from each region. The managers of both regions are subordinate to the general manager who, in their turn, reports to the CEO of the company.

The guide below describes how to configure the hierarchy properly in this situation.

1. Create an account for the general manager. In its properties, activate dealer rights and select all the billing plans.
2. Create accounts for the managers of regions A1 and A2. Specify the general manager as their creator. In the properties of the created accounts, activate dealer rights and select the billing plans which the managers can assign to the clients.
3. Create a separate account for each client. Specify the manager of the client's region as a creator and assign an appropriate billing plan to the client. In the account properties, specify the required parameters.

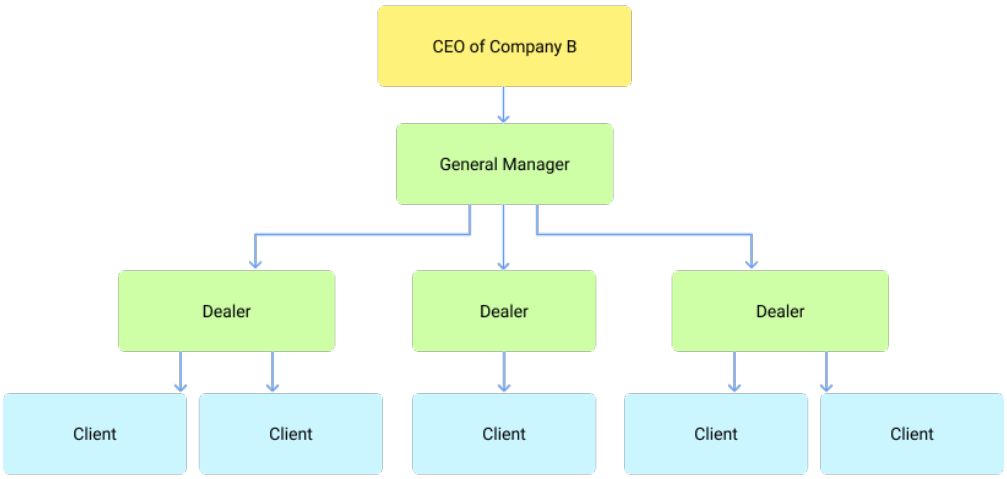


Example 2

Company B cooperates with dealers who provide satellite monitoring software to logistics organizations. The general manager handles the dealers' accounts and reports to the CEO of the company.

The guide below describes how to configure the hierarchy properly in this situation.

1. Create an account for the general manager. In its properties, activate dealer rights and select all the billing plans.
2. Create accounts for the dealers. Specify the general manager as their creator. In the properties of the created accounts, activate dealer rights and select all the billing plans which the dealers can assign to their clients.
3. Now the dealer can organize the hierarchy of subordinate accounts depending on the specifics of their business.



Changing the service structure

You can change the service structure in the following ways:

- transferring units,
- importing and exporting the resource contents and user settings,
- creating an account for an existent user.

If you want to make more complex changes to the structure, for example, to add the manager's account or transfer an account with all the contents, send a request to support@wialon.com

Access Rights

Access Control List, or ACL.

The access right is the ability to see certain system objects and carry out authorized actions with them. In the first place, the access rights are applied to the macro objects of the system such as accounts (resources), units, users, unit groups, and retranslators.

The access rights are established primarily by the service manager in the CMS Manager interface. However, some features can be available to the end user. Any users of the system, including managers and end users of any level, can be rights holders.

When you create a user, you can grant them access rights on the **Access** tab. You can also establish the rights on the same tab in the properties dialogues of the system objects.

Types of rights

The set of **standard rights** that can be applied to any type of macro object includes:

- View item and its basic properties
- View detailed item properties
- Manage access to this item
- Delete item
- Rename item
- View custom fields
- Manage custom fields
- View admin fields
- Manage admin fields
- Edit not mentioned properties
- Change icon
- Query messages or reports
- Edit ACL propagated items
- Manage item log
- View and download files
- Upload and delete files

Find more about standard rights here.

In addition, for each object type, there are **special rights**, that is, a proper list of allowed and forbidden actions which are individual for this particular type of object. For instance, the unit ACL includes a special right to create, edit and delete service intervals, the user ACL contains the right

to act as a given user, the resource ACL has the right to create, edit, and delete geofences, and so on. See more information about special rights for each type of object on the following pages:

- Unit ACL
- Unit group ACL
- User ACL
- Resource/Account ACL
- Route ACL

On the **Access** tab of every object, the rights are divided into two sections. The left section displays standard rights, and it is the same for any type of object. The right section contains special rights, and its contents depend on the type of the object to which the access is set.

Hierarchy

When assigning rights, it is important to maintain the hierarchy.

- The user-creator has full rights to the created object. Only the user of the higher level can limit these rights.
- It is impossible to give a user more rights to an object than the creator of this user has to the same object.
- A user who has transfer rights can transfer the rights to other users. However, the user can not transfer more rights than they have themselves.

Standard Rights (Item ACL)

There are 16 **standard rights**, i.e. rights that every macro object has.

Type of right	Code	Description
View item and its basic properties	0x1	Allows seeing the item in various lists and panels. The **General** tab (at least, name, creator, and resource or account) is available in the item properties dialog. However, no properties can be changed without additional rights. This is a basic right: without it, all other rights have no effect.

Type of right	Code	Description
View detailed item properties	0x2	Allows viewing more item properties. It influences both units (viewing the **Trip detection** and **Fuel consumption** tabs) and accounts (the contents of the **General** tab in the account properties dialog is supplemented, and the **Services** and **Restrictions** tabs appear in this dialog; the **Account** tab is added in the user settings dialog).
Manage access to the item	0x4	Allows granting other users rights to the item. As a rule, the **Access** tab becomes available in the item properties where the user can set access rights to this item. Besides, the item appears on the **Access** tab in the dialogs of other users, where the rights can be established as well.
Delete item	0x8	Allows deleting the item from the system.
Rename item	0x10	Allows renaming the item.
View custom fields	0x20	The **Custom fields** tab becomes available for viewing in the properties of an object (unit, unit group, user, resource). Moreover, the **Profile** tab also becomes available for viewing in the unit properties. Both **View custom fields** right and the next one (**Manage custom fields**) influence only the objects mentioned above (units, unit groups, users, resources).
Manage custom fields	0x	Allows creating, delete, and change custom fields in the unit/group/ user/resource properties, as well as edit the contents of the **Profile** tab

Type of right	Code	Description
	40	in the unit properties. This right is valid only together with the previous one.
View admin fields	0x10000	Allows user to view custom fields with limited access (admin fields) on the **Custom fields** tab of unit/group/user/resource properties.
Manage admin fields	0x20000	Allows user to create, delete, and edit admin fields.
Edit not mentioned properties	0x800	Allows editing some advanced item properties. This right is applicable only to units (gives the opportunity to edit color schemes for a track/ sensor on the **Advanced** tab, or enable the icon rotation on the **Icon** tab).
Change icon	0x1000	Allows changing the icon assigned to the item. It is valid only for units and unit groups, since other items do not have such a feature.
Query reports or messages	0x2	Allows querying messages and create reports for given item.

Type of right	Code	Description
	0 0	
Edit ACL propagated items	0 x 4 0 0	Works only on unit groups. Allows adding/removing objects to/from a group.
Manage log	0 x 8 0 0	Allows seeing the log of an item which appears in the table report **Log**. You should have the **Query messages or reports** access right to see it.
View and download files	0 x 4 0 0 0	Allows using the file server to view and download files for the chosen item.
Upload and delete files	0 x 8 0 0 0	Allows using the file server to upload and delete files for the chosen item.

If a user has the right to see the unit, its affiliation to the account, creator, groups, assigned driver, etc., these rights can be fully realized only if this user has at least the minimum rights to the corresponding items (account, user-creator, group, driver).

Resource/Account ACL

If a user gets access to a resource, they can view and use its contents (geofences, jobs, notifications, drivers, report templates, and so on) for tracking purposes as well as create such objects in this resource in the main interface of Wialon.

If a resource is also an account, the advanced access rights (such as adding payments, restricting services and determining their cost, and so on) are applied to it. Such operations are possible only in the CMS Manager interface.

Standard rights

The following standard (Item ACL) rights can be applied to resources/accounts.

View item and its basic properties

Allows seeing whether system objects such as units, users, unit groups belong to this account. It is usually written on the first tab of their properties dialog.

View detailed item properties

Applicable to accounts only. The second and third sections of the account properties dialog become visible as well as the **Services**, **Restrictions**, and **Advanced** tabs. If the end user is given this right to their account, the **Account** tab will appear in the user settings which allows viewing the current balance of the account, information on used and available services, etc.

Delete item

Allows deleting the resource with all its contents. However, to delete an account, you should additionally check the **Manage account** box.

Query reports or messages

For resources, this check box allows to generate the **Log** table and see how different users created, edited and deleted the contents of the resource (the **Manage item log** checkbox is required). It also allows the user to generate reports on drivers and trailers, as well as driver and trailer groups if they belong to this resource. For accounts, this check box gives permission to see the **Statistics** tab (the history of payments and withdrawals) but only if you check the **View detailed item properties** box, too. The similar section appears on the **Account** tab of the user settings.

Edit not mentioned properties

Allows editing the FTP-server settings on the **Advanced** tab of the account.

Standard access rights **Manage access to this item**, **Rename item**, **View custom fields**, **Edit custom fields**, **View admin fields**, **Edit admin fields**, **Manage item log**, **View and download files**, **Upload and delete files** work for resources/accounts as described above.

Such checkboxes as **Change icon** and **Edit ACL propagated items** do not affect resources or accounts at all.

Special rights

The following special rights can be applied to resources/accounts:

Resource ACL	
View geofences	Allows viewing the geofences created within a resource.
Create, edit, and delete geofences	Allows editing and delete the geofences of this resource, as well as create new ones.
View jobs	Allows viewing jobs created within a resource.
Create, edit, and delete jobs	Allows editing and deleting the jobs of this resource, as well as create new ones.
View notifications	Allows viewing notifications created within a resource.

Create, edit, and delete notifications	Allows editing and delete the notifications of this resource, as well as create new ones.
View drivers	Allows viewing drivers and driver groups of a resource. In addition, it allows viewing the automatic binding list of the drivers.
Create, edit, and delete drivers	Allows editing and deleting the drivers and driver groups of this resource, as well as create new ones. Moreover, it allows creating and editing the automatic binding list of the drivers.
View passengers	Allows viewing passengers created within a resource. In addition, it allows viewing the automatic binding list of the passengers.
Create, edit, and delete passengers	Allows editing and deleting the passengers of this resource, as well as create new ones. Additionally, it allows creating and editing the automatic binding list of the passengers.
View trailers	Allows viewing trailers and trailer groups created within the resource. Moreover, it allows viewing the automatic binding list of the trailers.
Create, edit, and delete	Allows editing and deleting the trailers and trailer groups of this resource, as well as create new ones. In addition, it allows creating and editing the automatic binding list of the trailers.

trailers	
View report templates	Allows viewing report templates created within a resource.
Create, edit, and delete report templates	Allows editing and deleting the report templates of this resource, as well as create new ones.
Manage account	For accounts only. Combined with the **Delete item** checkbox, it allows you to completely delete the account from the system, together with the resource and its contents, account creator and all objects created by this user. In combination with the **View detailed item properties** checkbox, it gives permission to control the billing plan and payment (the **General** tab), number and cost of services (the **Services** tab), and some other parameters (the **Restrictions** tab).
View orders	Allows viewing orders created within a resource.
Create, edit, and delete orders	Allows editing and deleting orders of this resource, as well as create new ones.

ⓘ In the main Wialon interface, only manipulations with inner resource contents are possible (i.e. geofences, notifications, report templates, drivers, etc.), including the permission to see the log of content changes. The account-related activities (such as payment control, tariffication, etc.) can be performed only in the CMS Manager interface.

User ACL

One user can have access rights to other users, and then edit their properties, define rights, etc. In this way, for instance, a service manager sets the rights to the clients of the service.

Standard rights

Some standard access rights are applicable to users.

View item and its basic properties

The user appears in various panels and lists. The **General** tab with all its contents and the **Advanced** tab (access to email) are available in the dialog of user properties. Username is displayed in different reports and in the **Creator** field.

Manage access to this item

The user appears on the **Access** tab in the properties dialogs of other users. Here there is a list of access rights which can be given to other users toward this one as a system object.

Edit not mentioned properties

Allows to edit the user properties on the **Advanced** tab, change individual user settings as well as send messages to this user from the management system.

Query reports or messages

Enables the **Logs** tab in the user properties dialog, which displays user activity (entries to/exits from various system services). This checkbox also gives permission to generate user reports. It should be noted that to execute the **Custom fields** report, one needs to have access to the custom fields of this user. In addition, the **Log** report can be executed if in addition there is the **Manage item log** access right.

Standard check boxes **Delete item**, **Rename item**, **View custom fields**, **Edit custom fields**, **View admin fields**, **Manage admin fields**, **Manage item log**, **View and download files**, and **Upload and delete files** work for users as described above.

Such access rights as **View detailed item properties**, **Change icon**, and **Edit ACL propagated items** do not affect users at all.

Special rights

Here is the list of special rights that can be applied to users:

User ACL	
Manage user's access rights	In the dialog of user properties, the **Access** tab becomes available where the user can be given rights to various system objects. Besides, user rights can be changed automatically – through appropriate jobs and notifications.
Act as given user	The right to enter under the name of the given user, create objects on his behalf, etc.
Change flags for given user	Allows changing the properties on the **General** tab of the user properties dialog. However, to change the password, the previous box should be checked as well.

Unit ACL

A user can obtain the ability to see a unit on the map, track its state (speed, sensor values, etc.), change its properties, execute commands, generate reports about its activity, use the unit in jobs and notifications, etc.

Standard access rights have been described above. Below is the list of special rights which can be applied specifically to units:

Unit ACL	
View connectivity settings	Allows to view the device type, unique ID, phone number(-s), device access password on the **General** tab, as well as the filtration parameters of the messages on the **Advanced** tab. In addition, the device type, phone number(-s), and UID also appear in the unit tooltip and in the extended unit information. If the SMS service is activated, the user can also send text messages to this unit.

Unit ACL	
Edit connectivity settings	Allows to edit the device type, unique ID, phone number(-s), device access password on the **General** tab, and messages filtration parameters on the **Advanced** tab.
Create, edit, and delete sensors	Sensors and their values are always visible, but this checkbox allows to edit and delete them, as well as create new ones. Additionally, the calculation tables and graphs of the created sensors become available for editing.
Edit counters	Allows to change the values of the counters (GPRS traffic, mileage, engine hours) and methods of their operation.
Delete messages	Allows to delete data messages and messages about sent commands in the **Messages** panel. It also allows to delete the records from the log (if the **Manage log** checkbox is enabled). Works only in combination with **Query messages or reports** check box.
Execute commands	Allows to send commands (e.g. from the **Monitoring** panel). In addition, when configuring tasks and notifications, this right is checked to display the commands in the list of the available commands.
Manage events	Allows to register such events as fuel fillings, maintenance work, custom event, and unit status. A special registrar in the **Monitoring** panel is used for that. Also this checkbox allows to delete already

Unit ACL	
	registered events. If the **Manage log** checkbox is enabled, a record can be added to the unit log.
View service intervals	Allows to view the **Service Intervals** tab in the unit properties dialog as well as view the maintenance state in the unit tooltip and extended unit information.
Create, edit, and delete service intervals	Allows to edit and delete service intervals as well as create new ones. Works only in combination with the previous checkbox.
Import messages	Allows to import messages to a unit database. Works only in combination with the **Query messages or reports** check box.
Export messages	Allows to export messages from a unit to a file. Works only in combination with the **Query messages or reports** check box.
View commands	Enables the **Commands** tab in the unit properties.
Create, edit, and delete commands	Allows to create, edit, and delete commands on that tab. Works only in combination with the previous checkbox.
Edit trip detector and fuel consumption	Allows to edit such tabs as **Trip Detection**, **Fuel Consumption**, **Eco Driving**, and report parameters on the **Advanced** tab. Works only in combination with the **View detailed item properties** check box.

Unit ACL	
Use unit in jobs, notifications, routes, retranslators	Allows to create jobs and notifications for the unit, assign it to routes, and use it in retranslation.

Some details about standard rights for units:

- **View item and its basic properties**
  The following information is available in the unit properties dialog: on the **General** tab — name, creator, account, counters; on the **Advanced** tab — color schemes for sensors and tracks; on the **Sensors** tab — the list of sensors; on the **Unit Groups** tab — the list of groups where the unit belongs (if the groups are accessible). The information about the current state of the unit can be seen in its tooltip and in the extended unit information: the time of the last message, current location, speed, altitude, satellites, values of counters, sensors, and parameters, as well as the presence in geofences and assigned driver. The checkbox allows to see the unit in various lists and panels, monitor its movements on the map in real time (though the tracks cannot be built) and watch its movement along the routes (but it cannot be assigned to the rounds). This checkbox also allows to control unit groups, i.e. add/remove the unit to/from groups which can be done through the properties dialog of the unit group.
- **View detailed item properties**
  Gives access to the settings used for the reports. The user can see the properties applied to the reports: the **Trip Detection** and **Fuel Consumption** tabs, report parameters and messages filtration settings on the **Advanced** tab. Neither editing these things nor report execution is allowed.
- **Edit not mentioned properties**
  Allows to edit the color schemes for sensors and tracks on the **Advanced** tab.
- **Query reports or messages**
  Allows to view messages for the selected interval (except for the log), query reports (except for the tables **Log** and **Custom Fields** which require additional rights), and build tracks.
- **Manage item log**
  Allows to query the unit log through messages or reports (if the checkbox **Query reports or messages** is enabled) and make custom records in the log (if the box **Manage events** is checked).

Other standard access rights (**Manage access to this item**, **Delete item**, **Rename item**, **View custom fields**, **Manage custom fields**, **View admin fields**, **Manage admin fields**, **Change icon**, **View**

and download files, **Upload and delete files**) work as described above. The **Edit ACL propagated items** check box does not affect units at all.

Unit Group ACL

The set of rights for unit groups is the same as for individual units. The access rights given to a group extend to the units that belong to it. For example, if the right to view commands is given to a user, then the user will be able to see the commands of each unit in the group.

Besides, some access rights can affect not only units in the group but the group itself. For example, if the right to change the icon is granted to the user, then this user will be able to change both the icon of any unit in the group and the icon of the group itself. Here is the list of rights with dual action:

- View item and its basic properties
- Manage access to this item
- Delete item
- Rename item
- View custom fields
- Manage custom fields
- View admin fields
- Manage admin fields
- Change icon
- Query reports or messages
- Manage item log
- View and download files
- Upload and delete files

The **Edit ACL propagated items** checkbox is the right that allows to add and remove the units to/ from the group.

The rest of the access rights affect only units. See Unit ACL for details.

When using groups, follow the hierarchy of rights and consider the peculiarities described below.

- The creator of the group should have rights to the units. In this case, they can transfer the rights to these units to the users that are lower in the hierarchy by giving them access to the group.
- When a user receives access rights to the group, they receive the same rights to all the units that belong to it. In this way, the user’s rights to the units can be expanded due to the group.
- The group can expand the access rights to the unit, but not limit them. If the user's rights to the unit and the group to which it belongs are different, a wider list of rights is applied.

When creating a unit group or giving other users access to it, the creator's rights to the units do not change.

Route ACL

Route access rights can be the following.

View item and its basic properties

Activating this right allows seeing a route in the **Routes** panel.

Manage access to this item

Allows transferring the right to the routes to other users. Moreover, this right allows seeing the route not only in the panel but also on the map. The user can edit the route (add, delete checkpoints, and change their radius), add schedules, show list of rounds for the route, and copy the route.

Delete item

Allows deleting a route.

Rename item

Allows renaming a route.

Query reports or messages

Allows receiving reports containing data about the available route.

Creator

One of the key moments in the management of the Wialon monitoring system is the correct and consistent assignment of the creator for certain macro objects of the system.

The creator of a system object is the user of the system on whose behalf this object was created and to whose account it belongs to. Initially, when creating an object, the user-creator gets full access rights and can also give other users access to it.

You cannot withdraw the **View item and its basic properties** access right from the creator of an object.

The creator of any user automatically gets full access rights to all the objects created by this user.

Building a hierarchy with the help of the creator allows to divide the amount of work between several users, assign different rights to objects, and also reduce the amount of processed information on the screen at the expense of 'unnecessary' data.

There cannot be objects in the system that do not have a creator. The creator is assigned when creating an object and cannot be changed later. Usually (when a user, a unit or a unit group is created) the creator is selected from the list of existing users. However, when a new account is set up, its creator can be created with it simultaneously.

> To assign a user the creator of an object, you need the **Act as given user** access right, as well as a direct hierarchical relationship to it.

The users that cannot be assigned creators of an object are not shown in the list of available users. If an object is created by means of copying or you do not have manage rights to any user, the field of selecting a creator is unavailable and the current user (i.e. you) is assigned the creator. While viewing the properties of an object, the creator is only shown if there is some access to this user.

It is impossible to delete the user that is the creator of some object. You first should delete the object. For basic users, it should be done manually. As to the account creator, it is possible to delete it only by deleting its account.

Access Dialog

> To assign rights, make sure to check the following boxes: **Manage user's access rights** to the user which is being granted the rights, and **Manage access to this item** to the objects for which the rights are set.

To set access to an object, go to its properties dialog and open the **Access** tab. This tab is displayed only if you have the **Manage access to this item** right.

On the left, you will see the list of the users. This list includes only those users towards whom you have the **Manage user's access rights** right). The users who already have some access to the item are highlighted and displayed at the top of the list. To quickly search for users, apply the dynamic filter located above the list. Enter the name or part of the username. The users whose name corresponds to the mask will be displayed.

Another way to facilitate your work with the list is to use sorting. You can sort the items either in the alphabetical or access rights order. To do it, use the button to the right of the dynamic filter.

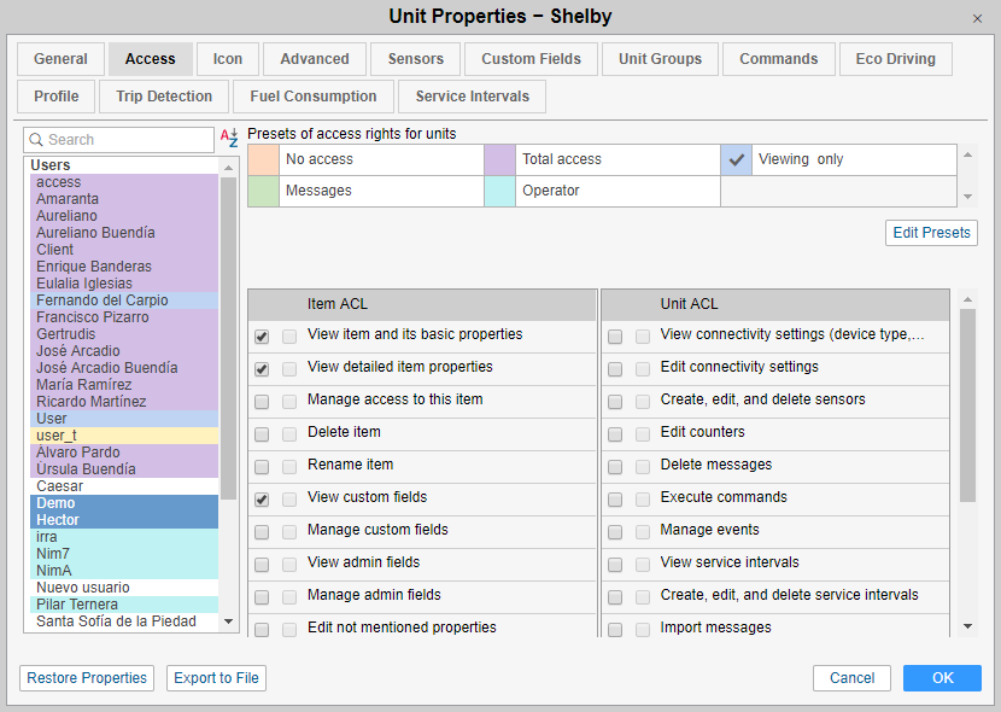
 — activates access rights order.

 — activates alphabetical order.

If the number of items exceeds 1000, the alphabetical order will be used by default.

The right part of the dialog displays the list of access rights and the existing access rights presets. The list of rights is divided into two sections — standard and special. Their detailed description can be found in the following sections:

- Standard rights item ACL;
- Unit ACL;
- User ACL;
- Unit group ACL;
- Resource account ACL;
- Route ACL.



There are 2 columns of checkboxes in each section of the access rights list. The first one (direct rights) is used to enable/disable rights. The second one (combined rights) shows the rights the user currently has (the column is for viewing only).

There may be a case when the direct rights are enabled but not applied to the chosen user. It happens when the users superior to the chosen one do not possess these rights (hierarchy restriction). The absence of checkboxes in the second column signifies such a restriction.

In the case of units the reverse situation is possible — while the box is checked in the second column, it is not checked in the first one. It means the unit is included into groups towards which

the user possesses more rights than towards the unit itself. As long as the unit belongs to these groups, the user will possess the same rights both for this unit and the group.

Below are some principles of assigning access:

- To set the rights, select the user on the left, and on the right click the checkboxes with the required rights, or use a preset above.
- You can select several users at once — press the **Shift** or **Ctrl** keys and assign the same rights to several users.
- If you click a checkbox which does not work without another one, the latter will be marked automatically. For example, if you click the checkbox **Manage custom fields**, the checkbox **View custom fields** will be selected automatically, because you can neither edit nor remove the fields you cannot see.
- For the same reason it can be impossible to remove a checkbox while there are others depending on it. Those subordinate checkboxes must be removed first.
- To place or remove all the checkboxes in one section at once, hold the **Ctrl** key and click on any checkbox.

When finished, click **OK** to apply new rights.

Access rights presets

The presets facilitate and speed up the assigning of the access rights. You can create different sets of rights for different roles, for example, for operators, managers, customers, etc. Moreover, personal presets can be made for each type of object (unit, route, etc.). The created presets are then applied to the selected users with a single mouse click.

The presets section is located in the dialog above the access rights list. You can edit or delete the presets provided by default as well as create new ones. The **Edit presets** button is located below the presets list. After clicking on this button, the left part of the dialog and access rights list will be displayed as disabled, and the buttons for working with presets will appear.

To create a new preset, click on the **Create** button. A new preset will appear in the presets list. Give it a name (double-click on the name field), and then check the required boxes in the activated access rights list below. Click **Save**.

A new preset can be created by copying an existing one. To do this, click on the icon which appears when you point to the preset. Make changes (edit name and checkboxes), and then click **Save**. Note that you cannot create presets with identical checkboxes for the elements of the same type. Such copies will be removed.

To delete access rights preset, click on the icon which appears when you point to the preset.

Each preset has its own color which is given to it upon creation. The color cannot be changed. If a preset is applied to any user, then the username will be highlighted in the corresponding color in the left part of the dialog. However, there are some exceptions in color application. If there are no flags chosen in the preset (for example in **No access** preset), then its color is not applied (users without access are not highlighted in the list). The users who have access different to all the presets are highlighted in yellow in the list. This color differs from all other colors of the presets. The same color is given to the users whom the preset cannot be completely applied to (when the 'distributing' user does not have the rights which he is going to pass to others). Moreover, yellow background is applied to the users possessing combined rights but lacking direct ones.

The setting of user access is slightly different from the standard one. Its detailed description can be found below).

Access to units can be changed not only manually, but also automatically — through the corresponding types of jobs and notifications.

CMS Interface

The CMS interface is simple and in many cases intuitively comprehensible. In many places, there are tooltips which give explanatory information to various buttons, icons, dialog boxes, and other controls.

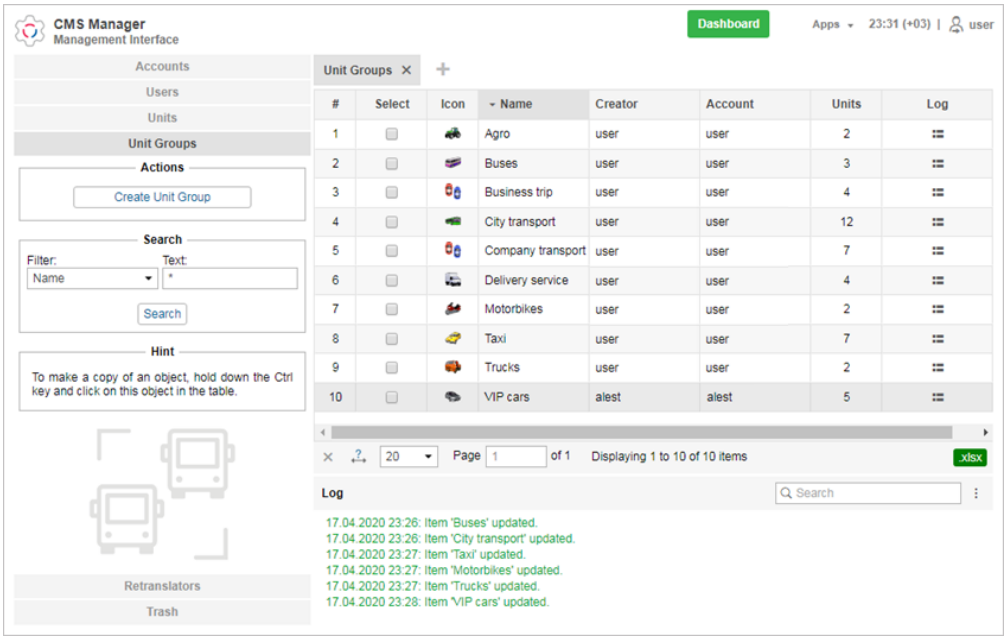
The work area can be divided into several sections described below.

The top panel is located at the top of the window. It shows your login, current time, and some buttons (Logout, Settings, Import/Export, English/Russian, Help). There, in the top panel, is also a place where warning messages come up.

The navigation and search panel is located on the left side of the screen. It contains five tabs — in accordance with five object types: accounts, billing plans, users, units, unit groups, and retranslators.

The results panel is the largest, central part. Here you can manipulate system objects (create, edit, delete, configure, assign rights, etc.).

The log is situated at the bottom of the window. Here, the messages about the operations performed, as well as errors, are displayed.



Top Panel

There is the logo of the CMS Manager system in the left corner of the top panel. The right part of the top panel contains the following elements:

- number of days till account blocking (displayed in green, but turns red as soon as the number of days left reaches 0);
- the Apps button — opens the list of available applications;
- current time (time zone in brackets);
- login (the right corner) — the name used to enter the management system (another login can be displayed in brackets if the main user is logged in as another user).

If the current time is displayed in red, this means a loss of connection with the server. This can be caused by the internet connection failure, or by some internal problems of the service.

For top users, this panel displays the number of available SMS, as well as the number of units left before reaching the limit.

User menu

User login is displayed in the right corner of the top panel. Click on it in order to open the additional menu. The menu contains the following items.

User settings

Opens the user settings dialog for viewing and/or editing.

Import/Export

Can be used to transfer the settings of units, users, resource contents (see Import and export).

Manage applications

Allows you to view and edit the list of authorized applications, and mobile notifications.

Service hierarchy

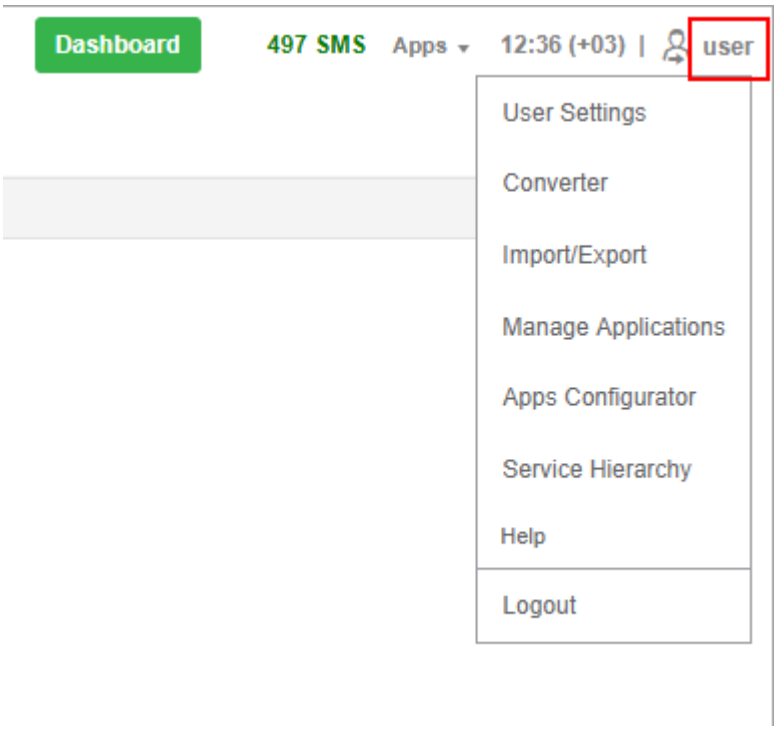
Allows you to view information about the service structure.

Help

Help request. Can be unavailable.

Logout

Button to log out of the system (end of session).



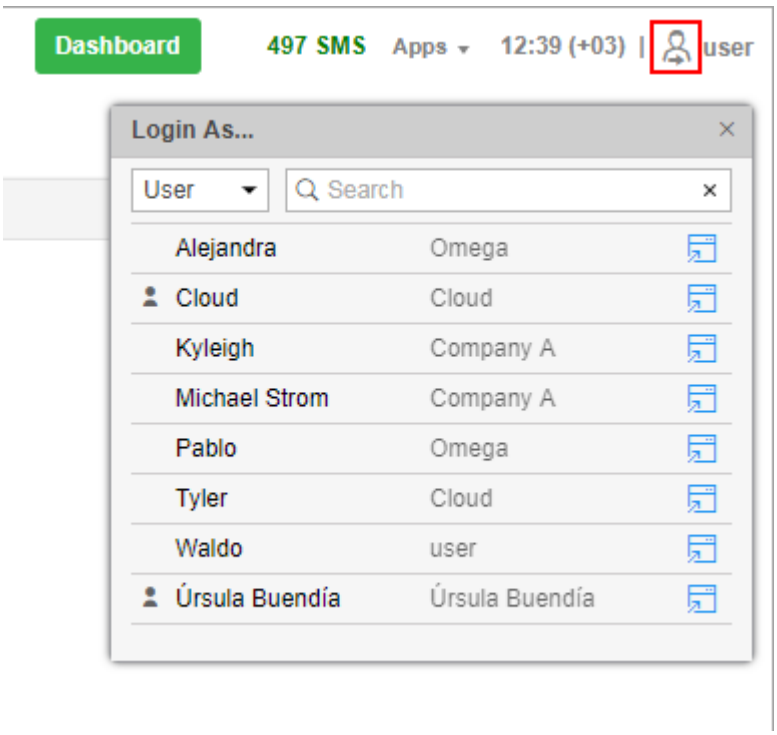
Additional menu items are available for the top users.

Conversion — converts objects from the metric system to the American and vice versa;

Apps configurator — allows adding and configure applications.

Login as another user

It is possible to log in to the system as another user. To do so, you should possess the **Act as given user** right towards the user.



If you want to log in as another user from the authorization page, you should enter your username and password, click on the **Login as** caption and select the necessary username in the open window. When you are logged in as another user, you can see only those objects that are available to them and perform the actions allowed to them. Note that the login history is stored in the account with which you have entered the system.

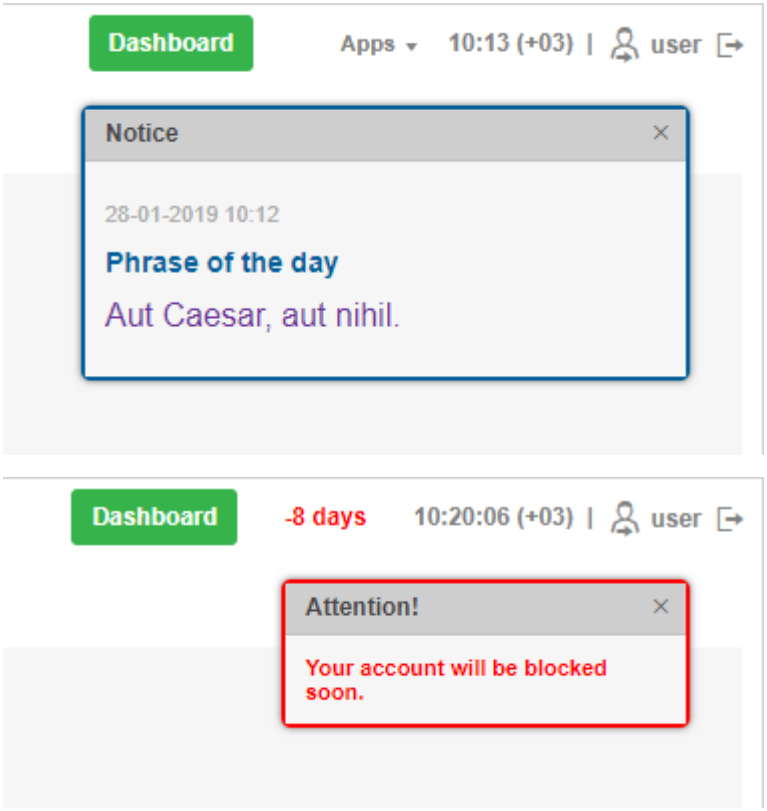
You can also switch to another user after entering the system. However, in this case, the login is not saved in the user history. To switch to another user, click the icon located to the left of the username in the top panel. Afterwards, opens the dialog with the list of available units. The users-creators of accounts are marked with the icon to the left of their names. Click on the name of the required user to sign under it in the current tab, or click on the icon at the end of the line to open the page in a new tab. For the search convenience, it is possible to use a dynamic filter. The search can be filtered by users or accounts. This is regulated by the filter in the upper left corner of the window.

There is also an alternative way to log in as another user. Go to the **Users** tab in the navigation panel. In the table of results, click on the **Login as** icon.

When you log on under a different user, its name is written in brackets next to your login (in the right corner of the top panel). To switch back to the main user, click on the icon (door with arrow) to the right of the name, and confirm your action in the appeared window.

Information notices

In the upper panel, under the username, information messages from the service manager, as well as notifications of the number of days remaining before the shutdown, can appear. Information messages are displayed in the boxes with a blue frame, warning messages — with the red one.

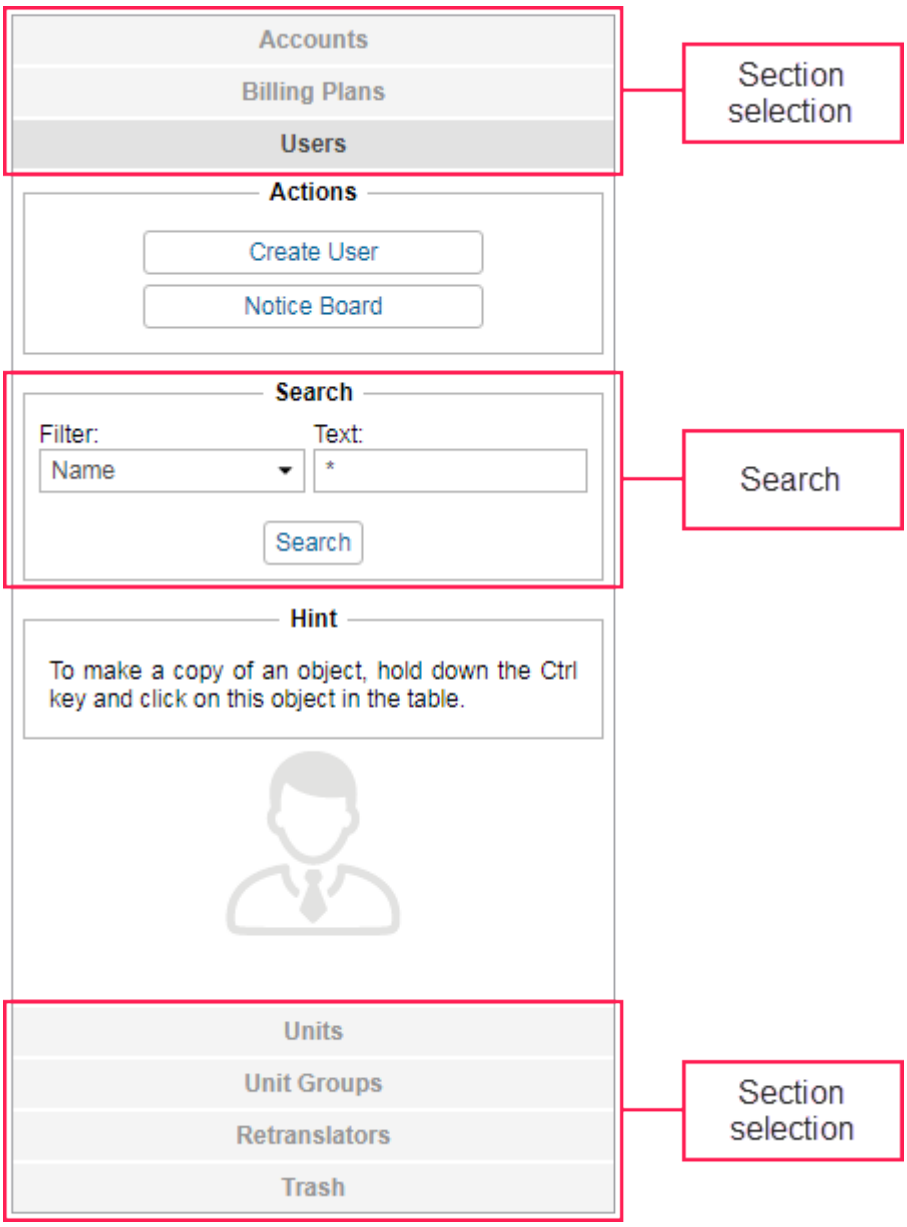


Navigation and Search

The navigation and search panel is on the left side of the window. Here you can form a query for what kind of objects should be displayed in the results panel.

Navigation

There are several tabs in the navigation panel. Each of them corresponds to a certain system object: **Accounts**, **Billing plans**, **Users**, **Units**, **Unit groups**, **Retranslators**. To navigate between them, just click on the name of the required tab.



Each tab consists of two sections: **Actions** and **Search**. The **Actions** section contains a button for creating a new object of the selected type. Detailed instructions for creating and configuring objects are given in the further topics of this guide.

The **Search** section is used to find existing objects. Then, the found objects are displayed in the results panel where you can manage them (view, edit, etc.)

Search

To search system objects:

1. Choose the section (**Accounts**, **Billing plans**, **Users**, **Units**, **Unit groups**, **Retranslators**).
2. Specify a filter.

3. Type in the request in the **Text** field.
4. Click on the **Search** button or press the **Enter** key.

The found objects are displayed in the results panel on the right.

> To find all the objects of a certain type (for example, all users), leave the **Text** field empty and click **Search**. Make sure that the filter is set to the default position, that is name.

Search filter

In the **Filter** field, choose the criterion on the basis of which the search is made. It can be:

- Name: the name given to the object when it was created;
- Creator: the creator of the object;
- Account: the account which the required object belongs to.

Individual filters for accounts:

- Parent account: search by the account from which the object was created;
- Billing plan: search by the billing plan used;
- Blocked accounts: search among the blocked accounts;
- Custom fields: search by the custom fields;
- Admin fields: search by the administrative fields.

Individual filters for resources:

- Custom fields: search by the custom fields;
- Admin fields: search by the administrative fields.

Individual filters for users:

- Billing plan: search by the billing plan used;
- Custom fields: search by the custom fields;
- Admin fields: search by the administrative fields.

Individual filters for units:

- Unique ID: the unique identification number given during the creation of the unit;
- Phone number: the phone number of the SIM card embedded to the equipment (two phone numbers are possible);
- Device type: the equipment type/name;
- Unit group: the group which the unit belongs to;
- Custom fields: search by the custom fields;
- Admin fields: search by the administrative fields;

- Profile fields: search by the profile fields;
- Activated: search among activated units;
- Deactivated: search among deactivated units.

Individual filters for unit groups:

- Custom fields: search by the custom fields;
- Admin fields: search by the administrative fields.

Individual filters for retranslators:

- Protocol: search by the protocols used;
- Server: search by the server name;
- Unit name: search by the unit name;
- Started: search by the running retranslators.

To see the list of all objects of the same type that have custom or administrative fields created in their properties, select the required filter (custom or admin fields respectively), type the characters ?* in the **Text** field, and click **Search**. In the same way, you can find all the units that belong to groups or have a specified unique ID, phone number, or completed profile fields in their properties.

Search text

Formulate your request in the **Text** field. Use the allowed characters and the asterisk sign (*). The asterisk is a wildcard that represents any combination of characters. The asterisk can be placed at the beginning, middle, or end of the request and can be used multiple times. For example, to find all MANs, select search by name, type ***man*** in the **Text** field, and click on the **Search** button or press **Enter**. All units whose name contains this combination of characters (both at the beginning and at the end of the name) will be found and displayed. The request is not case-sensitive.

Another wildcard character that can be used is the question sign (?). It replaces any single character.

To separate different parts of the request, use the comma (,). For instance, to find all MANs and all Ivecos, type ***man,iveco***.

Results Panel

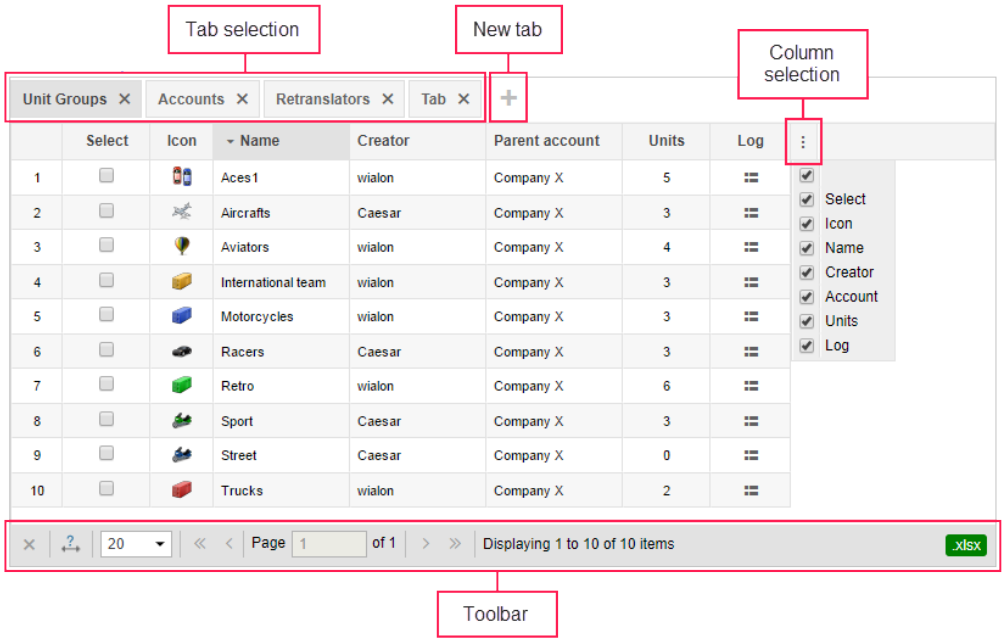
The results panel is located at the right top part of the window. Here the results of search are displayed.

It is possible to create up to five tabs in the results panel. To create a new tab, press on the inactive **New** tab that is on the right of all created tabs. To navigate between the tabs, just click on the required one. To close the tab, click on the button ✕ next to its name.

The caption on the tab displays object type: users, units, accounts, retranslators, or unit groups. Also, when navigating through tabs, if they represent different object types, the navigation and search panel changes, too.

Your actions (such as search) are always applied to the active tab. If this tab already contains any records, they will be replaced.

Managing tables



The data is given in the form of a table. Records are sorted by name in the direct order that is from **A** to **Z**. To sort the data by any other criterion presented in the table, it is necessary to click on the corresponding name of the table. Note that if sorting by column is available, when you hover over its name, the arrow of the cursor changes to a pointer (hand).

Table contents and, correspondingly, the number of columns, depend on the type of objects displayed. For example, the accounts table contains the biggest number of columns.

A set of columns can be adjusted according to your needs. To do this, click on the last column in a table header (⋮). Afterwards, in the appeared menu select the checkboxes for the required columns, or deselect them for the columns which are not needed at the moment.

At the bottom of the table, there is the **Tools** bar that can be used to perform several tasks such as deleting items, moving to another page, etc. Moreover, when working with such system elements as accounts (resources), users, units, unit groups and retranslators it is possible to save table data in Excel format. To do this, click on the corresponding icon in the right corner of the tools bar.

The width of the columns can be adjusted manually. To do this, click and drag the column edge in the required direction. To reset the settings, click on the **Columns auto width** button.

You can change the order of the columns. To do this, left-click on the heading of the desired column and drag it to a new position.

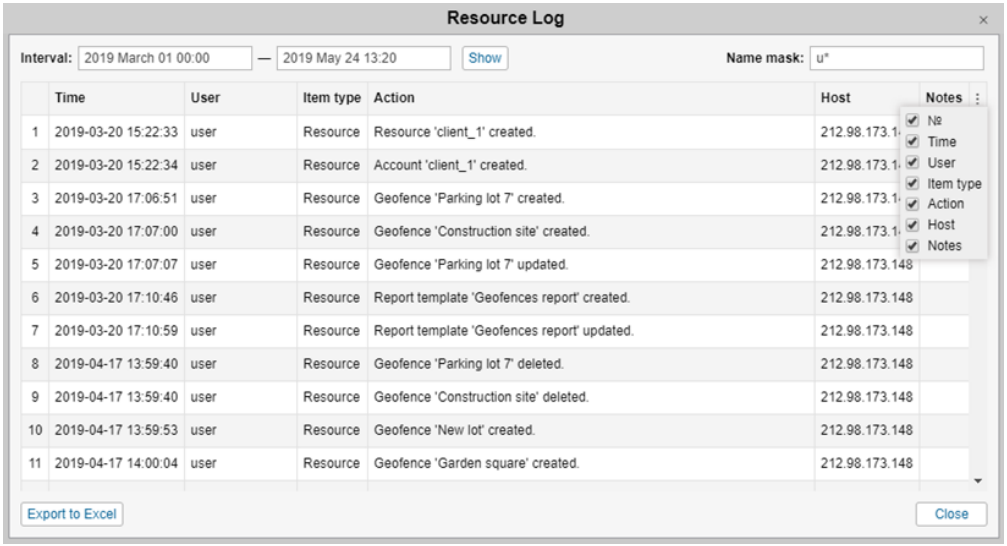
The adjusted set of columns, their width and order are saved during the current session.

Also in the tools bar, you can set the number of items displayed on the page. To do this, click on the drop-down list and select the required number (10, 20, 50, 100, 500, 1000).

To navigate between pages, use the arrow-shaped buttons. It is also possible to enter the page number manually and press **Enter**.

Log

In all tables, except the **Billing plans** table, you can find the log ( ) for the selected item. Its contents coincide with the contents of the report of the Log type in the monitoring system.



The log is presented as a table with the following columns.

Time — the date and time of the change.

User — the name of the user who made the changes.

Item type — unit, unit group, user, resource, retraslator or route.

Action — descriptin of the change.

Host — the address of the computer (device) from where the user made changes or from where a job or notification that they set up was executed.

Units — the number of units in a group (applicable only to the Unit Groups table).

Notes — an additional field where you can add your notes after exporting data to Excel.

To hide or show the columns, select the required ones in the list. To open the list, click the icon in the upper right corner of the table.

At the top of the dialog box, you can specify the required time interval. Also here you can find the input field for name masks that filter the contents of the table by the **User** column.

At the bottom there are buttons for exporting the log to Excel and closing the dialog box.

Standard operations

As a rule, you can apply a number of standard operations to any system object displayed in the table (accounts, billing plans, users, units, unit groups, or retranslators): create a new one of this kind (except billing plans), view or edit the properties of an object, copy or delete it.

Creating new items

To create a new object, open the corresponding panel on the left and click on the **Create** button. The button is disabled if the current user does not have enough rights.

Fill in the required fields and tabs of the dialog and click **OK**. The **OK** button remains disabled until there is enough information in the dialog and it is correct. Any macro object must have a name from 4 to 50 characters, and the text fields of the dialog should not contain any prohibited characters.

The new object does not immediately appear in the table. To display it, you need to apply the search parameters.

Copying

Copying is applied to units, users, groups of units, retranslators and billing plans (accounts and resources cannot be copied). Copying is an alternative way of creating new objects. This method is especially useful if you want to create an object with properties similar to the existing one.

To make a copy of an object, hold the **Ctrl** key and click on the required object in the table. This opens the item properties dialog, all fields and tabs of which are identical to the properties of the item being copied (at least those properties which can be shown according to your access level). You can alter any properties if needed, e.g. individual information such as name, phone number, etc. Then press **OK** to complete the creation.

> ⓘ In many situations, instead of copying you can use the Import/Export tool.

View and edit

To view or change the properties of an object, click on it in the table. The properties dialog will open. If you do not have enough access rights to the object, the **OK** button is not available and you cannot save any changes. Besides, some properties and even the entire tabs can be hidden.

If you made any changes and want to save them, press **OK**. To quit dialog without saving changes, press **Cancel** or click on the cross icon in the right-hand corner of the dialog.

Deleting items

To delete an item, check it in the **Select** column. To select all the items at once, press **Ctrl** on the keyboard and check any box in the corresponding column. Then click on the **Delete checked items** button (✕) at the bottom of the table. After receiving a warning message, click **OK** to delete, or **Cancel** to take no action. Several items can be selected, too. The result of the action is displayed in the log.

Remember that a certain access right is required to delete items (**Delete items**). Items that are not allowed to be deleted cannot be checked.

Keep in mind some peculiarities of deleting different types of objects.

Deleting of a unit group or retranslator does not delete units that are included in them.

To delete a user, use the red **Delete** button that is displayed next to each user in the table. However, you can only delete a user who is not the creator of any single object of the system. Read more about deleting users.

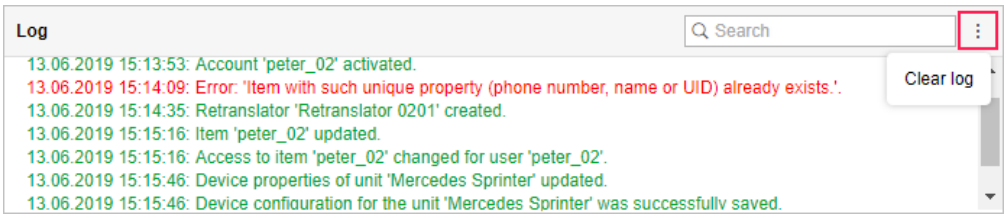
An account can be deleted only with all its contents and dependent objects, that is why deleting accounts is different from deleting other system objects. Read more about deleting accounts.

Top users have an opportunity to restore deleted items.

Log

The log is located in the lower right part of the page. It shows messages about the actions of the user-manager with their date and time.

The records about creating an object, changing its properties, a successful removal, and so on are displayed in green. Error messages are highlighted in red.



At the top of the log there is a dynamic search.

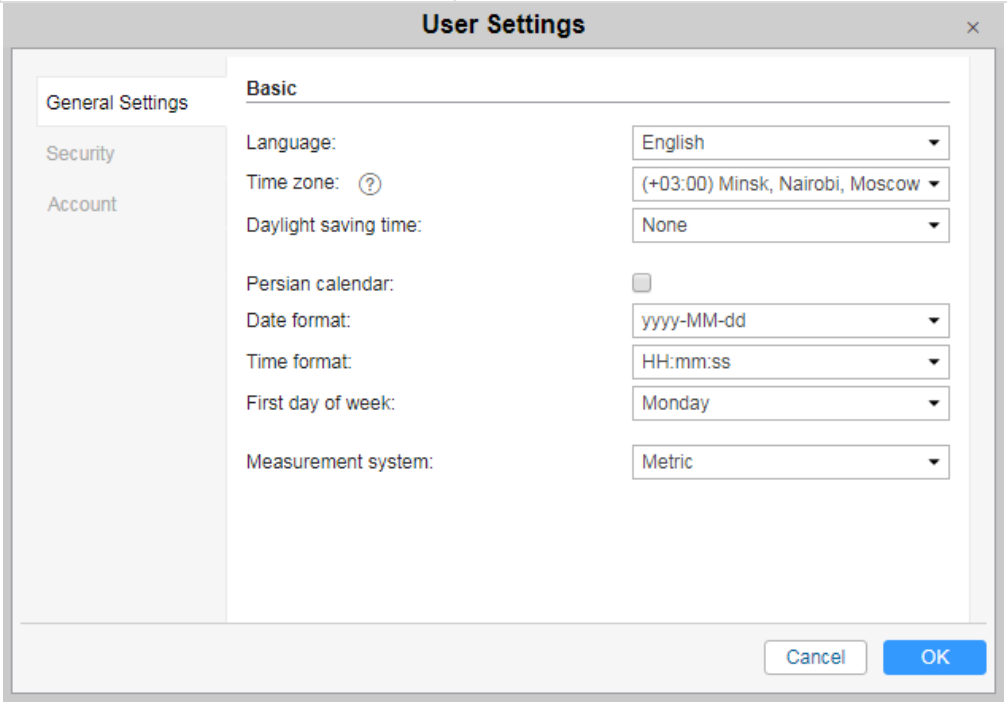
To delete all log entries, click on the settings icon ⋮ in the upper right corner and select **Clear log**.

User Settings

To view or change the settings of the current user-manager, select **User settings** in the user menu.

The **User settings** dialog contains four tabs.

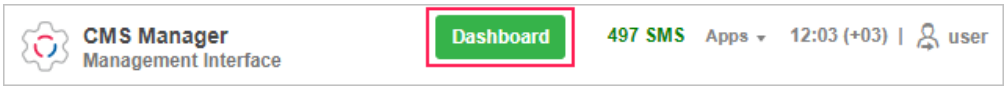
Tab	Description
General settings	Here you can indicate your time zone, email, change the password, etc.
Security	Here you can configure authorization settings, activate two-factor authentication and set an email notification about account blocking.
Account	Here you can view your billing plan, account balance, available and used services, etc.



The CMS Manager parameters are a reduced version of the User settings dialog.

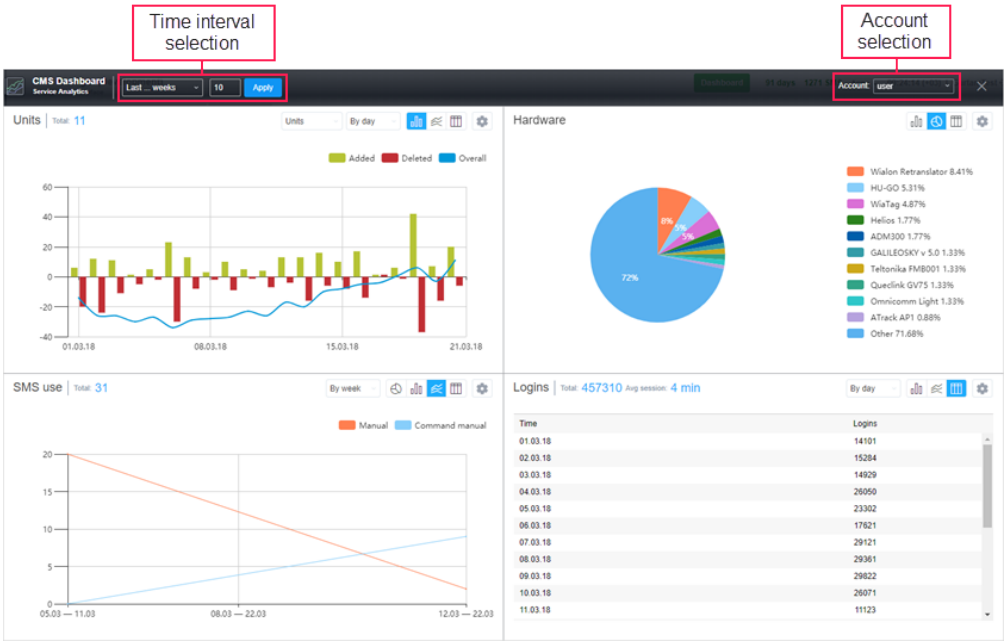
Dashboard

Dashboard is a tool that displays statistics in the form of graphs or tables. To open the Dashboard, click on the same name button, located in the top panel of the management system.



Dashboard structure

Information on the page is presented in the form of information blocks (graphs) with statistical data for the specified period. In the top panel of the Dashboard, you can select the time interval (on the left), as well as the account (on the right) for which the statistics is required.



The number of blocks can vary from 1 to 8.

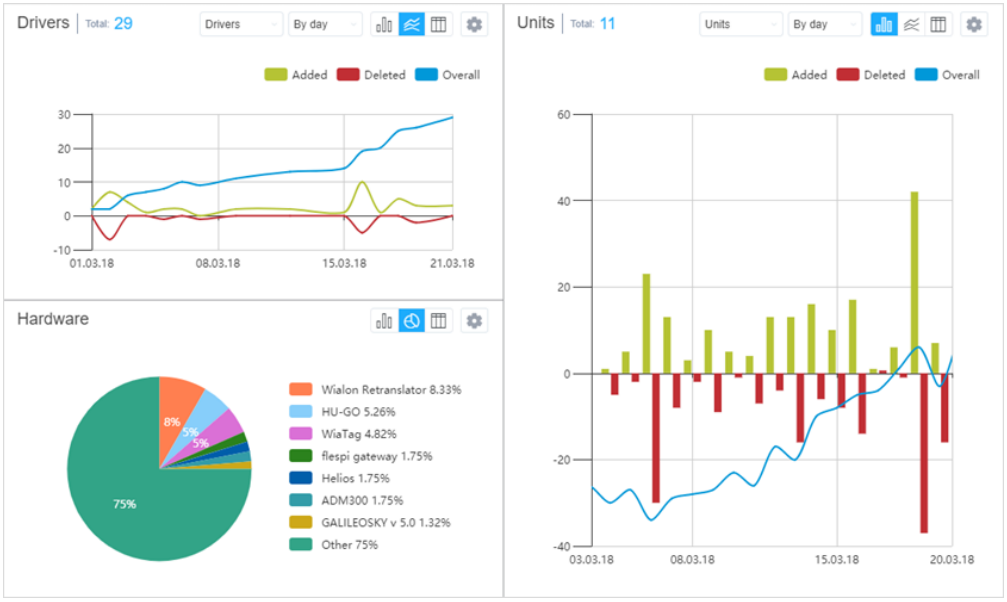
Information blocks can be added, deleted, moved, and resized.

Click on an empty cell to **add** a new graph.

To **move** the information block with a graph, move the mouse cursor over its header (the arrow of the cursor changes to the **hand** pointer) and, while holding the left mouse button, drag the graph to the required position).

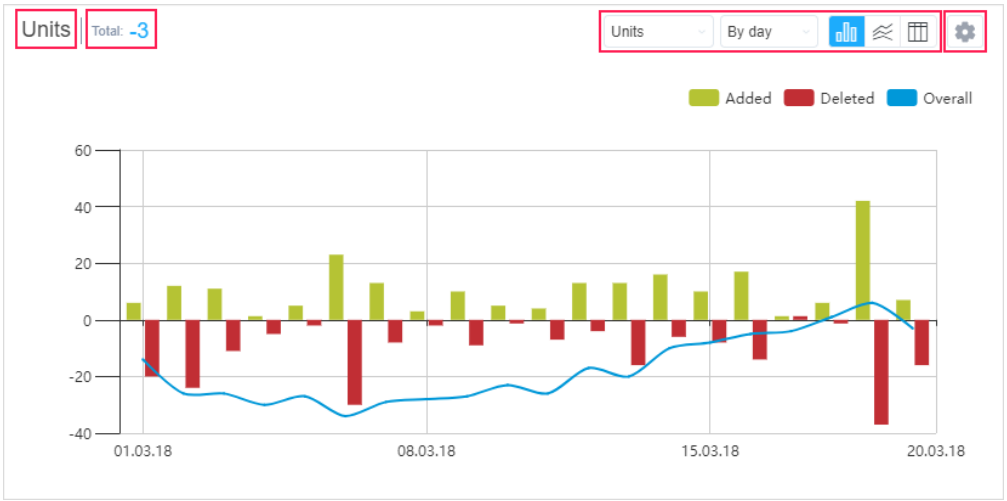
Click on the **basket** icon in the settings of the graph to **remove** it.

To **change the ratio** between the blocks, drag the horizontal or vertical separator up/down or left/right, accordingly.



Information block

The name of the graph is indicated in its header on the left together with the **Total** indicator. On the right, there are drop-down lists and switches, which, depending on the graph type, allow to change its form, the type of the object or grouping. Here is also the button to open the settings window.

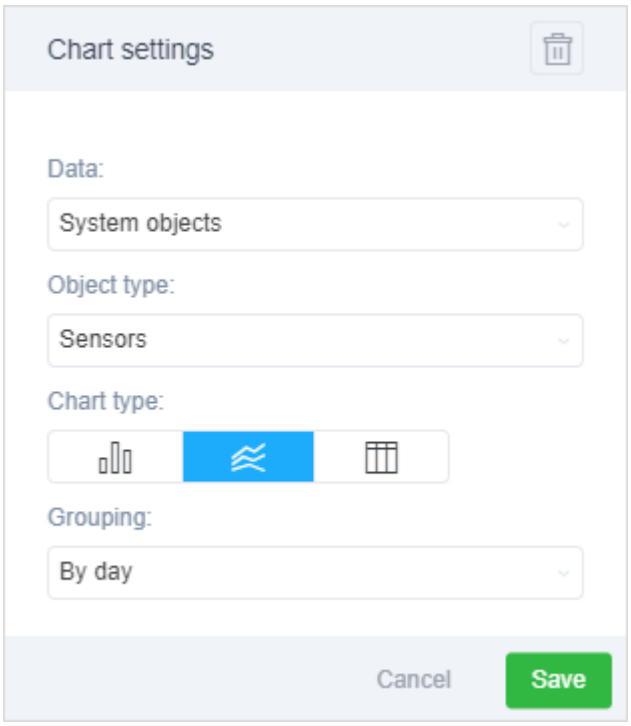


When you move the cursor over the elements of a bar, line or pie chart, tooltips appear with the information on the selected element.

Such graphs as a **Bar** and **Line chart** are scaled with the mouse scroll wheel.

Visualization of some elements of the graphs in the information blocks can be switched off. To do it, click on the button of the required element located above (for the bar or line chart) or on the right (for the pie chart) from the graph.

If you need to edit the graph, click on the button in the form of a gear located in the upper right corner of the header. Make the necessary adjustments in accordance with the data type and press **Save**.

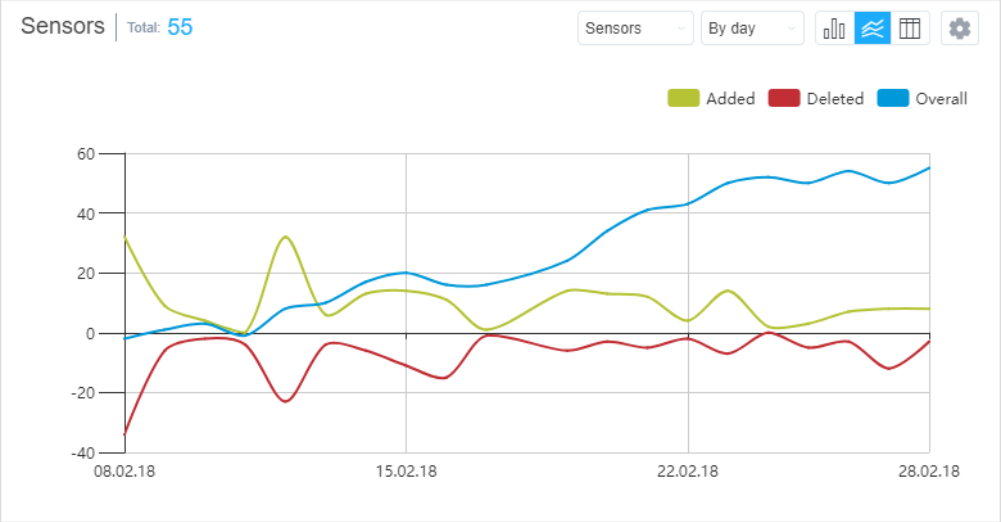


Graphs for 4 types of data are available on the **Dashboard** page: system objects, hardware, SMS use and logins.

System objects

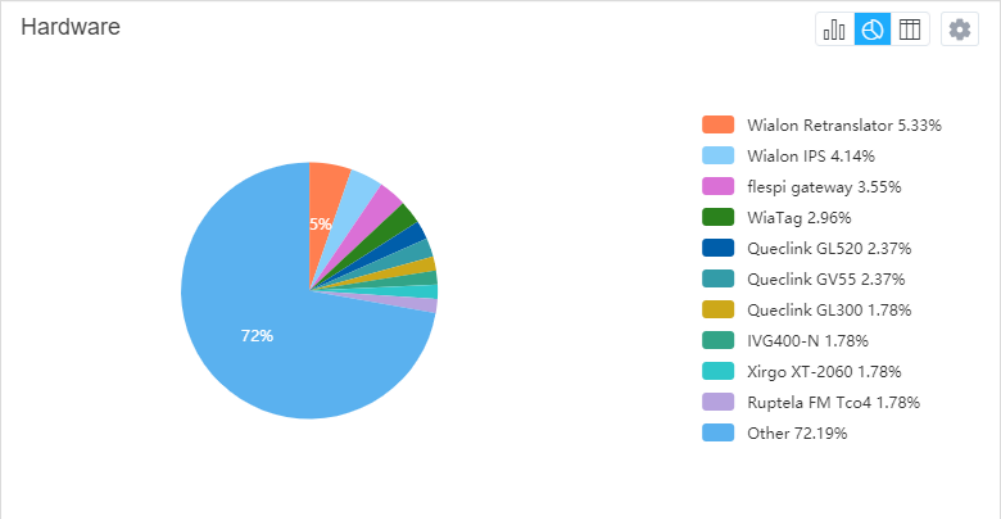
This block contains information on the increase or decrease in the number of system objects in use (units, users, resources, routes, notifications, jobs, sensors, drivers, trailers, geofences, passengers). The **Total** indicator shows the total increase or decrease for the reporting period.

The data of the **System objects** graph can be presented in the form of a bar or a line chart, or a table and grouped by days/weeks/months/quarters. Each graph contains the information about added and deleted objects. The bar and line charts also show the difference between the number of added and deleted objects from the beginning of the period to the selected point on the graph (**Overall**).



Hardware

This block contains the information about the added or deleted units with a certain type of hardware. The **Hardware** graph data can be presented in the form of a bar or a pie chart, or a table.



SMS use

This block contains the information about the SMS consumption. The **Total** indicator displays the total number of SMS messages sent during the reporting period.

In the settings of this chart, in the **Display data for** drop-down menu, you can select the type of data that will be displayed in the chart. The following options are available.

Consumption

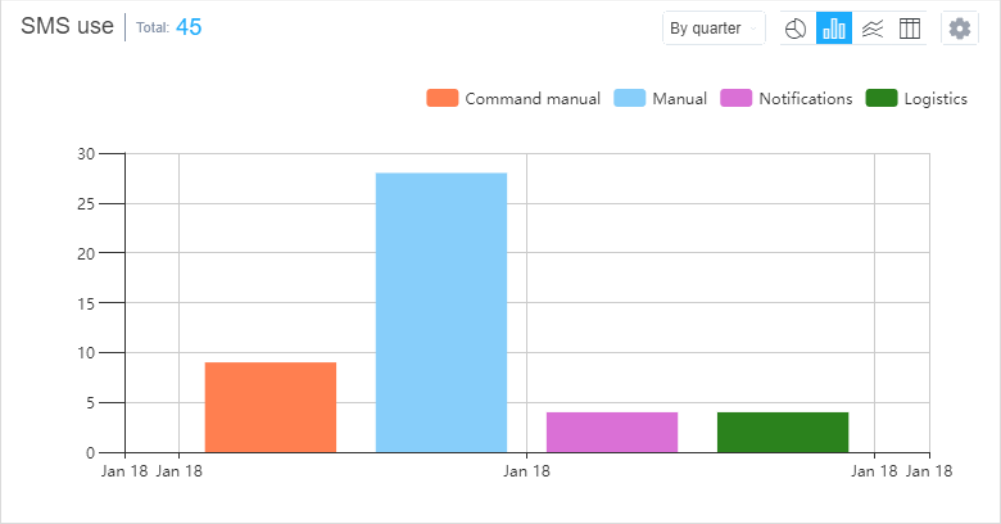
The data on the total SMS consumption can be presented in the form of a bar or a line chart, or a table and grouped by day/week/month/quarter.

Dispatch method

The data on the method of sending SMS messages can be presented in the form of a pie, a bar or a line chart, or a table.

Users

The data about users can be presented in the form of a pie chart or a table.



Logins

This block contains the information about the entries in the system. The **Total** indicator displays the total number of entries to the system and the average time of the session.

These graphs can be presented in the form of a bar, a line chart or a table and grouped by day/ week/month/quarter.

Time	Logins
08.02.18	13807
09.02.18	13676
10.02.18	13147
11.02.18	13076
12.02.18	14191
13.02.18	16868
14.02.18	15391
15.02.18	15477
16.02.18	15445
17.02.18	19185
18.02.18	30379
19.02.18	27305

Accounts and Resources

In most cases, the terms **resource** and **account** can be used as synonymous. However, in some situations, it may be useful to understand the difference between them.

A **resource** is a macro object of the system, which includes various micro objects created by users for different monitoring purposes:
geofences, jobs, notifications, drivers, trailers, passengers, report templates, and orders. The content of the resource can be easily saved to a file or copied from one resource to another (see Import and export).

The main difference between the account and the **resource** is the use of its own billing plan. One account may contain several resources or even other dependent accounts. The point is that the account includes not only the content of the resource (micro objects mentioned above) but also stores information about other macro objects, such as units, users, unit groups, retranslators, routes, or other dependent resources or accounts.

The account counts both macro and micro objects of the system and charges money for their usage. The billing plan is applied to the account and not the user. Therefore, the Wialon manager uses the account to limit the activity of the user, define the number and cost of available services, control payment, etc.

The creator is the key component of an account. For micro objects, the affiliation with the account is defined by the resource it was created in. However, for macro objects, it is defined by the creator. All macro objects created on behalf of the account creator, as well as other users whose creator it is, are automatically assigned to this account.

An account is most often created for each customer individually. However, within the same account, a number of users with different access rights can be created. For instance, we can create an account **Vehicle fleet** with users **Boss**, **Accountant**, **Machinist**, **Manager**, etc., and each of these users will use Wialon in their own way.

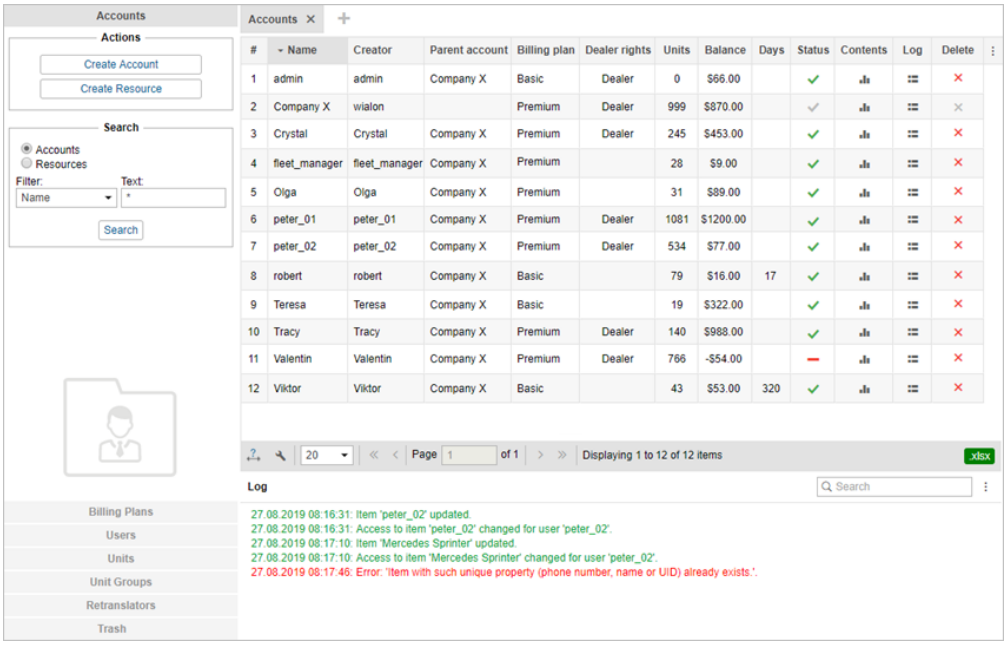
All dependent macro and micro objects are deleted together with their account. Read more about deleting accounts here.

Working with Accounts

Working with accounts and resources is possible only in CMS Manager. Click on **Accounts** in the navigation panel. Here you can:

- create new accounts and resources;
- find and display existent accounts and resources;
- control the balance of a client, add payment and days;

- allow/deny/limit access to different services;
- edit and delete accounts and resources;
- restore the contents of resources;
- view the contents of accounts.



On the **Accounts** tab of the navigation panel you can create a new account/resource, or find it among existing ones. This tab uses a switch, depending on the position of which either only accounts (by default) or only resources are displayed. To refresh table data after changing the position of the switch, click **Search**.

There are only three columns for a resource in the results panel — name, creator, account, and log.

The results panel for an account displays its name, creator, parent account, billing plan, presence of the dealer rights, number of units in it and in the subordinate accounts (taking into account the access rights of the creator), current balance, number of days left (the estimated blocking date is shown in the tooltip), status (active or blocked), date of blocking (if blocked), icons for querying a report on the account contents, open the log and for deleting the account. Note that the ways of deleting resources and accounts differ.

If blocking by days is activated in the account, then the amount of days left is displayed in the results panel in black color. If the same is activated in the billing plan, then the gray color is used. If blocking by days is disabled, nothing is displayed.

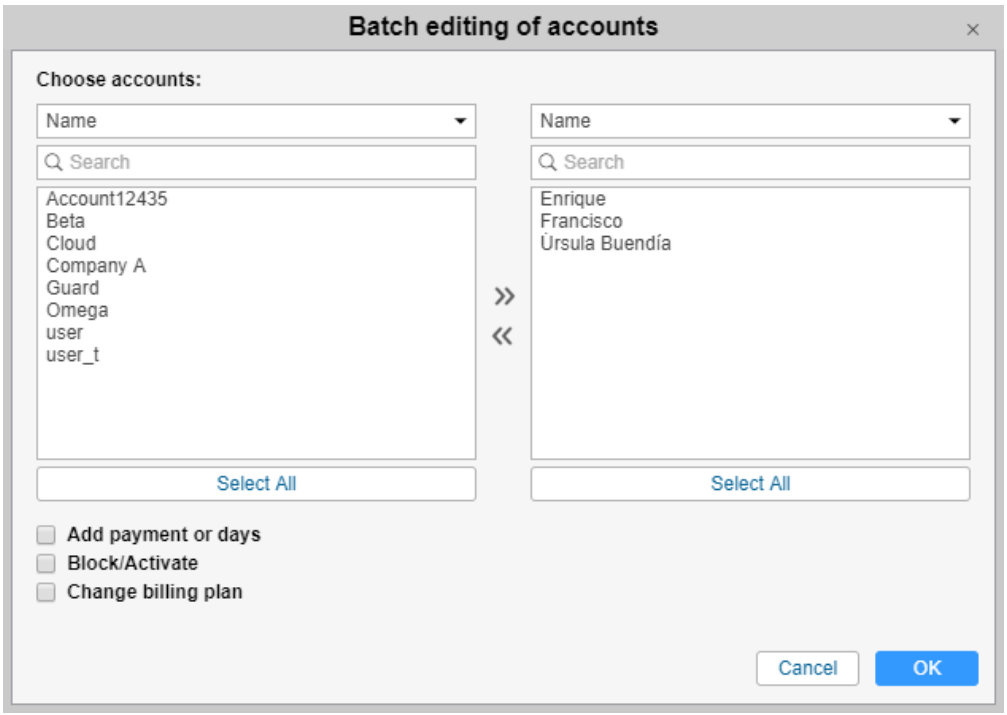
To open the properties dialog of an account or resource, click on them in the list. Depending on the level of access, certain tabs and fields of the dialog may be unavailable for editing or hidden at all. The resource properties dialog can contain up to 3 tabs — **General**, **Access**, and **Custom fields**.

Meanwhile, the account properties dialog can contain up to 6 tabs. The **General** tab is always available.

It is possible to save resource contents to a file or copy elements from one resource to another using the Import and export tool.

Batch editing of accounts

Batch editing is available for accounts. Press the icon in the tools panel to open the editing window. Transfer the required accounts from the left list to the right one (for search convenience, filtering by name, creator, account, billing plan, custom and admin fields and dynamic filter are available).



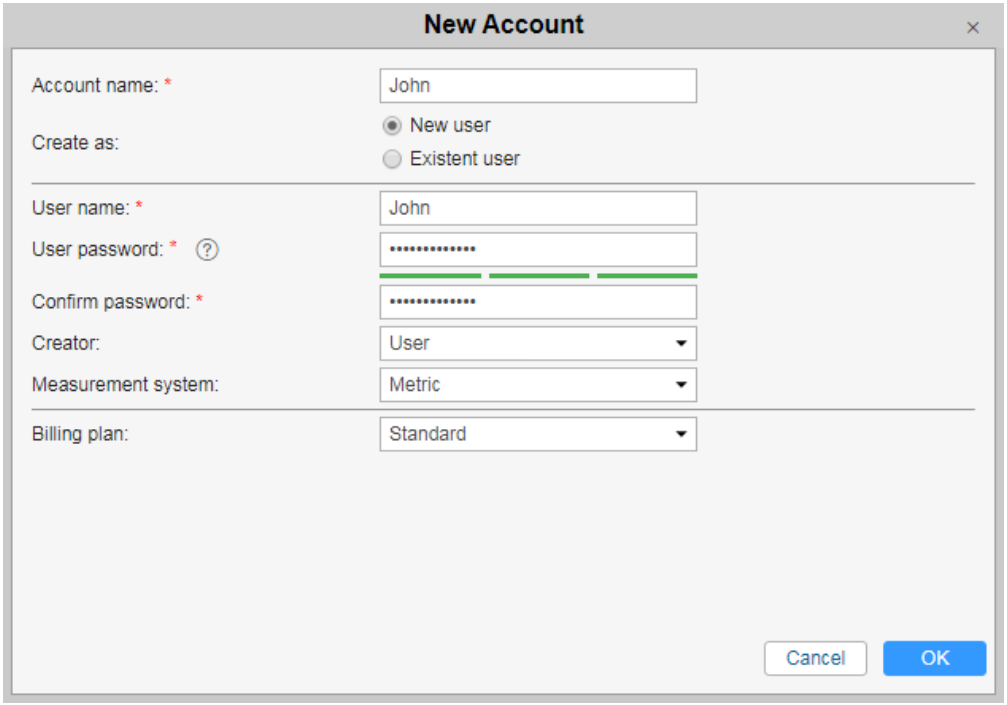
While batch editing, the following actions are possible:

- Add payment or days — a change in the balance or the number of days (a comment is required);
- Block/activation — activation or blocking of accounts;
- Change billing plan — change of the accounts' billing plan.

Creating Accounts

Accounts can be created or deleted only in the interface of CMS Manager. To create a new account, click the corresponding button on the **Accounts** tab of the navigation panel.

The parameters that are used while creating an account are described below.



Account name

Enter a unique name from 4 to 50 characters. In the system, there cannot be accounts with the same name.

Create as

A creator for a new system object can be either an existent user or a new one.

New user. A new user will be created and assigned as creator. Enter the login name for a new user. By default, the name of the account is the same as login name but you can give the user a different name. Then type a password and confirm it. You can also specify the creator for a new user if you do not want it to be the current user. In addition, for a new user, you can set the system of measures. Usually, it is inherited from the current user but you can readjust it here. Note that if the creator of a new user cannot distribute billing plans (account is not a dealer one), then the billing plans section is disabled.

Existent user. The drop-down list will prompt you to select a user from the ones already existing in the system. Note that the user who is already the creator of system macro objects cannot become the creator of new accounts as such an operation violates current hierarchy. However, this user can create a resource. When an account is created by an existent user, its measurement system is borrowed from its creator. However, it can be changed afterwards through the conversion.

Billing plan

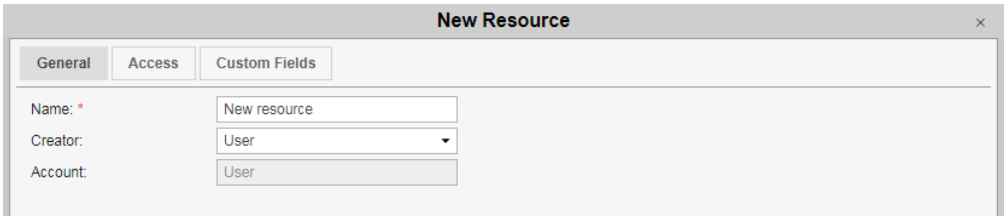
Billing plan usage is considered to be a distinctive feature of the account. Select a suitable billing plan for the account from the drop-down list. If there are no billing plans available, then the account cannot be created.

When all the fields are set correctly, click **OK**. A corresponding entry appears in the log. As a result of this operation, an account is created, and a user can also be created at the same time. In this case, the account creator automatically receives full access rights to the system elements created by it.

Creating Resources

Resources can be created or deleted only in the interface of CMS Manager. To create a new resource, click the corresponding button on the **Accounts** tab of the navigation panel.

Below are described the parameters used while creating a resource.



Name

Enter a unique name from 4 to 50 characters. In the system, there cannot be resources with the same name.

Creator

Choose a creator for a new resource.

Account

This shows which account the resource belongs to. In other words, this is the resource creator account.

The measurement system is borrowed from its creator by default. However, it can be changed afterwards through the conversion.

When all the fields are set correctly, click **OK** to save the changes. A corresponding entry appears in the log. The creator of the resource automatically receives full access rights towards created objects.

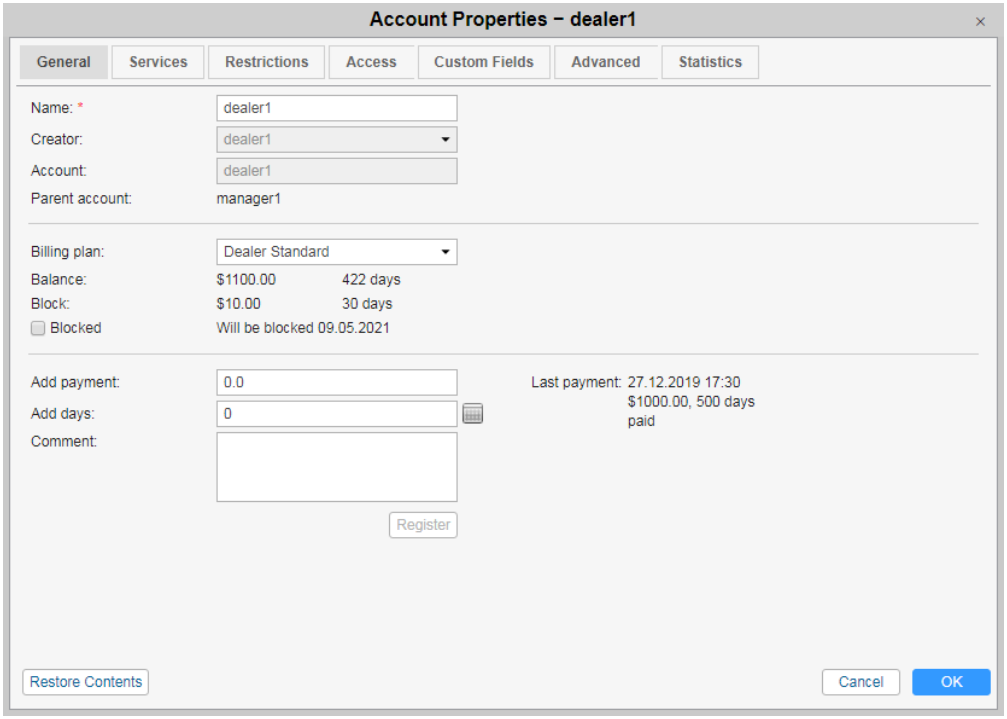
Account Properties

Account Properties dialog can contain up to 6 tabs. Their availability depends on the access rights.

General

The **General** tab has 3 sections. However, only the first one is available to the users with the minimum access. This section holds the name of the account, information about the creator, account, and parent account.

The second and third sections are designed mainly to add payment and block/unblock account.



The second section lists the billing plan, current balance, blocking limits, and the status of the account: active or blocked.

The **Balance** row shows the current monetary balance as well as the number of days left (if the option **Block by days** is enabled on the Restrictions tab of the same dialog). The row below specifies the limits at which the account is supposed to be blocked. Here, the limits are just displayed; they can be modified on the same **Restrictions** tab.

If the account is blocked, the corresponding checkbox is selected and the date of the blocking is shown in addition. If the account is active, the box is unchecked and the date of the estimated blocking is displayed (only if the option **Block by days** is enabled for the account). You can change the state of the checkbox manually if you, for instance, need to unblock the account as soon as the payment arrives. This box can also be checked manually to block the account, however, this strategy works correctly only if the money balance is zero or negative or if the amount of days left is less than 0. Note that to alter the position of the checkbox, there is no need to open the dialog — it can be done in the list of accounts itself, in the **Status** column.

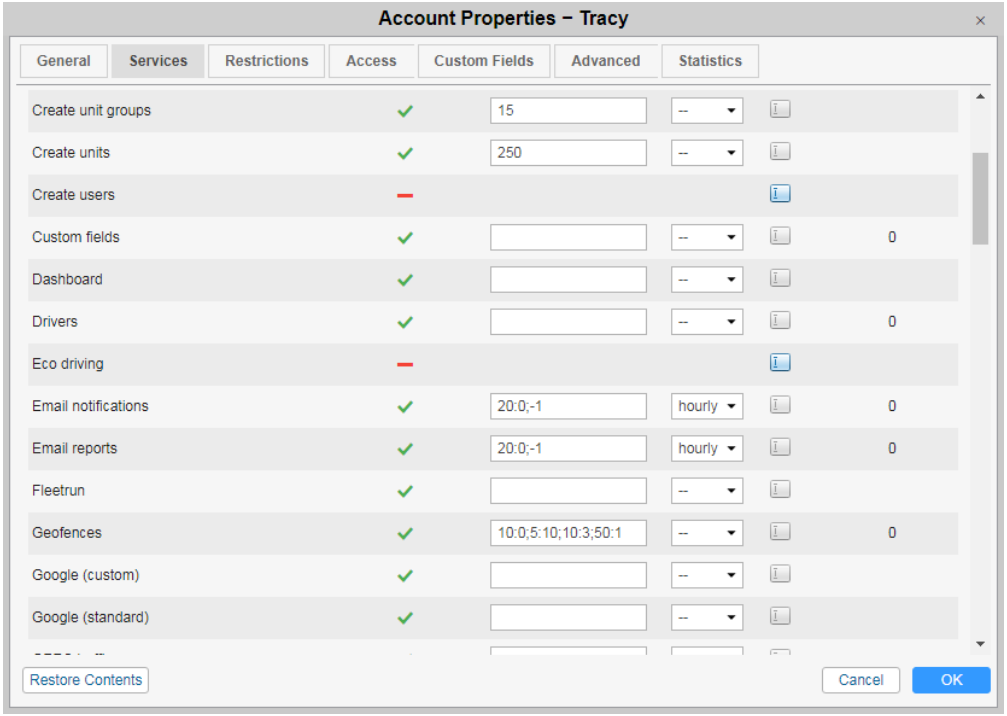
Adding a payment or days is done in the third section of the **General** tab.

To register a payment, enter the sum and comment (obligatory) and click **Register**. The sum will be added to the current balance, and the payment will be saved in the payment history (see the Statistics tab).

If the option **Block by days** is enabled, the field to add days will be available as well. The required number of days can be entered manually or specified using the calendar (the button to the right of the days entry field). Money and days can be added simultaneously in one payment or separately from each other.

Services

The **Services** tab in the Account properties dialog allows to manage the number of available units, SMS, geofences and other system objects, as well as enable or disable access to different services (such as retranslator, Wialon Mobile, jobs, etc.) and define their cost. The list of available services depends on the billing plan and activated modules.



Services can be sorted by the first or second column, i.e. by name (alphabetically) or status (enabled/disabled).

Service statuses:

- ✓ — service enabled,
- — — service disabled.

For enabled services, you can set the allowed number and cost, as well as the reset interval, if necessary. To set a quantitative limit on the service, just enter the necessary number in the

corresponding field. For example, if you set the **Geofences** field as 11, it will mean that only 11 geofences can be created within this account.

In some cases, a reset interval should be added to the quantity. For example, to set a limit of 5 text messages per hour. Other possible reset intervals are per day, per week, or per month.

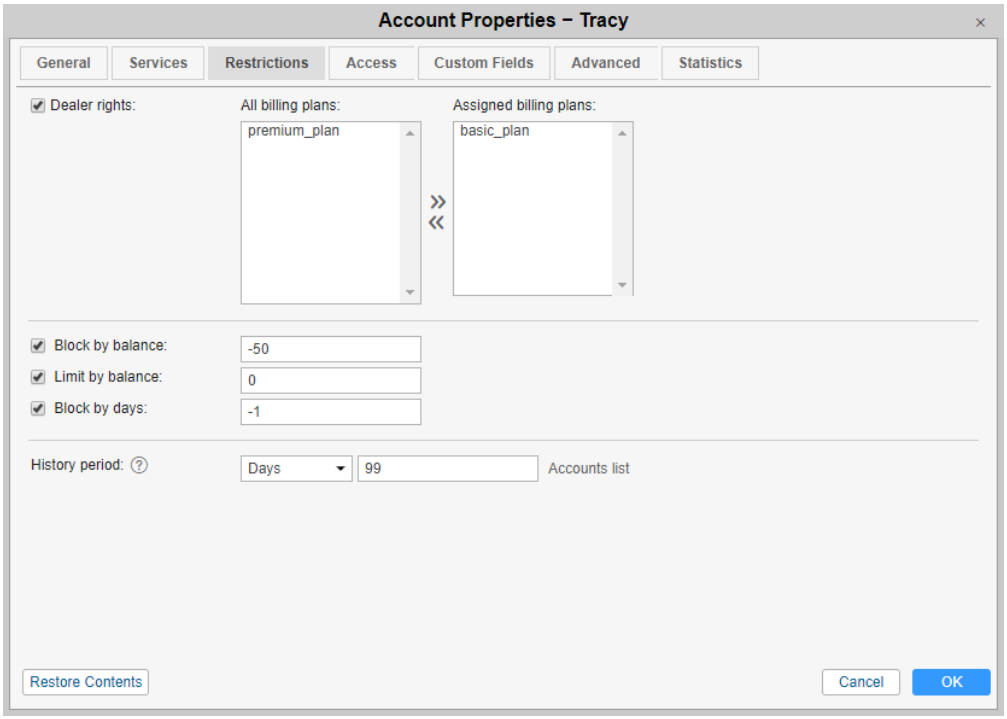
Along with the limit, you can set the cost in the format: COUNTER1:VALUE1;COUNTER2:VALUE2;VALUE3. The counter must be a positive integer (but values can be fractional). Each next counter (COUNTER (N + 1) must be greater than the previous one (COUNTER (N).
Here are some examples of cost lines:

Service	Cost line	Interpretation
SMS messages	1:0;10:1.5;-1	The 1st SMS is free, from 2nd to 10th the cost for one SMS is 1.5 c.u. The 11th SMS is not allowed to be sent.
Units	1:0;5:10;10:3;50:1	The first unit is free, from 2nd to 5th they will cost 10 c.u., from 6th to 10th — 3 c.u., from 11th to infinity — 1 c.u.
Geofences	5:0;-1	5 geofences can be created for free. The creation of the 6th geofence is prohibited.

The gray icon next to the service means that the state and restrictions for this service are taken from the billing plan assigned to the account. If the state or restrictions have been modified at some point and thus redefined for the account individually, the button  becomes active. Press it to restore the values of the default billing plan.

In the **Used** column, you can see the number of objects of the corresponding type, which have already been created in the account. This is relevant only for countable types of services (such as units, drivers, etc.) and makes no sense for uncountable (such as SKD, Eco driving, etc.).

Restrictions



Dealer rights

Check this box to create a sub-dealer, i. e. the account with the same rights and features (access to modules, services, billing plans) as the parent account. Next, specify the billing plans that will be available to it.

> ⚠ The **Dealer rights** option cannot be deactivated as long as it is a parent account.

The next three options are connected with restricting the activity of users in case of nonpayment. Usually, these values are either zero or negative (to give users the possibility to use the tracking system for some time after the expiration of the balance or days). If these options are not enabled, they will be borrowed from the assigned billing plan or parent account.

Block by balance

Indicate the balance (amount of money) at which the account should be blocked.

> ⓘ If you want to block the account manually before the specified balance value is reached, disable the **Block by balance** option. Otherwise, the account will be activated automatically.

Limit by balance

Indicate the balance of the account, after reaching which certain services and access to the CMS Manager should be disabled.

The following services become unavailable once the balance limit is reached:

- create units;
- create unit groups;
- create resources;
- create users;
- messages;
- apps.

The following services become unavailable once the balance limit is reached only if the price was indicated on the Services tab:

- SMS messages;
- Email notifications;
- Email reports;
- Google services;
- Yandex services.

Block by days

Specify the number of days reaching which the account will be blocked. This will work regardless of the **Block by balance** option. If both these parameters are adjusted, an account will be blocked when either of these conditions is met. In this case, the account can be blocked automatically not only with zero or negative balance but also if the specified number of days has expired. It can be useful for the demo access, for example, or the monthly fee control. When the counter reaches the number of days specified in this field, the service is automatically blocked.

If the **Block by days** option was activated and this state was saved, on the General tab will appear the balance of days left, as well as the line to add days when registering payment. Days counter decreases automatically every day.

ⓘ The days are counted according to UTC +3.

When 5 days are left, a special warning starts to come up each time the user logs in to the system: 'Your account will be blocked. ... days left.' Messages continue to appear until the number of days on the counter becomes less than zero. Then, the user receives the following message: "Attention! Your account will be blocked soon."

ⓘ If you want to block the account manually before the specified number of days is left, disable the **Block by days** option. Otherwise, the account will be activated automatically.

History period

This setting allows specifying the period during which the data is stored on the server. It can be specified in months or days. All the messages older than the history period are automatically removed from the database.
By default, the history period is taken from the billing plan settings. If the history period specified in the account settings exceeds the one in the billing plan settings, it is taken from the billing plan. If the history period specified in the account settings is less than that of the billing plan, it is taken from the account settings. To restore the default value, enter **0**.

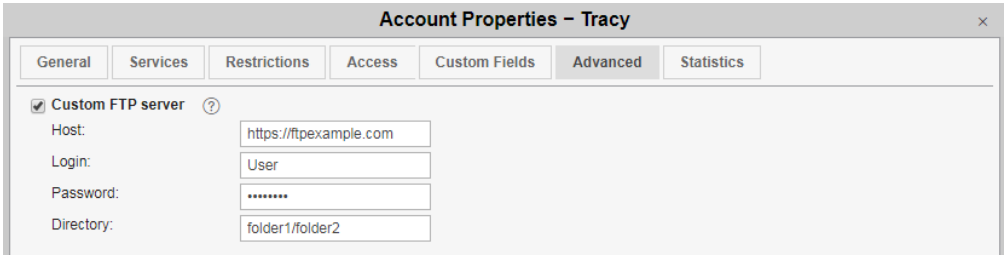
A subordinate account cannot have a longer history period than a parent account. When you reduce the history period of the parent account, it automatically changes in the subordinate ones if their initial history period exceeds the new value.

Advanced

Custom FTP server

When sending a report to email by job or notification, you can choose whether you want to receive files/archives or a link to the FTP server where the corresponding files/archives are stored.

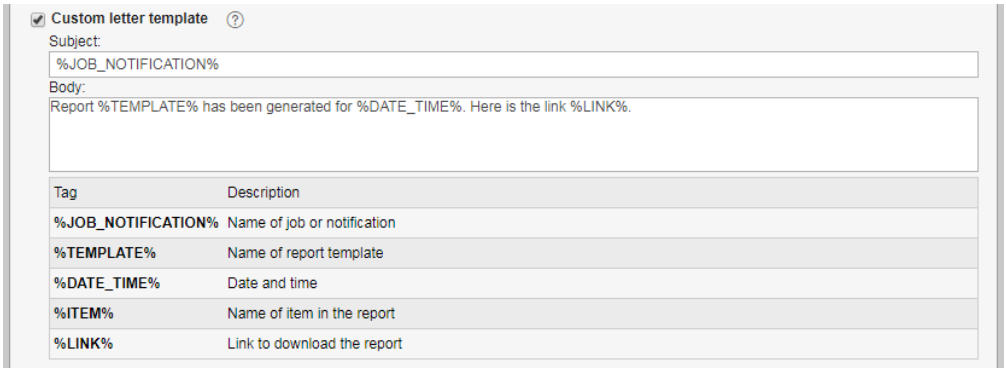
To use the FTP server, enable the **Custom FTP server** option on the **Advanced** tab and indicate its host, login, password and a directory for the storage of files or archives.



Custom letter template

To specify the subject and the body of a letter that is automatically sent by email upon job or notification execution, it is necessary to check this box and fill in the corresponding fields. Fields can be filled manually or chosen from a standard set of parameters (click required ones) which will be converted to the latest values at the moment of sending.

The type of the job or the action for the notification must be **Send a report by email**.

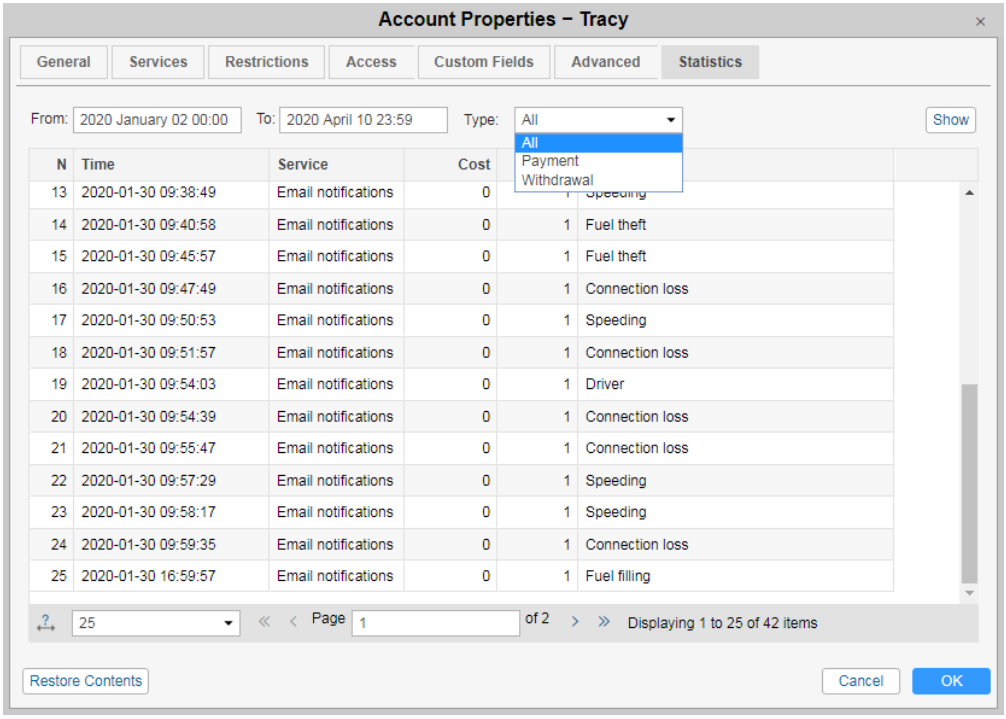


Other tabs of the **Account** or **Resource** properties dialog — Access and Custom fields — have standard contents described above.

Statistics

On the **Statistics** tab, you can view all additions to the balance as well as all withdrawals. Define time interval and press **Show**. All payments and withdrawals are shown in the table. Moreover, to see them separately, use a drop-down filter (in this case you should press the **Show** button again).

The table shows both payments and added days together with the comments given when payment/days were added.



List of Services

Here is the full list of services available in Wialon system.

Service	Description
Admin fields	Allows to create admin fields in the properties of the unit, user or group (on the **Custom fields** tab); defines the available quantity (in total) and the cost of such fields.
Advanced reports	Allows to use advanced reports, i.e., reports by unit groups, users, drivers, trailers, as well as groups of drivers and trailers (except for the **Log** table for users and unit groups). Works within Reports module.
App for iOS and Android	Activates access to the application for iOS and Android.
Commands	Activates the corresponding tab in the **Unit properties** dialog; defines the quantity (total for all units) and cost of commands.
Create resources	Activates the button to create resources and accounts on the corresponding panel (available only in CMS Manager).
Create unit groups	Activates the button to create unit groups in the corresponding panel.
Create units	Activates the button to create units in the corresponding panel.
Create users	Activates the button to create users in the corresponding panel.
Custom fields	Activates the corresponding tab in the properties of the unit, user or group; defines cost and quantity (in total) of custom fields; does not affect drivers and trailers.

Service	Description
Dashboard	Activates the Dashboard page.
Drivers	Activates the Drivers module and defines cost and quantity of drivers; if disabled, the Drivers panel is not shown, and any mentioning of drivers disappears from notifications, user settings, and **SMS** dialog.
Eco driving	Activates Eco Driving tab in the **Unit properties** dialog, as well as the same-name table in reports. Besides, Eco driving app does not work without this service.
Email notifications	Allows to send notifications by email. The service limit depends on the number of purchased licences. We recommend sending no more than 10 notifications per hour so as not to overload the server.
Email reports	Allows to send reports by email. The service limit depends on the number of purchased licences. We recommend sending no more than 10 reports per hour so as not to overload the server.
Fleetrun	Activates access to the Fleetrun application.
Geofences	Activates the **Geofences** module and defines the cost and quantity of geofences; if disabled, the **Geofences** panel is not shown, and any mention of geofences disappears from reports and user settings.
Google (custom)	Allows to regulate access to the Google maps, geocoding, and routing for the lower-level accounts. The service works with the key purchased from Google. With this service used, Google maps do not work in the Logistics application.
Google (standard)	Allows to regulate access to the Google maps, geocoding, and routing for the lower-level accounts. The service works with the key purchased from Google. It is recommended to use this service and disable the custom one.

Service	Description
GPRS traffic	Allows to control GPRS traffic through jobs, notifications, reports, and unit properties.
Groups of drivers	Defines the available quantity and cost of driver groups; works within the **Drivers** module.
Groups of geofences	Defines the available quantity and cost of geofence groups; works within the **Geofences** module.
Groups of passengers	Defines the quantity and cost of passenger groups; works within the **Passengers** module.
Groups of trailers	Defines the available quantity and cost of trailer groups; works within the **Trailers** module.
Hecterra	Activates access to the Hecterra application.
Import/ Export	Enables access to the dialogs of import/export in the user menu; activates the **Create from WLP** button in the **Units** panel and the **Export in file** button in the unit properties dialog.
Jobs	Activates the **Jobs** panel and defines the available quantity and cost of jobs.
Locator	Activates the **Locator** option in the user menu.
Maintenance	Defines the available quantity and cost of the service intervals; if activated, the **Service intervals** tab appears in the **Unit properties** dialog, maintenance can be registered in the Monitoring panel, and the corresponding notifications and reports appear.

Service	Description
Management system	Access to CMS Manager.
Messages	Access to the **Messages** panel.
MGRS	The service allows to activate the MGRS grid for Gurtam Maps.
Mobile notifications	Activates the corresponding action in notifications, as well as the tab in the **Manage applications** dialog (in user menu).
NimBus	Activates access to the NimBus application.
Notices to users	Allows to receive notices from the administrator of the service.
Notifications	Activates the **Notifications** panel and defines the cost and allowed quantity of notifications.
Orders	Activates access to the Logistics application and allows to generate corresponding reports either on units or drivers.
Passengers	Activates the **Passengers** panel and defines the cost and quantity of passengers.
Profile	Activates the **Profile** tab in the **Unit properties** dialog and the same-name table in the reports.

Service	Description
Reports	Activates the **Reports** module and defines the cost and allowed quantity of report templates; if disabled, associated jobs and notifications disappear and the trip detector cannot be used.
Resources	Activates the **Accounts** panel in CMS Manager; defines the quantity and cost of resources and accounts.
Retranslators	Allows to transmit messages from units to other servers and systems; activates the corresponding panel in CMS Manager; defines the allowed quantity and cost of retranslators.
Route rounds	Allows to create routes and defines the number of allowed rounds and their cost (within the Routes module).
Route schedules	Allows to create schedules and defines the number of allowed schedules and their cost (within the Routes module).
Routes	Activates the Routes module — enables the **Routes** panel and associated reports and notifications.
SDK	Remote access to the system via SDK and access to Apps.
Sensors	Activates the corresponding tab and defines the number of sensors (calculated for all units in overall) and their cost.
Site access	Here you can allow/deny access to different sites within your system (like Wialon Mobile v2, extra sites, etc).
SMS messages	Activates access to SMS messages. In order to send SMS messages, the **Can send SMS** option should be activated in the user properties.

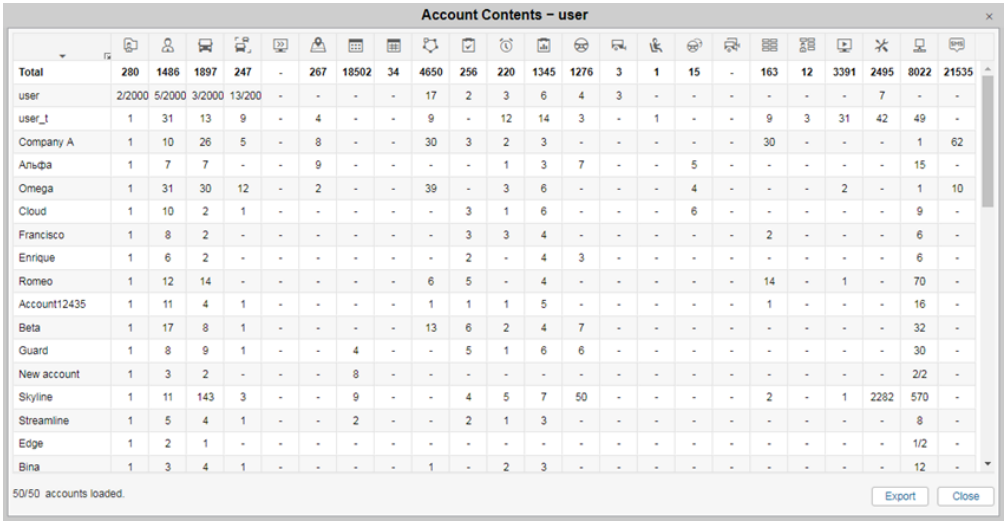
Service	Description
	This service doesn't allow limiting the number of available SMS messages and specifying their cost for a billing plan or account.
Tachograph	Activates the **Driver activity** and **Infringements** tables in reports on drivers.
Toll roads	Activates the **Toll roads mileage** and **Toll roads cost** columns in the **Trips** report and adds the corresponding statistics fields in the advanced settings of a report template. The service uses the Platon toll system.
Trailers	Activates the **Trailers** panel and defines the cost and quantity of trailers.
Unit deactivation	Allows to view the information about deactivated units. Top-level users and users with dealer rights are also able to deactivate units.
Unit groups	Defines the cost and quantity of unit groups.
Units	Activates the corresponding panel and defines the cost and quantity of units.
Users	Activates the corresponding panel and defines the cost and quantity of users.
Video	Activates the video surveillance mode.
Wialon Mobile (2)	Access to Wialon Mobile v2. If mobile service URL is different from m.wialon.com, it can be disabled only through the **Site access** feature.
Yandex (custom)	Allows to regulate access to Yandex maps for the lower-level accounts. This service works with the key purchased from Yandex. If used, Yandex Maps do not work in the Logistics App.

Service	Description
Yandex (standard)	Allows to regulate access to Yandex maps for the lower-level accounts. This service works with the key purchased from Yandex. Geocoding, routing, and panorama are available for the service. For geocoding and routing you can set the allowed number of requests.
Yandex (standard) — geocoding	Activates the geocoding for the Address tool, the **Monitoring** panel, the **Messages** panel, and the application Logistics.
Yandex (standard) — panorama	Activates the viewing of panoramic images of the locality for Yandex Maps.
Yandex (standard) — routing	Activates the possibility of building routes by Yandex Maps for the Routing tool.

Report on Account Contents

CMS Manager provides an opportunity to view a report on the account contents. The report is presented as a table displaying the amount of all the macro and micro objects included into the account.

To view a report on the contents of the account, click on the button in the results table on the **Accounts** tab.



To adjust the table, click on the button in the upper left corner of the table and select the required columns. The table is automatically rebuilt according to the chosen parameters. To facilitate the work with the data presented in the table, you can highlight any line by clicking on it.

By default, the table uses alphabetic sorting (by account name). However, the data from the table can be sorted by columns (from a larger to a smaller value and vice versa). To do so, click on the required column.

A table may contain numeric values separated by a slash ('/'). It is used when any of the features have been indicated. For example, the available amount of units is 20, but only five of them are currently used. Therefore, in the table, it is displayed as 5/20.

The left bottom corner of the dialog contains the information on the number of accounts loaded and the total amount of accounts. If the total amount of accounts exceeds 100, the data on the accounts are loaded in parts. For instance, if there are 200 accounts available, you receive information on the first 100, then press **Show more**, and view the remaining 100.

You can export a report on the account contents into a CSV file. To do this, click on the **Export** button in the lower right corner of the table.

Deleting Accounts/Resources

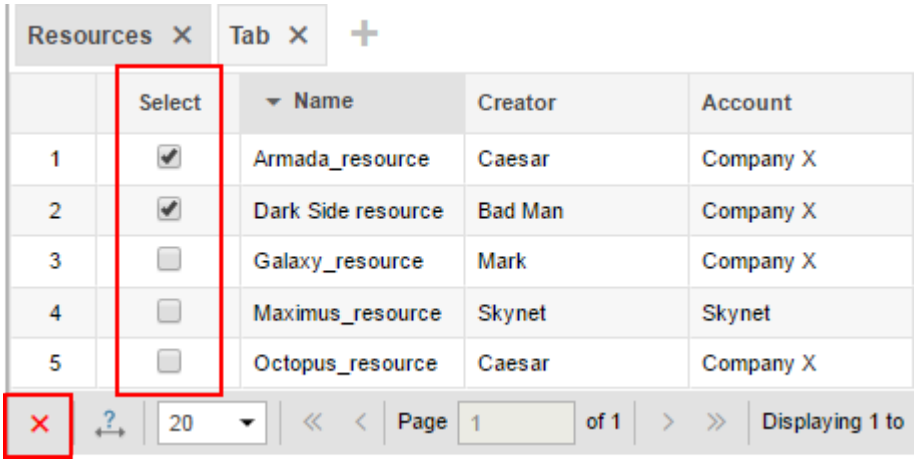
To delete an account or resource, you should possess the appropriate level of access to it. In most cases, the removal occurs when a service agreement is broken and a client stops using the system.

To delete an account, click the delete button in the corresponding column and confirm your action. When you delete an account, all its contents (geofences, drivers, trailers, passengers, jobs, notifications, report templates) are deleted, too. Besides, all users, units, unit groups, resources,

routes, retranslators that belong to this account and created by this account's creator (or other user established as the account's creator) are deleted as well.

	Name	Creator	Parent account	Billing plan	Dealer rights	Units	Balance	Status	Contents	Delete
1	Armada	Armada	Company X	The best plan		45	$500.00	✓		×
2	Company X	wialon		The best plan	Dealer	28	$400.00	✓		×
3	Dark side	Dark side	Company X	The best plan		50	$0.00	✓		×
4	Galaxy	Galaxy	Company X	test_plan		23	$400.00	✓		×
5	Maximus	Maximus	Company X	business_plan		70	$170.00	✓		×
6	Myriad	Myriad	Company X	business_plan		15	$30.00	✓		×
7	Octopus	Octopus	Company X	business_plan		65	$150.00	✓		×
8	Russian Company	-		The best plan	Dealer	0	$200.00	–		×
9	Skynet	Skynet	Company X	The best plan		22	$11000.00	✓		×
10	Spartac	Spartac	Company X	test_plan		50	$400.00	–		×

To delete a resource, check the corresponding box in the **Select** column, and click delete button in the bottom of the table. Note that all the contents of a resource will be deleted along with it (geofences, drivers, trailers, passengers, jobs, notifications, report templates).



Restoring Resource Contents

In Wialon, you can restore the resource contents. To do this, you should possess the following **rights** to the resource:

- Delete item,
- Upload and delete files,
- Create, edit, and delete geofences,
- Create, edit, and delete drivers,
- Create, edit, and delete trailers,
- Create, edit, and delete passengers,

- Create, edit, and delete jobs,
- Create, edit, and delete notifications,
- Create, edit, and delete report templates.

Also, the Restore of resources and unit properties option should be activated in the administration system.

You can restore the following **objects of the resource**:

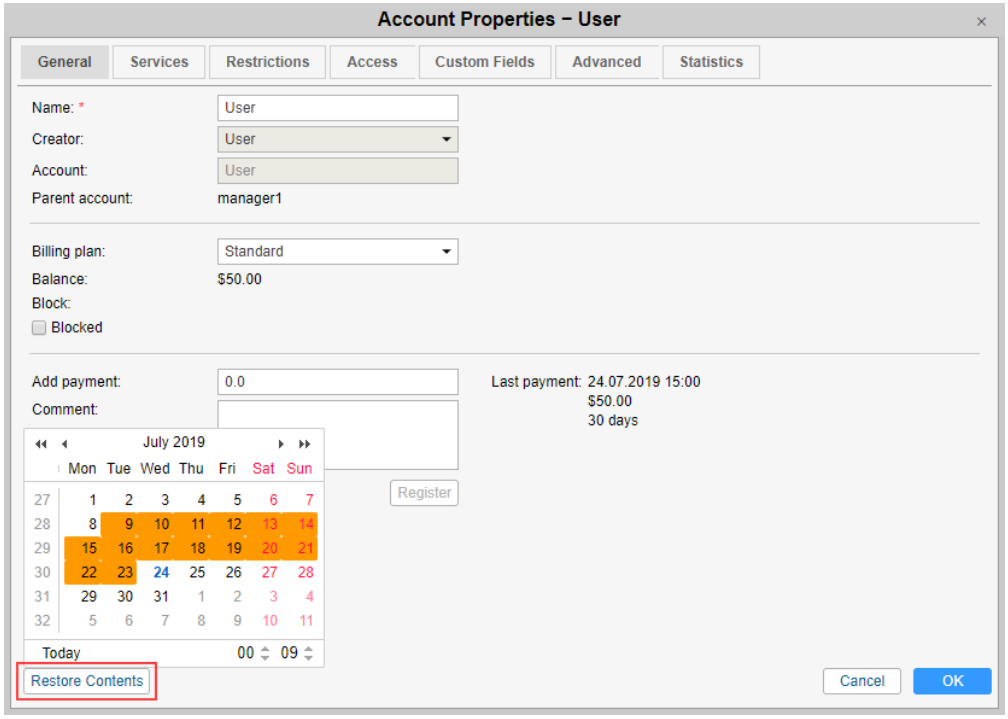
- geofences,
- drivers,
- trailers,
- passengers,
- jobs,
- notifications,
- report templates.

Groups of drivers and trailers as well as custom fields are not available for restoring.

To **restore** the resource contents, follow these steps:

1. Open the Accounts section in CMS Manager.
2. Click on the name of the resource or account for which you want to restore the resource contents. In the properties dialog, click on the **Restore contents** button.
3. In the calendar, select the date for which you want to restore the resource contents. The dates for which the stored contents are available (the days the resource contents have been

changed) are highlighted in orange.



4. In the import dialog that opens next (the mechanism of restoring is similar to import from WLP), select the import type and the objects you want to restore. By default, the contents are added to the resource selected initially. To change the resource, clear the search field in the **Destination items** section and select another one from the list. Use the filter and dynamic search, if necessary.

You can restore the resource contents for the number of days indicated in the administration system. If there have been no changes with the resource for more than the indicated time, you can restore only the last saved contents.

> ⚠ You cannot restore the resource contents of the top account.

Transferring Resource Contents

Any contents of a resource can be imported and exported:

- geofences,
- jobs,
- notifications,
- drivers,
- trailers,
- passengers,

- report templates.

When transferring geofences from one resource to another, the standard icons from the geofence library can be transferred using one of the previously described methods (KML/KMZ, and WLP import/export). Other images of geofences are transferred using KML/KMZ files only.

Drivers and trailers are exported without images. If you need to transfer them, you can use the copy function instead of import/export.

Drivers with the same phone numbers (or with phone numbers that already belong to some units) cannot exist in the system. Therefore, when you try to import such fields, their value will be reset (they can be edited later).

⚠ When importing drivers and trailers by merger or replacement, all their attachments (bindings) are lost.

If the report template contains parameters to filter intervals by geofences, these parameters should be checked (and probably corrected) when the template is copied to another resource as geofences can be bind to a template only within the same resource. Also, connection with units can be lost because the new owner of the template does not have enough access to the units.

The same is true for jobs and notifications if they mention geofences, units, users, reports, groups etc. since the new **owner** of a notification/task must have access rights to work with these objects.

Transferring Units from One Account into Another

You can transfer units from the currently used account to the subordinate ones or between the subordinate ones. The account should possess the dealer rights in order for the feature to be available.

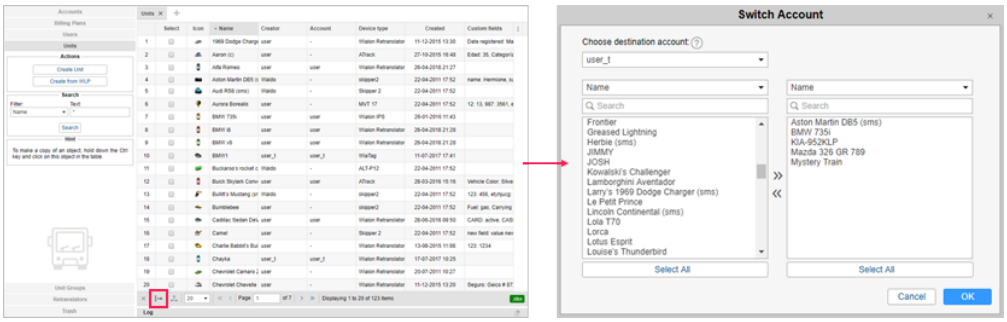
⚠ The **Units** and **Create units** services must be activated for the account to which a unit is transferred. Verify that this account is not blocked.

The following access rights towards a unit are required to transfer it from one account into another:

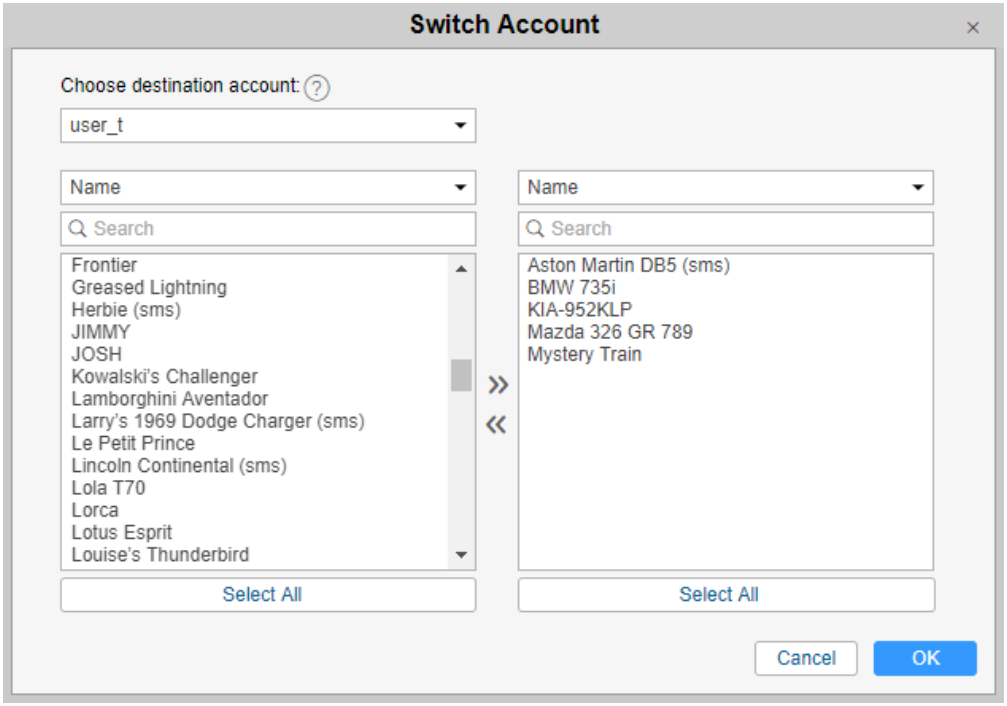
- Manage access to this item;
- Delete item;
- Edit connectivity settings;
- Delete messages.

Moreover, it is necessary to possess the **View item and its basic properties** right towards the creator of the unit and **Act as given user** towards the creator of the account you want to transfer the units to. The latter, in turn, must have the right to view the item and their properties towards the units from the right list of the dialog of switching account.

The units are transferred in the management interface. To begin with, open the **Units** tab. Then click on the **Switch account** button (unavailable if the account does not have the dealer rights) located to the right of the **Delete selected items** button.



The **Switch account** dialog is as follows:



There are two lists in its central part. The left list contains all the units that can be transferred, that is, the units towards which you have the appropriate access rights. The list on the right shows the units you want to transfer. The selection is done according to the principles described in the Multiple select box section. To transfer units from the left list to the right one and vice versa, use the arrows between them. To make the selection easier, there are filters above each list.

After selecting the units, in the dropdown list in the upper part of the dialog, you can see the accounts these units can be transferred to (based on the access rights). Choose the necessary account and click **OK**. Confirm your actions. As a result, for the units the creator and belonging to the account will be changed; for the accounts — the counter of created/available units.

Billing Plans

Billing plan is an element of the billing system, the main purpose of which is to limit user actions and billing services. The billing plan defines the set of available services, their cost, and some basic properties (such as the minimum balance at which the account is blocked, the minimum balance at which access to services is limited, currency format, and so on).

A billing plan assigned to an account defines initial set of allowed/denied services, which can be redefined later (extended or narrowed) for each account individually. If you adjust services through a billing plan, you can apply limitations and costs to several accounts at once (works for the accounts that are associated with this plan).

⚠ Only the top user can create and manage billing plans.

Working with billing plans

You can work with **Billing plans** only in the interface of CMS Manager. Open the **Billing plans** section in the navigation panel of the management system. Here you can create new billing plans, as well as view, edit, and delete the existing ones.

To create a new billing plan, press the **Create billing plan** button. The content of the **New billing plan** dialog coincides with the fields on the General tab of the **Billing plan properties** dialog.

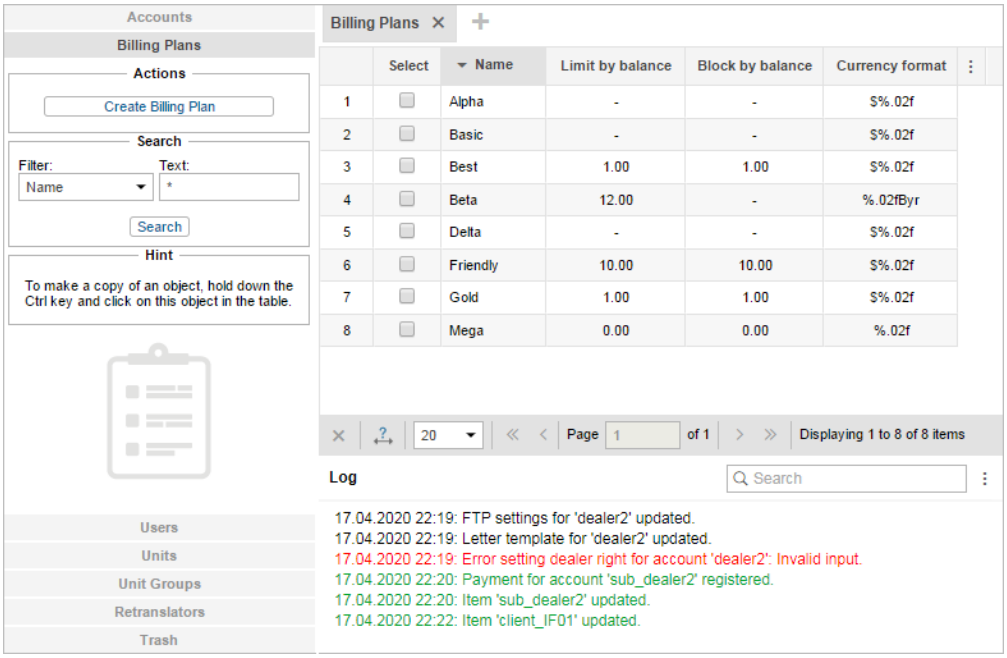
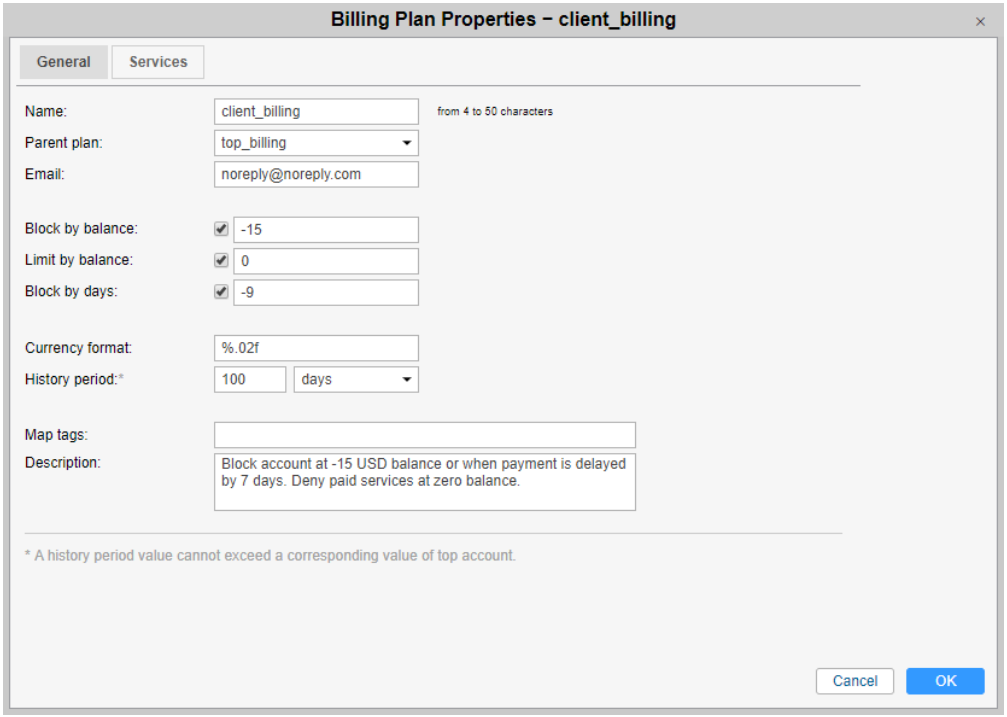


Table of results for billing plans contains the following columns: name of a billing plan, limit by balance, block by balance, block by days, and currency format.

General Properties

The **Billing plan properties** dialog opens when you click on the name of the billing plan in the list. Here you can adjust the settings of the billing plan. Some of them may be redefined in a particular account separately.



Name

Enter the name of the billing plan (from 4 to 50 symbols).

Parent plan

Select the parent (recursive) billing plan, if necessary. If it is assigned, the current billing plan inherits all its properties. These properties can be changed later but considering that the capabilities of a filial billing plan cannot exceed the capabilities of the parent one.

Block by balance

Enter the balance at which the account should be blocked.

Limit by balance

Indicate the balance at which certain services, as well as access to the CMS Manager, should be disabled. It works in the same way as the Limit by balance account restriction.

Block by days

Enter the number of days at which the account should be blocked. This option works independently of **Block by balance**. If you adjust both of these parameters, the account will be blocked after meeting either of these conditions. When the number of the days left is equal to that specified in the field, the service is blocked automatically. At the same time, when 5 days are left, the user begins to receive a warning message at each login to the site: **Your account will be disabled in … days**.

> ⓘ You can enable or disable the three features mentioned above according to your needs. Usually, their value is zero.

Currency format

Enter a currency sign before or after **%.02f**.

History period

The period of time during which the system stores the unit history (the database with the unit messages), unit and user logs, and so on. You can indicate this time period either in days or months (select from the dropdown list). All the messages older than the history period are automatically deleted from the database. You can also specify this parameter for every account separately.

Map tags

In this field, you can specify the tags of the maps that should be used for the billing plan. The tags

should be separated by commas. If the field is empty, it assumes that all default maps will be available.

Tags are indicated in the following way:

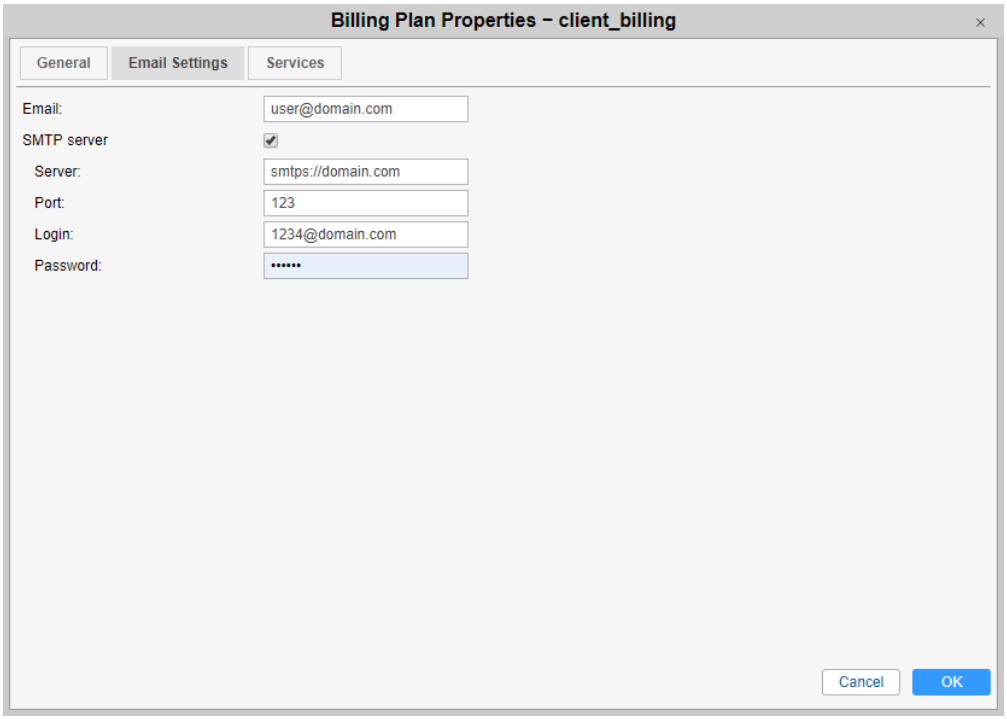
- Map name — an indicated map will be available as main one.
- '**+**' symbol is indicated before a map name — an indicated map is enabled in addition to the main one.
- '**-**' symbol is indicated before a map name — an indicated map is disabled.

Description

Add a description (optional).

Email Settings

Here you can configure email parameters for sending various system messages (notifications, reports, and so on).



Email

You can enter the email address from which system messages should be sent. If the field **Email** is not filled in, the address from the **Administrator's email** field is used. If it is also not specified, noreply@gurtam.com is used as the sender's address.

Most mail systems perform special checks for spam messages. They compare the original IP address from which the message is sent with the MX records of the sender's domain. If the MX

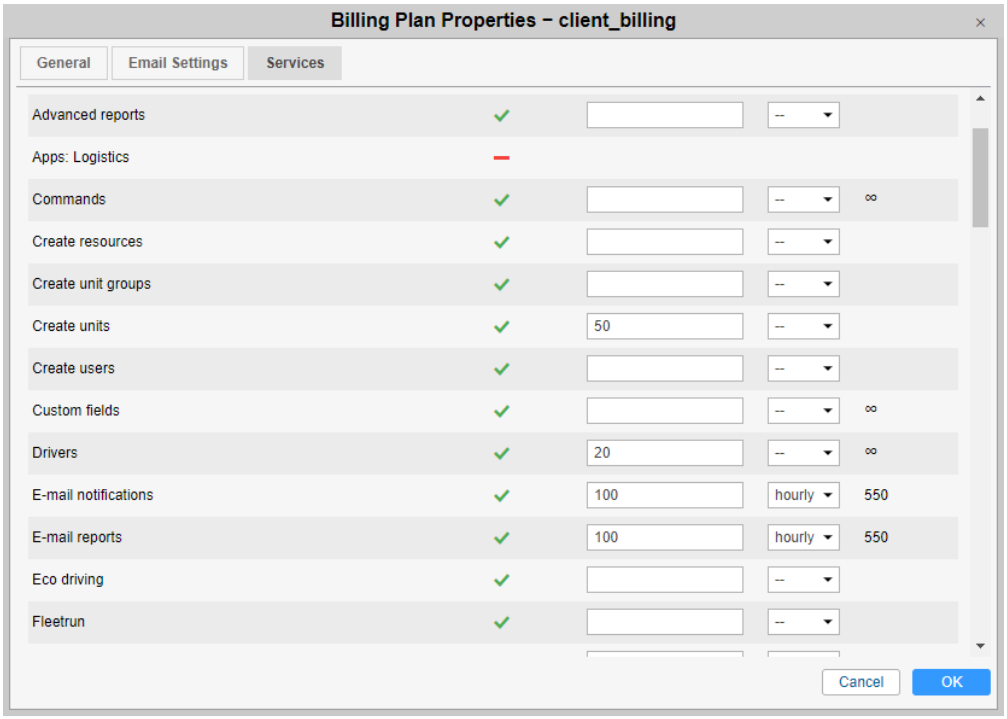
record is not found, the mail system may suspend sending messages, or add the sender's address to the **grey list**.

SMTP server

System messages can be sent using your SMTP server. To adjust this setting, enter the email address and activate the **SMTP server** option. Next, specify the server, port, login, and password. Make sure that the protocol (smtp or smtps) is specified in the server address.

Services

This tab provides the list of all services available to this billing plan, their state and cost.



The limit and cost of the services are adjusted in the same way as for accounts. However, there are some differences. For example, the **Limit** column shows the maximum possible number of services considering top account limitations.

You can adjust (redefine) the cost and number of the available services for every account individually, on the same-name tab.

> Disabling a service in a billing plan does not mean that the same service is automatically disabled in the account associated with this plan. If the state of the service is redefined in the account itself, the priority is given to the account.

Users

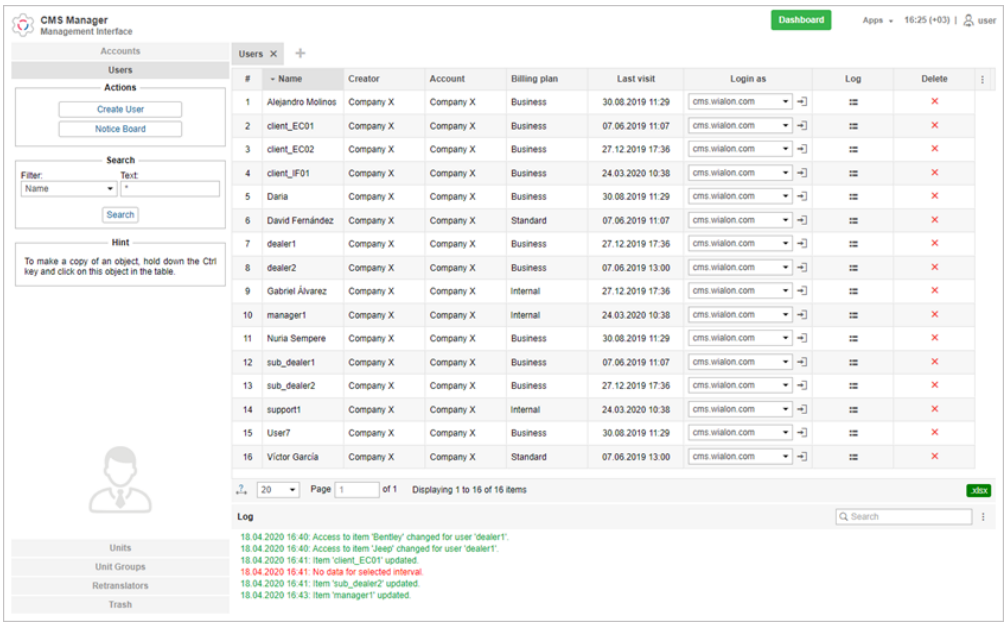
The user is a system macro object which has its unique name (login) and password. Using this login and password users can enter one of Wialon interfaces where they can control their units (end users) or manage the system itself (users-managers).

A user has access rights to interact with other system objects (units, other users, resources, etc.). These rights are assigned by a system manager. Besides, a user can be a creator of these objects, which also affects the hierarchy of access rights. Manager's duty is to properly build this hierarchy.

Users as system objects also have some specific applications in Wialon main interface, as described below (send SMS, control user activity, etc.).

Working with users

Working with users is possible both in CMS Manager and in the main interface. In CMS Manager, open the **Users** tab in the navigation panel on the left of the window.



There is a button to create a new user, a filter to search existent users, and a button (optional) to send informational notices to your users.

The table of results contains the following columns: Name, Creator, Account, Billing plan, Last visit, Login as, Log, Delete. The of information in cells, as well as the availability of buttons, depends on the access rights towards the selected user.

In the **Login as** column, next to the name of each user there is a list of sites available to his account. The drop-down list of the **Login as** column displays the list of sites available to the user account. To log in as a different user, select the required site and press the icon . His name will

be displayed in the parenthesis next to yours. Selected site opens in a new tab. To return to the main user, click on his name in the top panel.

> To be able to log in as a different user, the **Act as given user** access right is required.

You can apply standard operations (such as creating, viewing, editing, and copying) to users in the same way as to other system objects.

However, the following peculiarities should be taken into consideration.

You can create a user not only independently but also together with an account or resource.

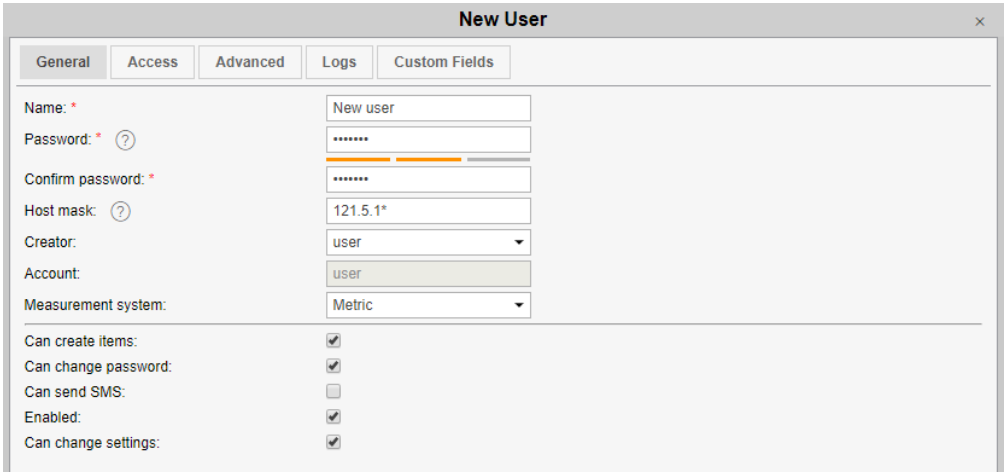
The operation of deleting is not the same for users as for other system objects. You can delete only those users that are not creators of any objects in the system. To delete a user, press the **Delete** button against their name and confirm your actions (a dash is displayed instead of the button if you have no rights to deletion). If you are trying to delete a user who is the creator of certain system objects, an alert which lists all of them is displayed. You cannot delete the user without removing these objects first. Nevertheless, it is possible to delete the user and the subordinate objects automatically by deleting an account they belong to.

User Properties

User properties are configured when creating, editing or copying a user in a special dialog on several tabs. The availability of different tabs and parameters depends on the access you have towards the user. Two tabs are available in any case — **General** and **Advanced**. Some properties become uneditable if the user account is blocked.

General

This tab contains the basic properties like name, password, allowed activity, etc.



Name

User name must be between 4 and 50 characters (read more about the Input Rules).

Password

A password is required for each user.
To ensure a high quality of password protection, it is recommended to adhere to the following rules when creating it:

- the minimum password length is 4 characters;
- use of uppercase and lowercase letters;
- use of numbers or symbols along with letters.

You have to enter the password twice (the second time is in the **Confirm password** field).

Host mask

The hostmask can be applied to the user to restrict IP addresses from which this user can log on to the system (for example, to restrict access only to working computers). To set a mask, use the wildcard character *, for example, the hostmask can be set like this: 212.0.13.*. You can indicate several masks separated by commas. The maximum number of symbols in this field is 1024. If no mask is set, the user can log in from any computer.

Creator

Select the creator from the dropdown list. User's creator can be any other user. The creator is important to build the hierarchy of the access rights. The user inherits the account and billing plan from the creator. The creator is assigned when the user is being created and cannot be changed afterwards.

Account

Here you can see to which account the user belongs to (if you have any access to this account). The account and the creator cannot be changed.

Measurement system

Choose a measurement system which will be applied to the current user. This parameter is shown only upon creating a new user. For existing users, it can be changed by the converter. Moreover, users can change a measurement system by themselves in the monitoring system. To do so, it is necessary to summon the user settings dialog and choose a proper measurement system on the General settings tab.

Can create items

Allow/Forbid the user to create units, unit groups, other users, accounts, resources, retranslators, and routes.

> ⚠ Regardless of whether the user has this permission, you can **assign** them as a creator of units, unit groups, other users, and resources. If the user does not have this permission, you cannot assign them as a creator of an account.

Can change password

Allow/Forbid the user to change the password. If this option is enabled, then, according to the security rules, the user will be required to change the password at the first login.

Can send SMS

Allow/Forbid the user to send SMS messages to drivers, units, and other users from Wialon main interface.

> ⚠ This option does not affect the execution of the commands via the SMS channel.

Enabled

If disabled, the user cannot log in to any interface of the system.

Can change settings

Activate this option so that the user can change the settings. If the option disabled, it becomes impossible to change the user settings and monitoring options.

> ⓘ To edit most of these properties, you should have the **Change flags for given user** access right. Changing password requires also the **Act as given user** access right.

Access

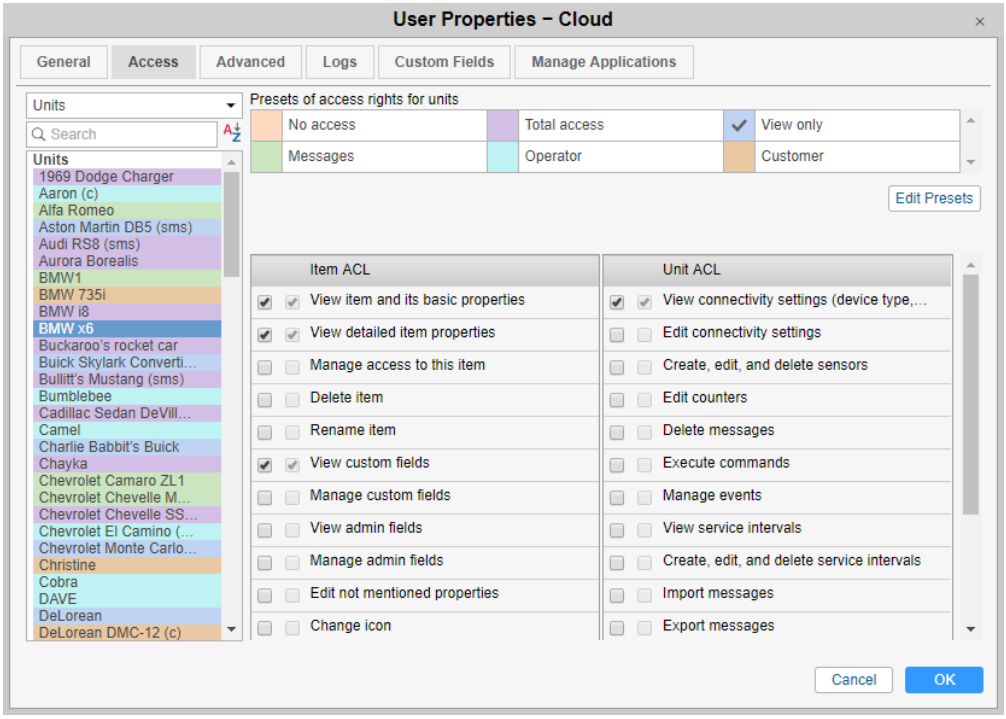
Here you can give the user access rights to such system objects as units, resources (accounts), unit groups, routes, and other users.

> ⓘ Access required: **Manage user's access rights**.

On the left, there is a list of objects. To quickly find the required one, use filters: select the object type in the dropdown list and set a name mask below. The objects that meet your request will be displayed in the list. You can sort them alphabetically or by access rights. To do this, click on the icon to the right of the dynamic filter.

The objects, to which the user already has any access, are highlighted in color. If there is no access, the background is transparent.

Select an object on the left and mark actions allowed to the user on the right. Find more information about the access rights here.

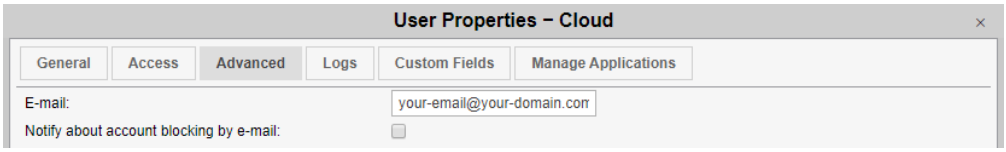


Note that here you set the rights of a specific user to various objects of the system. However, the user, in turn, is also a system object and therefore can be accessed by other users. In other words, other users can obtain access rights toward this user. To set access to a user as a system object, open the properties dialog of some other user and choose **Users** in the drop-down filter.

Advanced

Specify the email address to which the user will receive notifications from the administration of the service.

If you want to receive notifications about account blocking to the email address specified above, activate the **Notify about account blocking by email** option. Notifications start arriving daily 5 days prior to blocking. To work with this option, activate the Email notifications service in the account properties.



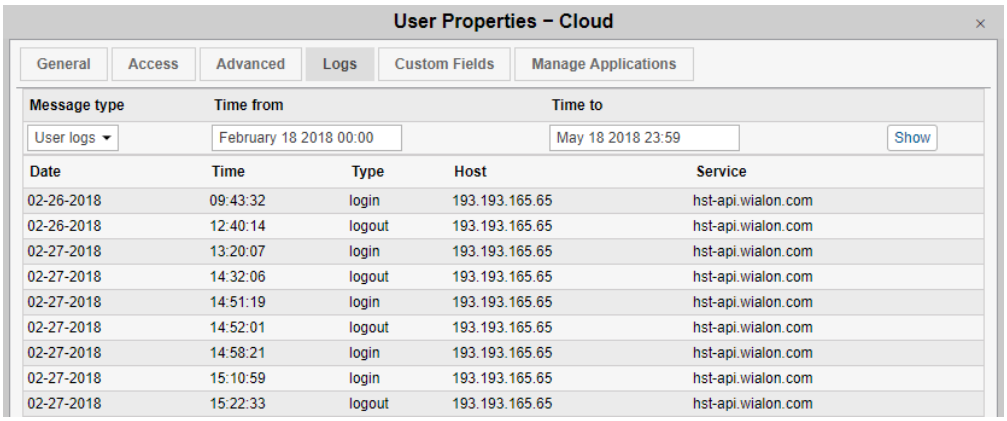
These settings can be changed by users themselves — in the User settings dialog.

To edit these properties, the **Edit not mentioned properties** access right is required.

Logs

In the log, you can see when a user logged in or out of the system, what service he used, from which host. Specify the time period and click **Show**.

Access rights required: **Query reports or messages**.



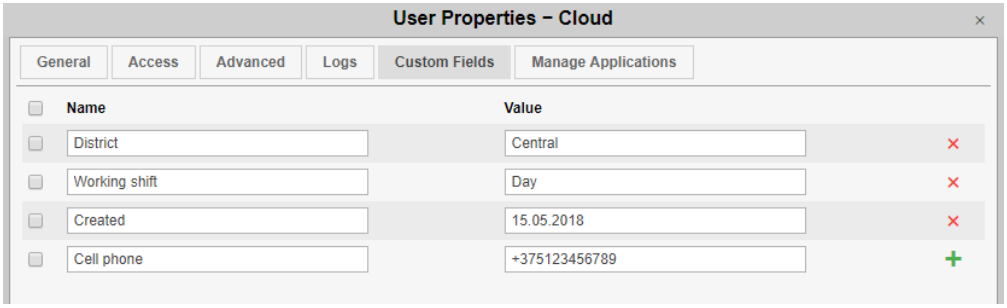
Besides the log, user activity can be controlled in different reports that are available in the main interface of Wialon.

Read more about the application of users here.

Custom fields

On this tab, you can add any information about the user, whether it is a home address or working shift. In the left field enter the name of the field, in the right field its value. To save the custom field, click on the **Add** button. To delete the field, click **Delete**. At the end of the dialog edit, click **OK** in the lower right corner. The next time you open the dialog, the fields will be automatically sorted alphabetically. Part of the fields can be marked as **administrative** (checkbox in front of the field), i.e. they will only be visible to users with the appropriate rights.

Access required: **View custom fields** — to view general custom fields; **Manage custom fields** — to create, edit, and delete general custom fields for the given unit; **View admin fields** — administrative custom fields; **Manage admin fields** — to create, edit, and delete administrative fields.



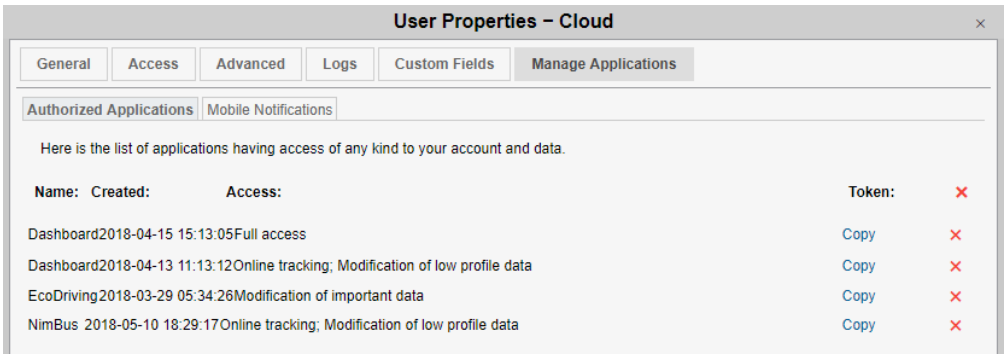
Manage applications

Authorized applications

This tab contains the list of applications that have any access to your account and data. To the left, there is an application name, to the right, you can see the access rights that the application has towards your data or account. To block an access for the application, it is necessary to delete the corresponding application from the list.

Mobile notifications

This tab contains the list of applications which are allowed to send notifications to your mobile devices. To the left, there is an application name, to the right, you can see a device type. To block mobile notifications sending, it is necessary to delete the corresponding application from the list.

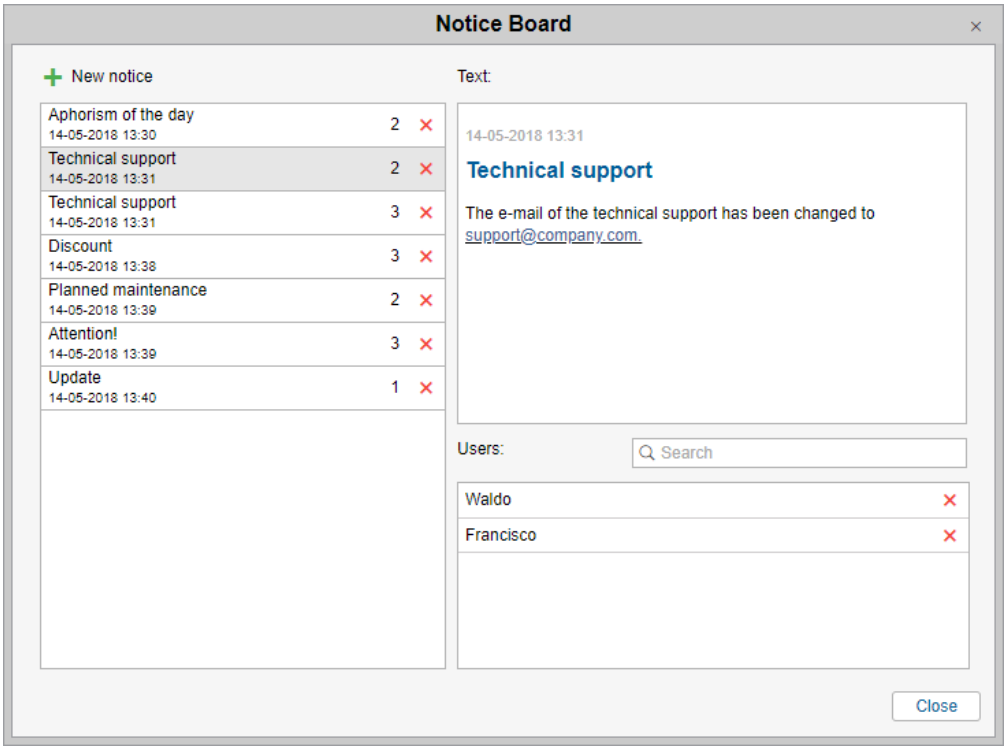


Notice Board

You can send information messages (notices) to the users of the system. To send them, you should have the **Edit not mentioned properties** and **View detailed item properties** access rights towards the user. The billing plan of the user must also have the service **Notices to users** and the account must be active (not blocked). Otherwise, they do not appear in this dialog.

To open the dialog of the **Notice board**, click on the button of the same name in the **Users** panel.

If there are some sent notices, the list of their subjects is shown in the left part of the dialog.



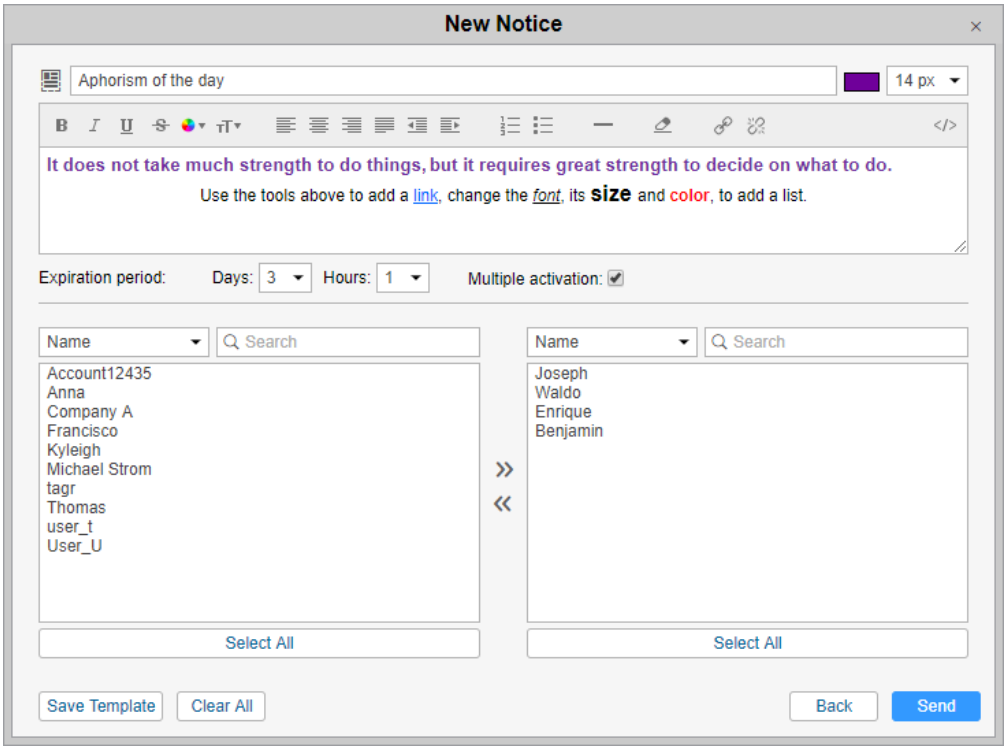
If you click on the subject of the notice, its text is shown in the field on the right. To delete a notice, click on the button in the form of the red cross in front of its name.

Apart from being deleted from the list, the sending to the recipients is canceled as well.

Under the field with the text, there is the list of the users to whom the selected notice has been sent to. To quickly find necessary users, use the dynamic search. It is possible to delete users (the notice will stop being shown to them) by clicking the red cross in front of their names.

Creating notices

To create a new notice click on the **New notice** button in the upper left corner of the dialog. The following dialog opens:



Introduce the topic of the notice in the field **Subject** and the text of any length below. Above the field with the text there are the tools that can be used for changing the font and its color, aligning the text, adding lists (numbered o bulleted) or a horizontal line, add an outdent or an indent. You can also add hyperlinks in the text of your message. To do so, enter the text you need to be shown as a hyperlink, click on the **Add link** button, type or paste the required link in the appeared field and click on the green flag on its right. In the left part of the tools panel, there is the **Show code** button by pressing which you can see the text in the form of a code.

Once you have entered and configured the text, adjust the expiration period (from 1 hour to 30 days) and enable the **Multiple activation** option if you need the notice to be shown to the recipient during his every login in the system during the specified validity period. If the option is disabled, the notice will only be shown once (till the user closes it).

Continue with choosing one or several addresses in the lower part of the dialog. The selection is done in the list on the left. Transfer the required users to the right list (by double click or using the **Add** button).

To quickly find the necessary users, use the dynamic filter above the list. Users can be searched by different criteria: name, creator, account, billing plan, custom fields, and admin fields. To select all the users at once, click on the **Select all** button.

The sent notices are shown to the corresponding users in a popup window (both in management and monitoring systems).

Notice templates

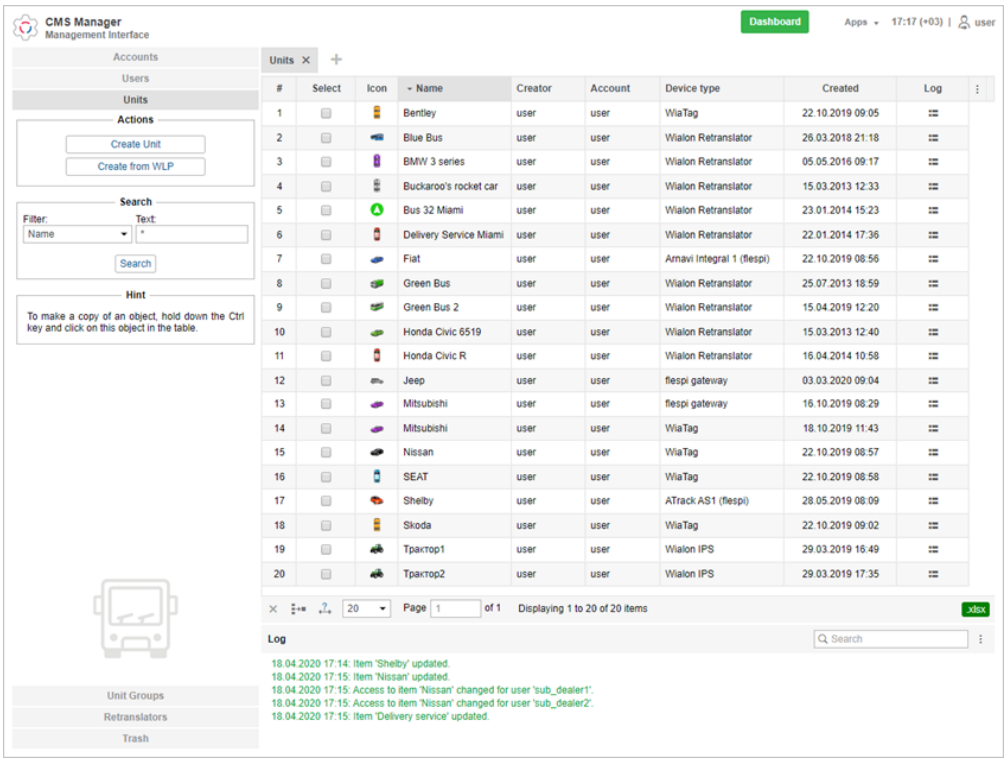
The system provides a possibility to save the created notices as templates, which can be used later for creating new information messages. To do this, use the **Save template** button at the bottom of the dialog. Please note that the minimum input information required to save a template is its subject.

To open the list of available notice templates, click on the **Templates** button ( ) in the upper right corner of the dialog of creating a notice. If you want to use a created template, click on its name. You can also copy and delete templates using the buttons and , correspondingly.

Units

The unit is a vehicle, machine, person, animal or other moving or stationary object, which is monitored by satellite monitoring. In the Wialon system, the unit is characterized by the type of equipment (GPS or GLONASS device) and the unique identification code of the unit in the system (ID). With units, you can work both in CMS Manager and in the main Wialon interface.

To work with units in CMS Manager, open the **Units** tab in the navigation panel. Units configured here become available for tracking (viewing on the map, monitoring various parameters and many others).



Here you can create a new unit, view existing ones, view or edit their properties, define access rights to units, and remove units from the system. These standard operations were described

above. Units created in the monitoring system or CMS Manager are automatically added to the work list of the monitoring panel of the user-creator. You can view the log for each unit. Besides, you can transfer units from one account into another.

Moreover, there is a possibility to create units with settings imported from WLP files. To do this, click on the **Create from WLP** button. Choose a file, indicate the parameters, and click **Next**. Afterwards, a unit with the indicated parameters is created, and a properties dialog of the created unit opens.

When creating units, take into account the following peculiarities.

You cannot create units in the top account.

It is not recommended to create units in the account with dealer rights.

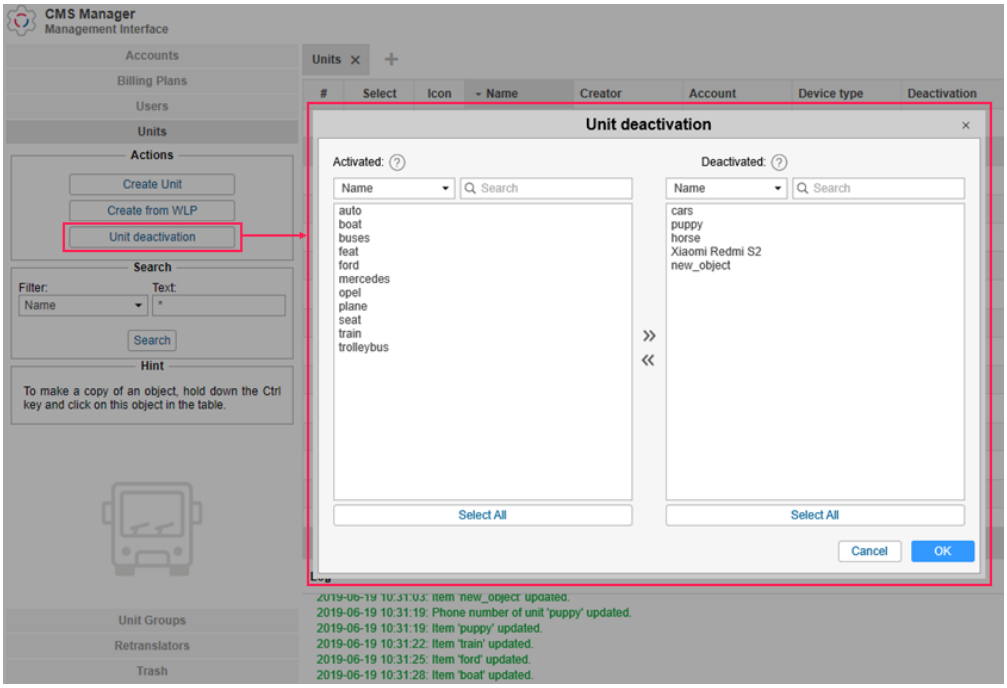
Unit deactivation

Deactivated units are the units that are temporarily unavailable for monitoring. Working with such units and their data is impossible until they are activated.

Deactivation of a unit may be necessary in case it is used, for instance, for a limited period of a year and does not need to be monitored the rest of the time.

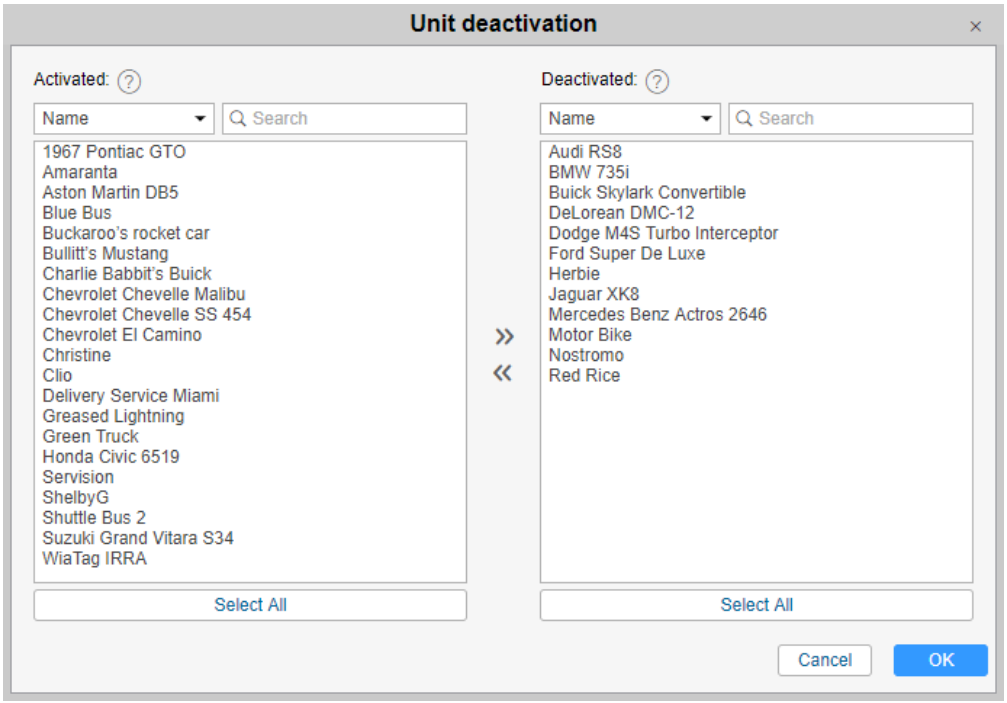
> ⚠ To be able to deactivate a unit, not only the user himself needs the **Unit deactivation** service, but also the creator of this unit.

Click on the **Unit deactivation** button in the navigation panel to open the deactivation menu. The menu consists of two lists, above each of which the filter and dynamic search are located, allowing to quickly find the required units.



In the list of activated units, only the units to which a user has the **Edit connectivity settings** access right are displayed.

To move units from one list to the other, use the arrow keys between them or double-click the required unit. When the limit is reached, the transfer of units to the list on the right becomes impossible. The corresponding entry indicating the names of the units that were not deactivated appears in the log.

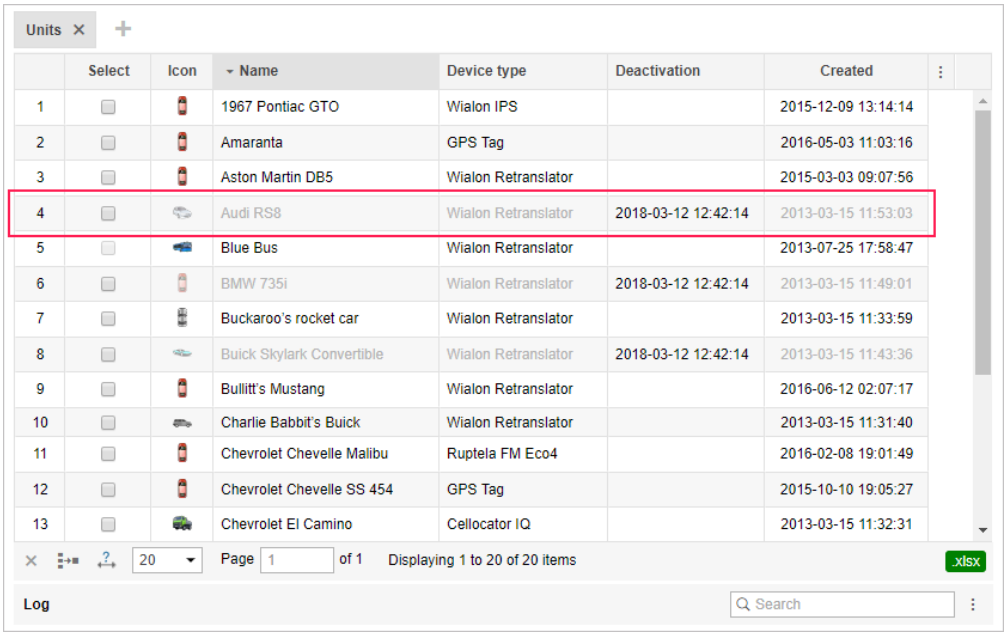


Press **OK** to save the changes.

The deactivated units are not displayed in the monitoring system, and their properties in CMS Manager become read-only. You can activate the units manually at any time (the process is similar to deactivation).

> ⓘ If the limit of deactivated units is exceeded when the changes are saved (for instance, by another user), an error message is displayed in the log, and only the number that fits into the limit is deactivated.

The date and time of the deactivation of units are displayed in the **Deactivation** column in the results window. The rows of the deactivated units are pale-colored.

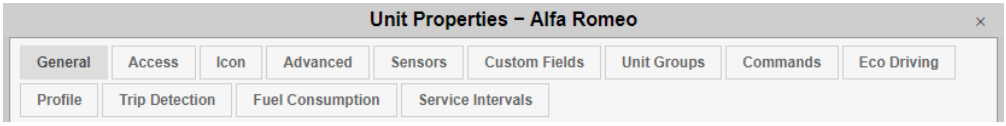


> ⓘ In case the corresponding service for the account is turned off, all the deactivated units in it are automatically activated.

Unit properties

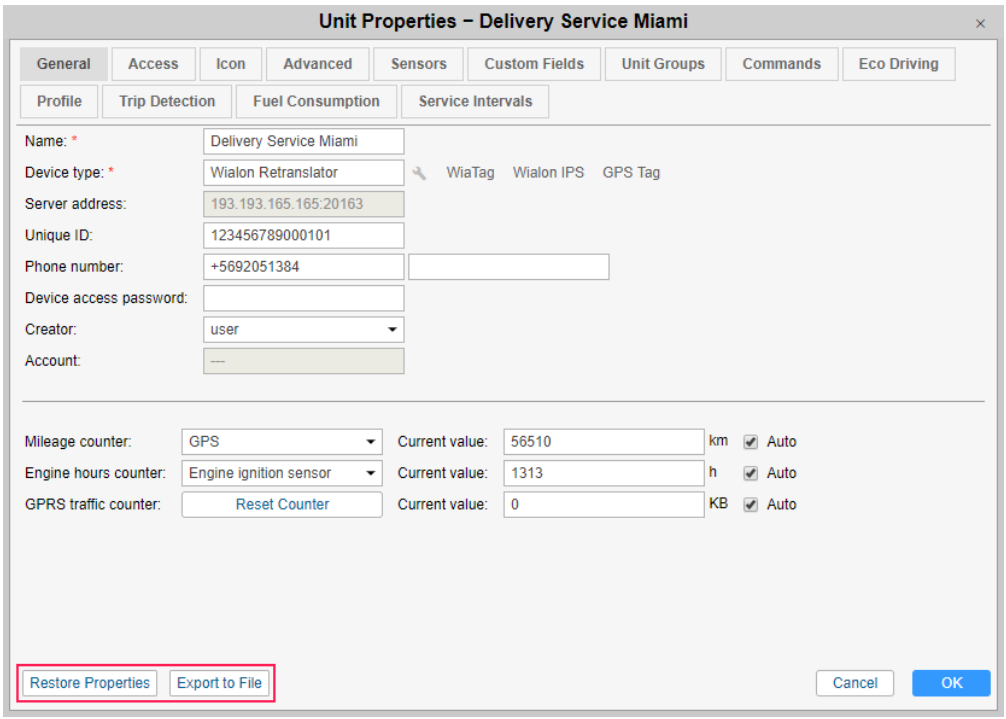
The unit properties are displayed when you create, edit or copy a unit. They contain many tabs and fields that define different unit parameters and how the program interprets the data received from this unit.

The number of tabs can vary depending on your access rights and activated services. The maximum number is 13.



Restore properties/Export to file

In the Wialon system, you can restore unit properties and export them to a file. To do this, use the buttons in the bottom left corner of the unit properties dialog.



Restoring properties can be useful if you accidentally edited or deleted some data contained in the unit's properties dialog on any of its tabs. The properties of the unit saved in the last 14 days are available.

To restore the properties of a unit, you must have the rights to all the properties of the dialog (regardless of which ones are to be restored), as well as the rights to delete the item and perform actions with the files.

The current configuration of the properties of the unit is stored on the server once a day. To return to any saved configuration, click on the **Restore properties** button. As a result, a calendar with the orange-marked dates for which there is a saved configuration will open. After selecting the date, the dialog of importing from the WLP file opens, where you can specify the properties that are to be restored.

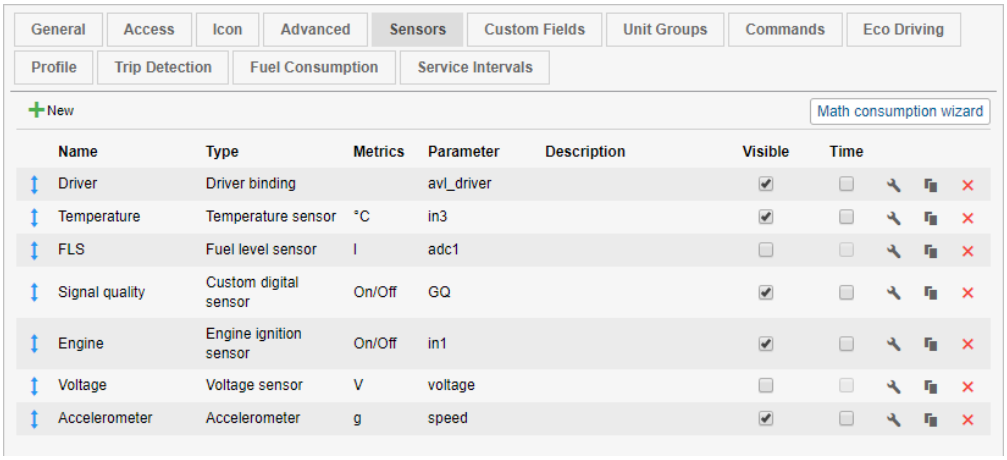
Sensors

On the **Sensors** tab of the unit properties, displays a list of all the sensors created for this unit. The table shows the name of the sensor, its type, unit of measure, the parameter on which the sensor is based, description, visibility and time checkboxes. On this tab, you can view, create, configure and delete sensors.

To create a new sensor, press the **New** button (+), fill in the fields and press **OK**. If you use similar devices for different units, it is convenient to configure sensors once, and then import them to other units.

Such buttons as **Properties**, **Copy**, and **Delete** are used to work with the created sensors, and located at the end of the line of the sensor name. To quickly create a sensor with similar settings, press **Copy** in the line of a template sensor. To edit a sensor or just view its settings, press **Properties**. To delete a sensor, press **Delete**.

> To make any alterations on this tab, you need the **Create, edit, and delete sensors** access right. Otherwise, you can only view existing sensors and their settings.



There is a **Visible** checkbox in the line with each sensor. It controls whether the sensor is shown or hidden. By default, depending on sensor type the checkbox is enabled or disabled. However, you may want to hide or show some particular sensors. Hiding is reasonable if a sensor is used as a validator and does not have its proper value.

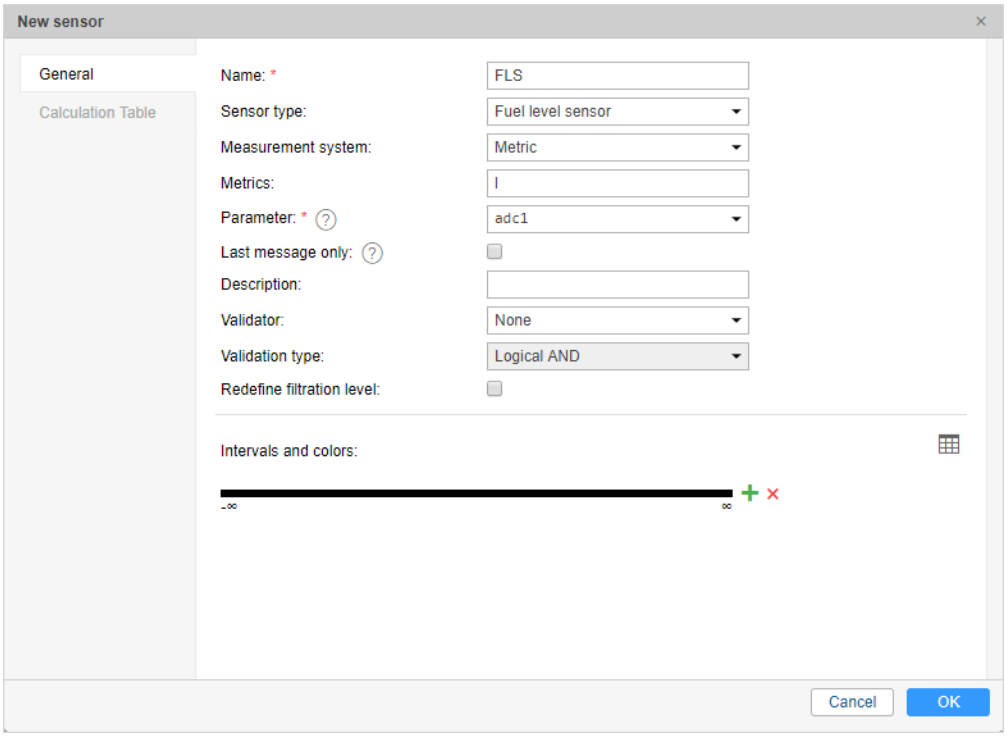
If a sensor is visible, then the **Time** checkbox may become enabled for it. If this box is checked, in the additional information about the unit, in addition to the value of the sensor in parentheses, it can also be specified how long the value of the sensor parameter remains unchanged. For example, **Ignition: On (15 minutes 35 seconds ago)**.

Some limitations are applied to this feature. The sensor should have no calculation table, validators, custom intervals, and the parameter of the sensor should not contain any references to other sensors. In these cases, the Time checkbox is unavailable. Besides, it is not possible to activate the **Time** option for the ignition sensor if there is a bitwise control indicated in its parameter.

The order of the sensors can be changed manually. To place sensors in a required order, just drag them up and down holding the arrow-shaped icon on the left. The order, as well as visibility, is taken into account in the unit tooltip, extended unit information, track player, track hittest, and on the Messages tab. Only visible sensors are shown, and they are displayed in the order as given here, in the unit properties.

Sensor Properties

When creating, editing or copying a sensor, an additional dialog with its properties is displayed. It consists of several tabs. In the first one, the basic properties are adjusted:



Name

Type the name of the sensor. It must consist of one or more characters. The name is visible in the unit tooltip, in reports and messages.

Sensor type

Choose the sensor type to form the dropdown list of available types.

Measurement system

In the dropdown list, choose a measurement system in which the sensor values should be received. This property and the corresponding dropdown list are only displayed for those sensors whose units of measurement differ depending on the selected system of measures.

Metrics

Metrics is presented in reports (also in chart legends), tasks, tooltips etc. As a rule, each kind of sensor has its own default metrics (units of measurement). For some sensor types, units of measurement cannot be changed, for others, you can do it manually. This is particularly applicable for digital sensors such as engine operation sensor or custom digital sensors. Instead of default On/Off values you can set **Activated/Deactivated**, **Laden/Unladen**, **Open/Closed**, etc.

Parameter

Select or enter the parameter(s) whose data the sensor should interpret.

Last message only

If this option is enabled, the sensor value displayed in the unit tooltip and other places is calculated only from the most recent message. In case there are no required parameters in the last message, **Unknown** is shown. If the option is disabled, the last known value which is calculated within a minute is displayed (regardless of whether it is recent).

Do not show unit location

This option is relevant for the digital sensor of the **Private mode** type. Its activation allows hiding the information about unit's location in the monitoring panel, on the map, in reports, tracks, etc. in case a private mode trip is detected. Next to the caption of such a unit, on the map and in the monitoring panel, the icon is displayed and the last known location is shown instead of the current one.

> When using this option, it is recommended to enable the display of the unit's caption on the map.

Description

This field is optional. It is displayed only in the list of sensors in the unit properties dialog.

Validator and **Validation type**

Validation is optional. It determines the interdependence of sensors from each other.

Next, you need to set the calculation table for the sensor. It is especially needed for analog sensors. Not all sensors send ready-made values that can be put into a report and understood by

the end user. If the possibility to transform parameters is not provided with a device itself, this transformation is adjusted with the help of the Calculation Table or the Calculation Table Wizard.

Consumption, liters per hour

This option is used to calculate fuel consumption mathematically for the sensors of the **Engine ignition**, **Absolute engine hours** and **Relative engine hours** types.

Intervals and colors

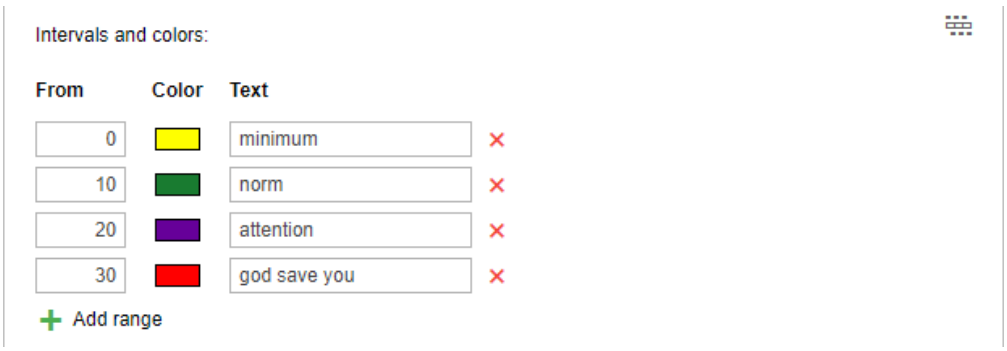
Wialon system provides a possibility to differentiate sensor values by color. For this purpose in sensor properties, it is possible to create intervals of values and choose their colors. There is also a possibility to accompany received digital values with text.

By default, any sensor values (from -∞ to +∞) are displayed in black. Click on the button + next to the scale to set the interval, select a color for it, and enter the text. Note that values are set for each interval individually. Here are some peculiarities of setting intervals and choosing their color that could be useful:

- No value in the first field corresponds to -∞, in the second — to +∞;
- If you add an interval that intersects with an existing one and goes beyond its boundaries, the added interval overwrites the existing interval;
- If you add an interval that intersects with an existing one and does not exceed its boundaries, the added interval is inserted inside the existing one. In addition, both the intervals to which the existing one was divided receives its text and color;
- You can select a color from a color picker or indicate its text value (in HEX) in the corresponding field.

Upon completion, all the set intervals of a selected color along with their text info are shown on the scale. Each interval of the scale, its color, and text can be edited. To do so, click the corresponding interval on the scale and set the necessary parameters. To delete all the set intervals from the scale, click on the button × to the right of it.

To enter intervals, select colors and specify text values, an alternative interface is also provided in the form of a table. To switch to the table view, click on the corresponding icon to the right of the scale. To switch back to the scale, click on the icon again. It automatically switches to the table view if you add more than 10 intervals.



If a sensor sends values smaller than the ones indicated in the first interval, such values are considered as a part of the first interval.

Created intervals can be used in several cases:

- to visualize sensor state in the corresponding column on the Monitoring tab;
- to display multicolor tracks of unit movements;
- to show unit on the map according to the sensor state (if it is chosen to replace usual icons with the motion state signs);
- to quickly find the necessary information on sensors either in the unit tooltip or in the extended unit information;
- to visualize sensor state in the Nearest units tool;
- to color the lines of the charts in reports in different colors;
- to describe the values of the **Formatted value** column of the Sensor tracing table (shown in parenthesis).

In the first three cases, on the Advanced tab of the unit properties, you must also specify a sensor for each case individually.

Additional properties

Some types of sensors have additional properties described below.

Redefine filtration level

This property is specified for the fuel level sensors. The degree of the filtration is usually adjusted on the Fuel consumption tab. However, in some cases, each sensor needs to be set up individually and this option provides such a possibility.

Filtration level

This option allows applying the smoothing algorithm to the sensor values. In the field, indicate the level of such smoothing: from 0 to 255. The filtration level is indicated individually for each sensor.

ⓘ The filtration level is taken into account only in reports (in tables and charts while drawing smoothed lines).

You can indicate the filtration level for the following sensor types:

- voltage sensor;
- weight sensor;
- accelerometer;
- temperature sensor;
- engine revs sensor;
- fuel level sensor;
- fuel level impulse sensor;
- custom sensor.

Validate unbinding

This property is specified for sensors of driver/trailer binding. If the option is activated, the driver bound to the unit can be unbound from it automatically only if the empty value comes from the same parameter which was used to bind the driver. Otherwise, the removal of the driver based on any parameter results in the removal of all drivers assigned to this unit. The same is for the trailers.

Unbinding code

This property is also applicable to the drivers/trailers binding sensors. Any code can be entered in the **Unbinding code** field. If the code is specified, the driver/trailer unbinding is carried out both when the empty value is received, and when the code is received.

Overflow by raw data

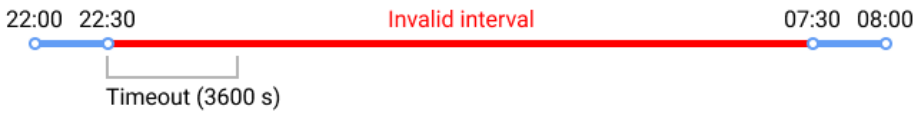
This option appears only for the differential counter sensors with overflow. If it is activated, raw data is analyzed first, and then the calculation table is applied. It means that raw data (and not data processed with the calculation table, as it is in the case when the option is disabled) is taken to estimate overflow.

Timeout

The **Timeout** option is applied only to historical data (reports). The option is used to search for invalid intervals during the sensor operation. If an interval between two messages with sensor data is longer than the value indicated for the **Timeout** option, the interval is considered invalid and is removed from the report. In this case, the message before the invalid interval becomes the end of one interval and the message after the invalid interval becomes the beginning of the next one. The timeout is specified in seconds.

If you specify 0 in the field or leave it blank, the option is considered disabled.

Example. Suppose that data messages from a custom digital sensor were received at 22:00, 22:30, 07:30 and 08:00. If the **Timeout** option is enabled, the report shows one continuous interval from 22:00 to 08:00. If you specify a timeout of 1 hour (3600 sec), several intervals are formed. Since the difference between the first and second messages is less than an hour, they form the first interval (from 22:00 to 22:30). The difference between the second and third messages is more than an hour, therefore this interval (from 22:30 to 07:30) is considered invalid and is not taken into account. The difference between the third and fourth messages is less than an hour, therefore they form the second interval (from 07:30 to 08:00).



You can specify a timeout for the following sensor types:

- engine ignition sensor;
- custom sensor;
- custom digital sensor.

Consumption, l/h

This option is designed for the motor operation sensors and is used for calculating fuel consumption mathematically.

If the ignition is off, the consumption is considered to be 0 l/h.

With overflow

This option is available for the sensors that can be influenced by occasional resets (mileage sensor, absolute engine hours, absolute fuel consumption sensor). When this option is enabled, the system uses the following algorithm. The value from the latest message is compared to the previous one. If the value is greater than the previous one, their difference is added to the previous value. If it is less, the value from the latest message is added. This algorithm ensures that the resets are taken into account and correct data is obtained.

Text parameters

This option is available only for the custom sensors. It should be activated if the sensor sends text parameters instead of numeric. In this case, in the table of intervals and colors, you can list these parameters and give them broader descriptions. For example, a device sends parameters **error1**,

error2, **error3**, etc. In accordance with the documentation for the device, you can specify a decryption for each parameter (i.e. **Power supply disconnected**, **Invalid data**, etc.). Besides, you can use special characters like * (asterisk). For example, the values can be entered as **error*** and its text would be simply **Error**.

Sensor Types

There are many types of sensors. When configuring a sensor (see sensor properties), the selection of sensor type depends on the device used and its principle of operation.

The table contains all sensor types currently available in the Wialon system. Moreover, here you can find units of measurement for the sensor values (either in metric or American/imperial systems), as well as a short description for each sensor type.

Mileage

The name of the sensor	Metrics		Description
Mileage sensor	kilometers (km)	miles (mi)	The sensor shows the distance traveled. It can be used to detect trips and parkings.
Relative odometer	kilometers (km)	miles (mi)	The sensor shows the distance traveled since the previous message. It can be used to detect trips and parkings.

Digital

The name of the sensor	Metrics	Description
Engine ignition sensor	On/Off or any	This is an engine operation sensor that is used in the report on engine hours as well as in trips/stays detection and counters. It also allows configuring the fuel consumption during idling.
Alarm trigger		A non-zero value of this sensor allows marking a message as an alarm message (SOS). The messages registered in the system

The name of the sensor	Metrics	Description
		before the sensor was configured are **not marked** as alarm messages.
Private mode	On/Off or any	This sensor is used to determine the trip type (**Business**, **Private**).
Real-time motion sensor	On/Off	The sensor determines unit motion state in real time. Its values are used to show the motion state in the **Monitoring** panel and on the map (if the **Replace unit icons with motion state signs** option is activated in the User settings dialog). The sensor can be based on such parameters as speed, ignition, engine revolutions, etc. Its parameter can contain formulae, which allows using validation.
Custom digital sensor	On/Off or any	This sensor can register two states (on/off, activated/ deactivated, etc.).

Gauges

The name of the sensor	Metrics		Description
Voltage sensor	volts (V)		The sensor shows some parameter value (not necessarily voltage). It can be used to analyze input data.
Weight sensor	tons (t)	pounds (lb)	This sensor is used to detect the weight of transported cargo.
Accelerometer	g		This type of sensor is used to measure acceleration at X, Y, Z axes and immediately detect a collision of cars.

The name of the sensor	Metrics		Description
Temperature sensor	Celsius degrees (°C)	Fahrenheit degrees (°F)	The sensor shows the value of temperature or some other parameter. It can be used to analyze input data. See the example of configuration.
Temperature coefficient			Temperature coefficient that affects fuel level calculations at different temperatures in the tank. See the example of configuration.

Engine

The name of the sensor	Metrics	Description
Engine revs sensor	rounds per minute (rpm)	The sensor displays engine speed.
Engine efficiency sensor	any	The sensor determines the coefficient when working under load used for the mathematical calculation of the fuel consumption. Can function as a reduction coefficient if its values are between 0 and 1.
Absolute engine hours	hours	The sensor registers the total amount of engine hours. It also allows configuring the fuel consumption during idling.
Relative engine hours	hours	The sensor registers the number of engine hours with regard to the intensity of work. See the example of configuration. It also allows configuring the fuel consumption during idling.

Fuel

The name of the sensor	Metrics		Description
Impulse fuel consumption sensor	liters (l)	gallons (gal)	The sensor shows the accumulated value of impulses. To convert the incoming value into the amount of consumed fuel, the calculation table should be applied. For such sensor type the calculation table is applied to the difference between two adjacent messages. After sensor creation and adjustment it is necessary to enable impulse fuel consumption sensor on the corresponding tab. Note that if a device sends not an accumulated value of impulses, but the number of impulses between the messages, it is necessary to use instant fuel consumption sensor.
Absolute fuel consumption sensor	liters (l)	gallons (gal)	The sensor detects fuel consumption over all period of vehicle operation. After sensor creation and adjustment it is necessary to enable absolute fuel consumption sensor on the corresponding tab.
Instant fuel consumption sensor	liters (l)	gallons (gal)	The sensor shows fuel consumed from the previous measure (message). After the sensor creation and adjustment it is necessary to enable instant fuel consumption sensor on the corresponding tab.
Fuel level sensor	liters (l)	gallons (gal)	This sensor is placed in the tank. After sensor creation and adjustment (see examples) it is necessary to enable fuel level sensor on the corresponding tab.

Fuel level impulse sensor	liters (l)	gallons (gal)	The sensor detects the number of impulses in a period. Fuel level in the tank is calculated from the received values.

Other

The name of the sensor	Metrics	Description
Counter sensor	any	The sensor can show passenger traffic or count the number of some actions such as opening/closing the door, etc. There are several types of counters: • instant (counts the number from the previous to the current message), • differential (shows total number), • differential with overflow (2 bytes), • switcher from OFF to ON (counts the number of activations), • switcher from ON to OFF (counts the number of deactivations). Besides, you can enter any unit of measurement for this sensor (it is displayed in the **Formatted value** column of the Sensor tracing table).
Custom sensor	any	This is a custom sensor for which you can set any unit of measure. Its values can be displayed in the unit tooltip, in the extended unit information or sent to report.
Driver binding		This sensor can be used to detect drivers assigned to units.
Trailer binding		This sensor can be used to detect trailers attached to units.

The name of the sensor	Metrics	Description
Passengers sensor		This sensor supports the detection of passengers entering and leaving a vehicle.

Sensor Parameters

Parameter is a required sensor property. Most of the sensors are based on a parameter coming in messages.

Parameters can be of any names. These names are predefined in the device configuration, for example, **param199, param240, TEMP, pwr_int, gsm, can6**, and the like. Read device specification to find out which parameters are available and what they measure. On the Messages tab, you can also request messages from the unit and view the available parameters in the corresponding column.

The parameters from the last message appear in the dropdown list of available parameters when creating or editing a sensor. However, even if the parameter you need is not on the list, you can enter its name manually.

The same parameter can be used to create any number of sensors. The maximum number of sensors allowed can be viewed on the Account tab of the **User settings** dialog.

Virtual parameters

Some parameters are defined in the system by default and are suitable for almost any type of equipment.

speed	speed of motion
altitude	altitude above sea level (maybe not supported by some devices)
sats	satellites count

course	course (direction of motion)
lat	geographical latitude
lon	geographical longitude
time	Unix time of the message
regtime	time of registering a message on the server

ⓘ Some rare types of devices may not support any of these parameters, e.g., altitude or speed.

Inputs and outputs

The system supports up to 32 digital inputs and outputs. They are adjusted in the following format:

inN	digital input parameter, N — input number
outN	digital output parameter, N — output number
adcN	analog input parameter, N — input number

For example, **adc8** is a parameter that registers the values coming from the eighth analog input.

Usually, the data from digital inputs and outputs are presented in messages in the following format: I/O = 0/0, where I refers to inputs, O — outputs. If I/O = 0/0, it means all bits (inputs and outputs) are inactive. If a value in any of them is not zero, it means that one input/output or several of them are active. To determine which exactly, convert the hexadecimal number to binary and use the latter to define a bit number.

For instance, when the ignition was activated, we received the message with the parameter I/O = 10/0. To get the bit number (input) in which the value of the sensor is shown, it is necessary to enter the received value in the calculator in the mode of hexadecimal values (HEX). That is, enter 10 and switch to the binary mode (BIN). We get a new number - 10000. Now we have to calculate in which position 1 has appeared. The calculation is done from right to left. In the given case 1 is in

position 5, i.e. the ignition sensor is connected to the fifth port. Since the changed number is before the fraction (I/O), it is the input. Consequently, the parameter name is in5 (digital input 5).

For a sensor, it is also possible to specify the parameter name as **in** or **out** to indicate the sum of all inputs and outputs, respectively.

Constant parameter

Besides, **constN** parameter can be used to create a sensor that always returns the same value. N is any number, e.g., const10, const-8.5. Such a sensor can be helpful in charts or as a validator.

Such a sensor can be used both independently (for example, in charts to indicate some critical mark) or as a part of validation chain or in expressions.

Expressions

Parameter for a sensor can be set in the form of expression where you can use:

- parameters in the current message (**adc1**, **in1** etc.),
- parameters in the previous message (they begin from the hash sign #, for example, **#adc1**),
- bitwise parameters (like **param199:3**),
- sensors (sensor name must be in square brackets, for example, **[Fuel level]**),
- constant numbers (**const10**, **const-4.54** etc.),
- mathematical operation signs:

+	addition
–	subtraction
*****	multiplication
/	division
^	exponentiation & rooting
( )	brackets of priority
|	value availability check

:	conversion operation

For example, **^const2** — square, **^const0.5** — extract the square root.

If one of the parameters that an expression includes is not valid, its total value is also invalid.

> ⚠ The parameters from the previous message are not available for the **Private mode** sensor and its validator, in notifications and in tooltips for charts.

Expressions allow creating a great variety of sensors that meet any needs and tasks.

Example 1: detecting speed by GPS coordinates
To detect speed by coordinates, you can create a sensor with the following parameter:

```
((lat-#lat)||const2+(lon-#lon)||const2)||const0.5/(time-#time)*const200000
```

Explanation:

The traditional formula to calculate the speed of the movement is "distance divided by time". To calculate the distance, the Pythagorean theorem is used. The squared difference of latitudes in neighboring messages plus the squared difference of longitudes in neighboring messages, and then the square root is extracted from this sum. The resulting value is the distance (in degrees). This value is divided by the time difference in two neighboring messages. As a result, it is the speed in degrees per second. To convert the value to kilometers per hour (or miles per hour), you should apply the conversion coefficient of degrees to kilometers (or miles) at different latitudes. The coefficient may vary depending on the geographical position. The example above shows the coefficient equal to 200 000 which is used for Moscow.

To calculate the coefficient, the following formula is used:

```
111321*cos(55.75583)/1000*3600=225513.52
```

where 111 321 is the length of the parallel arc in 1° longitude at the equator, m;

55.75583 is the latitude of Moscow in decimal format.

If you want to calculate the coefficient for another location, insert its latitude in decimal format into the formula without changing other values.

If you have the ignition sensor, you can set the parameter in the following way:

```
((lat-#lat)||const2+(lon-#lon)||const2)||const0.5/(time-#time)*const200000*[Ignition
sensor name]
```

> ⚠ You can use such a sensor only in reports (not in online notifications) because it requires the parameters from the previous message.

Example 2: relative engine hours sensor
To obtain data about real engine hours, create two sensors:

- relative engine hours sensor,
- engine hours coefficient sensor in accordance with engine revolutions.

First, create a sensor of **Relative engine hours** type. The parameter for the sensor is:

```
(time-#time)*[Name of coefficient sensor]/const3600
```

That is, the time difference in neighboring messages multiplied by the coefficient of the intensity of work and divided by 3600. The division by 3600 is applied to convert seconds into hours.

Then, create the coefficient sensor that will define the intensity of work depending on engine revolutions. Dependency scheme can be the following:

- 1 minute work with the intensity of 2000 rpm corresponds to 90 seconds of engine work => coefficient 1.5
- 1 minute work with the intensity of 1500 rpm corresponds to 60 seconds of engine work => coefficient 1
- 1 minute work with the intensity of 1000 rpm corresponds to 40 seconds of engine work => coefficient 0.67
- 1 minute work with the intensity of 500 rpm corresponds to 20 seconds of engine work => coefficient 0.33

Suppose, the **param1** sends engine revolutions. Then the coefficient parameter is the following:

```
(param1+#param1)/const2
```

That is the arithmetic average of engine revolutions between neighboring messages.

To convert revolutions into coefficient, adjust the calculation table for this sensor:

- x=500 y=0.33
- x=1000 y=0.67
- x=1500 y=1
- x=2000 y=1.5

⚠ You can use such sensors only in reports (not in counters, nor in online notifications) because they require the parameters from the previous message.

Example 3: value availability check

There is equipment installed on the vehicle, which sends some parameter (for example, param1). Then the equipment gets out of order. A new one is installed. The new equipment sends the same data in another parameter (for example, param2). To exclude data loss during report generation, it is necessary to use value availability check in the **Parameter** field upon creating a sensor. The old equipment worked all December, the new one — all January, and we need a report for these two months. If the value availability check is used during the parameter indication (**param1|param2** entered as sensor parameter), then the system takes a value from the **param1** parameter, and if the **param1** value is invalid (for example, the equipment is broken), then the system takes a value from the **param2** parameter. In other words, when using the value availability check, the system takes into account the first valid value of the parameter received.

```
param1|param2
```

⚠ Does not work with digital sensors.

Textual parameters

Most parameters are designed to send numeric data, however, in some cases, they may provide textual data. This can be, for example, a name of a status (business/private), some state (free/waiting/busy, on/off), time passed since a certain event, etc.

Sensors with textual parameters do not require configuration of calculation tables. Textual data is displayed as it is.

The values of text-based sensors can be shown in:

- additional information about the unit,
- messages panel,
- track player,
- track hittest,
- the **Formatted value** column of the Sensor tracing table.

Conversion of parameters

The conversion of parameters can only be applied to the parameters that are received directly from the hardware. The cases of application are described below.

Bitwise parameter control

The bitwise parameter control gives an opportunity to control a specific bit and not the whole parameter. For example, in order to control the third bit of the parameter **param199** it is necessary to put a colon and the number of the required bit after its name.

```
param199:3
```

This feature is applicable when a device sends various data in one parameter: for instance, the first bit shows alarm condition (on/off), the second bit indicates the state of the driver's door (open/closed), the third — headlights, etc. Thus, using bitwise control it is possible to create several sensors on the basis of one parameter.

ⓘ The parameters of the **double** type are converted into **int**, and only then the bit is retrieved.

We advise you not to address directly a bit above the 53rd. If necessary, you can use the following scheme.

1. Create a sensor in which the required parameter comes. For example, **Sensor1**.
2. Create another sensor. For example, **Sensor2**.
3. For the parameter of the second sensor, specify the formula **[Sensor1]/const4294967296**. In that way, a shift of 4 bytes to the right occurs.

Conversion of textual parameters

If there is a textual parameter in the sensor formula, it is converted into 53-bit integer. By default, it is interpreted as decimal, however, positional notation can be specified after colon. For example, there is a parameter called **text_param** and it has the value **100**, then:

```
text_param = 100
text_param:10 = 100
text_param:16 = 256
text_param:2 = 4
```

Determination of the day number in a year

To determine the number of the day in the year (relative to January 1), it is necessary to indicate **d** after the colon. For example, for March 28, 2017 11:00:00 the Unix time corresponds to the value **1490698800**. Therefore,

```
time = 1490698800
time:d = 87
```

Sensor Validation

Validation determines the dependence of the main sensor on a validator and makes it possible to combine their values to get one final value. You can configure validation by selecting a validator and validation type in the sensor properties.

A **validator** is a validation sensor that can change the value of the main sensor. The validator is selected from the list of available sensors that were created earlier for the same unit.

Types of validation

A **validation type** is a logical or mathematical operation in which a validator can influence the final value of the main sensor. There are 12 types of validation, each of which is described below.

Logical AND

The type of validation in which the **logical AND operation** (conjunction) is applied to the values of the main and validation sensors. In this operation, the final value of the sensor is either 1 or 0. If the values of both sensors are not 0, the value of the main sensor is 1. If the value of at least one sensor is equal to 0, the final value is 0.

Logical OR

The type of validation in which the **logical OR operation** (disjunction) is applied to the values of the main and validation sensors. In this operation, the final value of the sensor is also either 1 or 0. If the value of at least one sensor is equal to 1, the value of the main sensor is 1. If both values are 0, the final value is 0.

Not-null check

The type of validation in which the value of the main sensor is unchanged, provided that the validation sensor is not zero. If the validation sensor is zero, a dash is displayed in the value of the main sensor.

Mathematical AND

The type of validation in which the **mathematical AND operation** is applied to the values of the main and validation sensors. It is a bitwise **logical AND operation**, that is the two values are converted to their binary number equivalents, and then the **logical AND operation** is applied to the bits of the same number.

Mathematical OR

The type of validation in which the **mathematical OR operation** is applied to the values of the main and validation sensors. It is a bitwise **logical OR operation**, that is the two values are converted to their binary number equivalents, and then the **logical OR operation** is applied to the bits of the same number.

Sum up
The type of validation in which the values of the validation and main sensors are summed up.

Subtract validator from sensor
The type of validation in which the value of the validation sensor is subtracted from the value of the main sensor.

Subtract sensor from validator
The type of validation in which the value of the main sensor is subtracted from the value of the validation sensor.

Multiply
The type of validation in which the value of the validation sensor is multiplied by the value of the main sensor.

Divide sensor by validator
The type of validation in which the value of the main sensor is divided by the value of the validation sensor.

Divide validator by sensor
The type of validation in which the value of the validation sensor is divided by the value of the main sensor.

Replace sensor with validator in case of error
The type of validation in which the value of the validation sensor is displayed in case the value of the main sensor has not been determined.

ⓘ The validation chain can consist of any number of sensors. That is the first sensor can be a validator for the second one and depend on the third one.

Calculation Table

The calculation table is very important in sensors configuration (see sensor properties). According to the calculation table adjusted, raw data coming in a parameter is transformed into sensor values, for instance, some abstract 86 is interpreted as 10.5 liters of fuel.

The calculation table is not always necessary. For example, if the sensor is digital and sends only 1 or 0, which correspond to the **On/Off** states, there is no need in the value calculation table for such a sensor.

ⓘ The completed calculation table is essential for the analog engine ignition sensor since it is necessary to determine how all available analog values are transformed into two available states — On/Off.

Calculation table recalculates data according to to the equation of the straight line **Y = a×X + b**, where:

X is the input value that comes from the device;

Y is the output value that is included in the reports, charts, tooltips, etc.;

a is the coefficient that determines the slope or gradient of the line (tangent of the angle, or relation of the opposite cathetus to the adjoining one);

b is the displacement of a straight line along the Y-axis.

Upon the arrival of the value (i.e. **X**), it is substituted into the calculation table, **a** and **b** are calculated automatically, and the output receives a final value, i.e. **Y** (it gets into reports, graphs, tooltips, etc.).

Each row of the table operates only within its segment that is to the **X** value of the next row. That is why **X** values cannot be repeated.

It is possible to get the tangent of the angle (that is needed to be substituted for the **a** coefficient) using mathematics. To do it, find on the **X** and **Y** axes the segments of values operation (deltas). Then divide the values **Δy/Δx**. The result value is the tangent of the angle.

Lower and upper bounds are used to set the limits for input values. Note that the bounds correspond to the half-open interval. In other words, the lower bound is included in the interval of valid values while the upper one is not. In case of receiving values beyond the indicated interval, these values are considered to be invalid. Moreover, depending on the enabling/disabling of the **Apply after calculation** checkbox, the indicated limits are applied to the raw values X (disabled checkbox), or to the processed values Y (enabled checkbox).

Incorrect pairs of values can be removed with the button  . To remove all pairs at once, click on the delete button in the header of the table.

A graphic for the created calculation table can be viewed by clicking the **Show chart** icon at the top of the table header.

Methods of filling the table

Fill in **all** available fields (**X**, **b**, and **a**). Use this method to get the calculation table under your complete control.

Fill in only **X** and **b** values, and **a** set as zero. This method is convenient if you need to convert an analog signal to a digital one.

Fill in only **X** and **a** values. In this case, **b** is calculated automatically. This method is convenient if you need to get a curve knowing the angles, but without recalculating the Y offset.

In some cases, it is possible to adjust the calculation table knowing the **X** and **Y** values. In such cases use the calculation table wizard (right part of the dialog box).

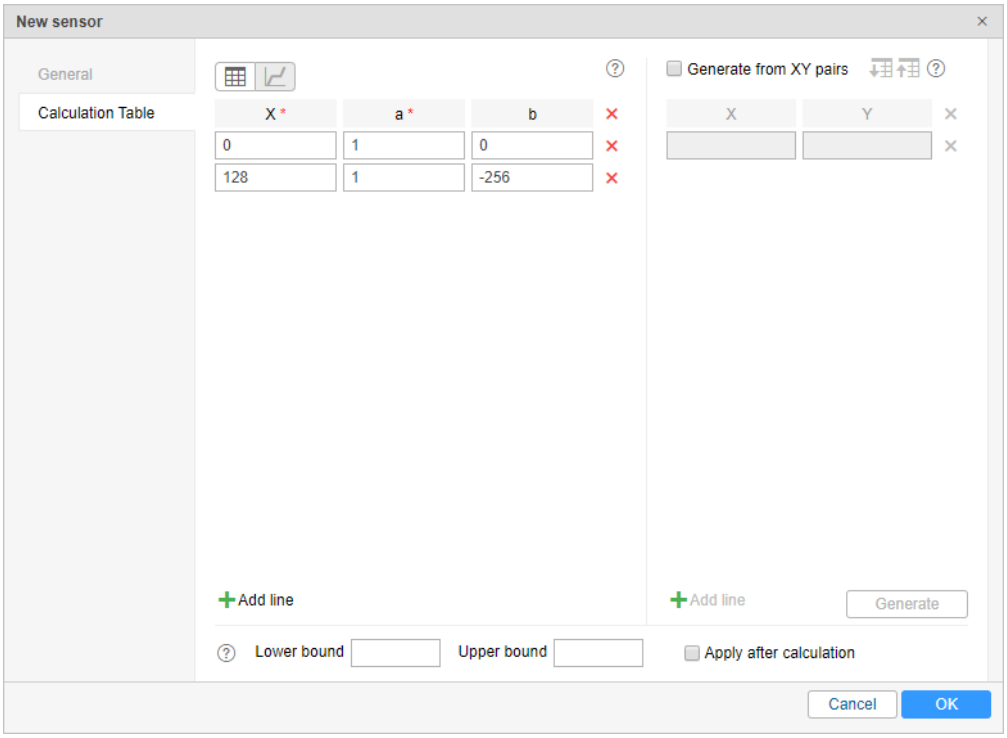
Chart managing

A chart can be managed using the following buttons:

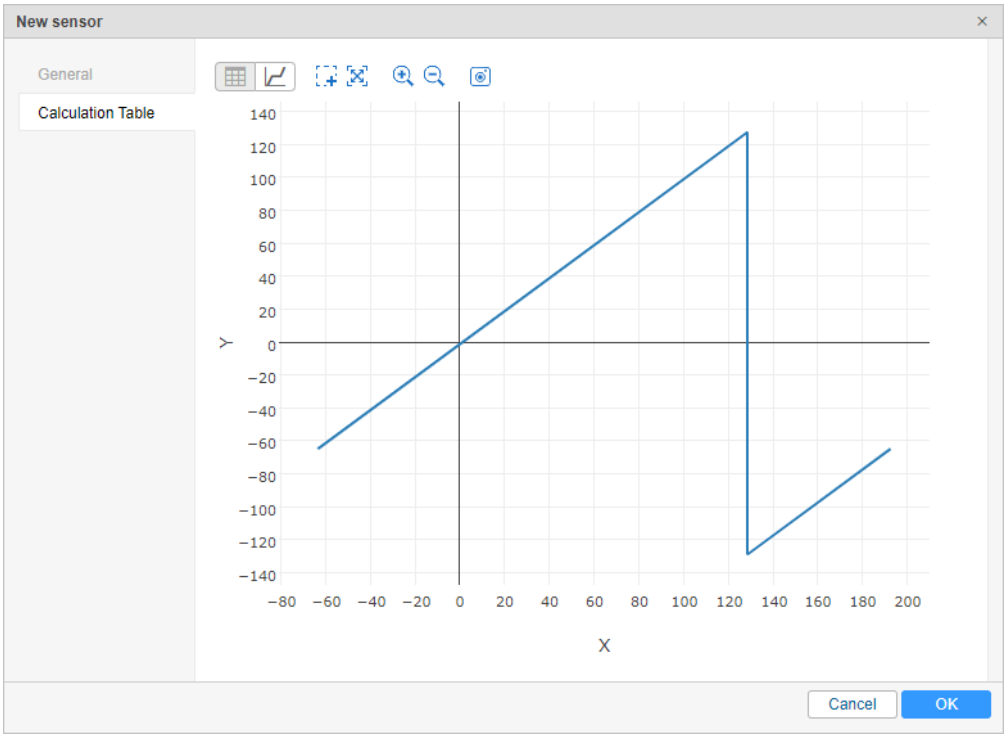
Area selection	When this button is activated, it becomes possible to scale (zoom) any selected area of the chart. To do this, select the appropriate area by holding the left mouse button. The procedure can be repeated any number of times.
Autoscaling	This button allows you to return to the default chart scale.
/ **Zoom in/ zoom out**	The buttons to scale a chart along the X-axis. Click on the button in order to make the visible area of the chart twice as wide/narrow in regards to the current position. Yet the center of the chart stays in its place.
Save as PNG	This button allows you to save the visible chart area along with the axis in PNG format.

Example 1: temperature sensor

As an example, let us create a calculation table for the temperature sensor. Suppose that the data is coming in complement code, i. e. the positive values are from 0 to 127, and negative from 128 (which corresponds to -128 degrees) to 255 (which corresponds to -1 degree).



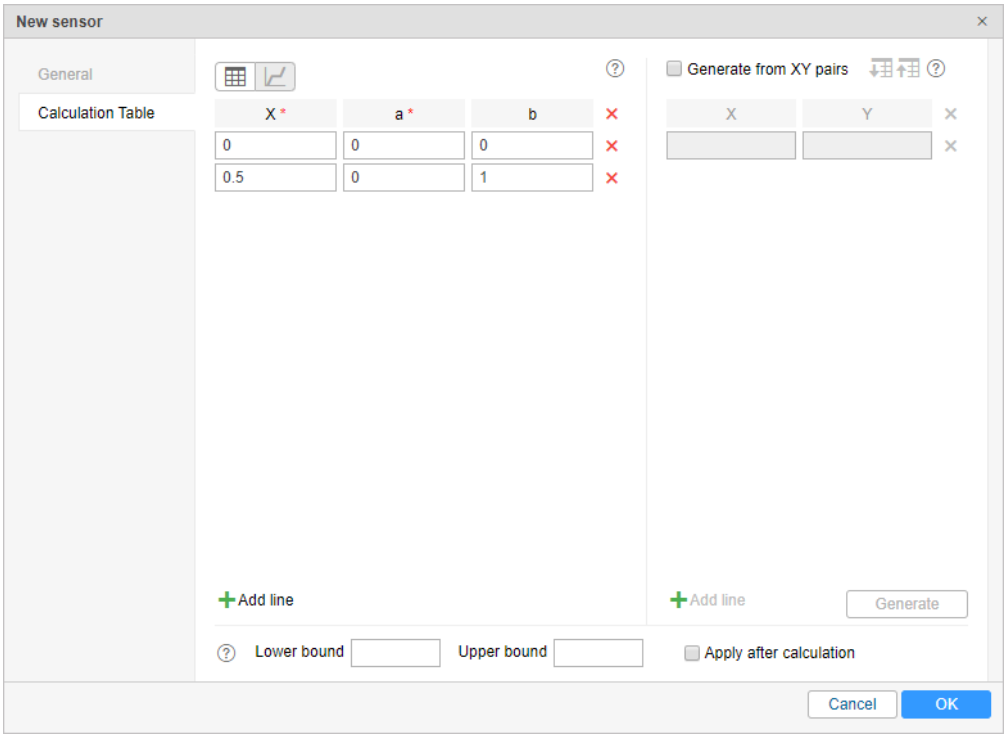
On the basis of the values indicated in the table, a chart is made. To view the chart, click the **Show chart** icon.



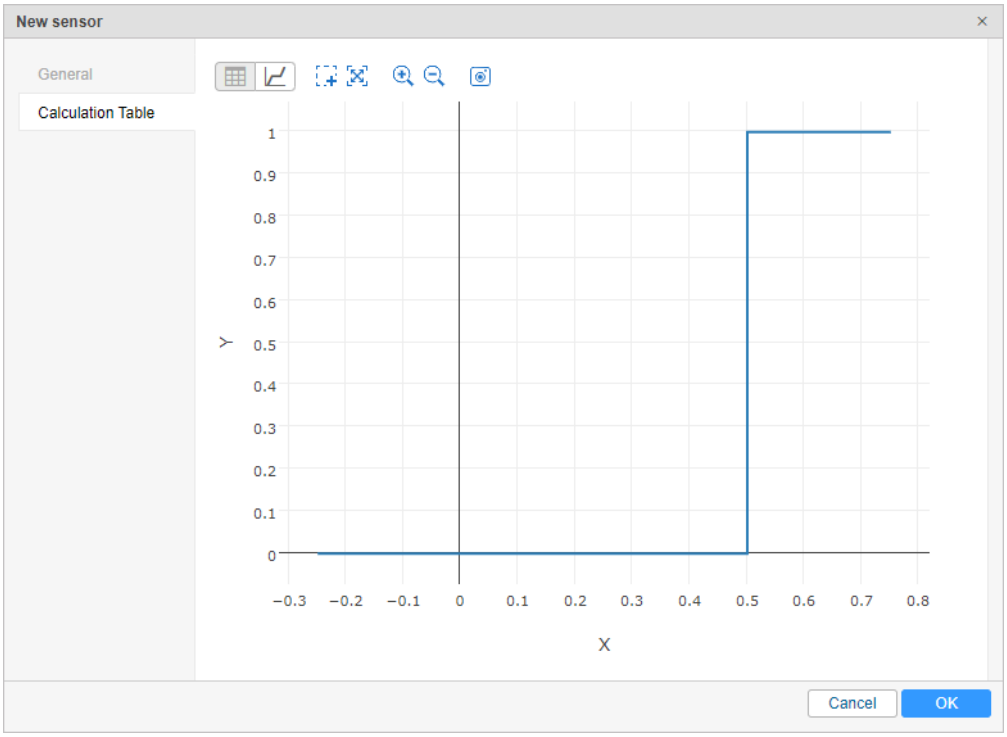
The calculation graph always has a somewhat extended view — along the X-axis it stretches to the right and to the left. This is due to the fact that on the first interval the function also works in the opposite direction — up to minus infinity, and on the last interval — up to plus infinity.

Example 2: engine ignition sensor

It is possible to configure a non-digital ignition sensor based on the parameter sending voltage. For instance, the voltage up to 0.5 V would mean **ignition off**, and over 0.5 V — **ignition on**. For such a sensor, we should create a calculation table as shown above:



Move to the **Calculation chart** and see if the result meets your expectations.



Calculation table wizard

The Calculation Table Wizard is a tool that simplifies the process of creating a calculation table. It is sufficient to indicate input **X** values and corresponding output **Y** values. You can use the calculation table wizard to calibrate a sensor experimentally. For instance, you fill in different

volumes of fuel into the tank and each time you take the readings from the sensor. The Calculation Table Wizard is located on the right side of the dialog window. It is disabled by default. To use a wizard, indicate the **Generate from XY pairs** flag.

Enter the pairs and click **Generate** in order for them to be processed by the system. On the basis of values indicated in the wizard, a calculation table will be created.

The program calculates **a** and **b** using the following algorithm.

a is calculated by the formula **ΔY/ΔX**. X- and Y-axial displacement is calculated separately for each interval, and then Y-axial displacement is divided by X-axial displacement, that is **ΔY/ΔX**.

b is calculated by the formula **b = Y — a × X**.

ⓘ In the upper right corner of the table wizard, there are buttons for exporting the introduced XY pairs into a CSV file and importing values from CSV or TXT files.

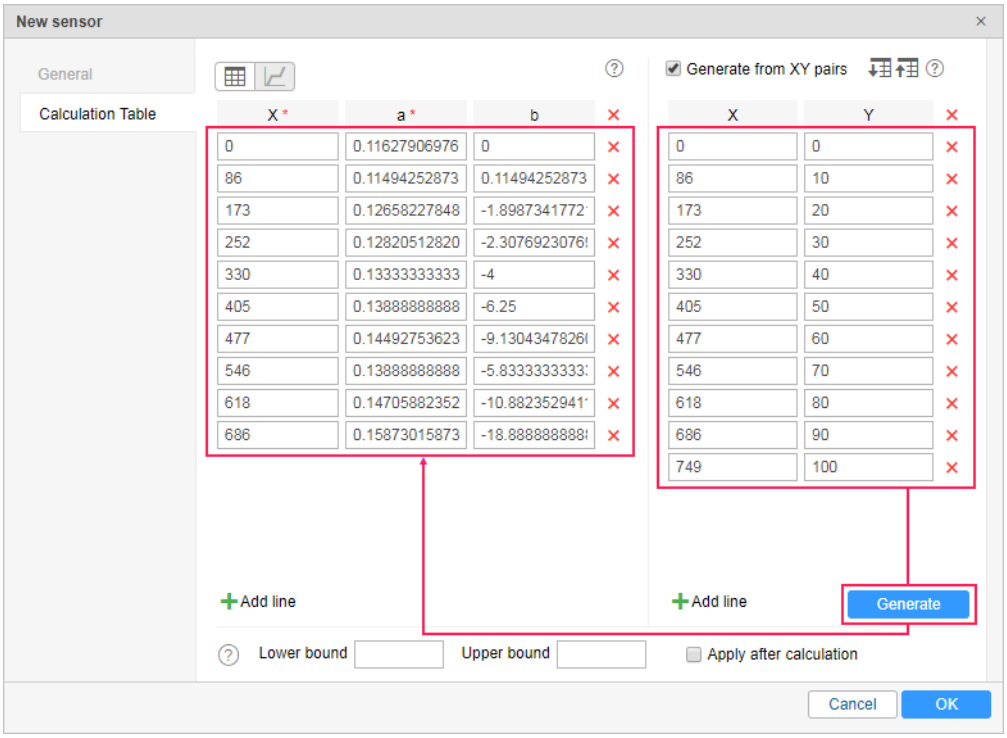
Example 1: fuel level sensor

Suppose that 10 liters of fuel was filled and the sensor sent the value 86, then 20 liters were added and the sensor showed 173, and so on. In the end, we can form a table:

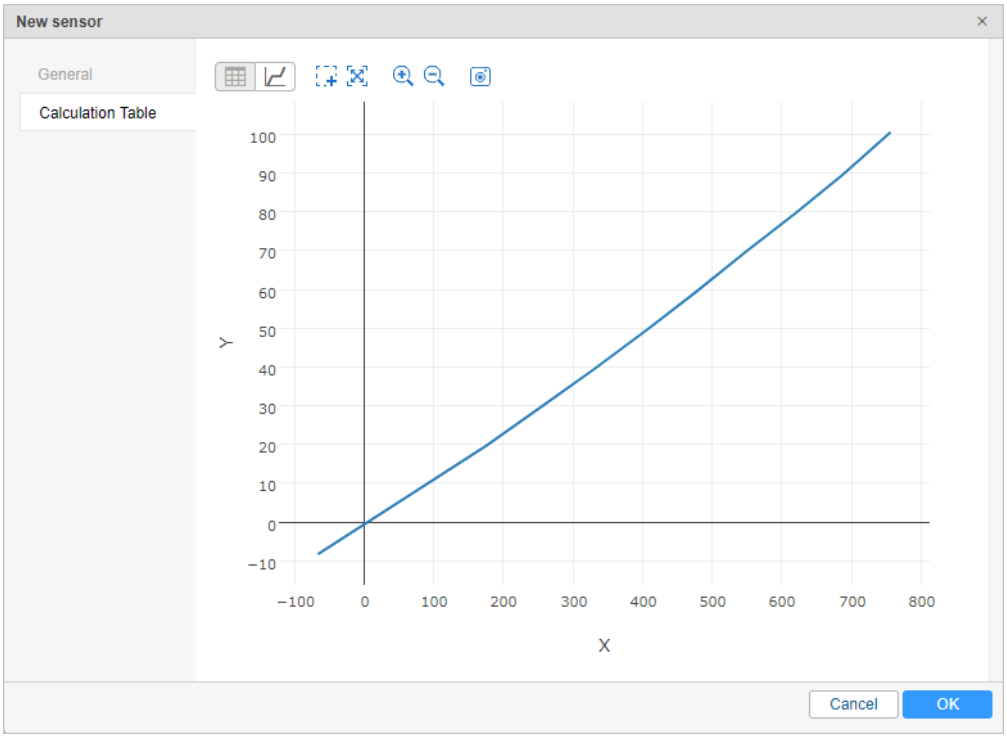
Input values (X)	Output values (Y)
0	0
86	10
173	20
252	30
330	40
405	50
477	60

Input values (X)	Output values (Y)
546	70
618	80
686	90
749	100

Enter these pairs into the wizard and click **Generate**. Based on the entered values, a calculation table (on the left) is generated.



In order to view a chart, click the **Show chart** icon.



All the data entered and saved on this tab is available when you open the dialog. Any changes in the calculation table do not affect the Wizard. In other words, the Wizard only shows the entered values but does not reflect the current situation.

Now let us see how **a** and **b** were calculated. The first interval starts with 0 and lasts until 86. At that, at the last point the output is 10. So, **X** displacement is **ΔX** = 86 — 0 = 86, and **Y** displacement is **ΔY** = 10 — 0 = 10. Now **a** coefficient can be calculated: **a** = **ΔY/ΔX** = 10 / 86 = 0,11627906976744186.

For other intervals, we apply the same calculation scheme (there will be one interval less than there are rows in the Calculation Wizard):

Interval	**X**	**Y**	**a**	**b**
N	**X**	**Y**	$(Y_{(i+1)} - Y_{(i)}) / (X_{(i+1)} - X_{(i)})$	**Y — a × X**
1	0	0	(10 — 0) / (86 — 0)	0 — a×0
2	86	10	(20 — 10) / (173 — 86)	10 — a×86

Interval	X	Y	a	b
N	X	Y	$(Y_{(i+1)} - Y_{(i)}) / (X_{(i+1)} - X_{(i)})$	$Y - a \times X$
3	173	20	(30 — 20) / (252 — 173)	20 — a×173
4	252	30	(40 — 30) / (330 — 252)	30 — a×252
5	330	40	(50 — 40) / (405 — 330)	40 — a×330
6	405	50	(60 — 50) / (477 — 405)	50 — a×405
7	477	60	(70 — 60) / (546 — 477)	60 — a×477
8	546	70	(80 — 70) / (618 — 546)	70 — a×546
9	618	80	(90 — 80) / (686 — 618)	80 — a×618
10	686	90	(100 — 90) / (749 — 686)	90 — a×686
11	749	100	(110 — 100) / (812 — 749)	100 — a×749

The information on how to make the calibration of a fuel tank can be found here.

Example 2: fuel level sensor

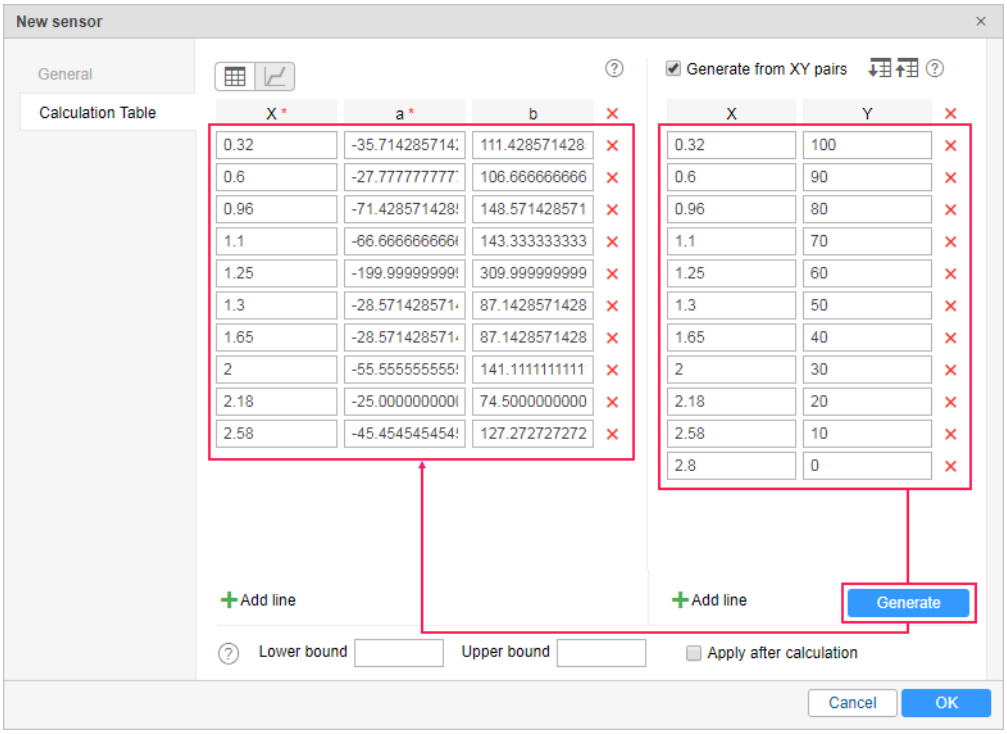
In this example, input **X** values decline while output **Y** values grow. Insert the pairs into the Wizard in any order — they will be rearranged automatically.

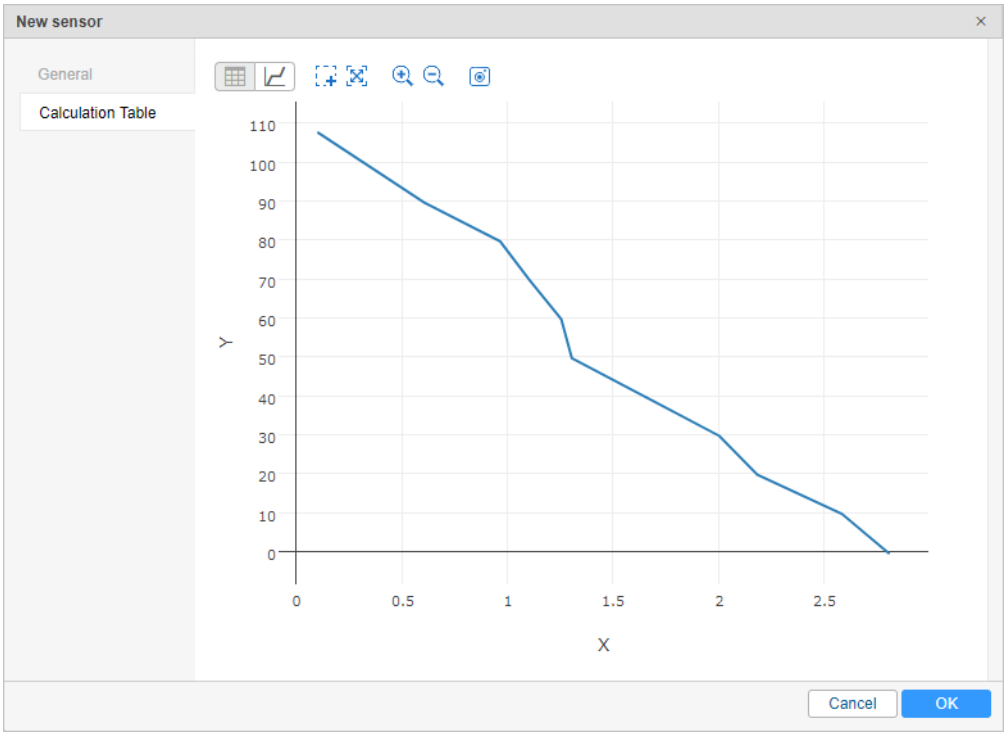
Initial data:

Input values (X)	Output values (Y)
2.8	0

Input values (X)	Output values (Y)
2.58	10
2.18	20
2.0	30
1.65	40
1.3	50
1.25	60
1.1	70
0.96	80
0.6	90
0.32	100

Enter these pairs into the Wizard, generate the calculation table and view the calculation chart.





Calculated intervals for this sensor are as follows:

Interval	X	Y	a	b
N	**X**	**Y**	$(Y_{(i+1)} - Y_{(i)}) / (X_{(i+1)} - X_{(i)})$	**Y — a × X**
1	0,32	100	(90 — 100) / (0,6 — 0,32)	100 — a×0,32
2	0,6	90	(80 — 90) / (0,96 — 0,6)	90 — a×0.6
3	0,96	80	(70 — 80) / (1,1 — 0,96)	80 — a×0.96
4	1,1	70	(60 — 70) / (1,25 — 1,1)	70 — a×1.1
5	1,25	60	(50 — 60) / (1,3 — 1,25)	60 — a×1.25
6	1,3	50	(40 — 50) / (1,65 — 1,3)	50 — a×1.3
7	1,65	40	(30 — 40) / (2,0 — 1,65)	40 — a×1.65
8	2,0	30	(20 — 30) / (2,18 — 2,0)	30 — a×2
9	2,18	20	(10 — 20) / (2,58 — 2,18)	20 — a×2.18
10	2,58	10	(0 — 10) / (2,8 — 2,58)	10 — a×2.58

The information on how to make the calibration of a fuel tank can be found here.

Converting Signed Parameters

It is supposed that data received by Wialon in the format of two- and four-byte integer appears to be unsigned. In other words, all the incoming values (both positive and negative) are displayed as unsigned, i. e. positive.

If the equipment used by you sends signed values in any parameter (for example, temperature parameter), it is necessary to create a sensor on the basis of this parameter and adjust a calculation table in a proper way.

Parameter analysis

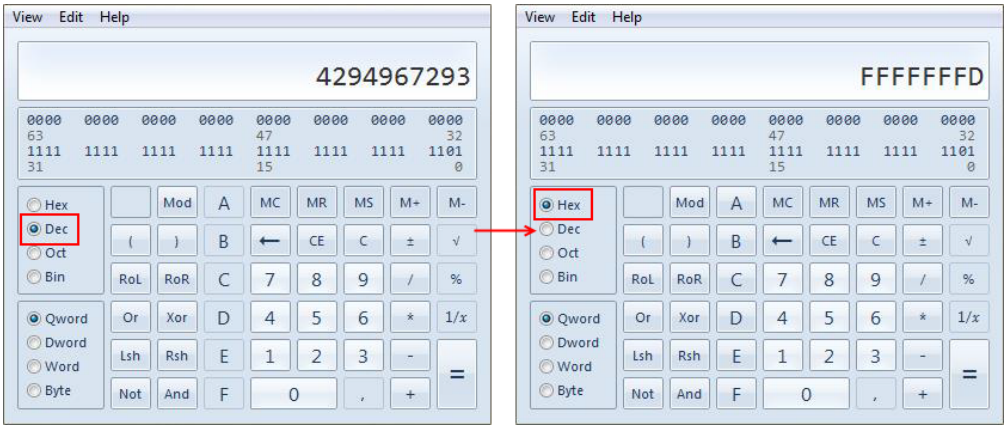
Switch to the Messages tab and request messages for any interval of time. Indicate **Show parameters as raw data**. In the column **Parameters** find the parameter you are interested in and analyze its incoming values.

Time	Altitude, m	Parameters
2015-12-11 13:38:28	206	adc1=2.586, param240=1, pwr_ext=28.138, param24=6, battery_charge=0, I/O=5/0
2015-12-11 13:38:59	210	adc1=2.608, param240=1, pwr_ext=28.138, param24=4, battery_charge=0, I/O=5/0
2015-12-11 13:39:09	223	adc1=2.564, param240=1, pwr_ext=28.129, param24=3, battery_charge=0, I/O=5/0
2015-12-11 13:39:39	223	adc1=2.608, param240=1, pwr_ext=28.157, param24=2, battery_charge=0, I/O=5/0
2015-12-11 13:39:50	232	adc1=2.586, param240=1, pwr_ext=28.138, param24=2, battery_charge=0, I/O=5/0
2015-12-11 13:40:20	247	adc1=2.586, param240=1, pwr_ext=28.119, param24=1, battery_charge=0, I/O=5/0
2015-12-11 13:40:50	263	adc1=2.556, param240=1, pwr_ext=28.138, param24=0, battery_charge=0, I/O=5/0
2015-12-11 13:40:50	260	adc1=2.578, param240=1, pwr_ext=28.157, param24=0, battery_charge=0, I/O=5/0
2015-12-11 13:41:20	267	adc1=2.578, param240=1, pwr_ext=28.157, param24=4294967295, battery_charge=0, I/O=5/0
2015-12-11 13:41:51	257	adc1=2.556, param240=1, pwr_ext=28.148, param24=4294967295, battery_charge=0, I/O=5/0
2015-12-11 13:42:42	265	adc1=2.549, param240=1, pwr_ext=28.129, param24=4294967295, battery_charge=0, I/O=5/0
2015-12-11 13:42:42	258	adc1=2.549, param240=1, pwr_ext=28.129, param24=4294967295, battery_charge=0, I/O=5/0
2015-12-11 13:42:52	244	adc1=2.556, param240=1, pwr_ext=28.138, param24=4294967295, battery_charge=0, I/O=5/0

You can see that when the temperature goes down and crosses 0 degrees threshold the necessary negative numbers are constituted with enormously large ones.

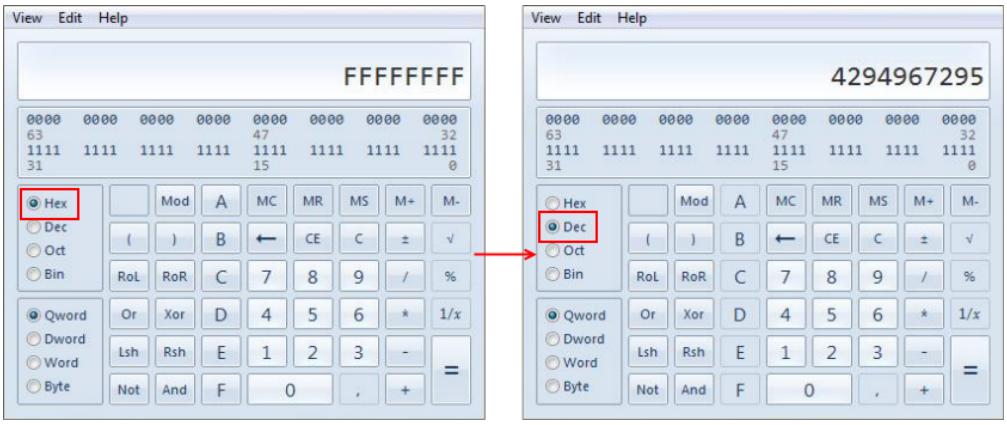
Defining the maximum value

Firstly, you should define the maximum threshold for such numbers. In order to do so, take any of the **incredibly large digits**, which occurs in the values of the parameter, and enter it into a calculator in the decimal mode (Dec.). Afterwards, switch to the hexadecimal displaying (Hex. mode).



Count the register length in the number appeared. Possible values are: 2, 4, 8. If the register length is less, we should round it up (for example, 5 should be rounded up to 8). In our case the register length is 8.

Now letter **F** should be entered in to the calculator in Hex. mode as many times as the register length appears to be after rounding up. Afterwards, switch to the **Dec** mode. Appeared result is the maximum possible number. You should write it down or memorize.



Sensor calculation table

Open the unit properties and create a sensor on the basis of this parameter. Now you should create a calculation table for it. Switch to the **Calculation table** tab of the sensor properties.

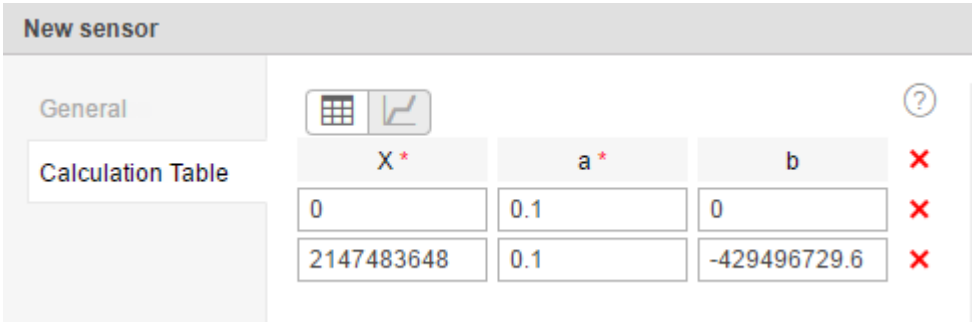
We have found out that all the interval of possible values is from 0 to 4294967295. Therefore possible values start from 0 to the half of the maximum number and negative numbers go from the half to the end of the maximum number (where the maximum number is the smallest negative number module). Divide the maximum number by 2, which equals 4294967295 : 2 = 2147483647,5. It means that positive values start from 0 to 2147483647 and negative —from 2147483648 to 4294967295.

In the calculation table **X** is the raw value sent by the parameter, **a** is the coefficient, **b** is the necessary correction. And all these values are needed to get a certain **Y** which appears to be a real value of temperature.

Whether the coefficient (**a**) is used for this parameter can be found out in the equipment specification. In our case, the coefficient equals 0.1, therefore if the value of the parameter sent by the equipment equals 6, the real temperature is 0.6 degrees.

For the first segment, correction for **b** is not needed (i.e., 0) but the second segment needs it because the values go in reverse order (maximum number corresponds to the smallest negative temperature value module). To calculate **b** shifting, it is necessary to add one (because we already have 0) and multiply by a coefficient. Therefore we have: (4294967295+1)x0.1 = 429496729.6. The received value should be deducted, that is why it should be entered into the calculation table as negative.

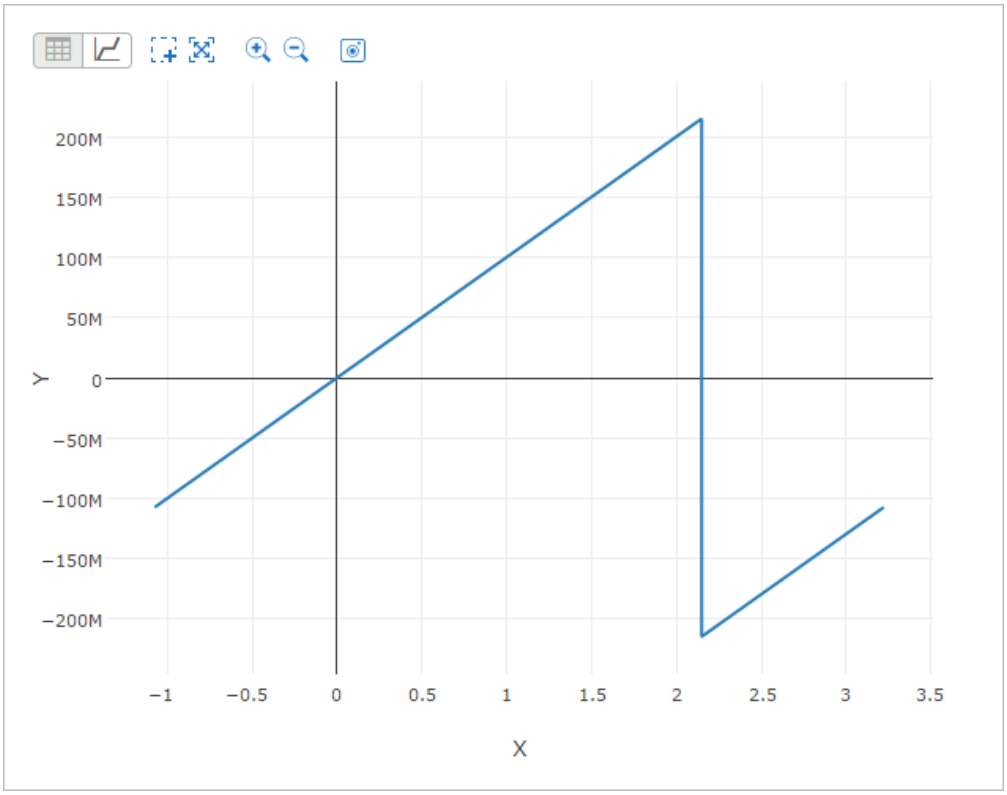
Now you can enter both the intervals (for positive and negative numbers) in the calculation table.



The calculation can be also made in the **Hex** mode. To do this, enter the letter **F** as many times as the number of digits (in our case 8), and then divide by 2. Then go to the **Dec** (decimal digits) mode and save or memorize the resulting number. This is the maximum positive value.

Result analysis

You can analyze the resulting table, switching to the **Calculation table** tab and clicking **Refresh** button.



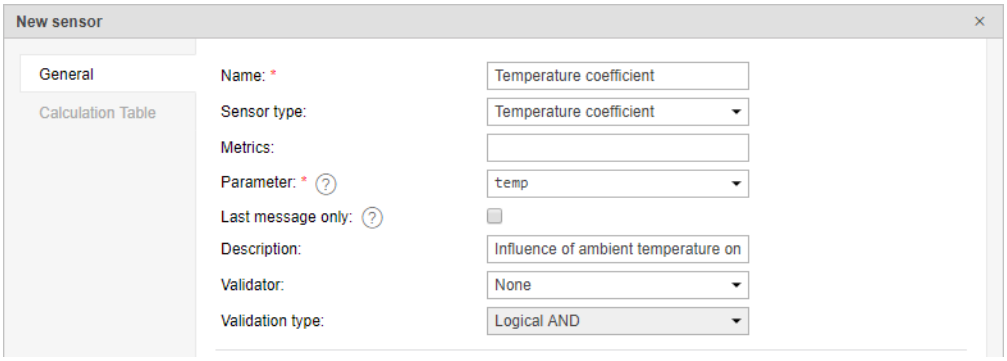
Besides, you can estimate the sensor setting on the Messages tab. Request messages on the unit for the same time interval, and this time select **Show parameter as sensor values**.

1	2015-12-11 13:38:28	0	0.60
2	2015-12-11 13:38:59	0	0.40
3	2015-12-11 13:39:09	0	0.30
4	2015-12-11 13:39:39	0	0.20
5	2015-12-11 13:39:50	0	0.10
6	2015-12-11 13:40:20	0	0.30
7	2015-12-11 13:40:50	0	0.00
8	2015-12-11 13:40:50	0	- 0.10
9	2015-12-11 13:41:20	0	- 0.30
10	2015-12-11 13:41:51	0	- 0.30

Temperature Coefficient

The temperature coefficient is a sensor which is created on the basis of a parameter that sends the temperature/voltage and is used to adjust the fuel level in the tank. Any liquids can be compressed and expanded depending on the ambient temperature, that is why the readings of fuel level sensor, especially of high volumes (for example, tanker), may seem to be incorrect without taking into account the temperature values.

The temperature coefficient sensor, as well as other sensors, is created in the unit properties on the **Sensors** tab. Press **New** and fill in the required fields. The type of sensor is **Temperature coefficient**, name and description are any of your choice. Unit of measurement is not obligatory. Be sure to clearly indicate the parameter that sends the temperature data.



Afterwards, switch to the **Calculation table** tab and using the Wizard enter the coefficient values — the maximum and minimum temperature coefficient. Beforehand, some preliminary preparations should be done.

1. Look through the specification and find out the maximum and minimum working temperatures of your fuel level sensor. In our case they are t_{max} = +100 and t_{min} = -60°C.

2. Find out the nominal temperature for the reference volume, in other words, the temperature which does not change fuel amount that is, does not require the use of a coefficient. In our case the value is the following: t_{rated} = +20°C.
3. Find out the density of a fuel you use (ρ). In our case it is diesel fuel, whose density is 0.89 t/m^3.

Calculate the values of the coefficients using the following formulas:

$$P_1 = \frac{(t_{rated} - t_{min})p}{1000} + 1$$

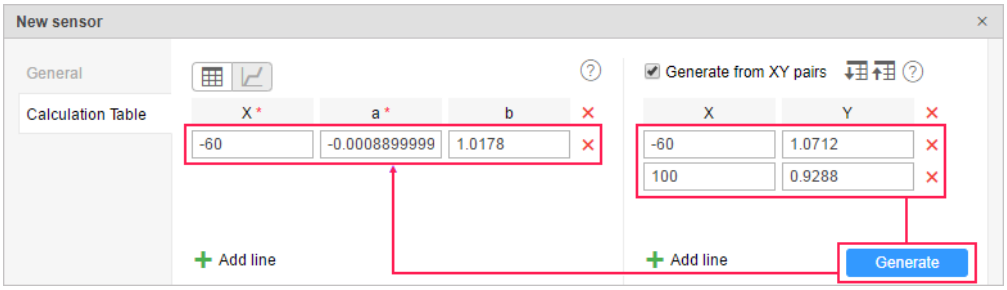
$$P_2 = 1 - \frac{(t_{max} - t_{rated})p}{1000}$$

Thus we have:

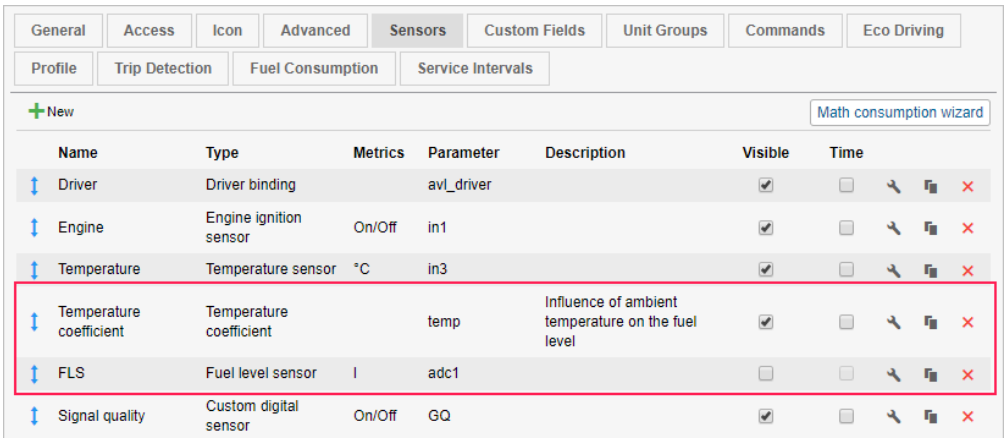
$$P_1 = \frac{(20 - (-60)) \times 0.89}{1000} + 1 = 1.0712$$

$$P_2 = 1 - \frac{(100 - 20) \times 0.89}{1000} = 0.9288$$

Now enter the data found for the minimum and maximum temperature values into the fields of the **Calculation table wizard** and generate a calculation table.



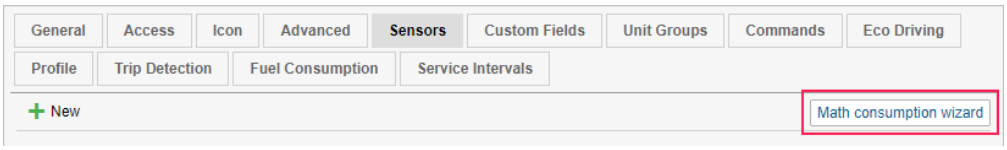
If the parameter sends not temperature, but, for example, voltage, then instead of the minimum, maximum, and rated temperature it is necessary to know the minimum and maximum voltage and also a rated voltage of a reference amount and do the calculations on the basis of this data.



Math Consumption Wizard

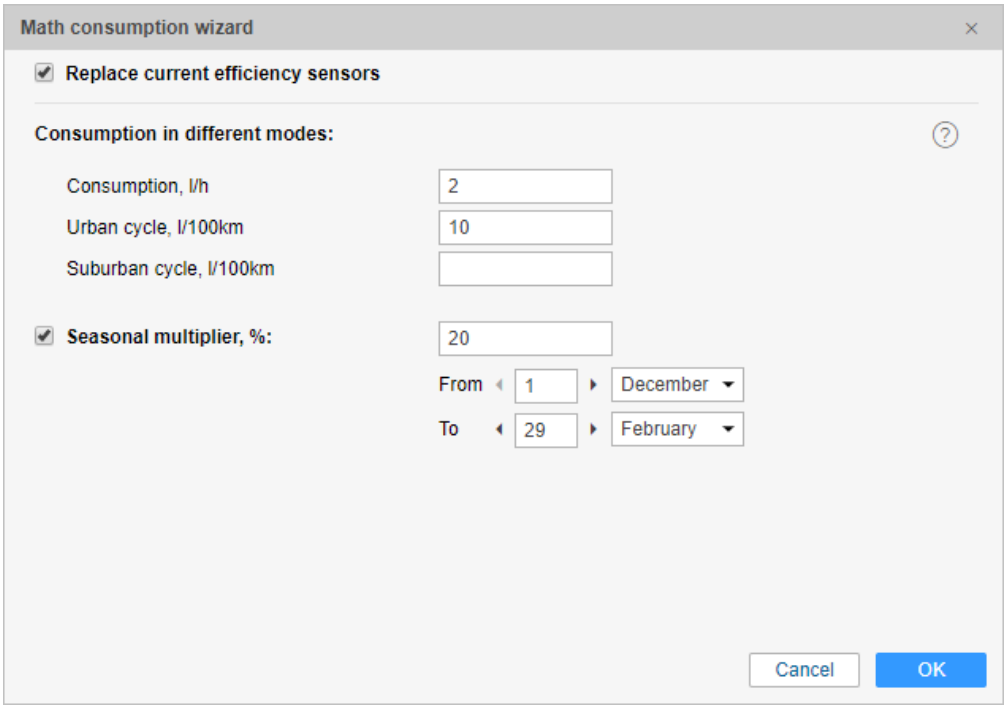
The wizard simplifies the process of creating and configuring the sensors for the mathematical calculation of fuel consumption. Calculation of fuel consumption is made in accordance with the speed of the unit.

To open the wizard, click on the corresponding button in the upper right corner of the **Sensors** tab of the unit properties.



While opening the math consumption wizard, the system searches for existing engine operation sensors (ignition, relative and absolute operating hours) and engine efficiency sensors, and also checks the values of the previous settings.

The window of the wizard consists of two sections and looks as follows:



In the **first** section, two options may be available for activation according to the previous properties of the unit.

Replace current efficiency sensors

Is shown if engine efficiency sensors have been found. The checkbox of this option is activated by default. When you press **OK**, the sensors created before are replaced by the new ones. If the checkbox is not activated, the new sensors are added to the existing ones.

Create previous version-based sensors

Is shown if the unit has previously activated fuel calculation checkboxes. If the option is enabled, the two sections of the wizard located below become inactive and are filled with the available data.

In the **second** section you can specify the consumption in different modes and the seasonal multiplier.

Consumption in different modes

Consumption, l/h — the fuel consumption during idling. If the field is filled in, its value is substituted in the first ignition sensor. If it is not, then the fuel consumption during idling is calculated as [urban cycle/10] (according to the statistical data).
Urban cycle, l/100 km — fuel consumption in the urban cycle (obligatory option).
Suburban cycle, l/100 km — fuel consumption in the suburban cycle.

After pressing the **OK** button, the ignition sensor is created (or the consumption during idling for the existing sensors is modified), as well as the engine efficiency sensor with the parameter

(speed + #speed)/const2. The data for the consumption in urban and suburban cycles and the minimum moving speed from the trip detector is used for the calculation table.

Seasonal multiplier, %

In this part of the math consumption wizard the multiplying or reduction coefficient for different seasons is adjusted. In the **Seasonal multiplier** field the coefficient is indicated in percent (for the reduction coefficient it should be a negative number). In the fields **From** and **To** the time frames of the season are entered.

If the values for the seasonal multiplier are indicated, after pressing the **OK** button the engine efficiency sensor with the parameter time: d is created.

> All the sensors created by means of the math consumption wizard have the mark **(wizard)** in their names.

General Properties

On the **General** tab of the unit properties, you can set the parameters described below.

> Access required: **Edit connectivity settings** — to view and edit devices type, phone number, UID, and access password.

Name

The name of the unit must be between 4 and 50 characters. By this name, the unit is shown on the map, in the worklist, in the reports.

Device type

Select device type from the list of the supported hardware. The list is formed according to your license. If the required device is not listed, you can send a request for its integration.

Three devices that are most often used by the current user are listed on the right and can be easily selected with a simple mouse click. To display the full list of available device types, click on the entry field once (it should be empty). To quickly find a necessary device type, use the dynamic filter.
On the right of the entry field there is a button which can be used to configure the device parameters for the given unit, however, it is active only if this configuration is supported within the selected device type.

Upon creating a unit from WLP file there can be a situation when the device type used by the source unit is not available for your account. In this case, the device type of a new unit is automatically changed for the Wialon Retranslator.

Server address

The domain name or IP address of the server (switching with the button IP) to which the data arrives, and the port of the device. The port is determined automatically after selecting the type of the device. This field shows the value specified on the System tab in the administration system. The field is displayed for the user who has the **View connectivity settings** access right with regard to the unit.

Unique ID

Enter the unique ID for the unit required to identify it by the system. Usually, it is IMEI or serial number. Some types of devices may support two unique IDs. In this case, the additional input field appears on the right. The maximum number of symbols for an ID is 100.

Phone number

Here enter the phone number of the unit if it has embedded SIM card. The phone number should be in the international format, e.g., +15557654321. If your device supports two SIM cards, you can enter the second phone number on the right.

Device access password

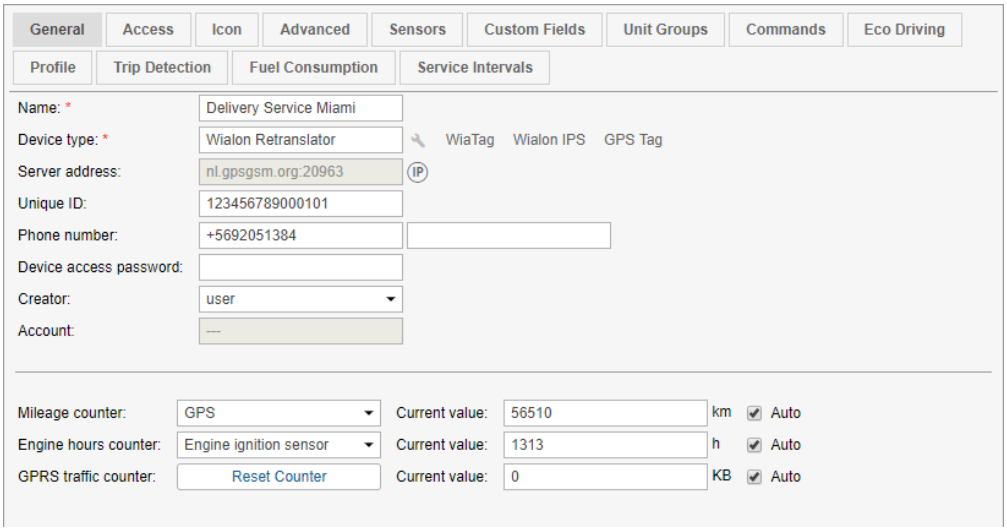
This password is required for some device types to execute commands or send data.

Creator

The user who is the creator for this unit (if you have any access to this user).

Account

Here you can see to which account the unit belongs (if you have any access to this account).



Units with the same ID within a certain type of device type, as well as units or drivers with the same phone numbers, cannot exist in the system. If you are attempting to create a unit with an ID or a phone number that is already in use in the system, a special alert is displayed. However, the unit is created anyway but with **empty** ID or phone number values which can be edited later.

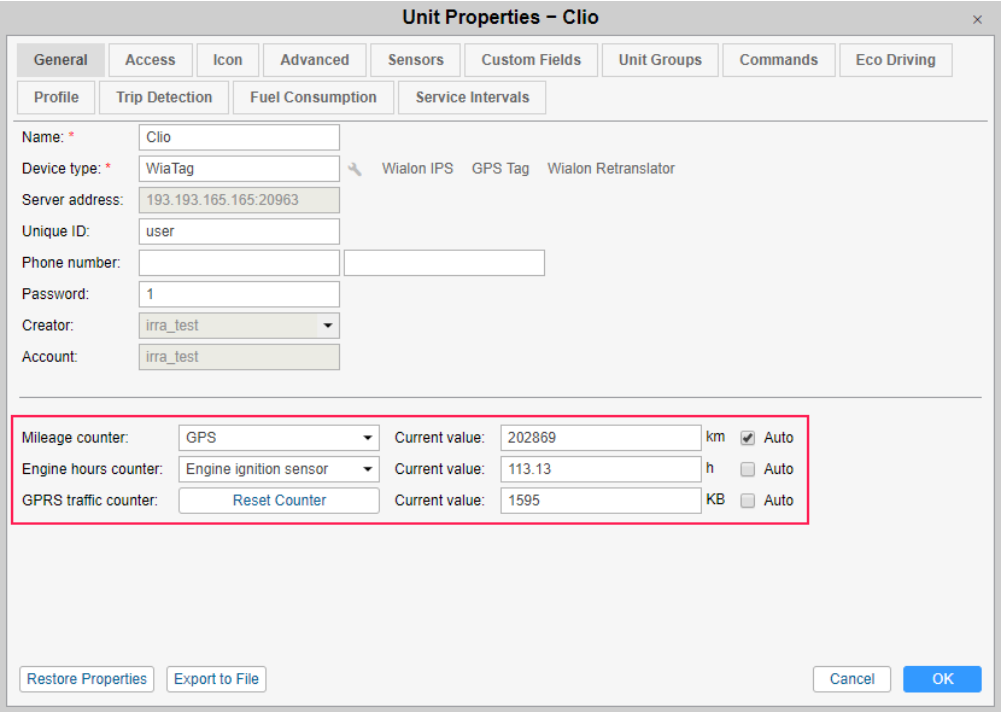
Unit parameters can be set in different measurement systems. When creating new units, the system of measures for them is taken from the settings of the current user. Therefore, to set a system of measurement for a unit, it is necessary to select a corresponding system of measurement in the settings of the current user. For existing units, the system of measures can only be changed by conversion.

Counters

Access required: **Edit counters** — to edit current values of counters and calculation methods.

Parameters for counters are adjusted on the General tab. Counters are widely used in the system: in online monitoring, as well as in reports. Three types of standard counters are supported: mileage counter, engine hours counter, and GPRS traffic counter.

> In order for the engine hours and mileage by sensors to be calculated correctly, the device should send data with the required sensor parameters at least once every 100 messages.



Mileage counter

Mileage counter is used to calculate distance in reports.

The mileage counter can be set to one of four methods of calculating:

- GPS — mileage is calculated by GPS coordinates (possible for any unit).
- Mileage sensor — mileage is calculated in accordance with the mileage sensor.
- Relative odometer — mileage is calculated according to the relative odometer sensor which counts the distance traveled since the last message.
- GPS + engine ignition sensor — mileage is calculated by GPS coordinates taking into account the readings of the ignition sensor.

> If a sensor (including sensor-validator) needs a parameter from the previous message, such a sensor cannot be used as a method of mileage calculation.

The selected method of calculation affects the data in reports (mileage, duration), tracks (mileage), and messages (distance). If you choose to calculate mileage by a sensor and your unit does not have it, the mileage values equal zero.

Engine hours counter

The engine hours counter calculates engine hours by one of three sensors (engine hours are measured in hours):

- engine ignition sensor;

- absolute engine hours sensor;
- relative engine hours sensor.

You can enter a fractional value for the engine hours counter (it is shown with accuracy to two decimal places also in unit's extended information on the **Monitoring** tab and in its tooltip on the map). The point is used as a separator.

⚠ If a sensor (including sensor-validator) needs a parameter from the previous message, such a sensor cannot be used as the method of engine hours calculation.

Engine hours counter is widely used in tabular reports.

GPRS traffic counter

The GPRS traffic counter is used to calculate Internet traffic consumed by the unit to transmit and receive data. Traffic is measured in kilobytes (KB). At any moment, you can reset this counter manually by pressing the **Reset counter** button. You will be offered to save the event of reset and the current value in the unit events history to be exported to the report later.

Counter properties

You can set the current value for each counter. If you activate the **Auto** option to the right of the counter, the newly received data will be automatically added to this value.

ⓘ The values of the counters are updated every 10 minutes.

To reset the counter manually, type '0' in the **Current value** field. You can alter (set, reset) the values of the counters not only in this dialog box, but also with the help of jobs and notifications. The values of mileage and engine hours can be shown in the unit tooltip and in the extended unit information.

The **Maximum interval between messages** and **Timeout** options are taken into account only in reports and do not work for counters online.

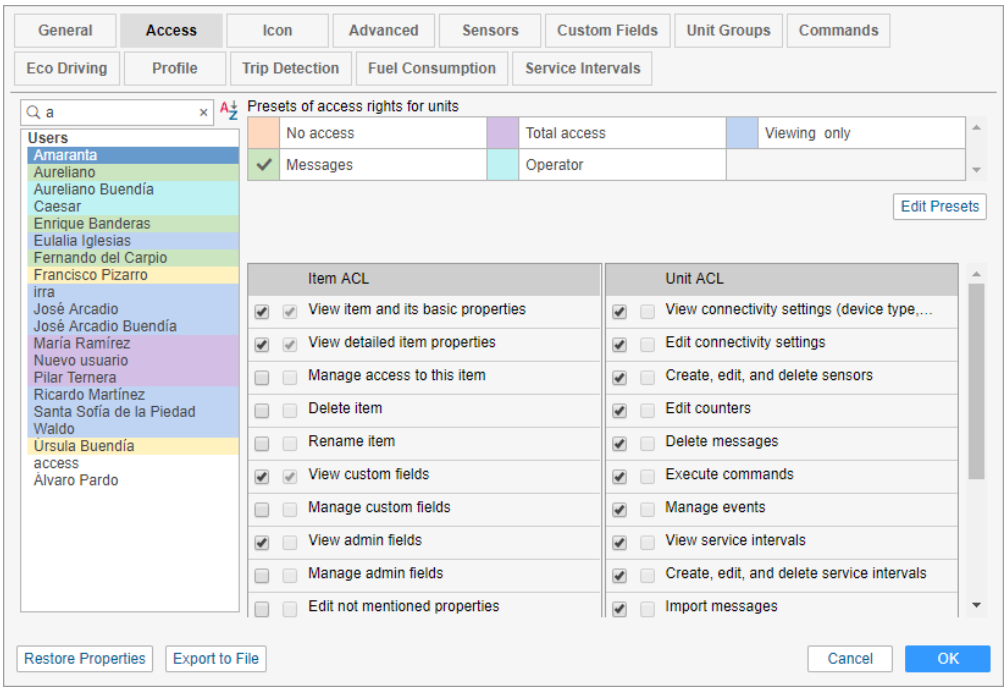
Access

On the **Access** tab of the unit properties you can indicate which access rights different user has towards the unit.

ⓘ Required access: **Manage access to this item** towards the unit you are editing; **Manage user's access rights** towards the users in the left part of the dialog.

The list of users whose access can be changed is displayed on the left. The users with the coloured background at the top of the list are those who already have some access to this unit.

On the right, the list of both standard and special access rights is displayed where the allowed actions are checked.



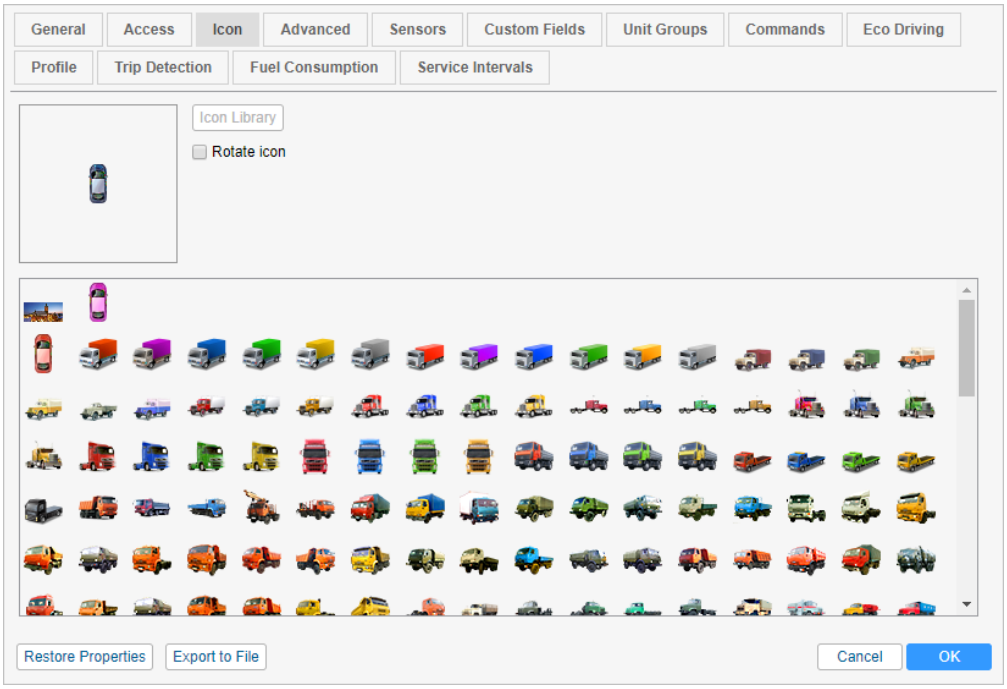
Icon

On the **Icon** tab of the unit properties, you can select or load any image to display your unit on the map and on different unit lists.

> ⓘ Required access: **Change icon** — to choose an icon for a unit; **Edit not mentioned properties** — to rotate unit icon.

To display a unit, you can either use standard icons (click the **Icon library** button) or upload a custom image from your computer. To upload an image from computer, click on the current icon, select an image on your computer, and press **OK**. Supported formats are PNG, JPG, GIF, and SVG. Recommended image size is 32x32 pixels.

To delete the current icon, hover the cursor over it and click the **Delete** button. The current icon changes to the default one.



Depending on the course, the unit icon can rotate to show the direction of movement. To do this, enable the **Rotate icon** option. It is recommended to select an icon that looks strictly north (i. e. up), otherwise, the rotation of the icon may be misleading.

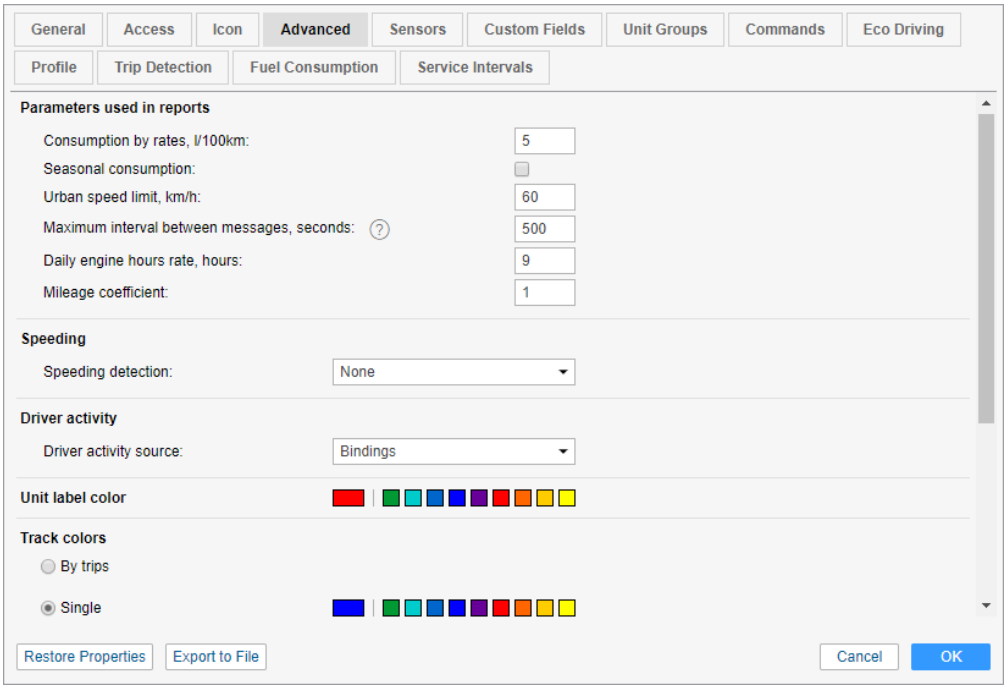
If the unit has the icon by default, and the group into which it is included, has the icon not by default, the unit takes over the group icon. It should be noted that in this case, the icon of the group does not rotate, even if the corresponding box was checked.

Note that in order to upload individual icons for units, unit groups, and geofences you can use the Icon Library application (for top accounts only). Icons uploaded to the system using this application are available in the standard icon library. To facilitate the work with the library, the uploaded icons are placed in the same list, but separately from the standard ones (at the top).

Advanced Properties

On the **Advanced** tab of the unit properties, various parameters are set for generating reports, colors for tracks are adjusted, and speed limitations are set.

Required access: **View detailed properties** — to view parameters for reports, driver's activity source, and messages filtration settings (the first, the second, the third, and the last sections); **Edit not mentioned properties** — to edit color schemes of the track/sensor (middle sections); **Edit trip detector and fuel consumption** — to edit report parameters, and driver's activity source; **Edit connectivity settings** — to edit parameters of messages filtration (last section).



Parameters used in reports

Consumption by rates, l/100 km

In this field, the fuel consumption per 100 km is indicated. To modify it, you need the **Edit trip detector and fuel consumption** access right towards the unit. Positive digital values can be introduced here. The default value is 0.

Seasonal consumption

Activate this option to set the seasonal calculation of the fuel consumption rate. Specify the fuel consumption per 100 kilometers (default value is 0) and the period (from — to) when this value should be taken into account. To modify this field, the user needs the **Edit trip detector and fuel consumption** access right towards the unit.

If the **Seasonal consumption** option is activated, then when a new sensor is created with the help of the math consumption wizard, the **Seasonal multiplier** option is activated there by default, and the value of the coefficient is counted in accordance with the values specified on the **Advanced** tab.

Urban speed limit, km/h

This setting is used in the report on trips. If the unit goes with the speed under indicated here, it is considered as urban mileage. If the speed is higher, this mileage is regarded as suburban. This property can be used in the trips reports, statistics, and in the advanced drivers reports.

Maximum interval between messages

Indicate the maximum interval between messages (in seconds). The excess of the specified value is interpreted by the system as a connection loss. This is reflected in the report on connection problems, while calculating intervals in the report on engine hours and during the calculation of fuel consumption by mathematical calculation or by FLS.

Daily engine hours rate

Indicate the daily rate of engine hours to use this value in the engine hours report (when calculating the utilization and useful utilization). The engine hours operation is defined by the corresponding counter.

Mileage Coefficient

The mileage coefficient is useful to compare the detected mileage with the mileage by odometer. The corresponding column can be included in any tabular report containing information about mileage, and in the statistics.

Speeding

In this section, a method for speeding detection can be selected. The selected option defines the order of further actions.

None

The default setting for this method is set to **None**. It means that speedings are not registered by the system. This option is relevant, for example, for stationary units where such data is not necessary.

Use fixed limit

For the **Use fixed limit** method the maximum speed limit is specified individually for each unit in the field **Fixed speed limit**. Upon receiving messages with the speed higher than the indicated one, the speeding is registered by the system. For this method, you can also enter the minimum speeding duration in seconds (1 second by default). The speeding the duration of which is less than the indicated one is not registered by the system as a speeding.

Use limits from roads

> ⓘ The **Use limits from roads** method is supported only by Gurtam Maps cartographic service.

With the **Use limits from roads** option, the speeding registration depends on the speed limitations indicated in Gurtam Maps (provided that the road limit is higher than 30 km/h). In other words, the system contains the data on speed limits for the particular road section, and if a unit exceeds this speed limit while moving by this section, the speeding is registered. For this method, you can

indicate the tolerance on speeding value. In this case, a speeding is considered to be the movement at a speed that is higher than the sum of the values of speed limit and tolerance on speeding. For example, in some countries exceeding the speed limit by 10 km/h is not a violation, that is why you can indicate 10 km/h tolerance on speeding. Therefore, by a road with the speed limit of 60 km/h, the unit can move with a speed of 70 km/h, and this speed will not be considered a speeding. Moreover, here (the same as for the previous method) the minimum speeding duration can be indicated.

ⓘ If «0» is indicated in the field **Min. speeding time, seconds**, the speeding is registered even if there is only one message with speeding, The duration of such interval in the reports is **00:00**.

Speedings are registered in the system, and subsequently, you can generate a speedings report. Moreover, during building a track you can enable speeding markers which highlight the corresponding events on the track.

Driver activity

Information on driver activity helps to track whether the driver follows the AETR standards or not. Such information is displayed in the unit or driver tooltips as well as in the extended unit information if the corresponding checkbox is indicated in the user settings.

This section allows choosing the source for determining driver activity. The dropdown list contains 3 items: **None**, **Tachograph**, and **Bindings**. If the **None** item is chosen, the unit or driver tooltips or the extended unit information do not show the current data on the driver activity. If the **Tachograph** item is chosen, the information on the activity of a driver bound to this unit is received from the tachograph installed in the vehicle. If the **Binding** item is chosen (for example, if a vehicle is not equipped with a tachograph), the activity of a driver bound to this unit is determined in the following way:

- **Driving** status is registered as the driver activity when either trip or stop have been detected for a unit.
- **Work** status is registered when parking has been detected.
- **Rest** status is registered upon unbinding a driver from such a unit.

Unit label color

By default, the names of the units and drivers assigned to the units are red on the map. However, you can change this color here and even set various colors for different units.

Track colors

Different colors can be used to show on the map not only the unit itself but also its movements (tracks).

Tracks can be built on the Tracks, Messages, Reports, or Monitoring (the **Quick track** option) tabs.

Different parts of the track can be colored differently. The settings are made in the **Track colors** section on the **Advanced** tab of the unit properties. There are 4 mutually exclusive options: **By trips**, **Single**, **By speed**, **By sensor**. The option selected in the properties of the unit is also selected for it by default in the tracks panel.

By trips

This option is designed to change the color of the track in accordance with the trips, which are determined by the trip detector.

Single

This option is designed to color the track in one color, which is convenient, for instance when building tracks for unit groups so that they do not visually merge with each other. The color of the track is selected from the palette.

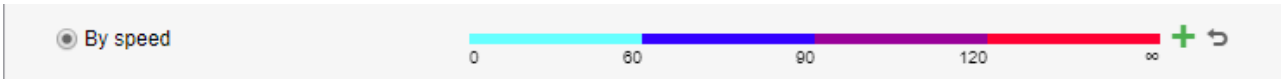
> When you sequentially build several tracks for one unit, a different color is used for each of them (taken in order from the palette).

By speed

This option is designed to change the color of the track depending on the speed. To set the values for the speed intervals and indicate their colors, click on the button + . The track color is set for each interval individually. In other words, it is necessary to set an interval, select the color, and click **OK**. Afterwards, the same procedure should be done for the rest of the intervals. Pay attention to some peculiarities of setting intervals and choosing their color:

- No value in the first field corresponds to -∞, in the second — to +∞.
- When you add an interval that intersects with an existing one and goes beyond its boundaries, the added interval overwrites the existing interval.
- When you add an interval that intersects with an existing one and does not exceed its boundaries, a new interval is inserted inside the existing one. Both intervals, to which the existing one was broken, receive its color.
- You can select a color from the palette or specify it in the HEX format in the field above it.

Upon completion, the intervals of the selected color are displayed on the scale. To edit the interval, click on it with the left mouse button, make the changes and click **OK**. To reset the settings to their default state, click on the button ↩ to the right of the scale.



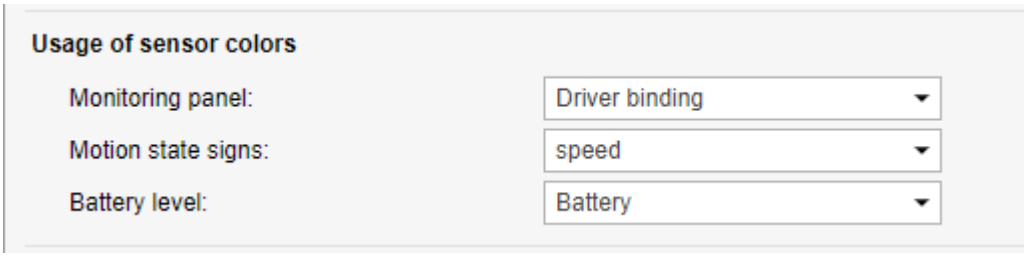
By sensor

This option is designed to change the color of the track depending on the readings of a sensor. Select a sensor from the dropdown list (the list is formed on the basis of all the sensors created for a unit). For each created sensor, you can set the interval values and pick their colors. Therefore, when this option is activated, the colors indicated on the interval scale in the properties of the selected sensor are used to draw the track.

Usage of sensor colors

In this section there are three dropdown lists that allow selecting the sensors, the colors of which should be used for:

- showing sensor state in the list of units on the **Monitoring** tab;
- indicating by color the last state of the sensor of the unit on the map;
- showing the battery level of the device in the work list on the **Monitoring** tab and in its monitoring options menu on the map.



If the unit does not have proper sensors, the options are blocked (inactive).

To configure a sensor that shows the battery level, it is necessary to create a custom sensor with the parameter in which the device sends data about the battery. If these data are not sent in percent, but in volts, it is necessary to fill in the calculation table for the sensor in order to display them correctly in the system.

Messages validity filtration

All the messages are stored in the system without any exception. However, in the case of data spikes, lack of coordinates, etc. such messages may distort the mileage count and various

indications in the reports. That is why, it is recommended to enable the filtration of data, in which invalid messages are not taken into account. To adjust the filtration settings, fill in the fields described below. Please note, that the filtration applies only to **new** messages.

Allow positioning by cellular base stations

Positioning by cellular base stations (**LBS detection**) is an alternative method of defining unit location. This method involves the use of cellular base stations as reference points for the location detection. Note that the method is not as accurate as the use of GPS, and just allows to receive the approximate location. When this checkbox is enabled, the **LBS detection** is used only if it is newer than the GPS data.

Skip invalid messages

Some controllers may send a flag about coordinates validity/invalidity in messages. A message with invalid coordinates is marked by the flag of invalidity, and when sending such a message to the server, the current time and the last valid coordinates are given. Wialon will consider this message as a message without position data, and it will be not used when constructing movement tracks, detecting the location in reports, etc. However, if this message contains other parameters (such as sensors), they will be used.

Minimum satellites

If the number of satellites locked is lower, the message is considered to be invalid. The recommended value is at least four.

Maximum HDOP value

HDOP stands for the Horizontal Dilution of Precision. HDOP is an error in the horizontal plane, at which the messages are considered valid. The smaller this parameter, the more accurately the coordinates are determined. If the HDOP value in the message is greater than the specified value, this message is marked as non-valid. Any messages with missing or zero coordinates, also undergo filtering, even if the device did not mark such a message as invalid. A message is recognized as invalid if at least one coordinate (longitude or latitude) is zero.

Maximum speed value

The messages containing speed higher than or equal to the value set here are marked as invalid. The default 0 value does not affect filtering.

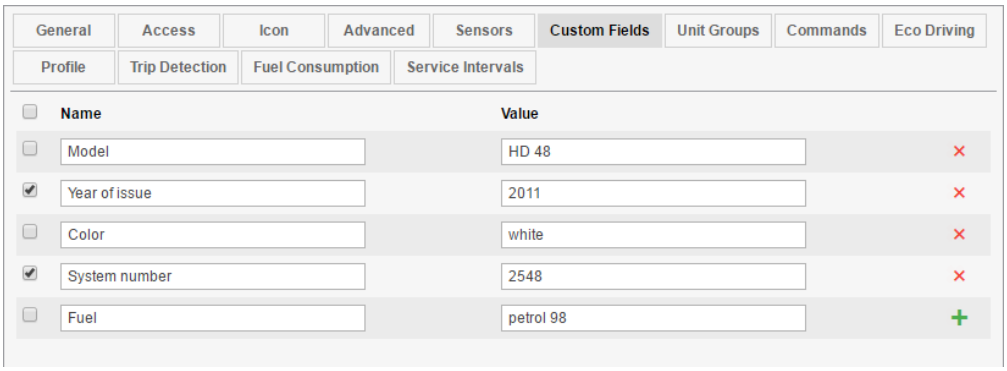
Custom Fields

On the **Custom fields** tab of the unit properties, you can create fields that display additional information about the unit, for example, fuel type, year of manufacture, load capacity, etc. Moreover, here you can indicate any external links. Some of these fields can be marked as

administrative (the checkbox before the field), i.e. they are visible only to users with the appropriate rights.

> Required access: **View custom fields** — to view general custom fields; **Manage custom fields** — to create new fields, as well as edit and delete existing ones; **View admin fields** — to view administrative custom fields; **Manage admin fields** — to create, edit, and delete administrative fields.

Enter a field name and its value and click the **Add** button. To delete an incorrect field, click **Remove**.



The next time you open the unit properties, the entered fields will automatically be arranged in alphabetical order.

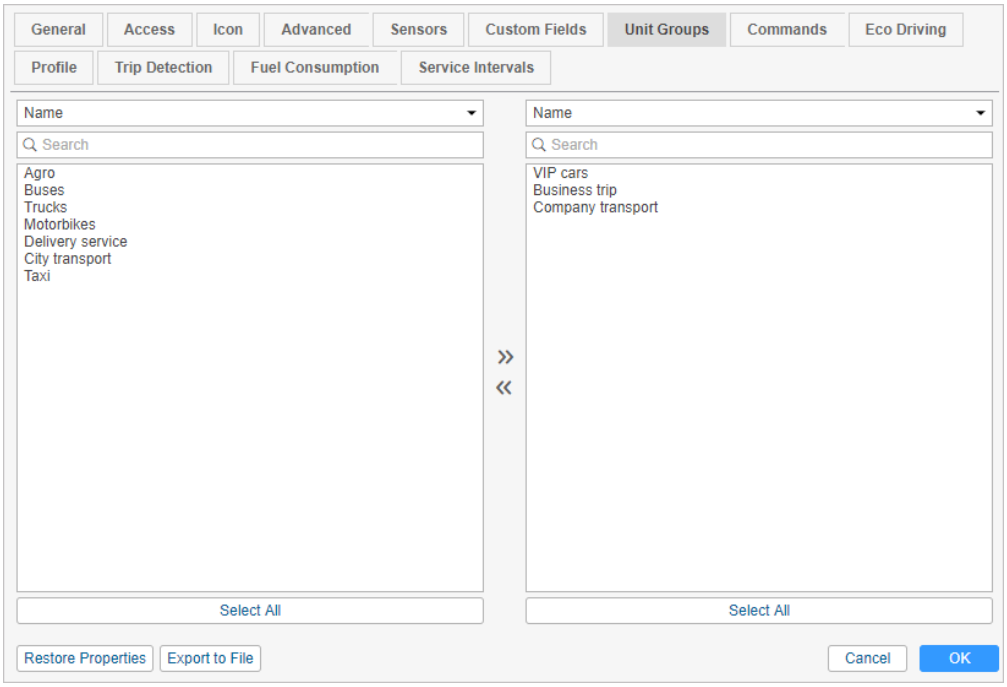
Application of the unit custom fields:

- In the unit tooltip and in the extended unit information (if enabled in the user settings);
- In the Custom fields table that can be generated both for a unit and for a unit group;
- On the **Monitoring** tab to search units by some property;
- In the text of notifications.

Unit Groups

On the **Unit groups** tab of the unit properties, you can view whether the unit is included in some group or not.

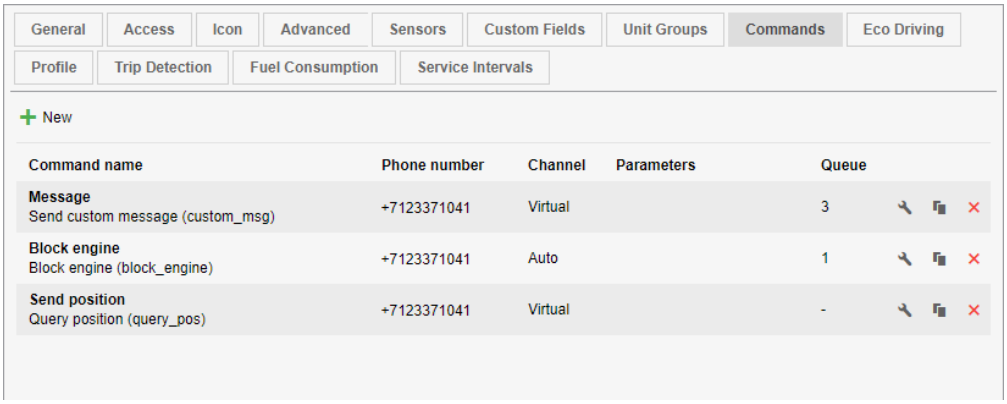
To the left is a list of existing groups, to the right — only those groups that include this unit. Use the **Add**/**Delete** buttons to include a unit in a particular group or exclude it from the group.



Commands

On the **Commands** tab in the unit properties, you can create and configure commands to be sent to the unit. A command can be sent manually from the monitoring panel and automatically by means of jobs and notifications. If you want a command that was sent automatically to be executed by several units at once, make sure that it has the same name in the properties of these units.

> To work with commands, the **Commands** service should be activated for the account. To send a command to the unit, the user should have the **View commands** and **Create, edit, and delete commands** access rights to this unit.



The list of commands contains the following information: command name, phone number and channel used for sending the command, parameters, and the number of commands in the queue.

When pointing with the mouse cursor to the queue, you can see an icon for clearing it. At the end of each line, there are icons for configuring, copying, and deleting a command.

To add a new command, click **New** (+). Specify the properties described below and click **OK**. To create a command from the existing one, click on the icon .

Command properties

Commands have the following properties:

Command name

The name of the command (names cannot be repeated within the same unit).

Command type

The original name of the command in the system. The list shows only the commands supported by this device. See the list of standard commands supported by Wialon.

Channel

Select the channel (the type of connection) by which the command should be sent: **Auto**, **TCP**, **UDP**, **Virtual**, **SMS**. If the **Auto** type is set, the program automatically selects a channel which is available at the moment of execution (If more than one connection type is available, the priorities are the following: UDP, TCP, SMS, Virtual). The list of connection types also depends on the device type indicated on the General tab.

Note that if the channel type is TCP or UDP, the unit is required to be connected at the moment of the execution. If it is not connected, you can send a **Virtual** command. In this case, it is queued and sent over the GPRS channel when the connection is established.

> ⚠ The Virtual commands are not available for all the hardware types and can be added upon request.

To execute the GSM command, make sure to specify the device's phone number in the international format in the unit properties and activate the **SMS messages** service for the account.

Phone number

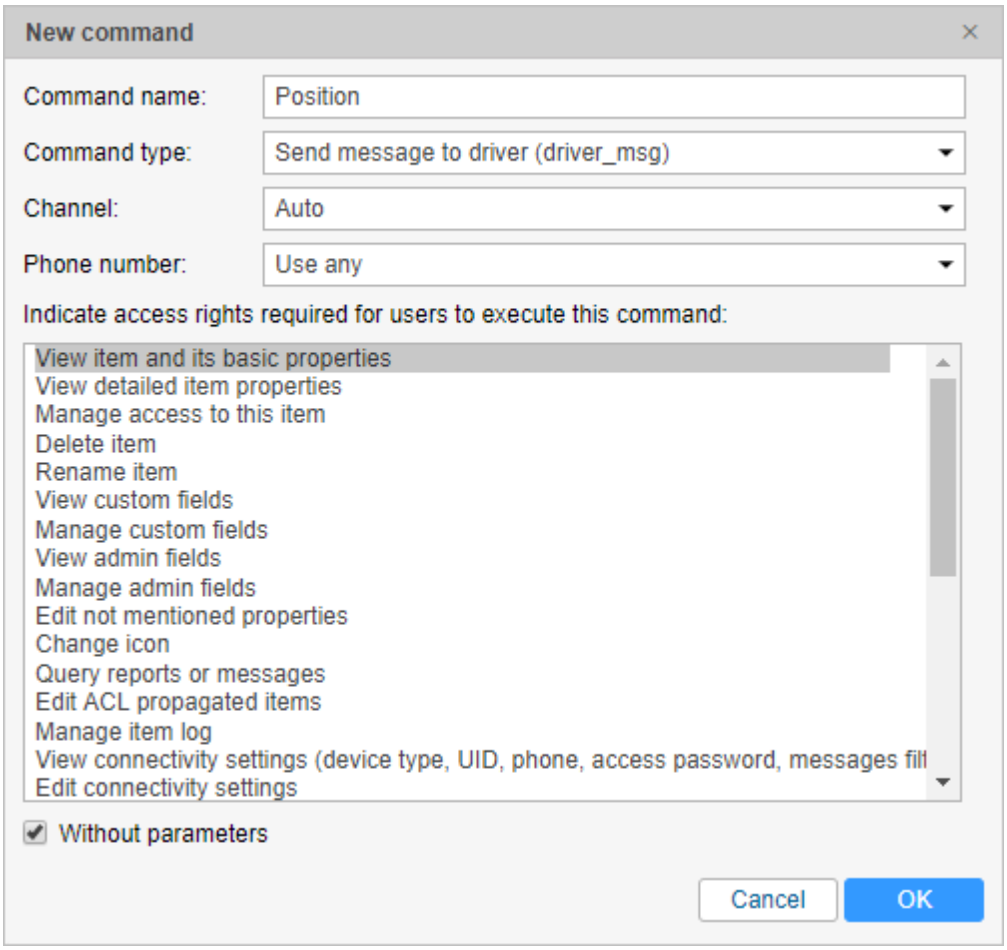
Phone number is required only for SMS commands. Some types of devices can support two SIM cards, so a unit can have two different phone numbers. Here you choose which of them should be used to send the command: first/second/any. The same as with the parameters and link type, the phone number selected here cannot be changed at the moment of sending the command.

Access rights

Indicate the access rights the user must have to execute this command. To select a combination of rights, press the **Ctrl** key. Regardless of the rights listed here, the **Execute commands** checkbox is required anyway.

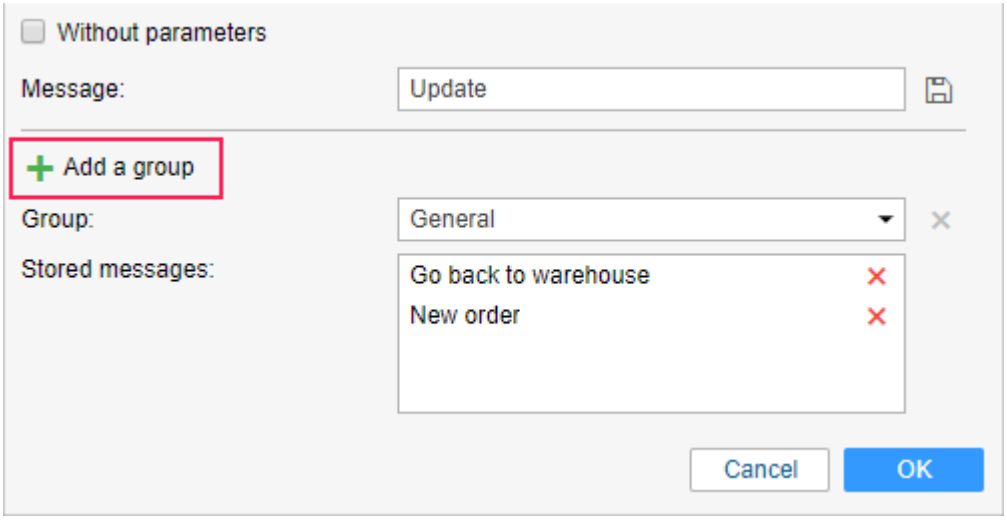
Parameters

Some commands require additional parameters. It can be, for instance, the input/output number, report interval, etc. These parameters can be set when configuring the command, and in this case, they are applied automatically each time when the command is being executed. Thus, several commands with different parameters and link types can be created on the basis of one command type. However, it is not obligatory to set parameters when creating a command, because you can indicate them during the execution manually. To do so, mark the checkbox **Without parameters**. It is impossible to change parameters (as well as connection type or phone number) if they are set.



When creating the **Send custom message** command, it is possible to create groups and add messages into them. It allows you to quickly find the required message while executing the command.

To create a new group, click **Add a group**.



Enter the name for the group in the appeared field. Press **Save** . The group is added to the drop-down list of the message groups.
To add a message to the group, enter the text of the message. Then, in the drop-down list of groups choose the one it should belong to.

Press **Save**. The message appears in the list below. Messages and groups can be removed by pressing the button .
To save the changes, click **OK**. If you want to dismiss the changes, press **Cancel**.

For details on sending the commands, see Commands.

Commands for flespi devices

A set of commands available for a flespi device depends on its type. When creating a command, you can configure its parameters. To do this, deactivate the **Without parameters** option and click on the **Configure** button. Next, enter the necessary parameters and click **Apply**.

If the **Without parameters** option is activated, you should indicate the parameters every time before sending the command.

For more information about how to send commands from Wialon to flespi devices, follow this link.

Eco Driving

Driving behavior influences the condition of a transported cargo, as well as the technical condition of a vehicle used. Wialon system possesses the functionality that allows receiving an assessment of the driving quality. The functionality helps to evaluate how a driver treats the entrusted vehicle, and as a result, improve the safety of driving, prolong the life of the vehicle fleet, reduce fuel costs, and ensure the safety of the cargo.

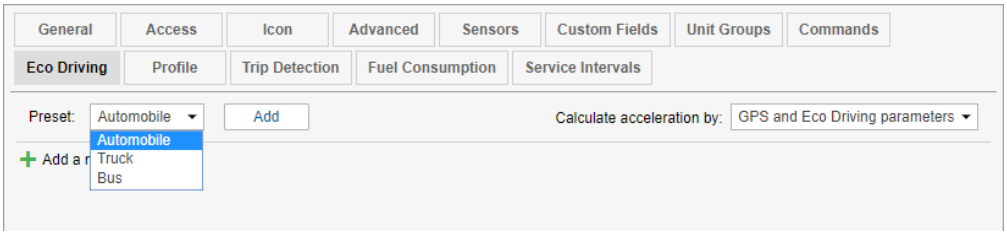
With these settings configured correctly, you can execute the special Eco Driving report as well as include columns with penalties and general rating into many other reports.

> Required access: **View detailed item properties** — to view the tab; **Edit trip detector and fuel consumption** — to edit the tab.

Settings

The **Eco driving** tab is a form where you should indicate the parameters used for penalty scoring. To add the eco-driving criteria, choose one of two options: use a preset criterion of one of the available templates or customize your own.

In the top left part of the **Eco driving** tab window, select one of the three available templates: **Automobile**, **Truck**, **Bus**.

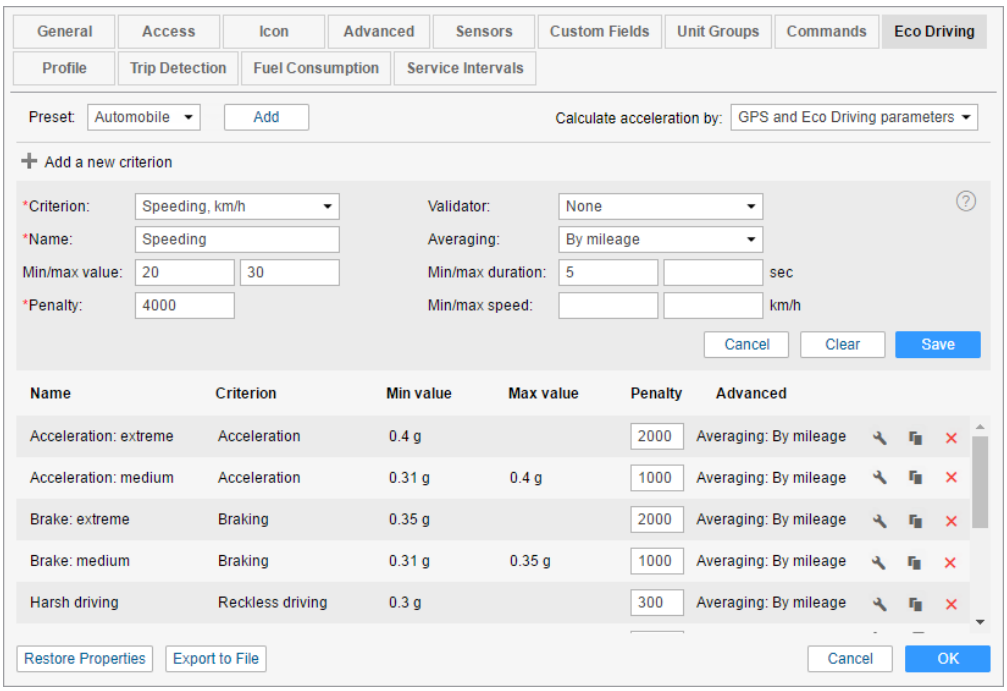


Click **Add**. Below appears a list of preset criteria for the selected transport type (if there are already criteria set for the unit, the criteria from the list is added to the existing ones). Select the required criterion and click the button in the shape of the wrench to change it. Press **Save**.

To add your own criteria, press **Add a new criterion** and fill in the required fields. Parameters are conditionally divided into 2 types: key parameters (obligatory fields, marked with an asterisk), and additional (optional) ones. Key parameters include criterion, name, sensor (if **Custom** criterion is chosen), and penalty value. In addition, here you can specify the minimum/maximum violation value. Additional parameters include validator, multiplier, averaging, minimum/maximum duration, and speed. After filling out the form, you can either save the selected criterion with its name and individual parameters or clear the form using the corresponding button.

To calculate acceleration (speedup, slowdown, turn, and reckless driving), the system uses different methods of data analysis: GPS, Eco Driving parameters or a combined one (GPS and Eco Driving parameters). By default, the data is analyzed on the basis of the combined method. When choosing GPS, the calculation of acceleration is made based on the positional data. When choosing Eco Driving parameters, the calculation is made in accordance with special parameters, which contain maximum acceleration value for the period between the messages. Only some devices can transfer these parameters. If GPS and Eco Driving parameters are chosen together, acceleration calculation is made based on both the positional data and special parameters.

Afterwards, the system chooses the biggest value. Note that the chosen method is applied to all the configured criteria.



Criteria

Criterion is a key parameter on the basis of which a driving quality can be determined. Wialon system supports the work with the following criteria: speeding, acceleration, braking, turning, reckless driving, and a custom one. The detailed information on every criterion is presented below.

Speeding

In the corresponding fields indicate a speeding value (minimum — maximum) in km/h which should be detected as a violation, and also a penalty value charged for this violation. Moreover, additionally, you can select a validator (multiplier), averaging, and also indicate min/max duration and min/max speed at which a violation is detected. Note that speedings are detected by the road speed limits (provided that the road limit is more than 30 km/h). However, in additional settings, it is possible to specify the min/max speed at which the violation is fixed.

Acceleration

This parameter is used to detect unreasonably hard vehicle speedups. In the corresponding fields, indicate an acceleration value (min — max) measured in g which should be detected as a violation, and also a penalty value charged for this violation. Moreover, additionally, you can select a validator (multiplier), averaging, and also indicate min/max duration and min/max speed at which a violation is detected. Such option as min/max speed can be applied, for example, in order to exclude low-speed accelerations from a report.

Braking

This parameter is used to detect unreasonably hard deceleration of the vehicle. In the corresponding fields indicate a braking value (min — max) measured in g which should be detected as a violation, and also a penalty value charged for it. Also, additionally, you can choose a validator (multiplier), averaging, and also indicate min/max duration and min/max speed at which a violation is detected. Such an option as the min/max speed can be applied, for example, in order to exclude low-speed braking from the report.

Turn

This parameter helps to evaluate the quality of passing the maneuver on the basis of the course during the turn, as well as the acceleration of the vehicle. In the corresponding fields indicate a value (min — max) measured in g which should be detected as a violation, and also a penalty value charged for this violation. Moreover, additionally, you can choose a validator (multiplier), averaging, and also indicate the min/max duration and min/max speed on which a violation is detected.

Reckless driving

This parameter is used to detect unreasonably hard accelerations prior to deceleration. In the corresponding fields, indicate a value (min — max) measured in g which should be detected as a violation, and also a penalty value charged for it. Also, additionally, you can choose a validator (multiplier), averaging, and also indicate the min/max duration and min/max speed at which a violation is detected.

According to the indicated settings the system detects so-called peaks of violations, afterwards sets the value for every peak, and also identifies intervals on which the peaks can be found. Furthermore, if you have several **Reckless driving** criteria with different violation settings, the system determines which one of them suits most. Afterwards, the filters indicated in the additional parameters section are triggered:

- min/max speed — on the basis of the received parameters, the system determines the maximum speed on the interval. Then the calculated speed is compared to the indicated speed range. If the calculated speed matches this filter, such a violation gets into the report. Otherwise, it is not included.
- min/max duration — if the duration of the criterion exceeds the **minimum** duration value indicated in the filter, such a violation gets into the report. If the duration of the criterion exceeds the **maximum** duration value, the penalty is multiplied by the number of maximum values detected on the violation interval.

As it has been mentioned before, a validator (multiplier) can be used for this criterion. The basic principles of using the validator (multiplier) are described below, in the **Additional parameters** section.

Custom

This parameter uses any sensor created in the system for a violation detection. Using a custom criterion, it is necessary to select a sensor itself (from the dropdown list), indicate the min/max violation value, and a penalty charged for it. Afterwards, you can choose a validator (multiplier), averaging, and indicate the min/max duration and min/max speed at which a violation is detected.

Key parameters

Criterion

Violation type (speeding, acceleration, braking, turn, reckless driving, custom).

Name

Any name for the criterion chosen above. It is considered to be an obligatory field because the system allows the same criterion to be chosen multiple times.

Penalty

A number of penalty points charged for the violation of such type.

Sensor

This parameter is available upon choosing the **Custom** criterion. Any sensor created for the unit can be used. Violations are registered using the values of the chosen sensor. Note that when working with a digital sensor you can indicate additional settings:

Violations from device — when this checkbox is activated, the duration of the violation coincides with the interval of the sensor operation (from on to off).

Min/max value

It is a range of violation values. If the received parameter value falls within the range, a violation is recorded (minimum value is included into the range, and the maximum is not).

For all the criteria except the custom one, the integration of intervals can be applied. In other words, if a repeated violation occurs during 10 seconds after the end of the primary one, then both these violations will be connected into one.

⚠ When evaluating the driving behavior, the speeding is determined by road limits.

Additional parameters

Validator

One of the sensors created for the unit, which is used to confirm or deny the incoming values by the selected criterion. The violation gets into the report upon receiving a positive value from the validator. Otherwise, the violation is not included into it.

Moreover, if you check the **Multiplier** box, the sensor chosen as a validator is used as a coefficient, multiplying the penalty score.

Here it is an example. If the main objective of the company is to provide the safety of the cargo during its transportation, the severity of violation evaluation should become higher. It is necessary to create a weight sensor and use it as a validator-multiplier. 0 value is received when the vehicle is empty, any positive value received for the loaded one. So, in case of speeding by the loaded vehicle, the penalty value is multiplied by the value of the validator.

Min/max duration, sec

The range of the duration of the criterion (from — to) at which a violation is recorded. If the duration of the criterion exceeds the **minimum** value indicated in the duration range, such a violation gets into the report. If the duration of the criterion exceeds the **maximum** value indicated in the duration range, the penalty is multiplied by the number of maximum values detected on the violation interval.

Min/max speed, km/h

The speed range (from — to) at which a violation is recorded. The system determines the maximum speed at a violation interval. Afterwards, this speed is compared with the specified range values. If the determined speed matches the indicated speed range, such a violation gets into a report. Otherwise, it is not included.

Averaging

There are 3 options for working with averaging:

Averaging is disabled. The penalty points received for the trip are summarized. Besides, they are accumulated in a linear progression. So, the bigger the trip interval is, the more violations can be registered.
However, this method does not match everyone. Therefore, it is possible to connect penalties with time or mileage intervals, and receive the average value of penalty points for the interval.

Averaging by mileage. Using the averaging by mileage, the total amount of penalty points is divided by the mileage of the trip. Therefore, as a result, we receive the average amount of penalty points for every kilometer of the trip.

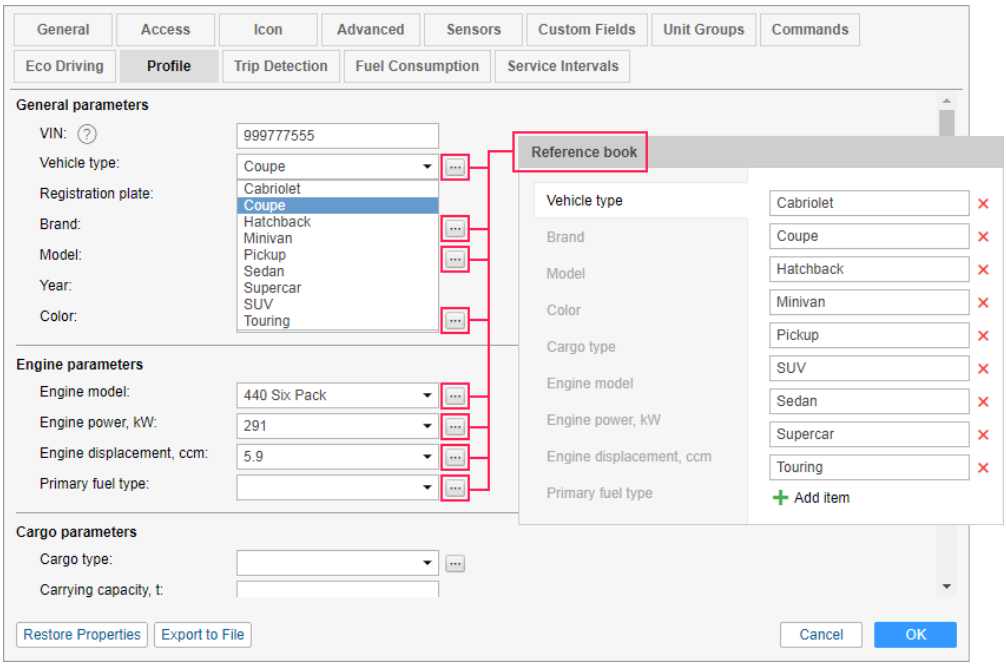
Averaging by time. Using the averaging by time, the total amount of penalty points for the trip is divided by the duration of the trip. Therefore, as a result, we receive the average amount of penalty points for every minute of the trip.

If a trip is less than 1 minute, then averaging by mileage or by time cannot be applied.

Profile

On the **Profile** tab of the unit properties in the corresponding fields, you can enter registration and technical information concerning a vehicle. Depending on the checkboxes indicated in the user settings, profile information can be displayed either in the work list or in the unit tooltip. Besides, the characteristics of the unit can be displayed in the corresponding report. Moreover, the characteristics, as well as other unit properties can be imported or exported.

Required access: **View custom fields** — to view this tab, **Manage custom fields** — to edit this tab.



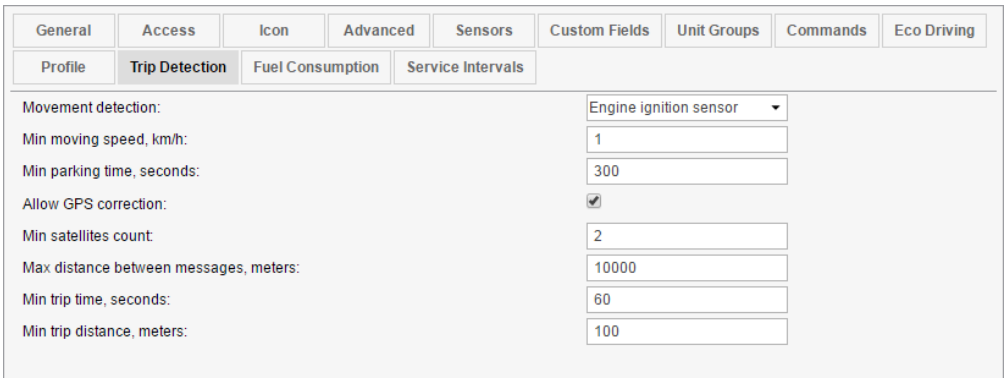
In addition to the standard input fields, the combo boxes (fields which allow to enter the value, then select the value from the drop-down list, and filter the drop-down list based on the entered value) are also displayed on the **Profile** tab. The dropdown list consists of values saved in the reference book. The reference book may contain up to 100 values for each combo box. The reference book can be filled in manually (open using the button to the right of a combo box and add new values) or automatically (enter values in combo boxes and save the entered characteristics).

Depending on unit settings, different measurement systems can be used in the profile characteristics.

Trip Detection

The trip detector is configured in the unit properties and is used to detect movement intervals (trips) and idles (stops, parkings). Depending on the equipment and settings on this tab, the reports, depending on the intervals of movement and idles, can look quite different. Therefore, it is important to set the correct settings here.

Required access: **View detailed properties** — to view this tab; **Edit trip detector and fuel consumption** — to edit this tab.



Movement detection

There are five main methods to detect movement.

GPS speed. Can be applied to any device type and configuration. The parameters of this method are described below.

GPS coordinates. Can be used for devices that send location data only since speed is not taken into account when calculating motion. The movement is detected if coordinates in two successive messages are different. This type of movement detection is always used with GPS correction (see below).

Engine ignition sensor. Available for units that have ignition sensor. The movement is detected upon meeting two conditions: the sensor should be switched on and the message is received at a speed that is greater than or equal to the minimum speed. The end of the movement is detected when the sensor is switched off or a speed value is less than the indicated minimum moving speed. Also, movement is considered to be terminated when the timeout is exceeded.

Mileage sensor. Can be used for units which have a mileage sensor. The sensor transmits absolute mileage. The movement is detected when the values of the distance sensor increase and the message is received at a speed greater than or equal to the minimum speed. Moreover, if the speed parameter is absent or invalid, the state of motion is determined only by the growth of the values of the mileage sensor.

Relative odometer. Shows what distance the unit has travelled since the previous message. The movement is detected upon receiving a message with more than 0 value of a relative odometer and speed value higher than the minimum moving speed. Moreover, the state of movement can be detected using relative odometer values only, if the speed parameter is missed or invalid.

After the movement detection method is chosen, use the parameters described below. These parameters allow detecting the states of movement, such as trips, parkings, and stops.

Detection of movement states

Min moving speed

Specify what speed should be considered as the beginning of the motion. This is required to exclude data outliers. The equipment can determine coordinates with some inaccuracy, therefore assign a low speed to the unit that is not actually moving. Set this parameter to exclude such cases from the trips. When determining movement by a sensor (for example, ignition), this parameter is used to detect stops inside a trip.

Min parking time

Specify how long (in seconds) the unit should be motionless to register this as a parking. This option allows you to include stops (in traffic jams, at lights or intersections) in a trip (instead of breaking the trip). However, if the time interval between the two closest messages is longer than the minimum parking time, the trip is broken into two parts. When detecting trips by the sensor (for example, ignition), this parameter is applied only to intervals with the sensor off or at a speed less than a minimum moving speed. If **Allow GPS correction** is on, the value of the minimum parking time should be no less than 10 seconds. Note that to detect a parking duration, it is necessary to receive at least two messages with a speed value below the min moving speed indicated.

Allow GPS correction

This option is applied automatically for the first two types of motion detection. In case you use one of the sensors (ignition, mileage, or odometer), to receive more precise data in reports, you can use GPS correction in addition. To activate the GPS correction of trip/stay detection, check the **Allow GPS correction** box and configure the parameters described below.

Min satellites count

Specify the number of available satellites at which you should consider the data to be valid. The recommended number is three and more, but for some types of equipment two is enough.

Max distance between messages

This setting is applied in the following situation: if from the previous message to the current one a unit has moved a distance greater than the specified one, the previous interval is terminated and a new one begins. The value of this field should be at least 50 meters.

Min trip time

This parameter is designed to exclude cases of the data outliers. For example, the unit in a parking lot moved from one place to another, and the movement of 40 seconds was detected. To exclude such cases from trips, set the minimum trip time (in seconds).

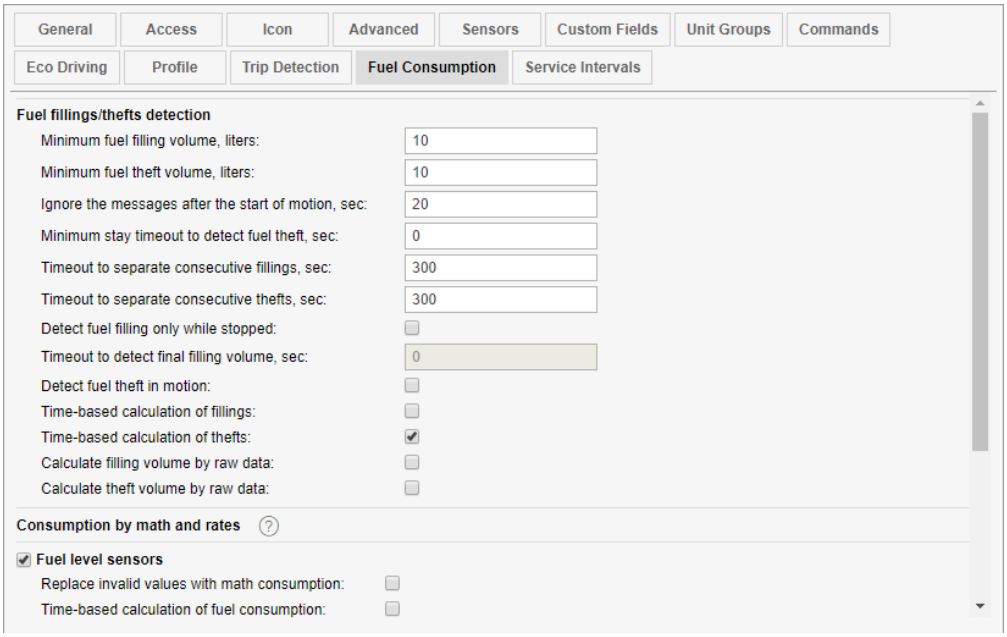
Min trip distance

This is a similar parameter. But here you indicate the minimum trip distance. For example, the car is parked, and the device sends coordinates according to which the car has moved slightly. It can happen due to the permissible equipment error. This situation can be counted for movement and to exclude it, indicate how far the unit should move to consider it a trip.

Fuel Consumption

Fuel fillings and thefts can be detected only if a unit has fuel level sensors and has the Fuel level sensors option activated. Fuel consumption is calculated if there are fuel consumption sensors. The determination accuracy depends on the accuracy of the installed sensors as well as on their correct configuration. The parameters adjusted on this tab are used during the calculations. For your convenience, they are divided into several sections.

ⓘ Required access: **View detailed properties** — to view the tab; **Edit trip detector and fuel consumption** — to edit the tab.



Fuel fillings/thefts detection

Minimum fuel filling volume

The minimum increase of the fuel level that should be considered a filling.

Minimum fuel theft volume

The minimum decrease of the fuel level that should be considered a theft.

Ignore the messages after the start of motion

This feature allows skipping the indicated number of seconds at the beginning of the movement when due to different factors the received fuel level data may not be very accurate. The beginning of the movement is registered when the minimum moving speed set in the **Trip detection** tab is achieved.

Minimum stay timeout to detect fuel theft

The minimum duration of the interval with no movement, followed by a decrease in the fuel level in the tank for more than the minimum fuel theft volume indicated above.

Timeout to separate consecutive fillings

The system can sometimes detect more than one fuel filling during a short time interval. In such cases, they can be combined in one if the time between them (timeout) does not exceed the time specified in the setting.

Timeout to separate consecutive thefts

This feature is similar to the previous one. Thefts are not summed up if the timeout is exceeded and if the fuel level has increased between them.

Detect fuel filling only while stopped

When this option is activated, fuel fillings are detected only at stops, that is, when the speed of the unit is lower than the minimal speed indicated in the trip detection. This allows reducing the number of false fillings which may be caused, for example, by fuel level fluctuations during the movement.

The initial fuel level is taken from the first message without movement or from the last message with movement.

If you type a certain value in the **Timeout to detect final filling volume** field, the system also detects fillings during this period after the end of the stop.

> If the time period between stops is less than the value specified in the **Timeout to detect final filling volume** field, these stops and the movement intervals between them are considered as **one** stop. The start time of the first stop is considered to be the start time of the filling, whereas the time after the end of the last stop and the expiration of the timeout is considered to be the end time of the filling.

Timeout to detect final filling volume

in the process of filling there can be interruptions. This option appears if the previous one is selected and allows to set the duration of such interruptions. In this case to determine the fuel level after refuelling, not the last message that corresponds to a filling is used, but the one that follows the indicated timeout.

Detect fuel thefts in motion

Traditionally, fuel thefts are searched during the stops. This feature allows searching for them during the motion, too. For example, it may be useful for ships. However, in many cases, it may cause the detection of false fuel thefts due to probable fuel level differences while, for instance, moving on rough terrain.

Time-based calculation of fillings

It is recommended to use this calculation method for the units with high fuel consumption during the idling (generator, tower crane, etc.). When it is activated, the whole time period is taken into account regardless of trips/stops.

For a time-based fuel calculation, the **Time-based calculation of fillings**, **Time-based calculation of thefts** and **Time-based calculation of fuel consumption** options should be activated simultaneously.

Time-based calculation of thefts

The feature is similar to the previous one, only applicable to fuel thefts.

Calculate fuel filling volume by raw data

With this feature activated, the initial and the final fuel levels on the interval corresponding to the fuel filling are replaced with the values from the messages before applying the filtration. This occurs only when the value from raw data exceeds the value obtained as a result of filtration.

Calculate theft volume by raw data

With this feature activated, the initial and the final fuel levels on the interval corresponding to the fuel theft are replaced with the values from the messages before applying the filtration. This occurs only when the value from raw data exceeds the value obtained as a result of filtration.

Fuel fillings and thefts can be controlled by means of the tabular Fuel fillings and Fuel thefts reports, as well as the Send fuel information by email or SMS job or the notification about fuel fillings/thefts.

Fuel level sensors

When this type of sensors is used, the fuel consumption is determined on the basis of its level in the tank according to the following formula: [fuel level value at the beginning of the interval] – [value at the end of the interval] + [fillings] – [thefts] (if the **Exclude thefts from fuel consumption** option is activated in the report settings).

The intervals are different for different report tables. You can learn more about the intervals from the description of the tables.

Replace invalid values with math consumption

If the feature is activated, in case of erroneous values on an interval they are replaced by the values calculated mathematically. The mathematical calculation uses the data indicated in the properties of ignition, relative and absolute engine hours sensors (option **Consumption, l/h**) and the value of the engine efficiency sensor.

Time-based calculation of fuel consumption

If the option is enabled, while calculating the fuel, all the time is taken into consideration, it does not matter whether the unit has been moving or not. If it is disabled, the fuel level during the intervals with no motion is not considered during the calculations.

Filter fuel level sensors values

This feature allows applying median filtering to the received values of the sensor to exclude data emissions (sudden increases or decreases). The minimum filtration level is 0 (zero) — with a smoothing of 3 messages. Then all the filtration levels from 1 to 255 are multiplied by 5 to determine the number of messages which are used for smoothing. Therefore, the higher the filtration level is, the more the fuel chart is approximate to a straight line, that is why it is not recommended using the filtration level higher than 8 (the optimum is from 0 to 3).

Impulse fuel consumption sensors

Two types of impulse fuel consumption sensors are used in Wialon: simple accumulative and with overflow (on reaching a definite value, the impulses counter resets and the calculation restarts from zero). It is not practical to use the first type, while the sensors with overflow are widely spread.

This calculation method takes into consideration the values of the sensors from the previous and the current messages: the previous value is subtracted from the current one and, if needed, the calculation table is applied to the received value. The sum of the values received on the interval corresponds to the amount of the fuel consumed.

Every sensor of this type must have a calculation table from impulses to litres (gallons).

Two options are available in this section:

Max impulses

If there is a limit after which the impulse counter is zeroed (overflow), it can be indicated in this field. However, with this limit adjusted in case of an emergency reset, the calculations will be meaningless.

Skip first zero value

If this option is activated and the value of the **Max impulses** field is **0**, the difference between the current and previous sensor values is taken into account when calculating the fuel consumption. If the value of the **Max impulses** field is non-zero, the **Skip first zero value** option is not taken into account when calculating the fuel consumption.

Absolute fuel consumption sensors

The sensors of this type show the fuel consumption during all the period of vehicle operation. AbsFCS values increase all the time, so the overflow of such a sensor is not expected.

The fuel consumption is calculated in the following way: the sensor's value at the beginning of the interval is subtracted from the sensor's value at the end of the interval and, if needed, the calculation table is applied (to every sensor of this type individually).

Instant fuel consumption sensors

If this type of sensors is used, the hardware sends messages that contain the amount of the fuel consumed from the previous message till the current one. Accordingly, to determine the fuel consumption on an interval, the values of the InsFCS are summed.

For instance, the hardware has sent three messages with the following values: x1 = 0,01 l, x2 = 0,023 l, x3 = 0,048 l. The fuel consumption during this interval is: x1 + x2 + x3 = 0,01 + 0,023 + 0,048 = 0,081 (l).

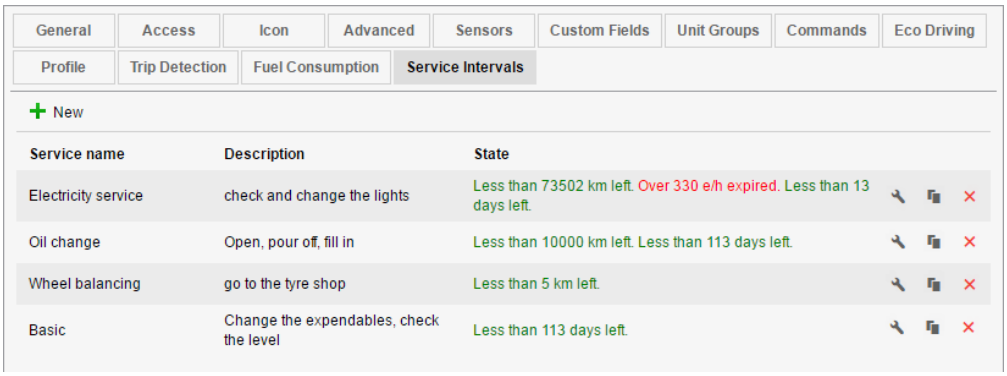
Service Intervals

To manage your fleet maintenance efficiently, we recommend you to use Fleetrun. It allows you to control the maintenance of units and trailers as well as the validity period of the drivers' permits and documents.

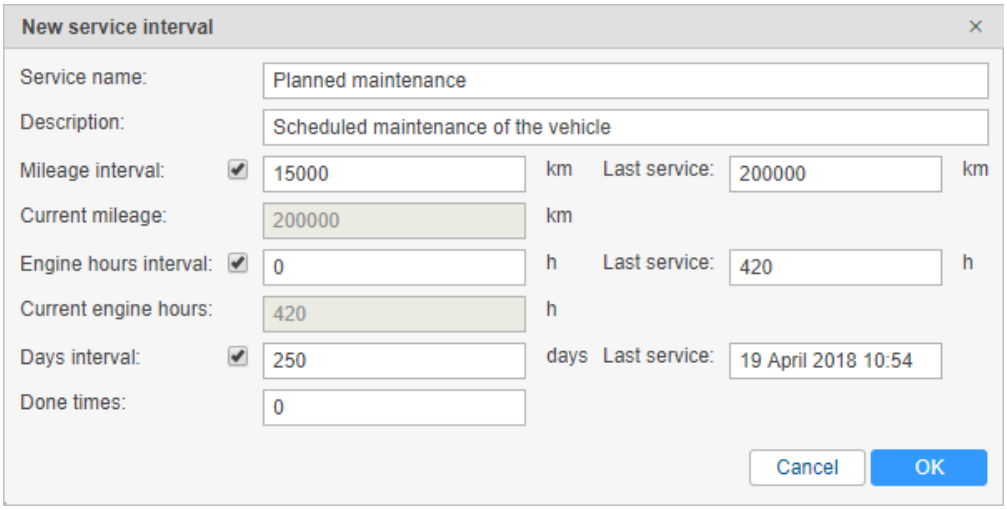
> Required access: **View service intervals** — to view this tab and its contents; **Create, edit, and delete service intervals** — to create new intervals, and to edit and delete existing ones.

On the **Service intervals** tab of the unit properties, you can define maintenance intervals to perform all the necessary maintenance activities in time.

In the list you see the name of each interval, its description (if available) and the state — how many days, engine hours or mileage have left or how long they are overdue. Depending on the state (time left or expired), the lines are either red or green.



To add a new service interval, click **New** (+). Then enter the required parameters: name, description, interval and the time of the last execution.



There are three ways to indicate the interval:

- **Mileage interval** means that the service should be performed every indicated number of kilometres (miles) travelled.
- **Engine hours interval** means that the service should be performed every indicated number of engine hours.
- **Days interval** means that the service should be performed every indicated number of days.

You can simultaneously select several interval types at once, and each of them is tracked independently. For example, the term by days can already be expired, and at the same time, the term by mileage — not.

When selecting an interval, indicate which counter value (or day) was when this kind of service was performed the previous time. Enter this value into the **Last service** field. For your convenience, the current values of the counters are indicated below.

ⓘ Check your counters properties on the General tab, and do not forget to mark the **Auto** checkbox.

Done times: here you indicate how many times this kind of service has already been done. This number can be entered into the field manually or changed automatically when registering a service of this kind. Besides, after registration, the time of the Last Service changes, and the count of days/ mileage/engine hours are zeroed and started again.

At the end press **OK**. The newly created service interval appears in the list. To manage the intervals, use the buttons located at the end of the line opposite to the interval name:

- **Copy** opens a dialog with the parameters of the selected interval. You can edit these parameters and save the interval under another name.
- **Properties** opens a dialog to view and/or edit the interval.
- **Delete** deletes the selected interval.

Service intervals in use

Tracking

Service intervals with their terms can be indicated in the unit tooltip and in the extended unit information. See User settings.

Events registration

Maintenance works can be registered in unit history and used in the report later. When registering maintenance, it can be bound to a certain service interval (existing in unit properties). After registration, the count of days/mileage/engine hours is restarted, the number of executions is added, and the last service term changes. The changes can be estimated in the unit tooltip, in extended unit information, as well as in the unit properties dialog.

Notifications

You can create a notification with the Maintenance control type. With the help of this tool, you can receive automatic notifications by email, SMS, in the online pop-up window or by other means about service terms which are approaching or expired.

Reports

Three tables related to service intervals can be generated for units or unit groups: **Maintenance**, **Upcoming maintenance**, and **Utilization cost**. The report on maintenance represents the list of registered maintenance works. The report on upcoming maintenance contains a list of service works set for a unit, as well as the status of their execution. The report on utilization cost includes maintenance works as well as fillings.

Some information about maintenance can be shown in statistics: total duration of maintenance work, the total cost of maintenance work, the number of services performed, the number of maintenance and refueling costs, and the total cost of operation.

Transferring Unit Properties

Almost any unit properties can be imported and exported.

General properties. Unit name, device type, phone number(s), unique ID(s), device access password (from the **General** tab).

Icon. Icon of the unit and the state of the **Rotate icon** checkbox.

> To transfer an individual icon, you must have the **View item and its basic properties** right towards a unit the icon of which you are going to transfer.

Device configuration. Device configuration parameters (from the **General** tab).

Counters. The current values of counters and their calculation parameters (from the **General** tab).

Report properties. Parameters used in reports, as well as speeding and driver activity parameters from the **Advanced** tab.

Advanced properties. Color parameters and messages filtration parameters from the **Advanced** tab.

Sensors. Contents of the **Sensors** tab.

Custom fields. Contents of the **Custom fields** tab.

Admin fields. Available admin fields from the **Custom fields** tab.

Commands. Contents of the **Commands** tab.

Eco Driving. Contents of the **Eco driving** tab.

Profile. Contents of the **Profile** tab.

Trip detector. Contents of the **Trip detector** tab.

Fuel consumption. Contents of the **Fuel consumption** tab.

Service intervals. Contents of the **Service intervals** tab.

An exception is user access and group membership (if you want to transfer such data, it's better to use the copy function), as well as information about the creator and account.

Units with the same unique ID within one device type, as well as units or drivers with the same phone numbers, cannot exist in the system. If you attempt to import such fields, their values are emptied, and you can edit them later.

Unit Groups

The unit group is a series of monitoring units that are combined together on the basis of a certain feature or without it. Unit groups are widely used in the Wialon system and are useful to both managers and end users. Therefore, it is possible to work with unit groups both in CMS Manager and in the main interface.

Unit groups in management

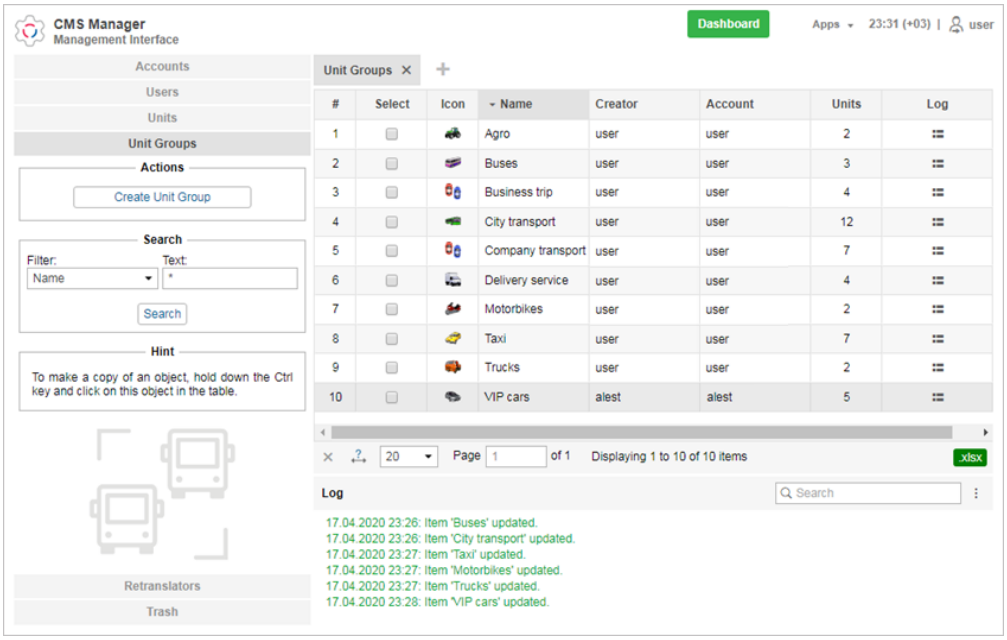
Unit groups help in the management of the system. They facilitate the assignment of rights to units, allowing you to give the user access to a whole group at once.

Unit groups are widely used for monitoring purposes.

> In the management system, all the available units, including the deactivated ones, are displayed in groups.

Working with unit groups

To work with groups of units, open the **Unit Groups** tab in the navigation panel of CMS Manager. Here you can create, view, edit, copy and delete unit groups.



There is a button to create a new unit group, as well as a search filter. The table of results displays the name of the group, icon assigned, creator, account, number of units and icon to open the log. Standard operations with objects (create, view, edit, copy, delete) are described here.

Unit Group Properties

When creating, copying, editing or just viewing unit group properties, you see a dialog with several tabs where group configuration is adjusted. The number of tabs can vary depending on your access rights (max — 4).

General

Name

The name of a unit group must be between 4 and 50 characters which must not be forbidden.

Creator

The creator is the user on behalf of whom the group was created (displayed if the current user has at least minimal access to it).

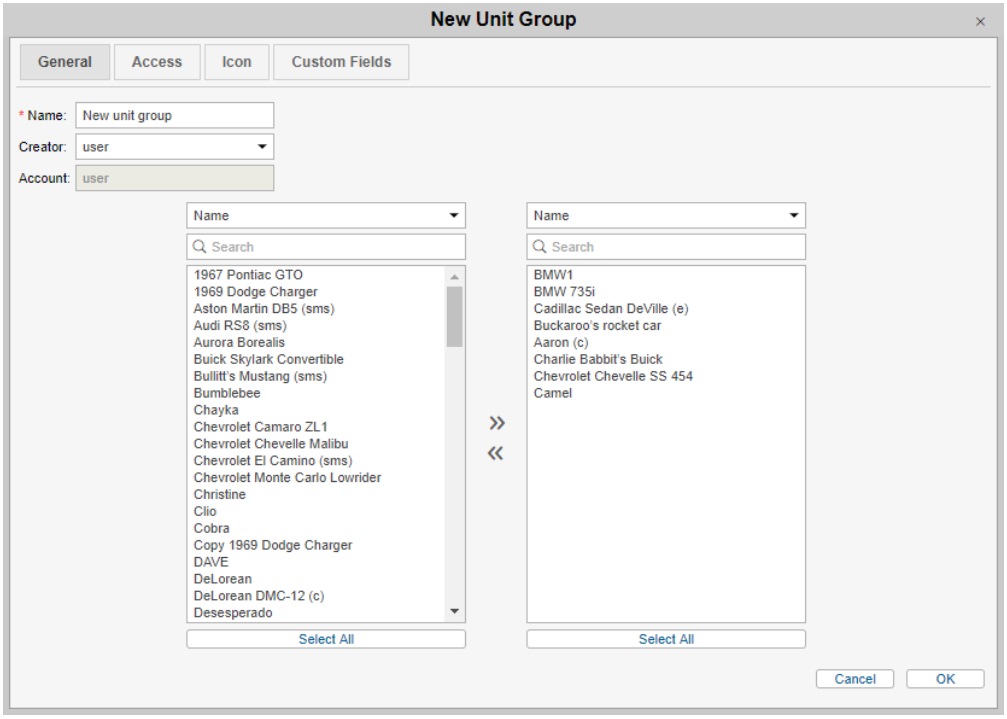
Account

Here you can see which account the unit group belongs to (if you have any access to this account). This property, as well as the creator, cannot be changed afterwards.

Units

Add units to the group. On the left, there is a list of all available units. For the convenience of search, it is possible to use the dynamic filter. This filter works not only by name but also by phone number, unique ID, device type, fields, etc. On the right, there is a list of units in the group. To add a unit to the group, double-click on it or click **Add**. To remove a unit from the group, press **Remove** or double-click on the unit in the right column.

> If you are editing an existing group, you are required to have **Edit ACL propagated items** access to this group to add/remove units. Otherwise, all units in both sections will be gray and you will not be able to move them.



In addition to the manual way to create groups, there is an automatic method that is available in the Wialon user interface. See Notification Actions for details.

Access

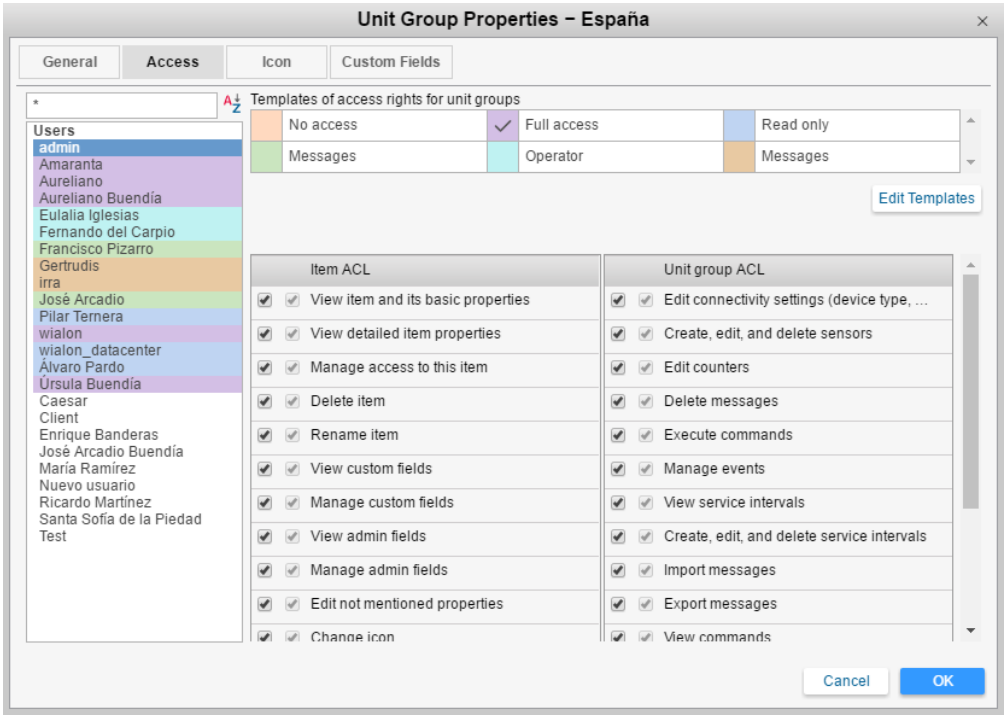
> Required access: **Manage access to this item** — to group; **Manage user's access rights** — to users.

On this tab, you can define the access rights that different users will have to this group.

On the left, there is a list of users whose access rights can be controlled. Colored background indicates the users who already have some access.

Select a user on the left and check access boxes for this user on the right. Access rights are divided into two sections — standard rights (Item ACL) and special rights (Unit group ACL).

Here you can read more about access granting.



Icon

> Required access: **Change icon** — to view this tab and change the icon of the group.

Image for the group can be selected from the set of standard icons (the **Icon library** button) or loaded from the disk (the **Browse** button).

The icon is used mainly to display the group in the Unit Groups list. However, it may also be used to display units that belong to this group. If a unit has a default icon, and a unit group which it belongs to has a non-default icon, then unit acquires the icon of this unit group. Here you can read more about icons.

Custom fields

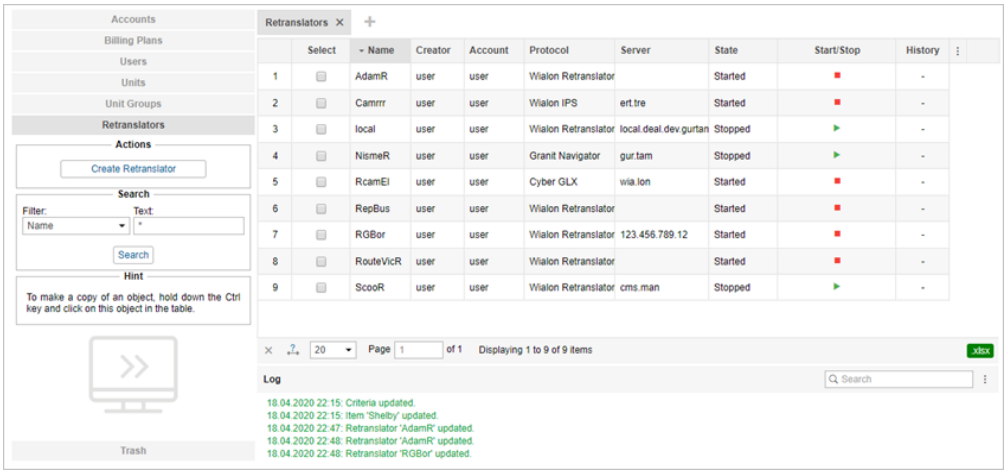
> Required access: **View custom fields** — to view general custom fields; **Manage custom fields** — to create, edit, and delete general custom fields; **View admin fields** — to view administrative custom fields; **Manage admin fields** — to create, edit, and delete administrative fields.

Here you can enter any additional information about the unit group. Information is entered in the form of fields: <field_name> — <field_value>. Enter a field name and its value and press the **Add** button. To delete a field, click **Remove**. Administrative fields (seen only by users with special access rights) are marked in the first column.

Retranslators

Messages from units can be retransmitted in real-time from your server to other servers or systems. It is possible to retransmit data to several servers simultaneously and at different protocols. The ID of a retranslated unit can be different from its ID in Wialon.

Retranslation is possible only in CMS Manager and it is done in the Retranslators panel. There you can create any number of retranslators that will transmit messages of selected units to other systems. At any moment, any retranslator can be stopped or resumed again.



To create a retranslator, press the **Create Retranslator** button. In the dialog enter a name for the retranslator (at least 4 characters) and choose a retranslation protocol.

The number of available retranslation protocols depends on your license.

The full list of protocols is the following:

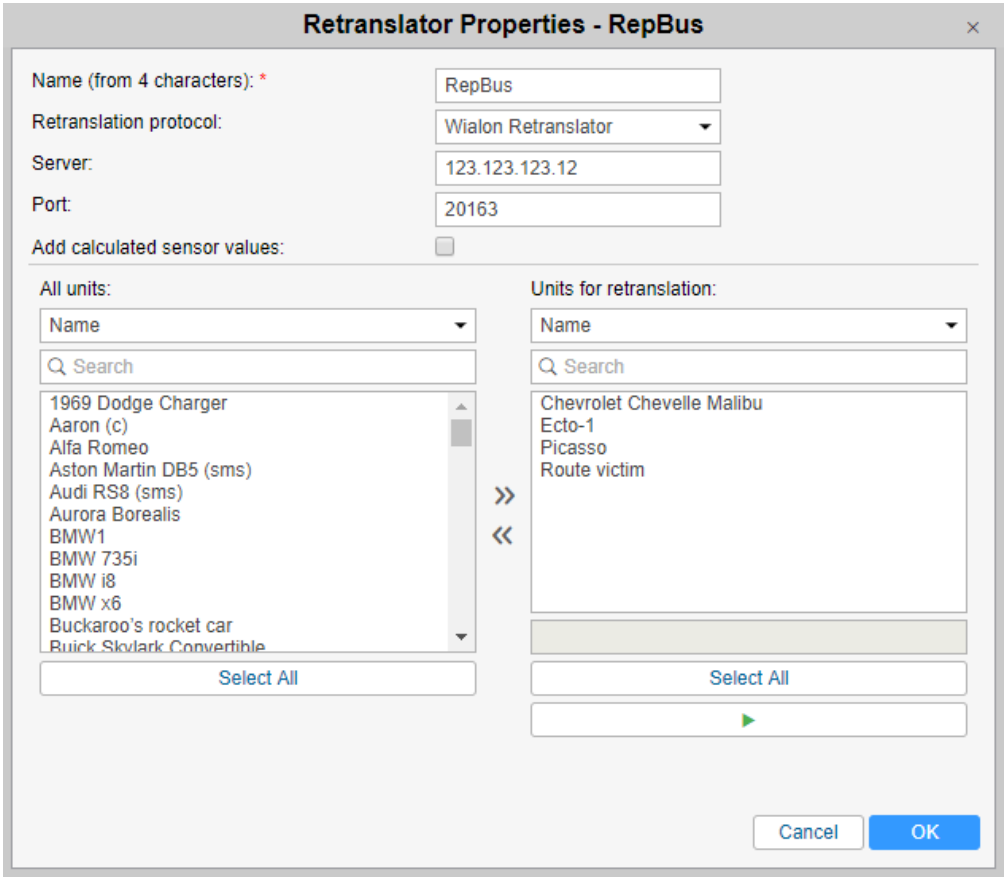
- Wialon Retranslator,
- Nis (M2M),
- Granit Navigator,
- SCOUT,
- Cyber GLX,
- Wialon IPS (1.1),
- VT 300,
- EGTS,
- SOAP (for the russian company ASU ODS),
- TransNavi,
- NVG,
- RTTI.

Then indicate the retranslation server, port, and in some cases authorization (**auth**). If the port is not indicated, it is automatically set by default. Authorization for Nis protocol is login and password separated by a colon (login:password). As for the EGTS protocol, you can disable authorization if it is irrelevant, indicate the time interval (in seconds) at the end of which the authorization will be repeated, and set the dispatcher ID. Also, you can indicate the carrier ID for the RTTI protocol. Moreover, note that such retranslation protocols as Wialon Retranslator and Wialon IPS support the option of calculated sensor values retransmission. Check the corresponding box (**Add calculated sensor values**) to enable the option. The EGTS protocol also allows retransmitting fuel data (**Retransmit fuel data** option).

Below is a list of available units. For the convenience of search, you can use the dynamic filter. Here units can be filtered not only by name but also by phone number, unique ID, device type, creator, profile fields, etc. After the necessary units have been found, move them from the left list (available units) to the right one (units for retranslation) by double-clicking on a unit or using the arrow-shaped buttons. Note that the dynamic filter can be applied to the list of units for retranslation as well (filtering by name and redefined ID). To delete units, move them from the right list to the left one using the **Remove** button (arrows pointing left). Besides, you can input a new ID for units to be retranslated. For retransmission by Granit Navigator protocol, the unit ID should be a number in the range from 0 to 65535.

> ⚠ The data from the units with empty IDs cannot be transmitted. For that reason, such units are not saved in the list of units for retranslation and when you reopen the dialog, you see them in the left part again.

For units with two IDs, the first one is shown.



When a new retranslator is created, it is stopped. It can be started from the list of retranslators or in the dialog of its properties.

In the results panel, you can see the retranslator's name, creator, retranslation protocol, server address, state, and icons to start/stop retranslator, open the log and delete retranslator. Click on a retranslator to view/change its properties.

When importing messages into a unit, only the latest one is retransmitted, provided it is not in the unit history yet. To retransmit all imported messages, use the **Retransmit past period data** option.

Past period retranslators

This option makes it possible to retransmit messages from units for the past period of time. In other words, you can specify a particular period of time in the past for which you would like to retransmit the data of the selected units.

> Data retransmission for the past period does not start immediately (it can take up to 10 minutes before beginning).

The required actions:

- In the retranslator dialog check the box **Retransmit past period data**;
- Indicate the period of retransmission (from — to);
- Press the start button to the right of the retransmitting period field.

> This option is active only if the prime retranslator has already been started.

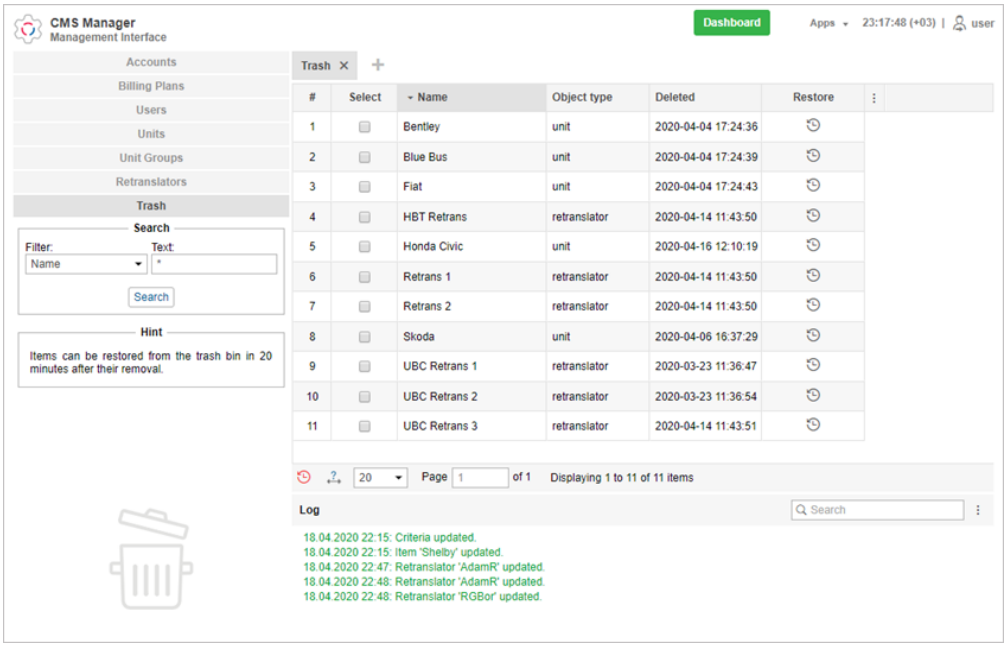
The progress of the data retransmission is shown in percentage in the **History** column of the results panel. The indicated value shows the percentage of the units for which data retransmission has already been finished.

Trash

Deleted system objects get into **Trash** and are stored there for 30 days. During this period, they still can be restored in the system.

Such objects as resources, units, unit groups, users, routes, and retranslators (that is, macro objects) can be found there.

> This panel is available only to the user-creator of the top account.



Use search to quickly find a necessary object. The table of results includes the following columns: the name of the object, its type, the time of removal, and the **Restore** buttons.

Restoring objects

For restoring, click on the **Restore** button next to the object. To restore several objects at once, select them and click on the **Restore selected items** button at the bottom of the table.

> You cannot restore objects earlier than 20 minutes after their removal. If 20 minutes have not passed, the objects are displayed in the table with the **Restore** button disabled.

The restored objects disappear from the list automatically and appear in the root account. You can transfer them to the accounts that are lower in the hierarchy, if needed.

The user-creator (the creator of the object at the moment it was deleted) and the users who are higher in the hierarchy get full access rights to the restored object.

The peculiarities of restoring **units**:

- a unit will no longer belong to a group after restoring, if the group has been changed in any way;
- the messages are restored together with the unit.

Import and Export

The Import/Export tool is designed to easily transfer and copy different objects and their properties. The Import/Export tool is available in both Wialon interfaces — manager's and user's. To open the tool, click on the corresponding item in the User Menu of CMS Manager or the main interface.

Import/Export subject

You can import/export:

- unit properties (sensors, commands, fuel consumption settings, etc.),
- contents of a resource (geofences, drivers, notifications, etc.),
- user settings (Monitoring panel settings, contents of user's tooltip, user's custom fields, etc.).

Moreover, you can choose particular items to be imported/exported, for example, you can indicate not all but certain service intervals or sensors (for units), certain geofences and jobs (for resources), etc.

Import/Export destination

Import and export of data can be done with the help of the files or directly from one object to another.

Exporting **to a file** allows you to store information on a computer and use it when necessary. For instance, you can create templates of unit properties, which makes it considerably easier to create and configure new units. Two file formats are supported:

- **WLP** is a native format for Wialon. It can be used to store and transfer different kinds of data such as unit properties, resource contents, and user settings.
- **KML** (if compressed — **KMZ**) is a widely known file format used to display geographic data in Google Earth and Google Maps. This format can be used in Wialon to exchange geofences between resources as well as import and export them from/to external sources.

Exporting **to an object** allows you to transfer data (properties or contents) straight from one object to another one of the same type or to several objects at once. For example, you can copy geofences from one resource to another.

Required access

Access rights are important for import/export. Keep in mind two simple rules.

You can export from an object only those properties or contents that are available to you (you should have at least view access to these properties in the initial object).

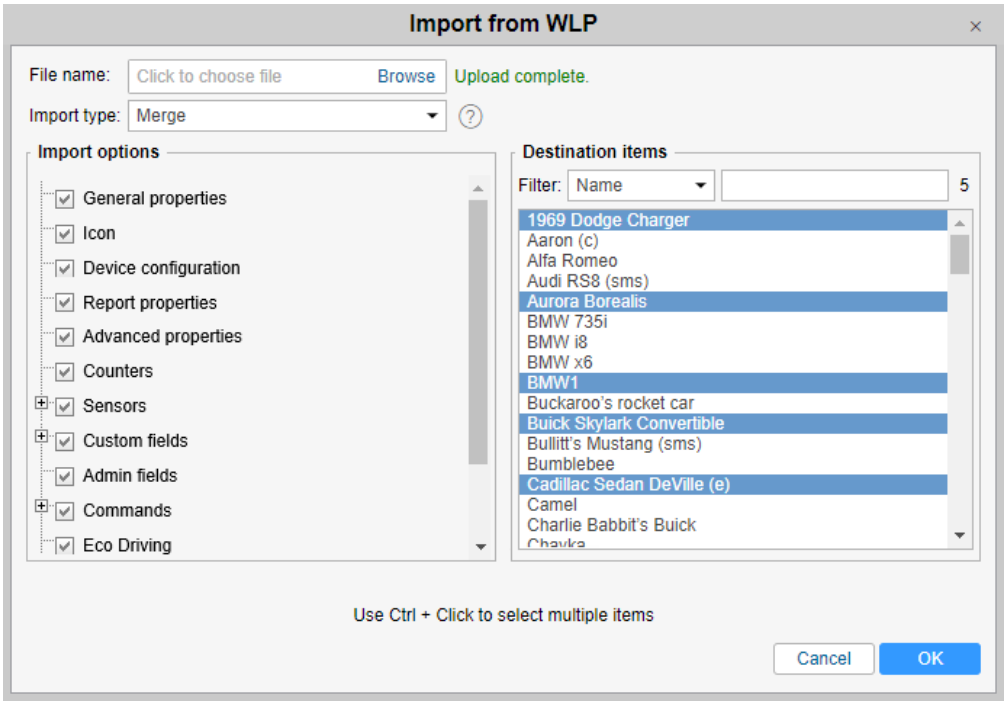
You can import into an object only those properties or contents that are editable for you (you need the **Create, edit, delete** access to these properties in the destination object).

Import from WLP

This option allows you to import unit properties, resource contents, or user settings from a WLP file to an object of the appropriate type. It makes sense only if you already have any WLP files.

Choose a file and press **Upload**. Afterwards, the chosen file is processed on the server, and available contents are displayed in the **Import options** section. At the same time, objects of a proper type are displayed in the section on the right (**Destination items**).

> This list is filtered by units of measure since it is not possible to import data if the source and destination items have different systems of measurement. For more information see the Measurement system and conversion section.



If the file contains the properties of the unit, the list of found properties is displayed to the left, and the list of available units is displayed to the right. If the file contains data from the resource, the list of found elements is displayed to the left, and the list of available resources is displayed to the right. If the file contains user settings, the list of these settings is displayed to the left, and the list of available users is displayed to the right.

On the left, select the data to import, and on the right — the destination objects. Use the dynamic filter to quickly find a necessary object (works by various criteria).

For unit properties (such as sensors, custom fields, commands, service intervals) and resource contents you should also choose import type.

Replace. Data will be replaced completely.

Merge. Items with the same name will be replaced and the new items will be added.

Append. Items with the same name will be left intact and the new ones will be added.

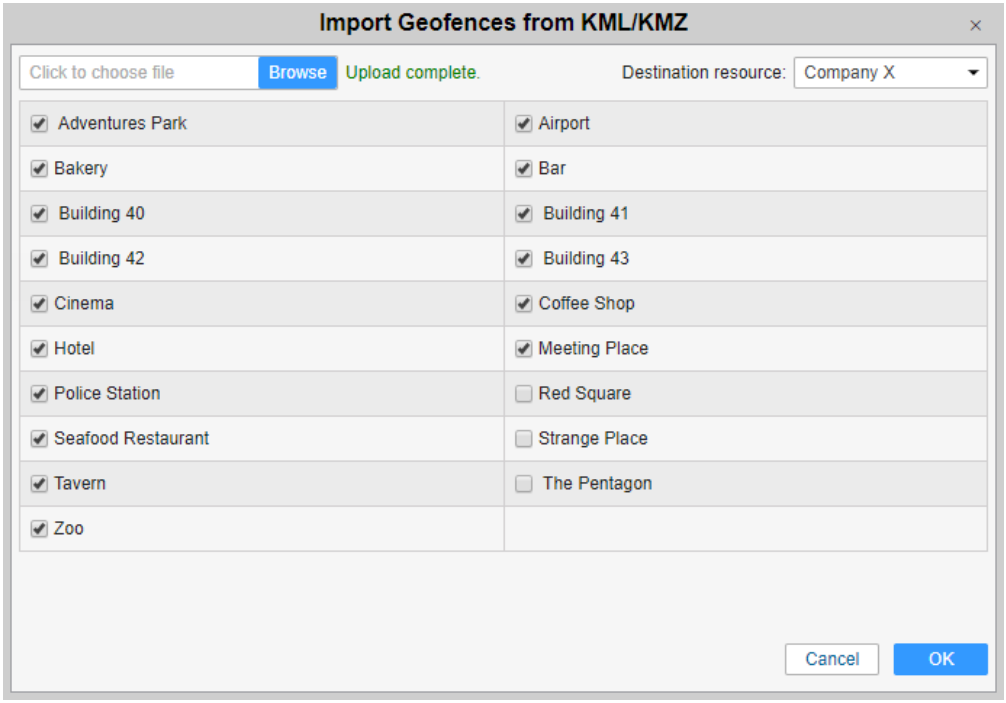
> ⚠ Regardless of the selected type of import, the **Replace** type is always used when importing the **eco driving criteria**, that is, the old data is deleted and the new one is entered.

At the end, click **OK**. If all or some of the data was not imported, a warning message is displayed on the screen. It contains a link to a file which you can download to see what data was imported and what was not. You can also check the status of the operation in the log.

Import from KML/KMZ

This option allows you to import geofences from a file to a resource.

Indicate the path to a proper file and press **Upload**. The file is processed on the server, and its contents are displayed below. Check items to be imported and select a destination resource. In the dropdown list, you can see only those resources to which you have **Create, edit, and delete geofences** access.



At the end, click **OK**. If all or some of the data was not imported, a warning message is displayed on the screen. It contains a link to a file which you can download to see what data was imported and what was not. You can also check the status of the operation in the log.

> ⚠ It is not possible to import a file which contains <MultiGeometry> tags. For successful import, open the file in the text editor, find and delete all <MultiGeometry> and </MultiGeometry> tags and save the changes.

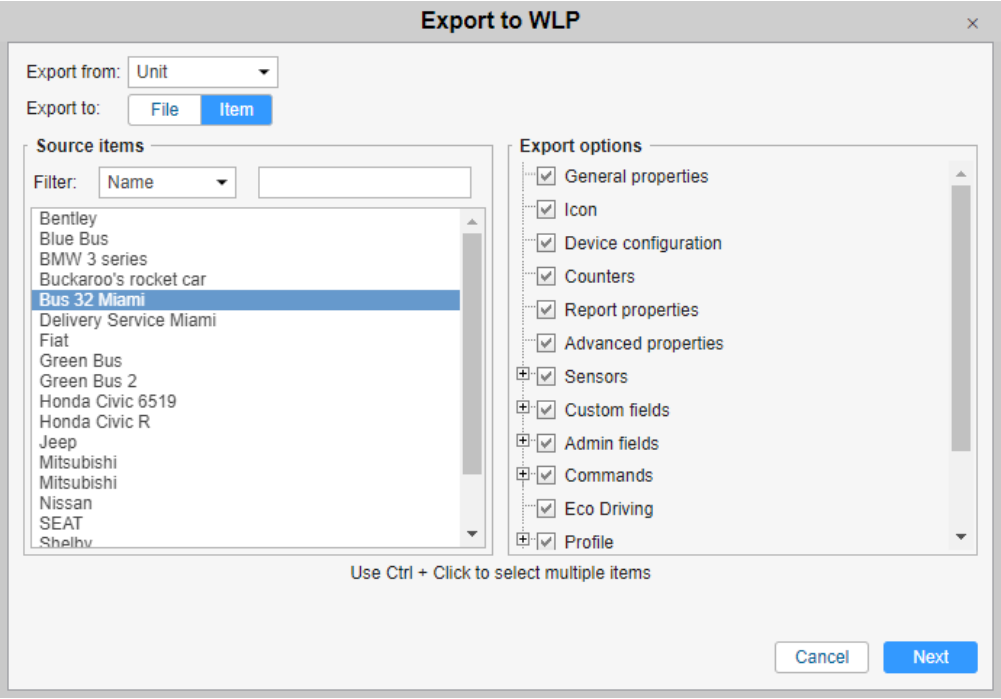
Export to WLP

This option allows you to export data from an object to a WLP file or straight to another object.

Choose object type (unit/resource/user) in the **Export from** the drop-down list. Then select the export destination — to a file or an item.

Export to an item

In the **Source items** section, select a necessary item (just one). To quickly find a certain object, use the dynamic filter (works by various criteria). When the item is selected, its available properties or contents are displayed on the right, in the **Export options** section. Choose the data for export. To tick all items at once, hold the **Ctrl** key and select any item. Repeat the same operation to uncheck all items at once.

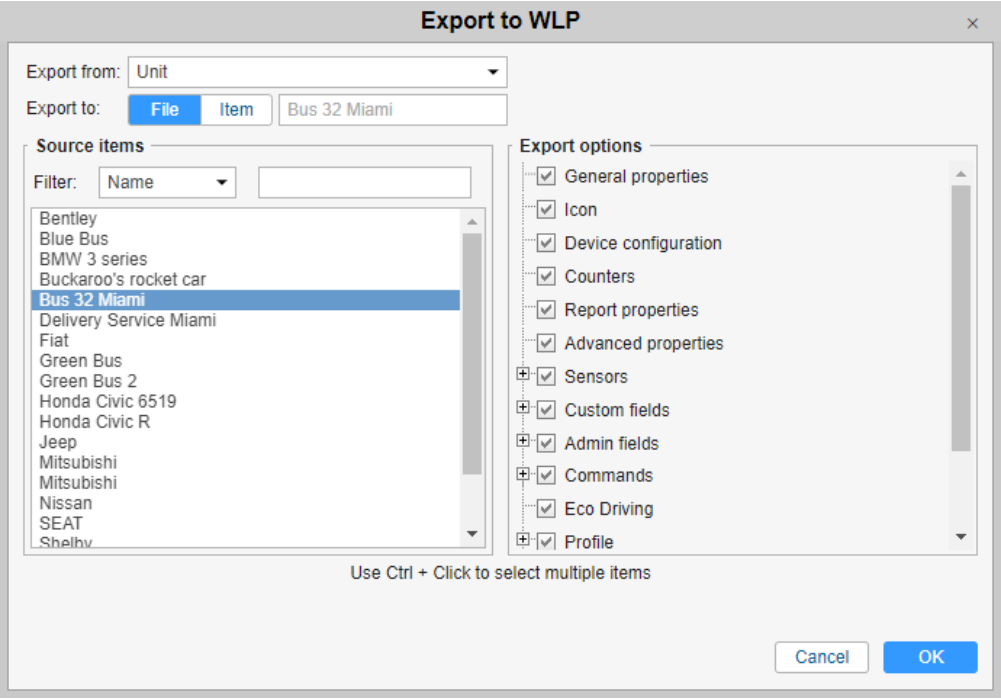


If you selected an export to an item, the Import dialog described above is displayed. Select destination objects there and press **OK**.

Export to a file

You can choose one or more objects to export to a file. To select multiple items, use the **Ctrl** or **Shift** keys. However, note that when exporting several objects, the subitems of Commands, Sensors etc. cannot be expanded. Thus, you can export only the whole contents of such tabs.

You can additionally type a name for the file. Otherwise, the file is named after the origination item (if only one is chosen) or have a name like **Units/Resources/Users** (if multiple items are selected).

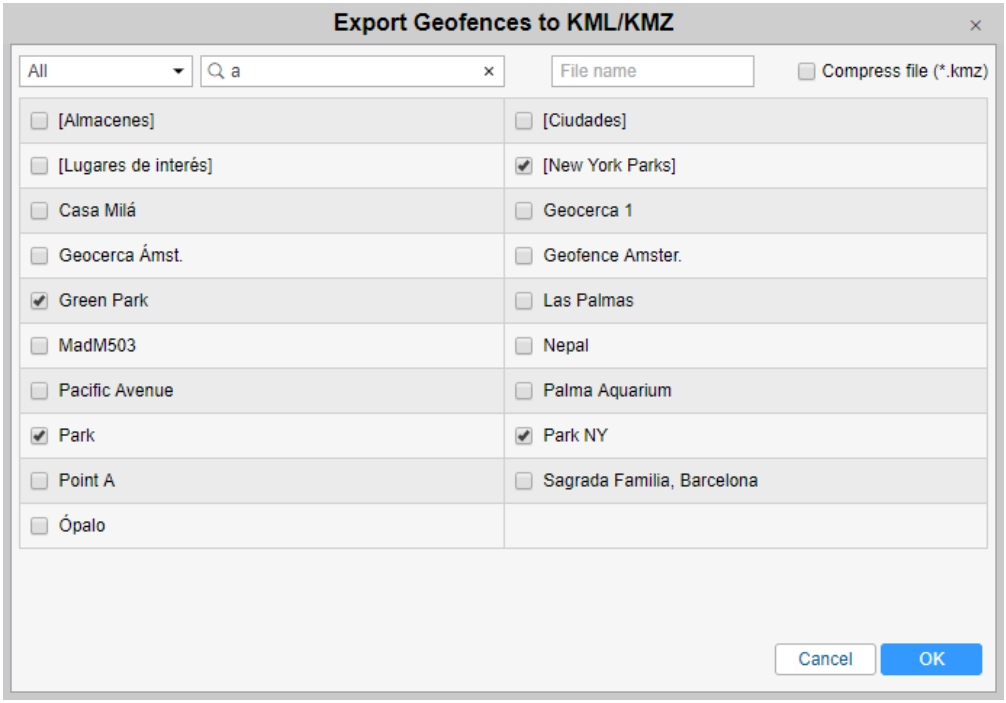


If you export to a file, after you press **OK**, the file is stored on the disk. As a result, you get a single WLP file (in case of one source item) or an archive with several files (in case of multiple source items).

Export to KML/KMZ

This option allows you to export geofences from all available resources to a file.

When you export to KML/KMZ, the list of all available geofences (depending on the item type chosen) is displayed. Check the items you want to export and press **OK**. Optionally, you can enter a file name and compress the file as KMZ. After that, press **OK** and save the file.

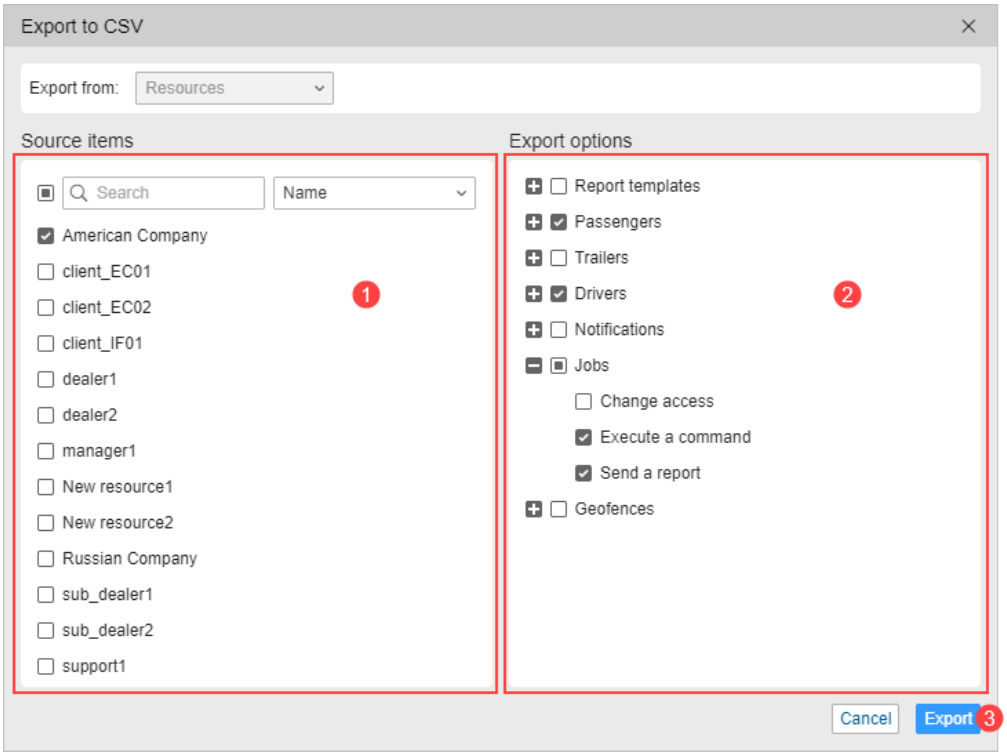


Export to CSV

This option allows you to export the contents of available resources to a CSV file.

To export the resource contents, follow the steps below.

1. Select one or several resources from which you want to export data.
2. Select the types of the resource objects which you want to export. If you mark one resource, you can expand the list of objects of each type (the button ⊞) and select the required ones. If you mark several resources, all the objects of the selected type are exported.
3. Click on the **Export** button.



The objects of **one type** from one resource are exported to a CSV file. In other cases, the data is exported to an archive with separate files for each type of objects. A semicolon is used as a field delimiter in the files.

Measurement System and Conversion

Wialon works with different measurement systems: metric, U.S., imperial, and metric with gallons. The corresponding feature can be set for units, resources, and users during their creation. The system of measures for routes is also set when it is created and is determined by the user's settings.

The table below provides you with the units of measurement (and their abbreviations) for the systems used:

	Metric	**U.S./imperial**	**Metric with gallons**
Mileage (large values)	Kilometers (km)	Miles (mi)	Kilometers (km)
Mileage (small values)	Meters (m)	Feet (ft)	Meters (m)

Speed	Kilometers per hour (km/h)	Miles per hour (mph)	Kilometers per hour (km/h)
Fuel amount	Liters (lt)	Gallons (gal)	Gallons (gal)
Fuel consumption	Liters per 100 kilometers (lt/100 km)	Miles per gallon (mpg)	Kilometers per gallon (kpg)
Temperature	Degrees Celsius (°C)	Degrees Fahrenheit (°F)	Degrees Celsius (°C)
Area	Hectares (ha)	Square miles (mi^2) or feet (ft^2)	Hectares (ha)
Weight	Tons (t)	Pounds (lbs)	Tons (t)
Carrying capacity	Tons (t)	Pounds (lbs)	Tons (t)
Dimensions	Millimeters (mm)	Inches (in)	Millimeters (mm)

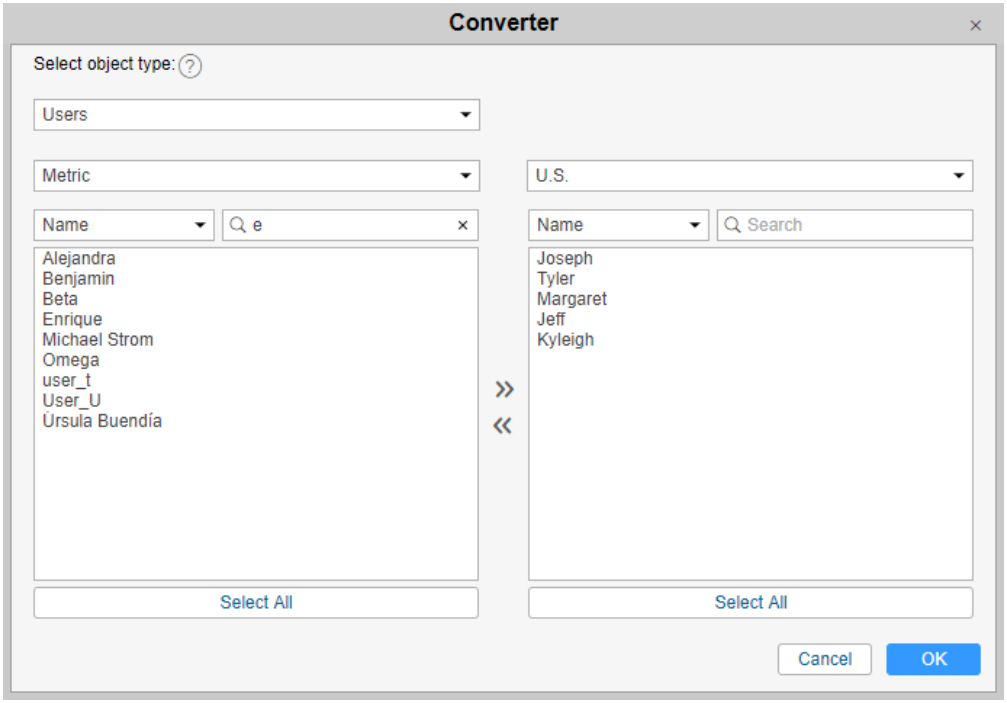
American and imperial systems, in fact, use the same units of measurement. The major difference is observed in calculating the volume of fuel. Below is a conversion from one system of measures to another:

1 U.S. gallon ≈ 0.833 imperial gallons
1 imperial gallon ≈ 1.201 U.S. gallons

Conversion

The system of measurement for the elements which already exist can be changed with the help of conversion. Only the top-level user can use **Conversion**. It is available in the interface of the

management system. To bring up the conversion dialog, it is necessary to select the corresponding item in the user menu. The dialog has the following view:



In the dropdown list, select the object type (units, resources, users, routes) for which the conversion is made. To the right of the dropdown list, there is a brief description of the actions that a re-performed on the objects of the corresponding type.

Below the object type, select initial and target measurement systems for conversion. For example, if you choose **Metric => U.S.**, a list of elements currently using the metric system is formed below.

From the list, select the objects which should be converted. To add these objects for conversion, use double-click or select an object and press the corresponding button (the arrow pointing right) between the lists. The added objects form the list on the right. To remove items from this list, either double-click them or select and press the corresponding button (the arrow pointing left). To select multiple items, hold the **Ctrl** key and click on the required items. To perform the conversion of the added items, click **OK** and confirm your actions in the appeared window. The success of the procedure is reflected in the log.

Conversion effects

Ideally, users have the same measurement system as resources and units used by them. In this case, everything that the user sees during online tracking in different panels and dialogs and also everything that is received by email using jobs and notifications has the same system of measures.

For units

If the conversion is performed over units, the units' parameters such as a trip detector, fuel consumption settings, counters, eco driving criteria, etc. are recalculated. This affects the representation of units in the tracking system. Changes affect not only units' properties, but also the display of messages, tracks, tooltips, etc.

⚠ The conversion does not affect the sensors of the unit. If it is necessary, their measurement system can be changed manually in the corresponding drop-down menu.

For resources

When converting resources, some contents of these resources, particularly, circle-shaped geofences, different settings of jobs and notifications, etc. are recalculated to other measurement systems.

The units of measure can be set individually in the section of general settings for every report template regardless of the resource it belongs to. Units of measurement chosen for a particular report template are displayed in the resulting report (whether done online or received according to a job or notification). Neither resource measurement system nor measurement system of a unit is taken into account.

For users

When converting users, the measurement system for the selected users is changed. It affects different online calculations, particularly the work of such tools as Distance, Area, Routing, Nearest units. Address defining parameters are recalculated as well.

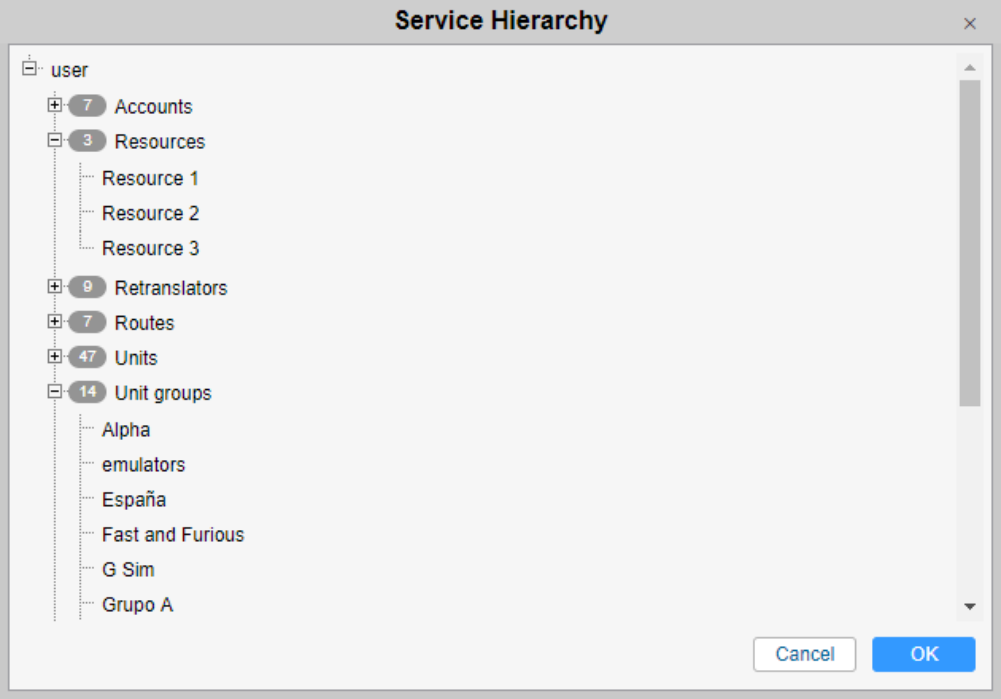
Besides, the system of measures indicated for the user is selected automatically when they create report templates, units, other users, resources (regardless of who is chosen as the creator or in which resource the object is created). At the same time, during the creation of these objects, the system of measures can be changed manually. It does not affect such objects as geofences, jobs, and notifications because their measurement system is taken from the resource they belong to.

For routes

When converting routes, a new system of measures is applied to the calculation of the radius of control points.

Service Hierarchy

Service hierarchy is a sort of report with a schematic representation of the information concerning the structure of your service. Select the corresponding item in the user menu in order to generate a table containing information on the types of macro objects used in your service, their amount, and the way these objects correlate with each other.



This feature is available both for top users and dealers.

Apps

Using SDK, you can implement your own tools and features and add them to your Wialon as additional applications.

Applications can be managed only by top users. The **Apps configurator** item of the user menu allows you to do this. Click on this item to open the **Apps configurator** dialog. It contains two tabs: **Installed** and **Library**. On these tabs, you can have a look at all the available applications, as well as configure and add new ones.

Installed

A list of added apps can be found on the **Installed** tab. To add a new application, click **Create** and indicate the following information:

Name

Enter the name of the application (at least 4 characters). It is displayed in the lists of available applications, as well as in the heading of the application when it is open.

Description

Enter any description of your app (optional).

URL

Type the URL where the application is hosted. Name and URL are mandatory, other parameters are optional.

Advanced URL parameters

If necessary, select advanced URL parameters. It is required to enable the **Active SID** or **Authorize hash** option so that users can log in to the application.

Advanced parameter	Description
Active SID	Enable this option to configure authorization by SID. With this authorization type, the user is not logged out of the application after a page refresh.
Current user	Enable this option, so that the URL contains the username that was used to log in to the application. It might be helpful, if the user logs in to Wialon using the Log in as button.
Base URL	Enable this option to add API address to the URL. For example, hst-api.wialon.com
Host URL	Enable this option so that the URL contains the address from which the user accessed the application. For example: hosting.wialon.com
Language	Enable this option if you want the application interface to be in the same language that is selected in the user settings in Wialon.

Authorize hash	Enable this option to configure authorization by hash. With this authorization type, the user is logged out of the application automatically after a page refresh.

Example of a URL with all the advanced parameters:

```
https://ecodriving.iot-platform.online/latest/?sid=026085dce21dcf6120bcfa1d922fda20&b=stable&authHash=0135c58bd6702db42c962e0126f00ebd&hostUrl=https%3A%2F%2Fcms.wialon.com&user=AliceNorris&v=1.51&baseUrl=https%3A%2F%2Fhst-api.wialon.com&lang=en
```

Some features are not implemented in some of the applications. If a feature is not implemented, its activation doesn't affect the application configuration.

Required services

Select services (features) which are required for the default activation of the application. If the list of features available to a user does not match this list (or if you leave this section empty), the application is disabled for the user.

Billing plans

Select the billing plans for which this application should be available.

Compatible languages

You can restrict access to the application for various interface languages. For example, if the Russian language is selected, this means that the application is available only when the Russian language of the interface is selected. If nothing is selected, it is assumed that the application should be available to all languages.

After setting all the parameters, press **Add** and when closing the dialog click **OK** to save the changes.

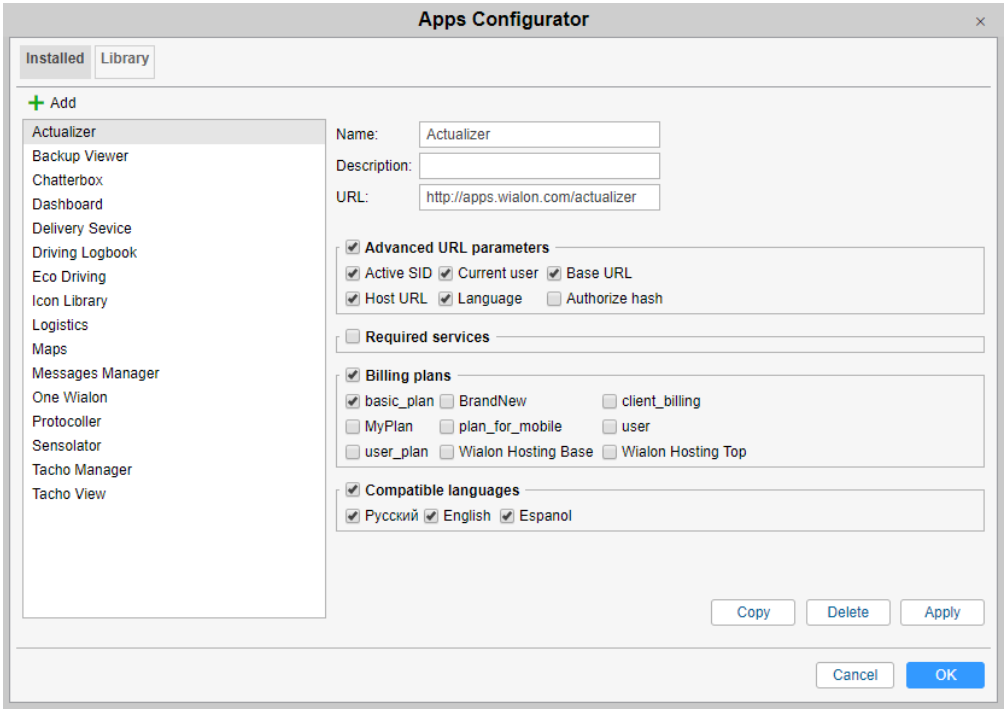
Operations with applications

To edit an application, select it on the left, change the parameters, press **Apply**, and then, when closing the dialog, click **OK**.

To delete an application, select it on the left and press **Delete**. Then, when closing the dialog, click **OK**.

To create a new application by copying, select the sample application on the left and press **Copy**. Edit the parameters, click **Apply**, and then, when closing the dialog, click **OK**.

To ignore all the changes made, press **Cancel**.

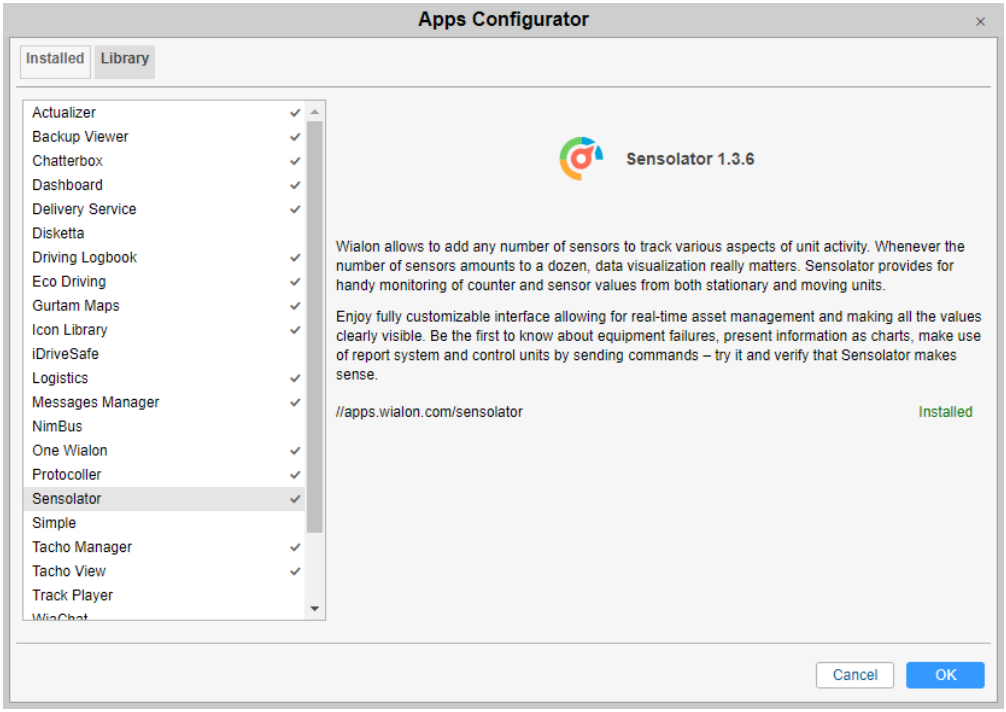


Added applications become available in the billing plans tab and in account properties on the List of services tab. You can enable and disable applications added by you and control their availability to other users.

Library

On the **Library** tab, you can select a suitable application and add it with a single mouse click. Adding application from the library is a little bit easier as all the mandatory parameters and the advanced URL parameters are indicated by default.

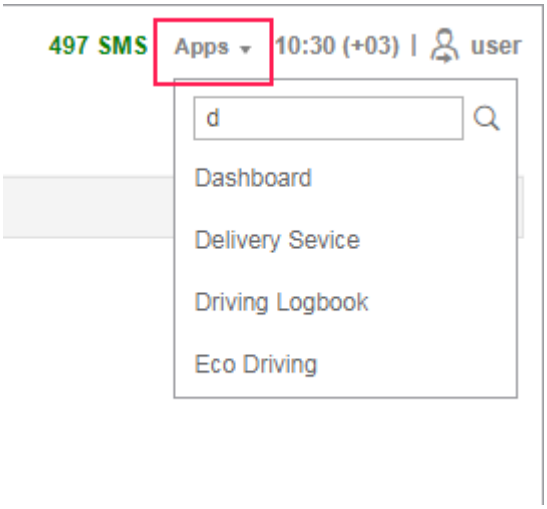
The list of applications is on the left. To the right of the list is a field that displays the current information for the application selected in the list. This information includes the following: application icon, its name, short description, URL, and release date. To add an application from the library, you must select it from the list. Then, if this application is not already installed, the **Add** button is activated below the description. To complete the procedure click **Apply** and then **OK**.



See also Wialon apps review.

Starting applications

To start an application, click on the **Apps** item in the top panel. A menu opens that lists all available applications (in alphabetical order). The dynamic filter is used to quickly find the necessary one. Click on the app's name to open it in a new tab of the browser.



Monitoring System

The monitoring system is used by end users to control their units (vehicle fleet, machinery, employees, pets, etc.).

Unit tracking includes:

- detecting the position of units and watching their movements on the map;
- observing dynamic changes of various unit parameters such as speed, fuel level, temperature, voltage, etc.;
- management of units (sending commands and messages, assigning jobs and routes, adjusting notifications, etc.) and drivers (phone calls, SMS, registering work shifts, binding to unit, etc.);
- interpreting information derived from a unit in various kinds of reports (tables, charts, movement tracks, event markers, complete statistics, etc.);
- and much more.

Tracking results can be either presented on a computer screen or exported to files in different formats.

System Requirements and Optimization

Consider these requirements to get the most from Wialon Local.

Web browser

Supported browsers are:

- Google Chrome
- Mozilla Firefox
- Opera
- Microsoft Edge

⚠ Update your browser to the latest stable version to work better with Wialon. In other versions or browsers, the system may function incorrectly.

Computer capability

Computer capability affects browser operation. The key points of high performance are **CPU** (central processor) and **RAM** capacity. Multi-core processors do not affect browser operation in most cases. The exception is Google Chrome that can use more than one core in its operation.

Considering all the above mentioned, the **minimum requirements** are:

- CPU at 1,6 Hz clock rate;
- 512 MB of RAM.

and **recommended requirements**:

- CPU at 2,4 Hz clock rate
  (if Google Chrome is used as web browser, a processor with two and more cores is recommended);
- 2 GB of RAM.

Monitor size and screen resolution should be also considered. The bigger the monitor is, the more data is queried from server and processed by CPU. It is especially true for the maps and when the Internet connection is slow. The solution for big monitors is to not use browser in full-screen mode.

Antivirus software can slow down computer performance as well as gathering actual data from units. If Wialon Local is getting slower, you can add it to the list of exceptions or simply disable antivirus monitoring during Wialon Local session. You can also create a rule which allows Wialon Local to develop any activity.

Internet connection

Wialon Local requires 1 Mbit Internet connection channel for one computer. If more than one operator will work simultaneously, do some tests and choose the most appropriate speed.

ⓘ When working with Wialon Local, your IP address should not be changed within a session.

Optimization measures

Here are some tips, which will help you to improve Wialon Local performance in cases when more than a hundred units are connected.

Web browser

Web browser is very important. See the list of supported browsers above. The most efficient is Google Chrome. It is followed by Mozilla Firefox and Opera. The slowest, according to our tests, is Internet Explorer.

Wialon Local efficiency strongly depends on browser event system. Each browser has its individual event model. As the tracking system is rather dynamic and tracks change with up to 2-second delay, some browsers (like Internet Explorer) cannot process such a large quantity of events. The solution here is to use a more powerful computer.

Graphics & tooltips

Graphic elements displayed on the map and in lists are resource-consuming. If you notice that your browser is getting slower, try to disable the mapping of the following elements: units, geofences, places, tracks, as well as names, direction arrows, and 'tails' for units (these elements are disabled with the three corresponding buttons in the Visible layers menu). Limit the number of units displayed in the Monitoring panel. Limit the number of other objects displayed on other panels that are frequently used (apply the filter for doing that). Enable only those elements that are necessary for your work at the moment. Several settings to adjust the way units are displayed are set in user settings in the **Unit visualization on map** section.

Unit's tooltip contents are also important. In the User settings dialog in the **Show additional information about the unit** section, you select which information should be presented in unit's tooltip and in extended unit information. To avoid browser overload, disable unusable items or even all items. If there are a lot of geofences or geofences composed of multiple points and the **Presence in geofences** option is enabled, then your browser could be strongly overloaded. So, make sure this option is disabled.

If the Internet connection is slow, disable geofences' rendering on map. Besides, if you query reports (containing map), messages, and tracks, clear your request as soon as it is no longer useful.

Pay attention to the fact that in order the charts to be shown the browser you use has to support the WebGL component. If the browser or the operating system cannot support it, you should enable the option **Render charts on server** in the user settings (limited functionality will be available).

Queries to server

When Wialon Local starts, not all data is loaded at once. It is made to speed up the loading and operation. That is why some action that done for the first time may take more time than for future work. Resource-consuming reports (such as reports on groups or reports with grouping and

detalization) should be avoided. Enclosed rows of detalization stay hidden until you expand them, and if there are a hundred or more enclosed rows the browser may hang.

Limitations

To ensure the effective operation of the monitoring system, take into account the limitations stated below.

Limits for reports

The maximum number of lines of a report is 250 000.

Limits for tracks

During one session it is not possible to build more than 50 tracks in total in all tabs (**Tracks**, **Monitoring**, **Reports**, **Messages**).

Limits for messages

No more than 1 message per second should be generated by a tracker.

Other limits

It is not possible to create more than 31 744 micro objects of **each** type (geofences, jobs, notifications, drivers, trailers, passengers and report templates) in one resource.

The maximum number of points of a geofence saved from a track cannot exceed 10000. If the number of points of a track is more than 10 000, it is saved as several geofences.

It is possible to edit a geofence if the number of its points does not exceed 5000.

Data Processing in Wialon

Different methods of data processing are used in Wialon. Some of them are as follows:

- real-time data processing;
- processing messages from the database upon request.

Real-time data processing

Real-time data processing allows for quick acquisition of data on trips, sensors, ignition, fuel, counters, speeding, and is used:

- in notifications about fuel thefts and fillings;
- in Dashboard;

- in sensor values on the **Monitoring** panel (in unit tooltips, extended unit information, and so on).

This mechanism is also used in Driving Logbook for detecting trips and their status and in Wialon for Android and iOS.

The data obtained as a result of such processing is bound to time and constitutes time intervals.

Processing messages from the database upon request

All the data sent by trackers go to the database that stores it in the form of messages. Every time the user wants to obtain summary data (for example, when executing reports or viewing tracks), a request is directed to the database and the system processes all the messages for the indicated time interval.

Possible reasons for discrepancies in results

In most cases, both mechanisms of data processing give the same results. The discrepancies might arise for the following reasons:

- not all black box messages are uploaded;
- the uploaded black box messages are older than one day;
- the unit properties have been edited on the following tabs: Advanced, Trip detection, Fuel consumption, Sensors;
- the messages are imported to the database.

If you change the unit properties, the recalculation of the data processed in real time is carried out automatically in 15 minutes. In the case of processing messages from the database upon request, the changes are reflected immediately.

> Recalculation is applied to the data processed in real time for the period indicated in the **History for N days** field of the Events module block in the administration system.

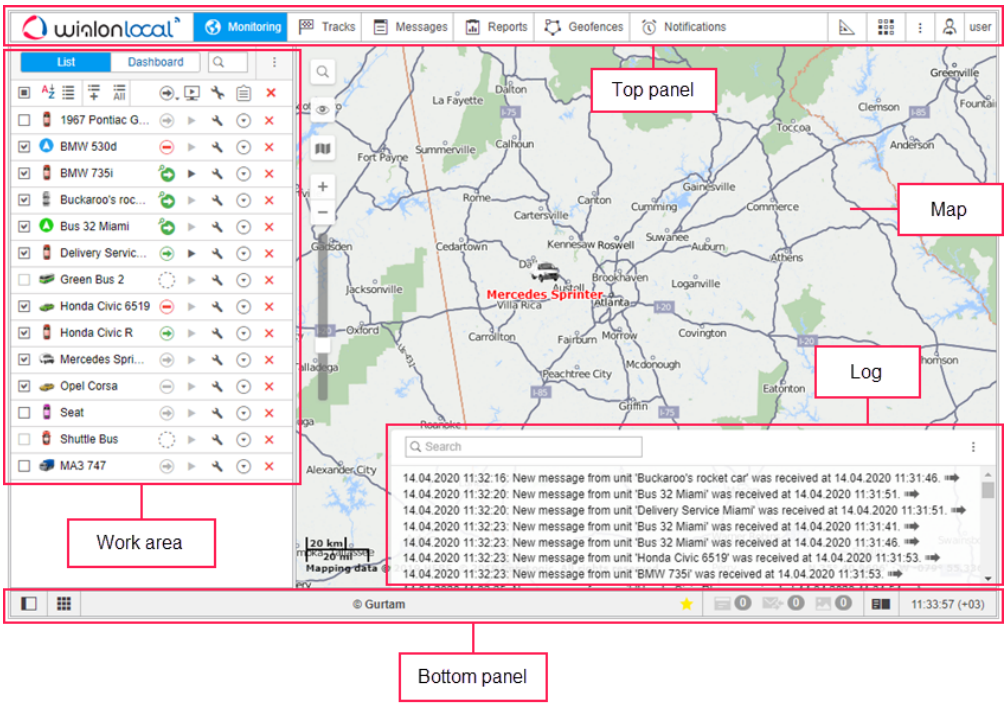
User Interface

The user interface of Wialon is simple and in many cases intuitive. There are plenty of screen tips and helpers associated with various buttons, icons, dialog boxes, edit fields, and other elements of the interface. Moreover, special icons are located in the interface . They are used to deal with the most 'difficult places', as a help text opens when you click on any of them.

Generally, the following basic structural elements can be distinguished in the interface design:

- work area,
- map,
- top panel,
- bottom panel,
- log.

There are also a lot of other different panels and windows which can be activated if necessary.



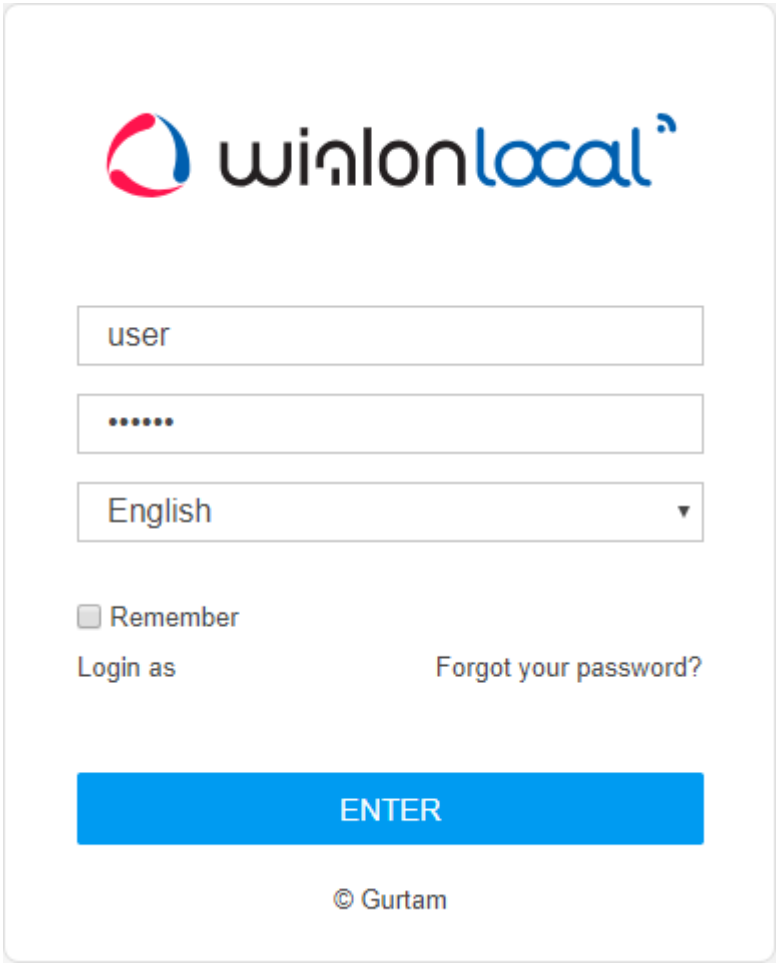
To switch to the full-screen mode, press **F11**. This feature is provided by the majority of browsers.

Login

Enter the service URL into the address line of your browser.

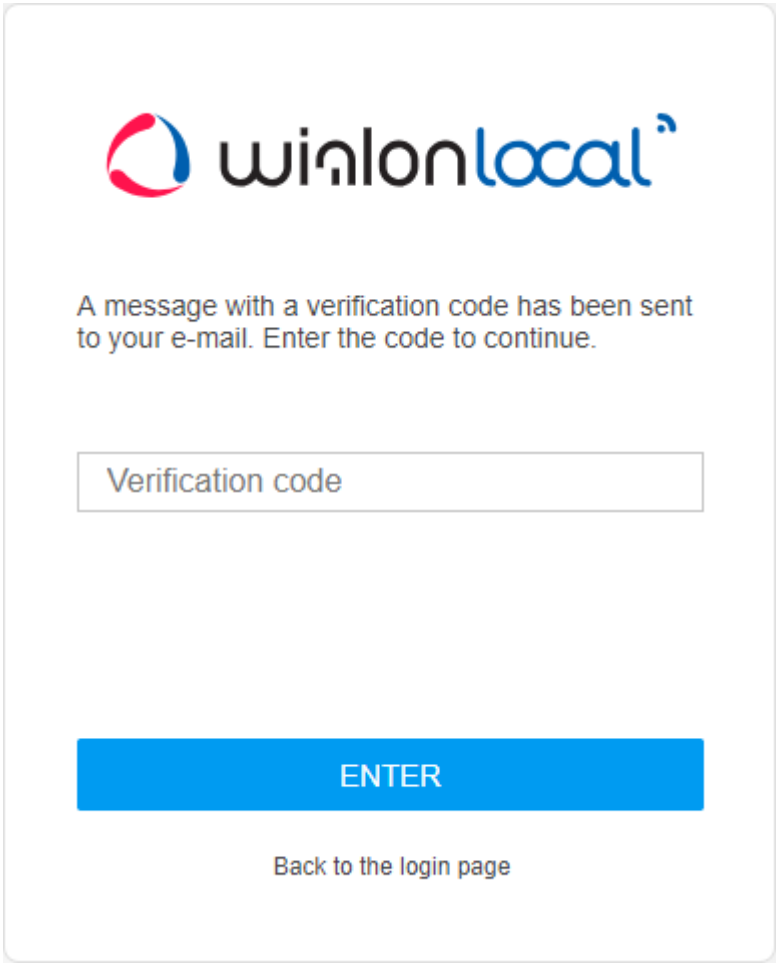
On the login page, enter your **username** and **password**. Note that the characters used in these fields are case sensitive. Afterwards, choose the interface **language**. If you want, you can change it at any time after logging in (in the user settings).

After all the necessary fields are indicated, click **Enter**.



If you use a personal computer, you can additionally check the **Remember** box. In this case, the next time you enter the system you will not be asked to input your login and password again. Moreover, this checkbox is necessary to automatically enter the system in case of losing the session. It should be noted that this option is limited to 30 days. Also, the box becomes unchecked when you exit the system.

For an account with two-factor authentication enabled, in addition to the password, you must enter a verification code, which is sent to the email or via SMS (the code is valid for 5 minutes). If the login did not occur and the entered code became red, then it was entered incorrectly. If you enter the wrong code repeatedly, the login will be temporarily blocked.



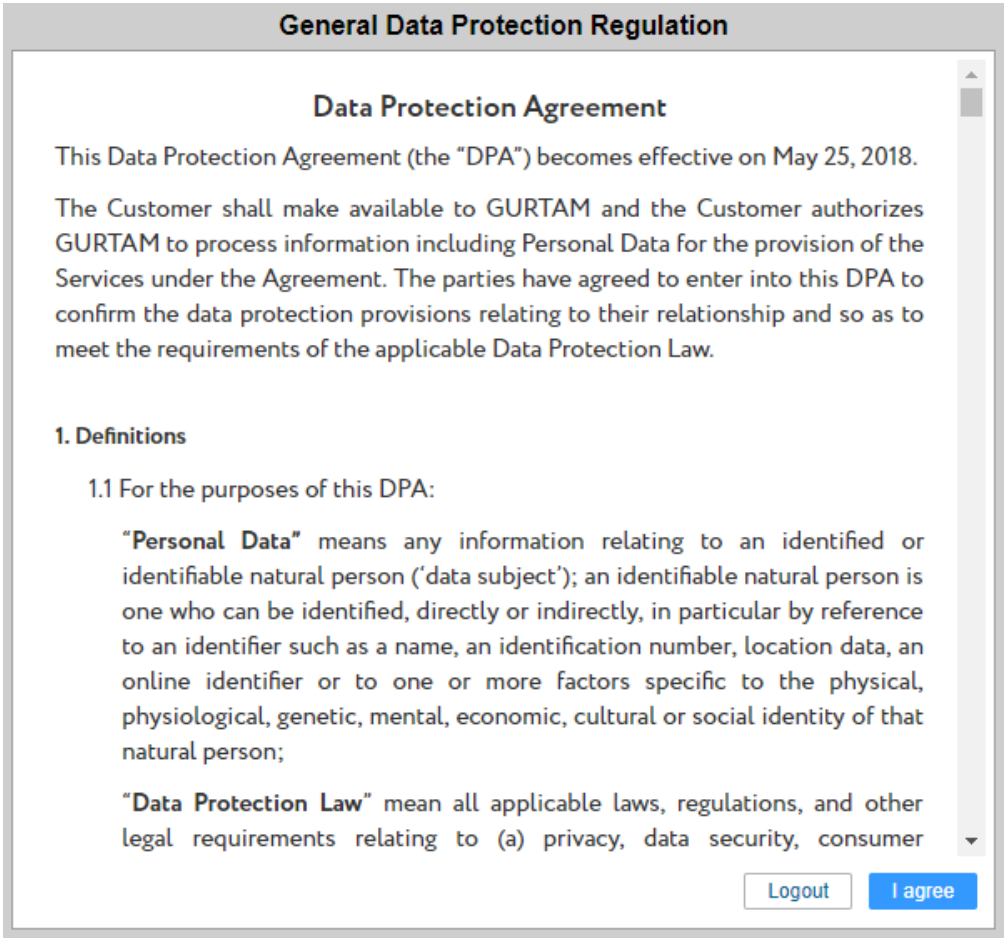
If the verification code has not been received, click on the **Resend the code** button (it becomes active within 30 seconds after the first request). In case two-factor verification via SMS is used, it is possible to choose how the code must be sent: in an SMS o by email.

If the current time is displayed in red and in the middle of the screen you can see a warning message (**Unable to connect to the server. The page will be reloaded automatically when the connection is restored**), then there is no connection to the server for more than two minutes. This can be caused by the Internet connection failure or some internal system problems. After the connection is restored the message disappears automatically, and the system continues its work. If the connection to the server is lost for 5 minutes and more, the session will be finished. However, when the connection with the server is restored, the user automatically logs in to the login page.

A quick login without entering (or even knowing) a user name and password is possible, provided that there is an active session available. Then URL-link should contain the **sid** parameter, e.g., http://wialonb3.gurtam.com/?**sid=3086417ea744b0dbb85202cebe3ff134**.
Note that the input must be from the same IP address. However, be careful giving away such links,

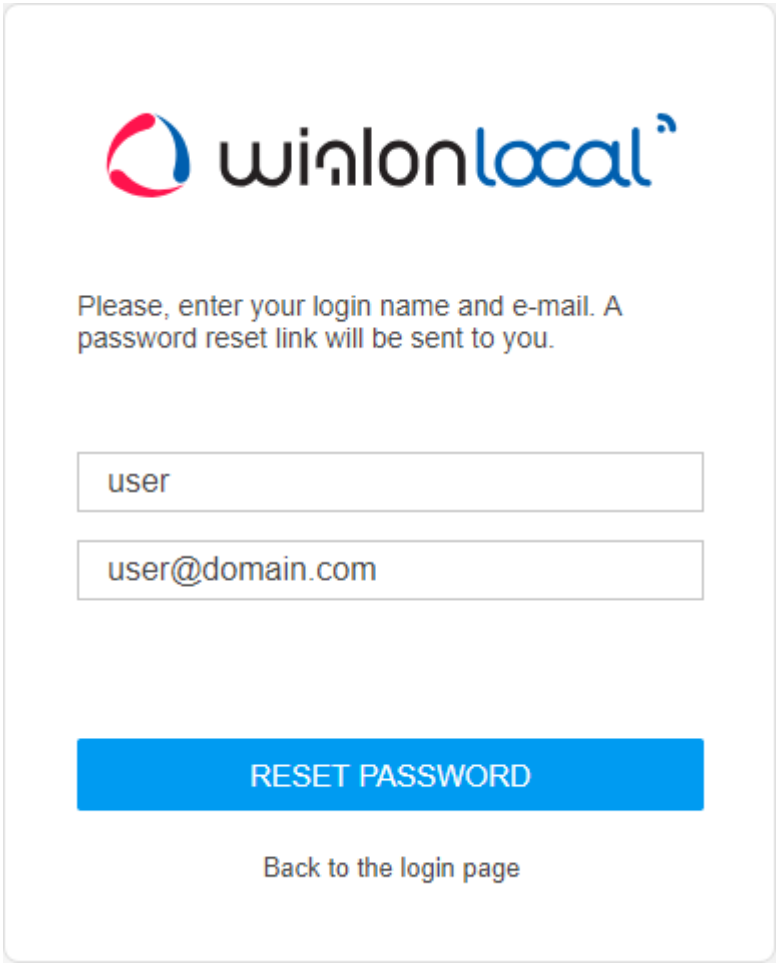
as, while the session is active, anyone who has this link can log into the system and perform different actions allowed to that user. To abort the current session, just exit the system (press **Logout**).

After the first login into the system, the Data Protection Agreement is shown. In order to proceed, click **I agree**.



Getting a new password

If you have already registered in the system but forgot the password, please, follow the **Forgot your password?** link. There you will be asked to enter your username and email address. Then press the **Reset password** button. A link to the page containing your new password will be sent to you. Follow this link to get your new password.



If you have pressed **Forgot your password?** by accident, just ignore the email with a password reset link and use your previous login and password. If you still follow this link, you will have to use a new password.

You can reset the password no more than once a minute.

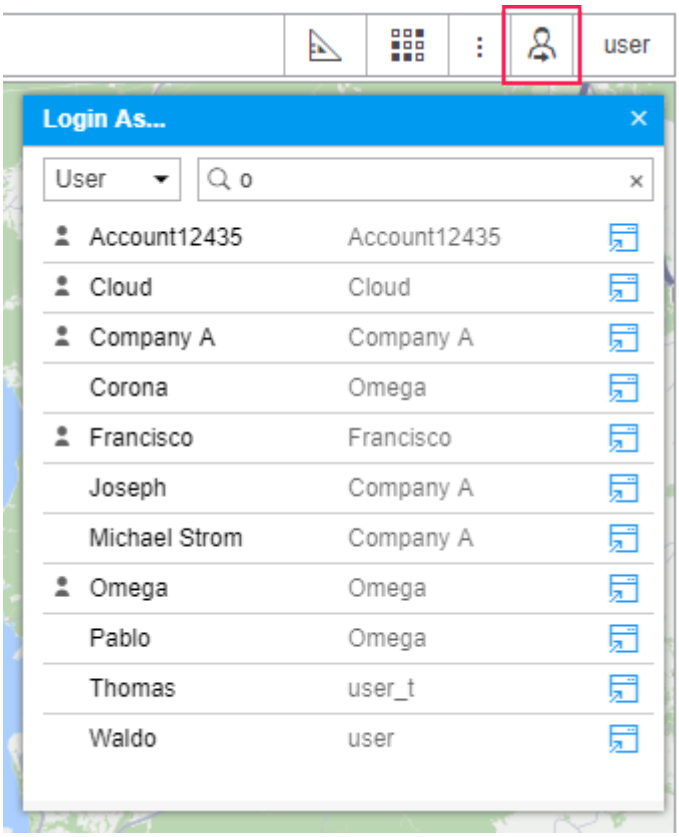
Password change

If the **Can change password** option is activated in the General tab of the user properties, then, according to the security rules, the password change is required at first login. In the opened window, type in the current password, and then enter the new password twice (the second time in the **Confirm password** field).

The current password for the user you logged in as can be changed in the Security tab of the user properties dialog. However, not all users are allowed to do this. Contact your service administrator for more information.

Login as another user

User impersonation allows you to access and operate as if you were logged in as another (subordinate) user. To impersonate, you need to have the Act as given user access right towards the user.



If you want to log in as another user from the authorization page, you should enter your user name and password, click on the **Login as** caption and select the necessary user name in the open window. When you are logged in as another user, you can see only those objects that are available to them and perform the actions allowed to them. Note that the login history is stored in the account with which you have entered the system.

You can switch to another user even after entering the system. However, in this case, the login is **not** saved in the user's history. To switch it, click the icon located to the left of the username. Afterwards, the dialog containing two columns (a username and an account name) is opened. Users-creators of accounts are marked with the icon to the left of their names. Click on the name of the required user to authorize in the current tab, or click on the icon at the end of the line to open the page in a new tab. For the search convenience, it is possible to use the dynamic search. The search can be filtered by users or accounts. This is regulated by the filter in the upper left corner of the window.

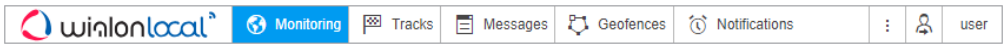
There is also an alternative way to log in as another user. Go to the Users panel, where each user has a special button for logging in under his name. If you do not have enough access privileges, the button is disabled.

After authorization as another user, the username is written in brackets to the right of the main one (in the right corner of the top panel). To switch back to the main user, click on the icon (door with arrow) to the right of the name, and confirm your action by pressing **OK** in the appeared window.

Top Panel

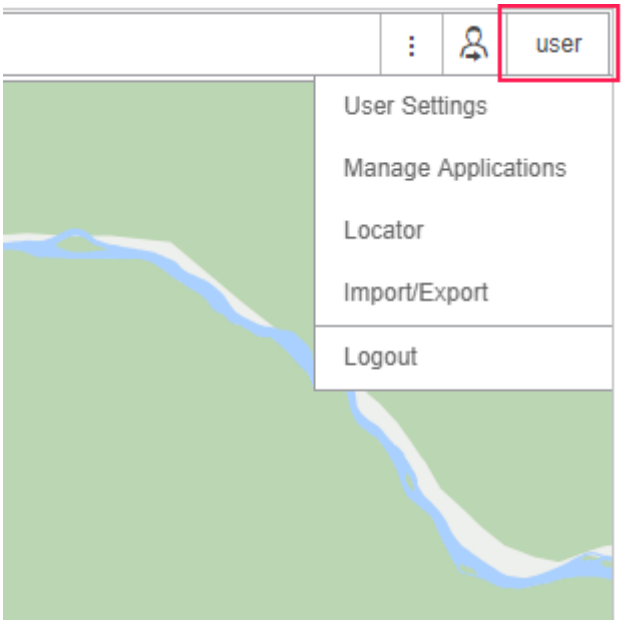
In the upper panel on the left, there is the logo of the tracking services provider, and on the right, there is the menu setting button and the username under which the user logs on.

The main menu of the program occupies the central part of the top panel. It contains different elements depending on the settings applied and also on the modules provided.



User menu

In the right corner of the top panel, the user's login is displayed, under which the authorization has been made. Meanwhile, one more login can be specified in parenthesis if the main user logged in on behalf of the other.



When clicking on the user name, an additional menu appears. It contains the following options.

User settings

Opens the user settings dialog for viewing and/or editing.

Manage applications

Opens the manage applications dialog.

Locator

Opens the locator's dialog.

Import/Export

Enables to transfer the settings of units, users, resources' contents (refer to Import and Export).

Help

Help request. Can be unavailable.

Technical support

Technical support request. Can be unavailable.

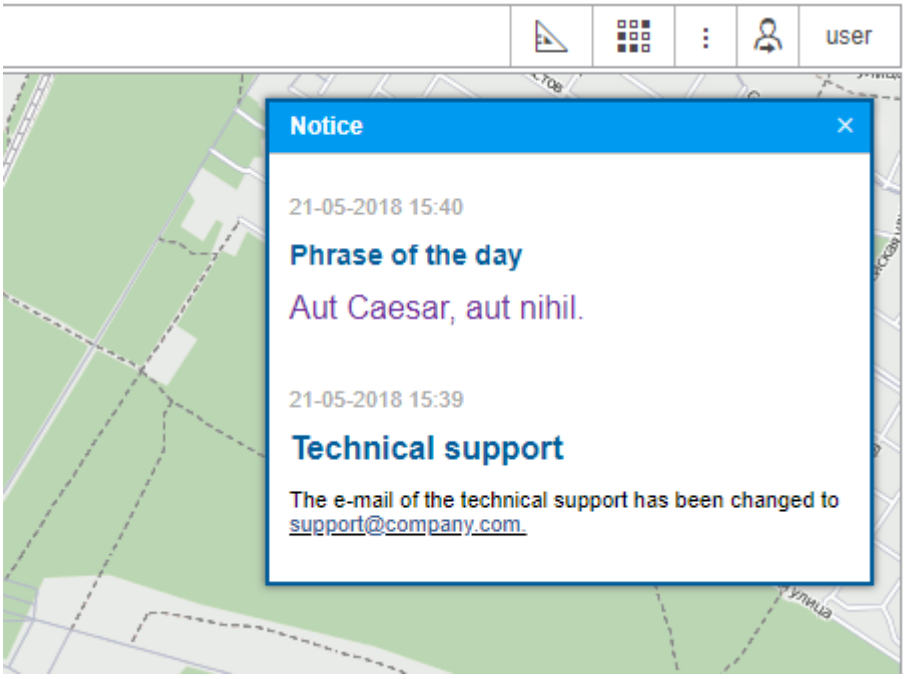
Logout

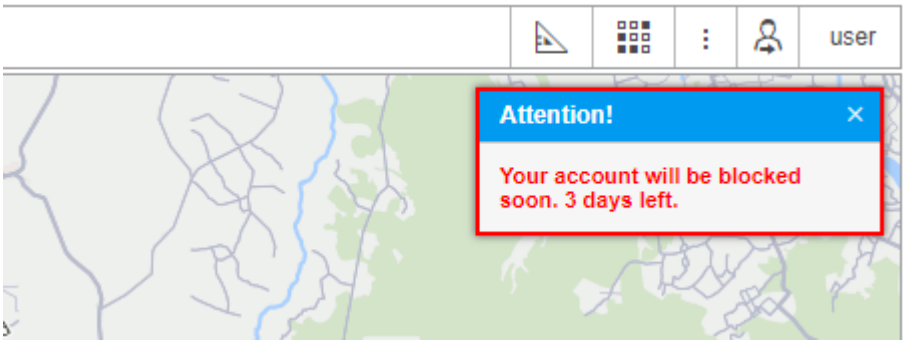
Click here to log out of the system (session termination).

Help and **Support** are links to third-party Internet resources containing either documentation or technical support. By default, they are disabled. You can enable and configure them in the administration system.

Information notices

Information notices from the service manager can appear in the top panel under the username, as well as notices on the number of days left before blocking the tracking system (if specified by the tariff agreement).





Work Area

In the left part of the screen, there is a work area in which various actions with different elements of the system are performed, as well as various requests, are formed.

Depending on the tag chosen in the top menu, one of the following tabs can be opened in the work area:

- Monitoring — tracking units position, state and movements.
- Tracks — viewing movement history.
- Messages — viewing the messages that come from the units.
- Reports — a wide range of tools for analyzing and sorting the data received from a unit.
- Geofences — creating, editing, removing geographical areas.
- Routes — creating and monitoring the traffic route of a unit according to its schedule.
- Drivers — creating drivers and assigning them to units.
- Trailers — creating trailers and binding them to units.
- Passengers — creating passengers and binding them to units.
- Jobs — creating, editing, removing jobs performed on schedule.
- Notifications — creating, editing and removing notifications of events.
- Users — managing other users.
- Units — managing available units.

Top menu also can include two panels which are not shown in the work area. They are:

Tools — tools for calculation distance and area, laying the best routes, searching for the nearest units, etc.

Apps — applications that solve various user's tasks.

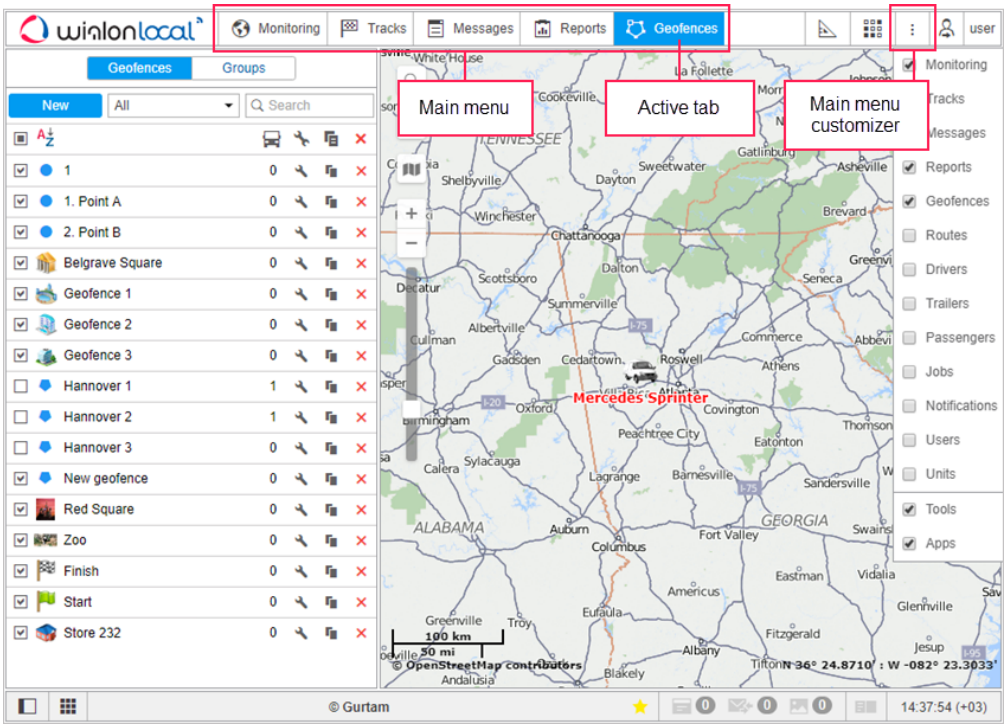
The width of the work area can be changed. To do this, click on its right border and drag it to the required direction, holding the mouse button. Moreover, you can hide the work area by pressing the button located in the lower left corner .

Main menu adjustment and navigation

To adjust the main menu, click the customizer icon ⋮ and select the menu items you would like to work with. The selected items immediately appear in the top menu.

The tab that is currently open is highlighted with a darker background. To navigate through the menu, you just need to click on the required name. The contents of the left panel (the work area) change automatically.

> ⓘ Keyboard shortcuts are used to facilitate navigation through the tabs.



All the range of items chosen for the main menu is displayed at the top. The names of the tabs are shortened if there is a lack of space. That is why you should choose only those items that you actually use.

Alternative means of navigation

If the browser window is small, but there are a lot of tabs selected, inscriptions generally become not visible, and menu tabs are presented just with icons. In such cases clicking on the icon mostly leads to switching on/off the layer on the map. Therefore, in such cases to switch the tabs you should additionally hold the **Ctrl** key.

Another means of navigation is through the menu settings window. If you click on the name of any item in the settings window, you will be taken to the corresponding tab. In this case, if before it was

not displayed in the menu, it appears. Also, do not forget that when you call the tab from the menu settings window the layer is activated automatically.

The same occurs in case of **forced** transitions between tabs, for example, when requesting a report from the monitoring tab or during the transition **from reports** to **messages**. Even if the requested tab is not displayed in the main menu, the transition is successful. In this case, the corresponding item is added to the menu and the layer becomes active.

Bottom Panel

The following buttons are located in the bottom panel:

— hide/show the work area;
— hide/show minimaps.
— hide/show the online notifications window;
— hide/show the window with the messages from drivers or SMS;
— hide/show the window with the pictures from units;
— hide/show log;
— hide/show information on the latest system updates.

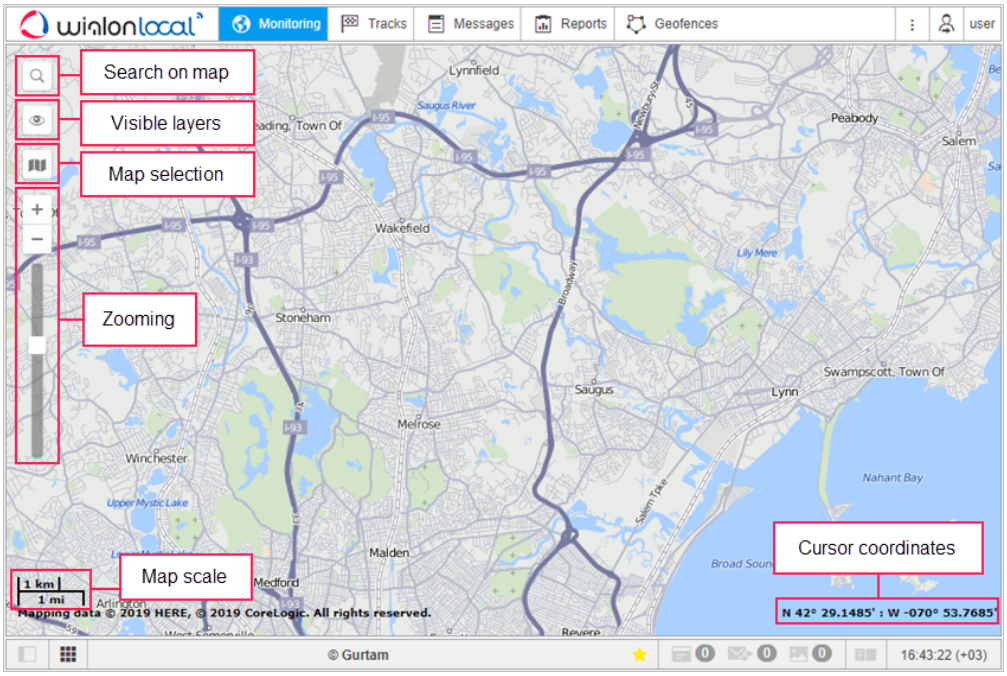
The lower right corner shows the current time and, in parentheses, a time zone (you can change it in the user settings).

Map

The map is available regardless of which panel is activated. Usually, it takes up most of the screen. Units and their traces, geofences and other elements can be displayed on the map.

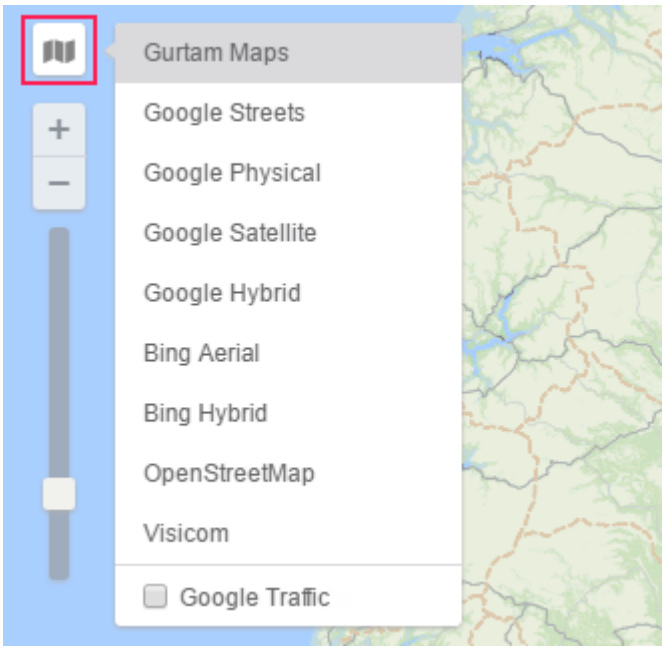
Map size can be adjusted in relation to the work area and the log. To do this, drag up/down or left/right the map scale slider, which is located between the corresponding parts of the interface.

To maximize the map size as much as possible, you can hide the work area and the log completely (using the buttons and) and switch to the full-screen mode by pressing **F11**.



Map selection

To change the base layer of the map, click on the button  in the upper left corner of the map. The menu of map selection is divided into two sections. The upper section contains base layers and the lower one contains additional informational layers. Select the base layer which should be used as the main map and a minimap.



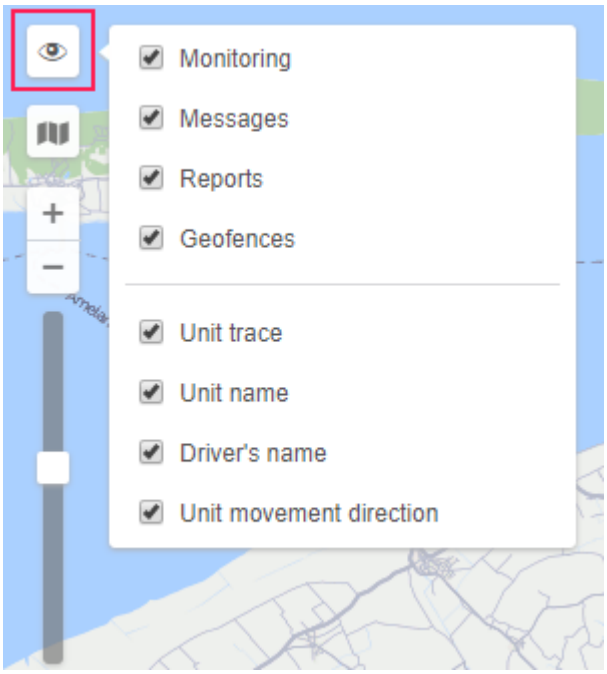
Depending on the selected base layer, additional layers can be available for it. They allow displaying the following information on the main map: traffic on roads, maritime navigation, or weather. To enable the required layer, select it in the section of additional layers.

The available base layers depend on the map sources selected in the user settings. There you can also save the current position of the map for further logins. If the option to select any map source is not available, contact your tracking system administrator.

> The base layer selected in this menu affects only the graphical form of the map. Geocoding (address detection, etc.) is carried out using mainly Gurtam Maps.

Visible layers

To add and remove visible layers on the map, use the button  in the top left corner of the map. Layers menu can be divided into two sections: layers of panels (at the top) and layers of units (at the bottom).



The graphic layers of the following **panels** can be displayed:

- Monitoring;
- Tracks;
- Messages;
- Reports;
- Geofences;
- Routes;

- Drivers;
- Trailers;
- Passengers.

You can activate graphic layers only if there are same-name panels in the main menu. For instance, if there is a **Monitoring** item in the main menu, the map can display the graphic layer with the location of the selected units. Once you add an item to the main menu, its layer automatically appears on the map and disappears once you remove it.

The **units** layers are designed to control the unit presentation on the map and include:

- unit trace;
- unit name;
- driver's name;
- unit movement direction.

The order of displaying layers

The layers are displayed in a specific order. Depending on the rendering priority, they can be divided into 7 groups, which are listed below. The elements of each next group are rendered upon the previous one. Some groups also have an internal rendering hierarchy.

I. Base map layers

II. Additional map layers

III. Base vector layers

- Geofences rendered in the browser
- Elements rendered on the server
- Trips in the trips report
- Routes

IV. Additional vector layers

- Inscriptions for drivers and trailers
- Tails of units
- Direction arrows of the movement of units
- Names of units
- Status icons
- Inscriptions of the markers of the LBS detector tool

V. Markers

- Icons of the geofences rendered in the browser
- Markers of the drivers and trailers unassigned from units

- Unit markers
- Markers of the drivers and units assigned to the units
- Markers of the Messages panel
- Markers of the initial/final position of the tracks in the tracks and reports panels
- Markers of the tracks hittest when geofences, reports, tracks are rendered on the server
- Names of geofences

VI. Tools

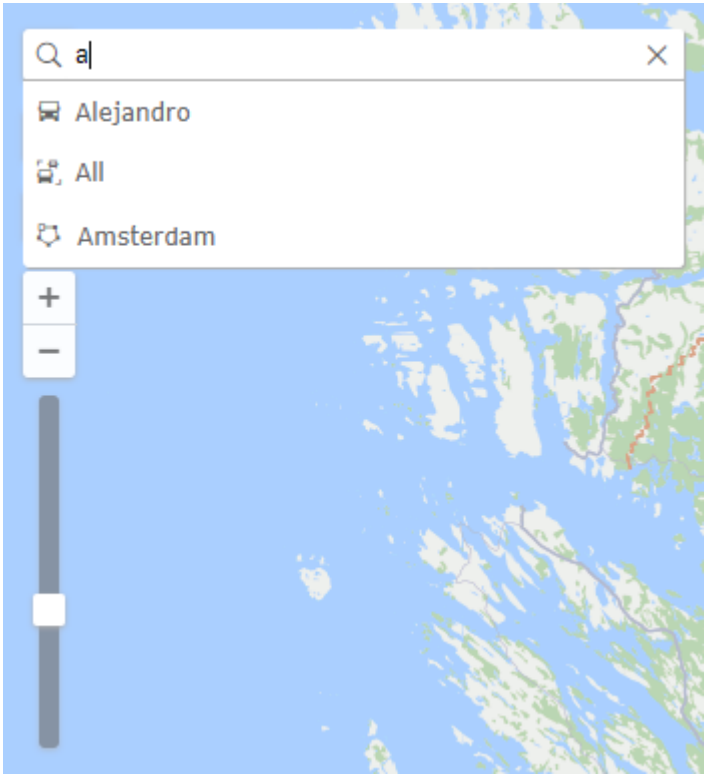
- Track player
- Distance
- Area
- Address
- Routing
- Hittest
- Nearest units
- LBS detector

VII. Editing Layers

- Created geofence

Search on the map

In the top left corner of the map, there is the **Search on map** icon  . This tool is used for the dynamic search of such system objects as units, geofences, unit groups, drivers, trailers, passengers, routes. Also, if the names of the above-mentioned objects do not contain the entered characters, then a list of addresses that match the specified filter is displayed (the search is performed in accordance with the selected geodata source).



Search Process

Click on the **Search on Map** button and set the search filter (enter the characters from the name of the object you are looking for). For a unit, you can enter its unique ID, registration plate, or VIN number indicated on the **Profile** tab of the unit properties dialog. As you enter the characters, you can see the list of the items that match your request. The search list displays the names of the objects and the icons that indicate their type. If the filter matches multiple objects, the list contains one result for each type of object.

Switching to the Object on the Map

Click on the required item in the search list to see it on the map. You can use the up and down arrow keys to navigate through the list of items and press **Enter** to select the required one. The map is automatically centered on the selected item. After the selection, the search tool collapses.

Using the map while working with different panels

The map is common for all panels. It means that while switching between the panels, zoom, and coordinates of the map center remain the same. Graphic elements such as track lines, markers, geofences, icons of units remain in their places. Therefore, for example, if you made a report showing parking locations on the map and then switched to the **tracks** panel to create tracks for the unit's movement (even if this is a completely different unit), all the graphical elements, lines, markers, etc. still will be shown on the map until you delete them or switch them off.

Such panels as **Monitoring**, **Tracks**, **Messages**, **Reports**, **Geofences**, **Routes**, **Drivers**, **Trailers** and **Passengers** can have their layers on the map. Graphic elements applied to a map when working in a particular panel, can be easily switched on and off. Displaying or hiding the graphic information on the map is adjusted for each layer individually in the layers menu, which can be opened by clicking on the **Eye** icon in the upper left corner of the map. Here you can read more about the work area.

Map navigation

To navigate through the map, left-click anywhere and drag the map in the desired direction.

Zooming the map

To scale the map, you can also use several methods.

Using the scale on the map

In the upper left corner of the map, under the navigation buttons, there is a scale bar that allows you to zoom in (+) or zoom out (-). In this case, the center of the map does not change its position. You can press the **+** and **-** buttons to change the scale in a step-by-step mode, or click anywhere on the gradation scale.

Using the mouse scroll wheel

It is even more convenient to adjust the zoom level using the mouse scroll wheel. Scroll up to zoom in and scroll down to zoom out. Direct the cursor to the required place so that it is not lost from view when the scale is changed.

Using the mouse and the Shift key

To zoom in on the area you selected, hold the **Shift** key and click on any rectangle on the map

Using a double-click

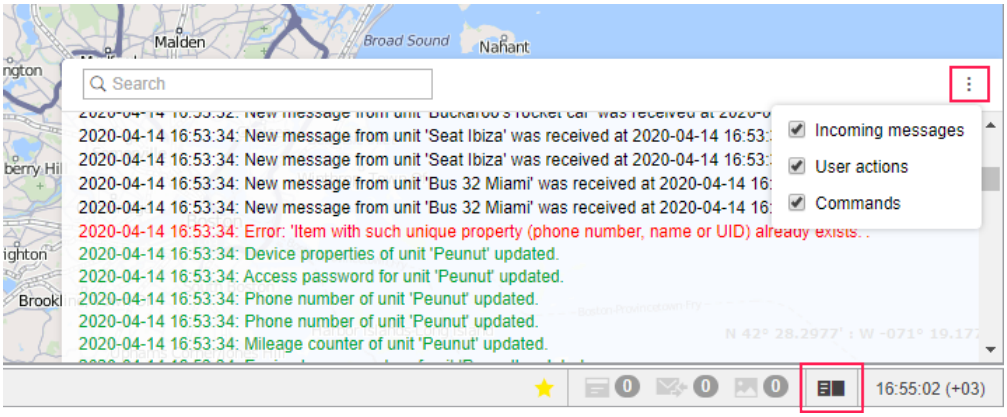
Double-click any point of the map to zoom in on it.

In the lower left corner of the map, the current scale of the map is indicated. In the lower right corner, you can see the geographical coordinates of the place the cursor points at. The coordinate format is selected in user settings and can be either degrees or degrees and minutes.

Log

In the lower right corner of the screen, there is a log that opens by clicking on the icon in the bottom panel. The log displays information about user actions, commands execution, and receiving messages from the units included in the work list of the monitoring panel.

You can adjust the size of the log by dragging its border or corner. At the top of the log, there is a dynamic search, and in the upper right corner, there is a log settings icon (⋮). In the settings, you can filter messages by type.



An arrow is displayed at the end of the lines for which unit location data are available. Click on the arrow to see the place of the event on the map.

Different colors are used to display text in the log:

- black is used for records of the actions of the unit, a change of location, a new SMS from the unit, etc.;
- green is used for records of user actions (creating and editing units, geofences, changing settings, etc.);
- red is used for error messages and alarm messages from the unit.

ⓘ When messages are sent from the black box or retransmitted, only those that have been generated not earlier than one hour before the last positional message are logged.

Shortcuts

Keyboard shortcuts ensure more convenient and quick means to navigate through the system. This feature is activated in the user settings.

Shortcuts for panels navigation:

- M — Monitoring;
- T — Tracks;
- E — Messages;
- R — Reports;
- G — Geofences;
- O — Routes;
- D — Drivers;
- I — Trailers.
- J — Jobs;
- N — Notifications;
- U — Users;
- Y — Units.

Shortcuts for tools activation:

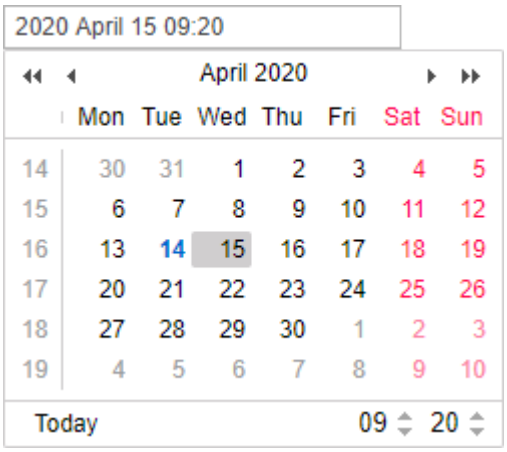
- 1 — Track player;
- 2 — Distance;
- 3 — Area;
- 4 — Address;
- 5 — Routing;
- 6 — Hittest;
- 7 — Nearest units;
- 8 — LBS detector;
- 9 — SMS.

Other shortcuts:

- A — Apps;
- F — Search on map;
- S — User settings;
- ~ — show/hide the left panel;
- L — show/hide the log.

Calendar

The calendar is used in many cases: to specify the time intervals to generate reports, indicate the date and time in notifications, jobs, routes, etc.



The calendar date includes the year, month (the name of the month is written) and day. The date mask selected in the current user settings dialog affects only the arrangement order of the year, month and day. The earliest possible date is January 1, 1971.

As for time, its format corresponds to the mask selected in the user settings dialog. The only exception is that regardless of the mask applied seconds are not displayed in the calendar.

There are several methods to work with the calendar and quickly set up a desired date and time: manual input, using buttons or the mouse scroll, etc.

Method 1

The date and time can be adjusted without opening the calendar itself — in the text field above it.

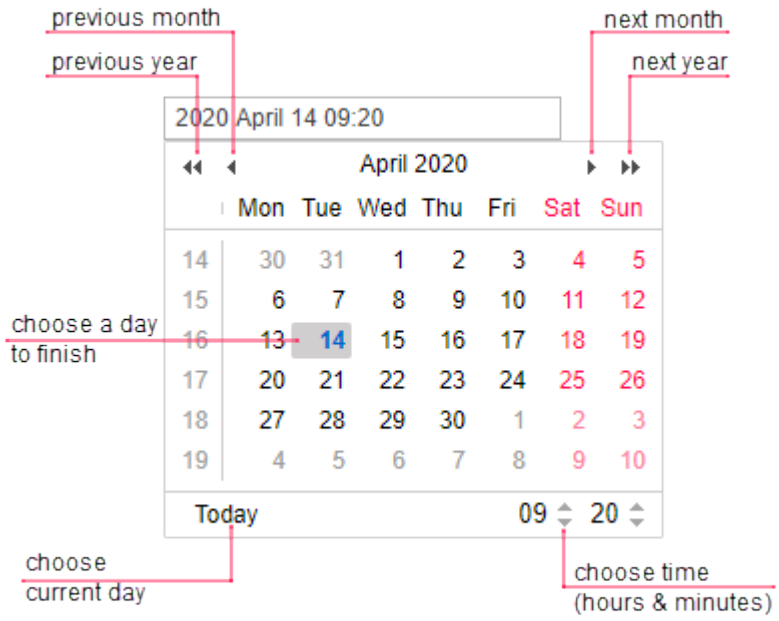
You can do this either manually, using the keyboard, or using the mouse scroll wheel. Place the cursor over the time element you want to alter and scroll up (to increase) or down (to decrease).

Method 2

Open the calendar, point to the date and time input field and click the left mouse button. Use the arrows to select the year and month. To change these values, you can either click on these buttons or use the mouse scroll. Single arrows are used to select the month, double — to select the year. After moving to the required month and year, click on the date below with the left mouse button. This closes the calendar, and the date you selected appears in the text box.

If you need more accuracy, then before selecting the date, specify the time in the lower right corner of the calendar. You can use the numeric input from the keyboard, as well as the scroll wheel.

Changes are accepted after clicking on the date with the left mouse button or pressing the **Enter** key.

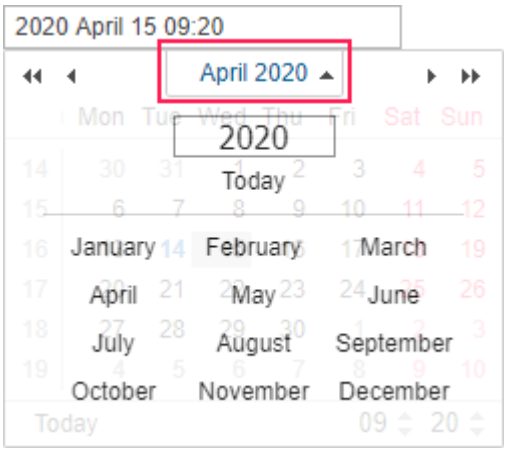


Method 3

Today's date can be set in one click. Open the calendar and click **Today**. This action affects the year, month and day but does not affect hours and minutes.

Method 4

In the calendar, click on the month and year field with the left mouse button. Below is the field with the year number. There enter the required year from the keyboard, then click on the name of the month and select the day.

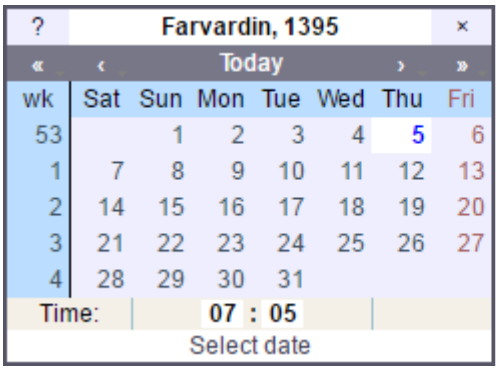


Additionally, you can set the hours-minutes in the manner described above.

The Persian calendar

The method of working with the Gregorian calendar is described above. However, Wialon additionally works with the Iranian calendar (also known as the Persian solar calendar). It is used in Iran and Afghanistan.

The Persian calendar can be activated in the user settings. If Persian (Farsi) is selected as the interface language, the calendar is also in Persian and is shown from right to left. In other cases, it is in English (in Latin characters and Arabic numbers) and shown from left to right.



In the Persian calendar, just as in the ordinary calendar, you can set a date, quickly select the present day, turn over the months and years, specify the time. By clicking on the question mark at the top you can call up more detailed information. To close the calendar, click on the cross-shaped button. In addition, the calendar can be dragged anywhere.

Filters and Masks

When creating various objects in the monitoring system (geofences, drivers, custom fields, sensors, etc.), lists are generated from them. Objects from the lists are displayed in the alphabetic order, with numbers first, then letters of the Latin alphabet, and then Cyrillic. Uppercase and lowercase letters are not taken into account. When you create a new object (for example, a new job or custom field), it is originally added to the end of the list. When you later open this list, the objects will be arranged in the alphabetical order. After renaming, the object remains at its former place until you reopen the list.

Filters and masks are used for convenience. They allow narrowing the list of items in such a way that only the objects necessary for users are shown. Also, they allow to find the objects with particular characteristics or name in the list and specify the objects of tracking system towards which a report, notification, etc. will be applied.

Dynamic search

If the list contains many items, it may be difficult to quickly find the required one. For convenience, you can use the dynamic search available in most panels. Start entering the name of the object (geofence, unit, route, and so on, depending on the active panel). You can type just a part of the name. As you enter the text, the list shows the items that match your query. The search is not case-sensitive.

If you leave the filter field empty, all the available items will be displayed in the list.

You can also use the dynamic filter when adjusting the access rights on the **Access** tab of the user, unit, and unit group properties. Moreover, you can use the dynamic filter to select a resource when creating notifications, jobs, report templates, geofences, drivers, or trailers (as well as their groups and automatic binding lists).

The usage of the dynamic filter in the **Monitoring** panel is described in the Unit list management section.

When searching, you can also enter special characters such as ***** and **?** the usage of which is described below.

Name mask

Besides the dynamic search, you can use filters to select an item when executing reports, configuring notifications, and so on. To do this, specify the name mask of the item, using special characters such as an asterisk (*****) and a question mark (**?**).

The asterisk is a special symbol which can be inserted in the query text to indicate any combination of characters in the name of the item. You can put an asterisk anywhere in the query (at the beginning, in the middle, at the end) or in several places at once, depending on what part of the name is known or is the same for a number of items. For example, if you type ***H*nda***, all **Hondas** and **Hyundais** will be found.

Another special symbol that you can use is a question mark (**?**). It replaces any character (one question mark stands for one character). You can put it at any place of the query.

The request is case sensitive.

Suppose that a unit has two fuel sensors with the names **Fuel level sensor** and **Fuel in tank**. You should create a notification that takes into account the values of both sensors. To do this, you should set the name mask that matches both of the sensors. In this case, the best choice is ***Fuel***.

If you do not want to use a name mask with asterisks and question marks, you should enter the exact name of the item.

To find **all** the items of a certain type (sensors, geofences, users, and so on), enter one asterisk in the query field.

You can use masks:

- in notifications to specify the monitored sensor, route, or driver, as well as to set an SMS text mask or a message parameter;
- in user properties to set a host mask for a user;
- in reports to specify the driver, sensor, event (violation), route and its geofence, and when selecting geofences;
- in the Messages panel to filter messages;
- in all panels instead of the dynamic filter.

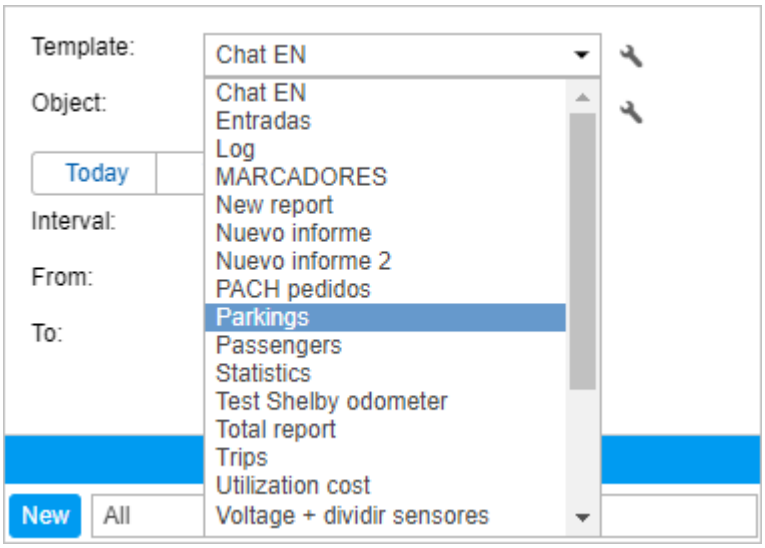
Manipulations with lists

When working with lists, keys and keyboard shortcuts can be used. Using the keys facilitates a lot of operations, such as list navigation, search for necessary items and their selection.

Dropdown lists

Dropdown lists are widely used in the monitoring system. They provide a possibility to work with a large number of items. For example, this can be a list of units available when generating a report, requesting messages, etc., a list of tables when editing report templates, etc.

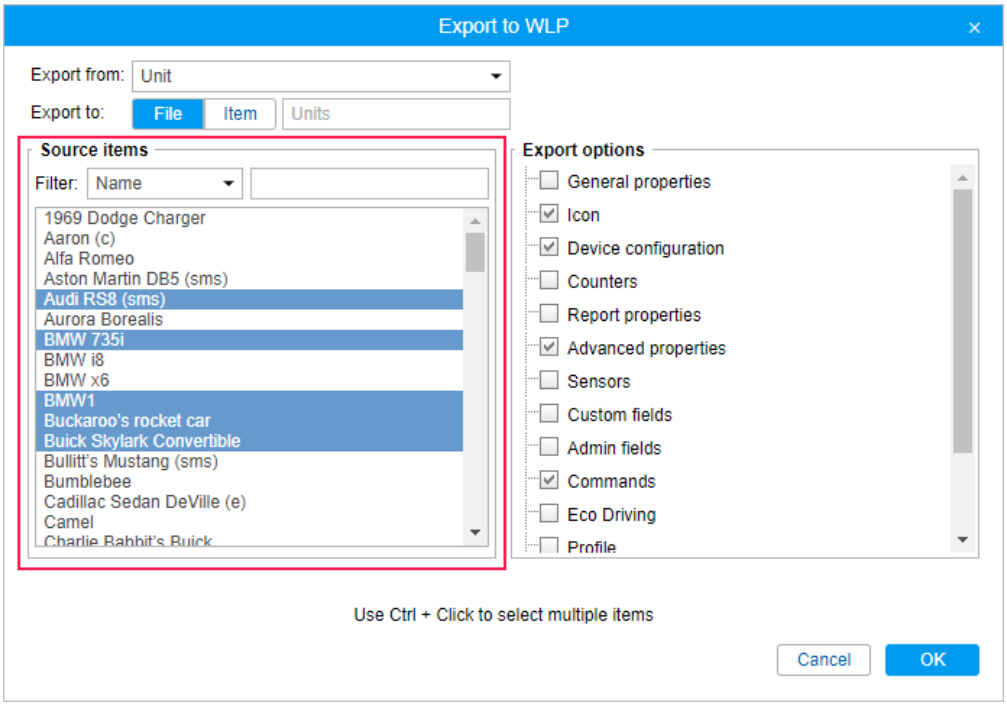
When building tracks or querying messages and reports, you can use dynamic search in dropdown lists. For tracks and messages, you can quickly find a necessary unit in the dropdown list, for reports you can find templates or objects. To use the dynamic search, click the corresponding dropdown list and start entering the name. You can use a wildcard character asterisk (*) to facilitate the search. As a result, the dropdown list is filtered according to the indicated symbols.



To work with the dropdown list, you can use a keyboard. Use arrows (up/down) for navigation through the list and the **Enter** key for choosing a necessary item.

Multiple selection list box

In the lists of such type, you can select multiple items. To choose several items throughout the list, hold the **Ctrl** button, and consequently click on the necessary items.

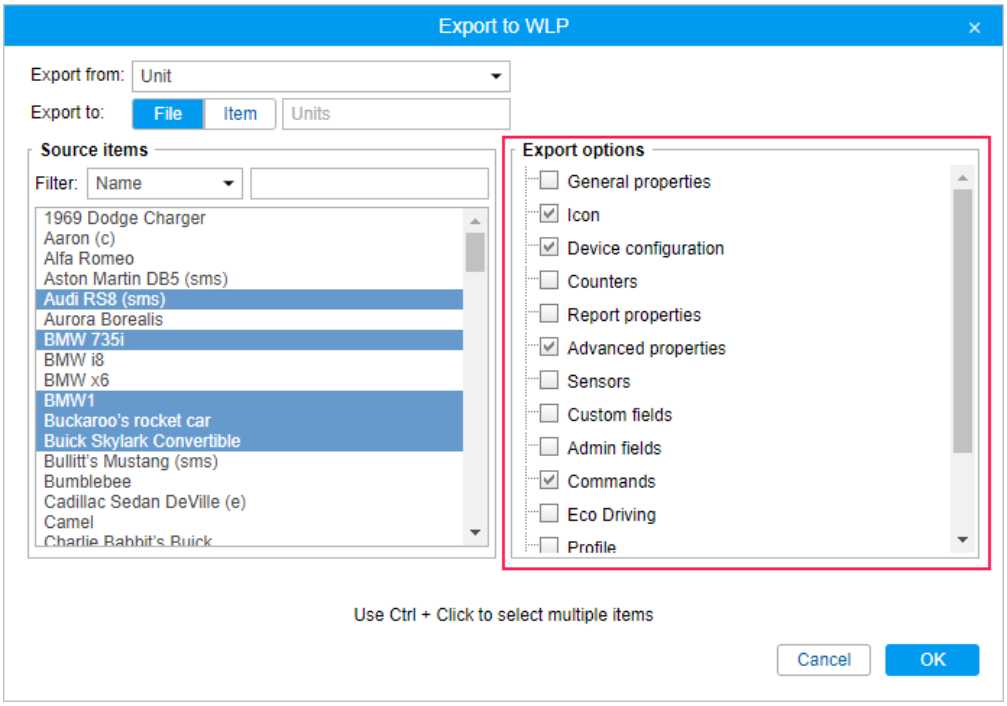


Moreover, the following keys and their combinations can be used:

- Home — move to the beginning of the list;
- End — move to the end of the list;
- up arrow — move to the previous item;
- down arrow — move to the next item;
- Ctrl + A — select all;
- Shift + Home — select everything from the current place to the beginning of the list;
- Shift + End — select everything from the current place to the end of the list;
- Shift + up arrow — consequently select the items going up from the current one;
- Shift + down arrow — consequently select the items going down from the current one.

Checkbox list

Multiple selection lists may contain checkboxes indicating whether the item is selected or not. The **Ctrl + click** combination can be used in such lists in order to check/uncheck all the items at once.



When working on macOS, it is necessary to use the ⌘ **+ click** combination instead of **Ctrl + click**.

Input Rules

Below you can find the rules that must be followed when entering data.

Names of units, unit groups, users, accounts, routes, and retranslators must contain at least four characters. Other objects (such as geofences, drivers, report templates, sensors, and so on) may have names with the length of one character.

Names of units, users, unit groups, accounts, and retranslators must not contain more than 50 characters.

You cannot enter letters in numeric fields (phone numbers, counter values, radius, fuel consumption settings, settings of trip detection, and so on).

It is forbidden to use the following characters: " (double quotes), { } (curly braces), \ (backslash).

It is forbidden to use:

- spaces at the beginning or end of the editable field (allowed in the middle);
- commas in the numeric fields as separators (to introduce fractional numbers, use a dot as a separator);

- commas, colon, ampersand (&) in the report templates (in column names, table headings, and names of statistics fields).

It is not recommended to use > < (angle brackets), as in some cases they will automatically be replaced with **>** and **<**.

If the data is incorrect, the line is highlighted in red and the **OK** button becomes inactive. As a result, you will not be able to save changes or create an object.

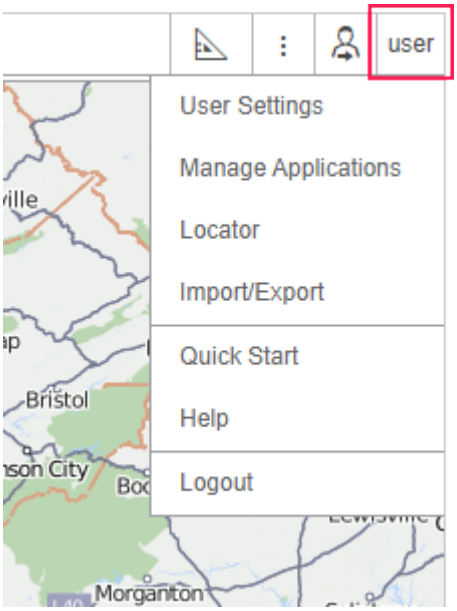
Phone numbers and email addresses

Phone numbers must be entered in the international format and contain all the necessary codes (country code, communication statement or city code, and then the phone number itself). Brackets, spaces, and hyphens are not allowed. The only symbol that can be used for entering phone numbers is plus (+) at the beginning of the number. Examples: **+19176726154, +15551234567**.

Email addresses must be in the format **username — the 'at' sign (@) — domain name**. Emails can contain letters of the Latin alphabet, as well as dots (.), hyphens (-), and underscores (_). Example: **username@domain.net**.

User Settings

Users can configure some system operation parameters according to their needs and tasks.



User settings can be changed if the corresponding checkbox has been marked in the user properties dialog.

To view user settings, click on the username in the top panel and then choose **User settings** in the menu.

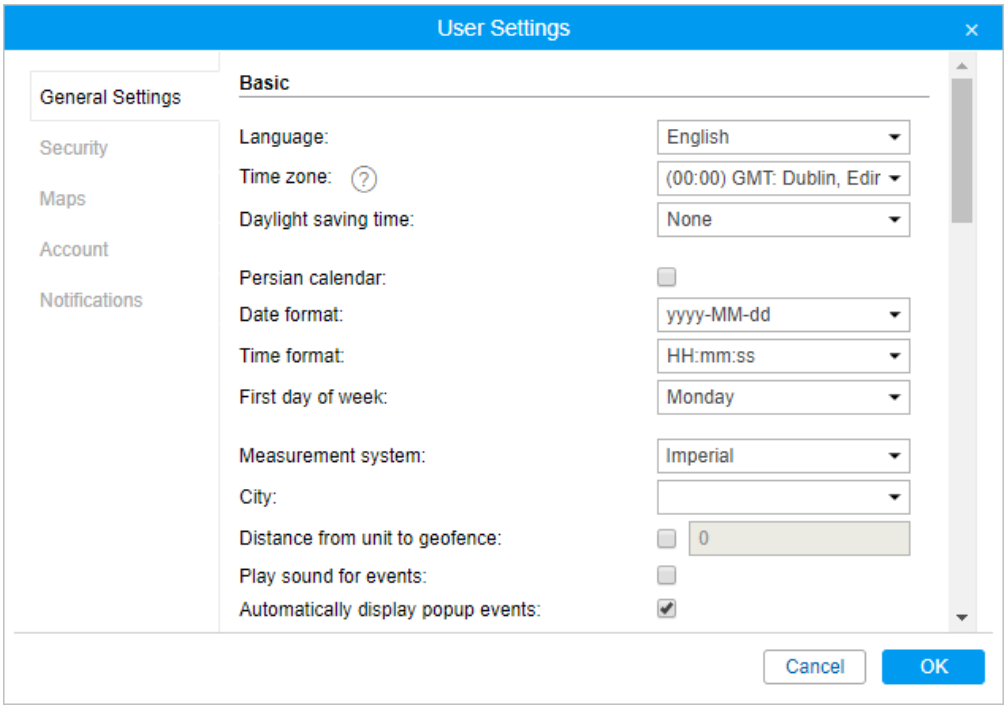
The **User settings** dialog can contain up to five tabs, depending on the system configuration:

- General settings
- Security
- Maps
- Account
- Notifications

The settings of one user can be imported to other users. Here you can learn more about the transfer of user settings.

General Settings

The first tab of the User settings dialog contains general settings. Here you can indicate your time zone, change the password to enter the system, and set many other parameters.



Basic

Language

The language menu. Contact your service administrator to expand the list of available languages.

Time zone

The choice of time zone influences the time parameters that are displayed in all dialogs and panels.

Daylight saving time

Specify DST options if you use summer and winter time in your region — choose the most appropriate DST schedule on the dropdown list. **None** — summer time is not used.

Persian calendar

This option allows activating the Iranian calendar also known as the Persian solar calendar. It is used in Iran and Afghanistan. If the option is chosen, the Persian calendar replaces the usual (Gregorian) calendar in the places where a user should indicate some time interval (to build a track, to query messages or a report, to set up a job or assign a route, etc.) Note that the Persian calendar can be used to indicate particular dates of an interval only (from – to). Working with **quick intervals** (**Today**, **Yesterday**, **Week**, **Month**, **Year**), the Gregorian calendar is applied. If the interface is in Arabic, the calendar is in Farsi (the language spoken in Iran) and is shown from right to left. Otherwise, it is in English (in Latin characters and Arabic numbers) and is shown from left to right (see details). Enabling/disabling the Persian calendar requires reloading the page.

Date and time format

Select the format of the date and time that is convenient for you. Depending on the entered mask, the data elements can be arranged in a different order and have a different appearance. A month, for example, can be displayed with a word or a number, a year with two or four digits, and so on. In addition, the day can also be included. The syntax instructions for each field are given in a tooltip. In the drop-down list, you can select one of the predefined masks. The table below shows some examples of formats:

Date mask	Time mask	Result 1	Result 2
yyyy-MM-dd	HH:mm:ss	2014-01-25 09:45:33	1987-12-02 17:20:00
d/MM/yy	HH:mm	25/01/14 09:45	2/12/87 17:20
d MMMM yyyy dddd	hh:mm:ss tt	25 January 2014 Saturday 09:45:33 am	2 December 1987 Wednesday 05:20:00 pm
dd MMM yyyy ddd	hh:mm tt	25 Jan 2014 Sat 09:45 am	02 Dec 1987 Wed 05:20 pm

First day of week

Select either Monday or Sunday as the first day of the week. This affects the appearance of the calendar and the manner of counting weeks in general.

Measurement system

Select one of the available measurement systems. The corresponding units of measurement are used in such tools as Distance, Area, Routing, Nearest Units. The measurement system also influences address processing, as well as the creation of routes. However, the earlier created units and resources (together with geofences, jobs, and notifications) possess the measurement system selected upon their creation. As for reports, their measurement system is set separately (refer to Advanced settings of a report template).

City

In this field, you can indicate your city. It is used in the Nearest Units and Address tools as the default city. Enter the name of the city. When you enter the first letters, the dropdown menu with the names corresponding to the request opens automatically. You can either continue typing in the name or choose it from the drop-down menu (there can be several cities with the same names in different countries).

In addition, this setting determines the position of the map when entering the monitoring system. However, if there are monitored units on the map, the map is scaled so that all of them are in sight.

Distance from unit to geofence

This option activates the calculation of the distance from a unit to a geofence when using the latter as the address. The maximum allowable value is 100 km or miles (depending on the selected system of measures).

ⓘ To work with this option, activate the Geofences service in the account properties.

Play sound for events

A sound can be played when an online notification is triggered or a driver's message is received. In Windows OS, QuickTime Alternative can be used as a media player. If you use Opera, you may need additional adjusting, so that the request to play or save the sound does not appear.

Automatically display popup events

If this option is activated, the online notifications and the messages from drivers are automatically shown on the display. If it is deactivated, only a number in the red circle in the bottom panel of the program near the corresponding icon indicates that new events have been received.

Use keyboard shortcuts

Check this box to activate the shortcuts.

Driver's activity

Check this boxto show the information on driver's activity in the unit and driver tooltips, as well as in the extended unit information.

Render charts on server

Check this box to use the static charts in the monitoring system.

Show additional information about the unit

In this section of the settings, you can choose what additional information about the unit should be displayed in the tooltip or in the worklist.

In the **left column**, check the boxes with the elements that should be shown in the unit tooltip (displayed as you hover the mouse pointer over the unit's icon). In the **right column**, check the boxes with the elements that should be shown in the extended unit information in the work list.

To select or remove the selection of all the items from any column, hold the **Ctrl** key on the keyboard and check any box of the corresponding column. You can change the order of those elements of the tooltip to the left of which there is the icon  . To do this, drag the double arrow icon up or down.

The unit tooltip can include the following information:

Last message

The time when the most recent message was received and how long ago.

Icon

Unit's icon of a larger size. If the icon has not been selected from the library and has been uploaded by the user, it is displayed in its original size, but not larger than 128×128 pixels.

Location

The most recent detected address of the unit.

Presence in geofences

If a unit in the latest message was within a certain geofence, the name of the geofence is displayed in the unit tooltip in the color that is assigned to it in the geofence properties. This option also affects units count in the **Geofences** panel.

Speed

The speed indicated in the latest positional message.

Altitude

The altitude indicated in the latest positional message (if the device is able to give such data).

Counters

The values of mileage counter and engine hours counter. To learn more, see Counters.

Satellites

The number of satellites locked in the latest positional message.

Coordinates

GPS coordinates of the unit, taken from the latest positional message received (in decimal degrees).

Sensor values

The sensors configured for the unit and their values converted according to the calculation table.

Connectivity settings

Device type, unique ID(s), and phone number(s) specified in the unit properties. This information is available to users with the **Edit connectivity settings** access right.

Parameters

The latest known parameters. Their names and values match those in the messages without conversion to other units.

Drivers

The name, photo, and phone number of the driver(s) currently bound to the unit.

Trailers

The name and photo (if available) of the trailer(s) currently bound to the unit.

Custom fields

Custom fields from the properties of the unit (general or/and admin fields depending on access rights).

Profile

Profile information of the unit.

Maintenance state

Specified service intervals and terms for their implementation (days/engine hours/kilometers left or expired).

> **The unit tooltip** contains information about the unit and its latest message. **The message tooltip** (as well as the tooltips of **charts** and **tracks**) only contains information about the message itself, i. e. does not include connectivity settings, icon, custom fields, profile, maintenance state, drivers, trailers.

Multicolor sensors in unit tooltip

Depending on the option selected in the drop-down list, the name and value of the sensor or only its value can be displayed in accordance with the color scheme adjusted on the first tab of the sensor's properties. If this option is disabled, the information about sensors is displayed in black.

> The mileage and engine hours counters are refreshed once a minute, as well as the information about drivers and trailers. Checking for presence in geofences is performed every two minutes. Other information is refreshed instantly.

Unit visualization

Replace unit icons with motion state signs

When the box is checked, all icons of the units are replaced by conventional signs showing their activity. The green arrow indicates that the unit is moving, and its direction shows — which way. The yellow circle means that the unit is standing with the engine running, the red square — that the unit is standing with the engine off. See Unit presentation on map.

Display overlapping units in one icon

If two or more units are **overlapping**, their icons are grouped into the common one.

It facilitates the visual perception of the map. The common icon is selected in the library (the **Library** button appears on the right when the setting is activated) and has a value indicator showing a number of units in it. To see the list of units the common icon contains, hover your mouse cursor over the icon for a pop-up window to appear. Upon clicking the common icon the map is scaled in such a way that all the units of the common icon get into the visual field. Note that overlaying icons cannot be grouped into the common one on the 2 largest scales. When you view the map on such a scale, accuracy is important, so all the icons are visible, regardless of their overlapping.

Show unit icons at map borders

If a unit is outside the visible area, its icon is displayed at the map border in the direction where the unit is located. Click on this icon to see this unit on the map.

Blur icons of inactive units

Check this box in order to differentiate unit states on the map.

Trace

It is possible to indicate the length of the trace which is added to a moving unit on the map (the **Points in traces** parameter) and select the color and width for it.

Other items on map

Display names of routes' checkpoints on map

Depending on the checkbox, route checkpoints can be displayed with or without their names on the map.

Display names of geofences on map

Depending on this checkbox, geofences can be displayed on the map with their names or without them. The color of the captions is adjusted in geofence properties.

Display overlapping geofences in one icon

If several icons of geofences overlap when displayed on the map, they can be grouped into one.

Place the cursor over this icon to know what geofences are hidden behind it. Note that for reports this option is set independently — in the advanced options of a report template.

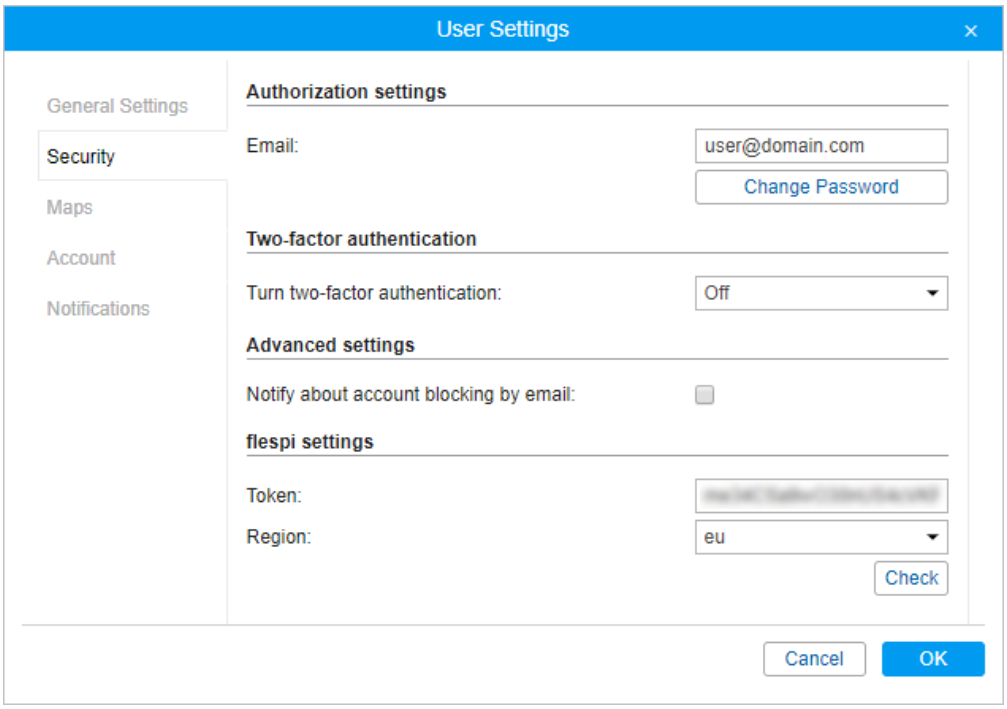
> ⓘ If more than 1000 geofences are displayed, they are grouped in one icon in case of overlapping.

Render geofences on server

By default, all geofences are rendered in the browser. Rendering on the server is advisable if not a very powerful computer is used for monitoring but the speed of internet connection is quite high. In such cases, the performance of the Wialon system increases significantly. When displaying a big number of geofences (more than 500), the option of rendering geofences on the server is activated automatically.

Security

On the **Security** tab of the user settings dialog, you can make the authorization settings and enable two-factor authorization.



Authorization settings

Email

An email address is required to recover the password in case it is lost and to receive a verification code when the two-factor authentication is enabled.

Change password

Type in your current password, and then your new password (twice). Click **OK** to save.

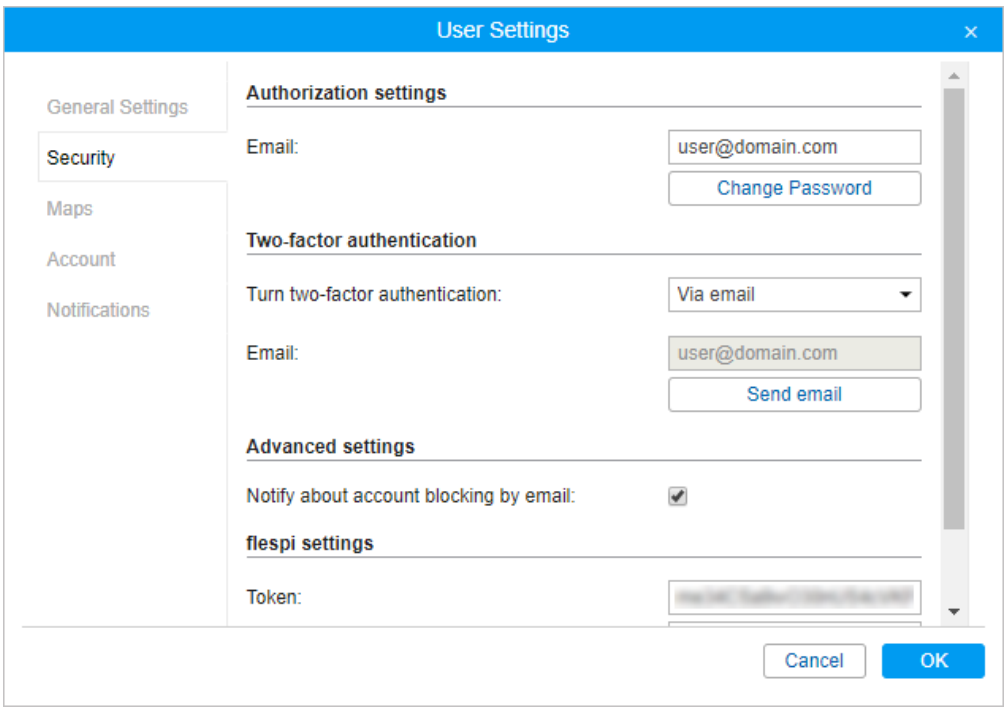
> ⚠ Not every user at the time of its creation is provided with the right to change the password.

Two-factor authentication

To enable two-factor authentication, in the drop-down menu select the method of receiving the confirmation code: via email or by SMS.

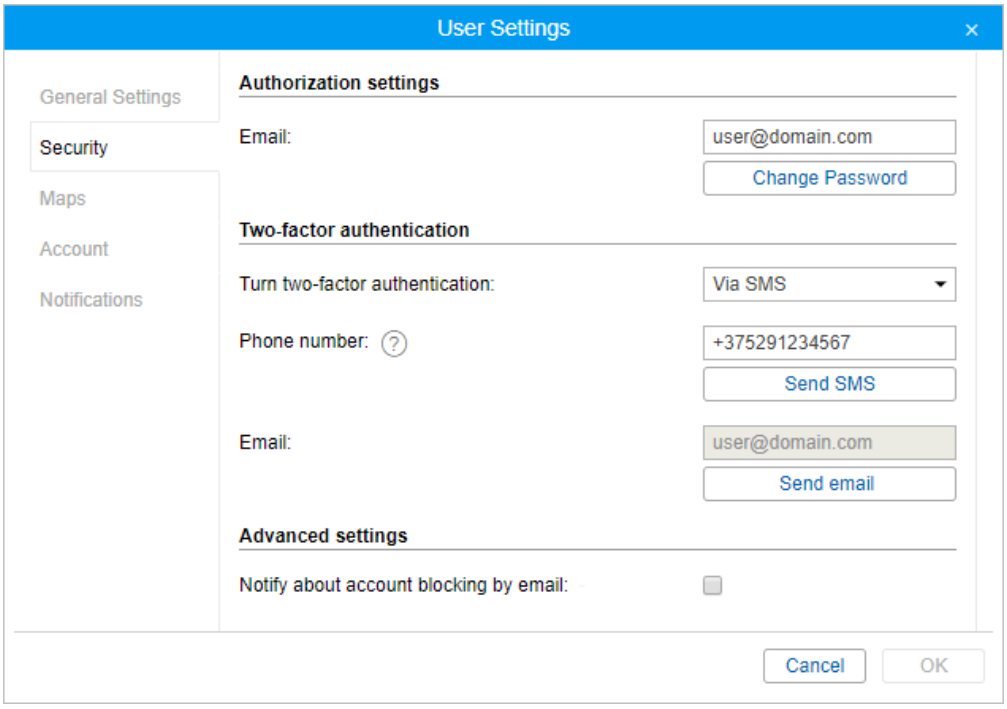
Via email

The code is sent to the email address specified in the authorization settings. To confirm the address, press **Send email** and enter the received code in the line that appears.



Via SMS

Specify the phone number to which you want the code to be sent. To confirm the phone number, press **Send SMS** and enter the received code in the line that appears. Standard rates apply for SMS messages.



In order to receive text messages, you should activate the SMS messages service in the account properties and the Can send SMS function in the user properties.

If an SMS cannot be sent (for example, the service is disabled or the number of available text messages is exceeded), the confirmation code is sent to the email specified in the authorization settings.

Advanced settings

Notify about account blocking by email

Activate this option to receive notifications about account blocking to the email address specified in user properties. Notifications start arriving daily 5 days prior to blocking.

To work with this option, activate the Email notifications service in the account properties.

flespi settings

Authorization

To obtain a token, click on the **Login** button and authorize in flespi.

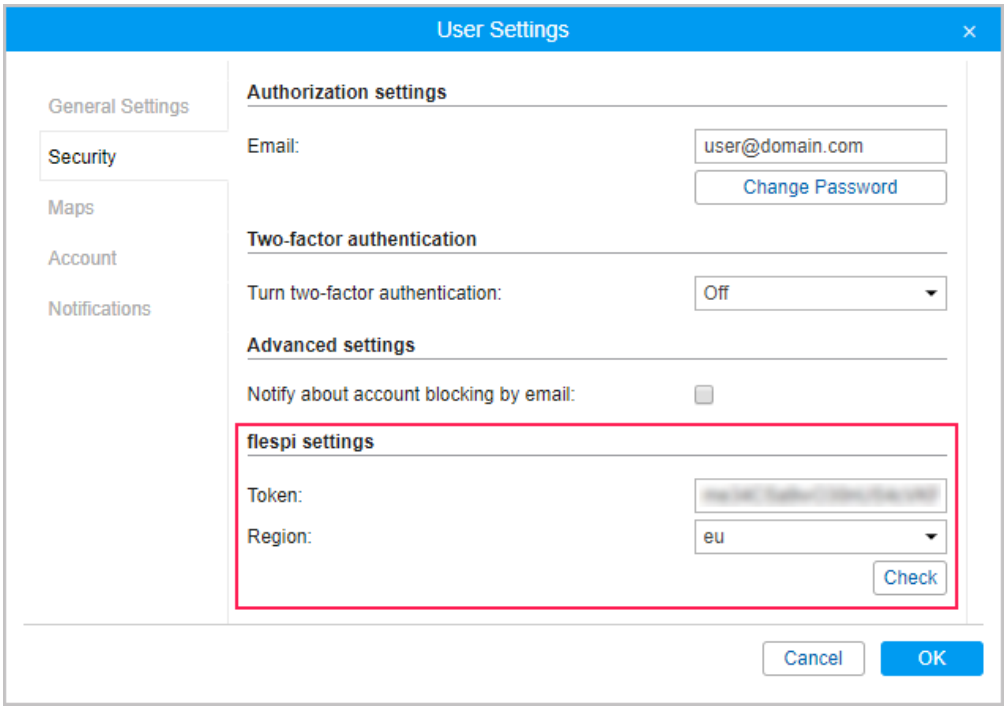
Token

The field with the generated token is displayed after successful authorization in flespi. The token is valid for one year. To see the information about the status (active/expired) and the expiration date of the token, click **Check**. If necessary, you can edit the token manually.

Region

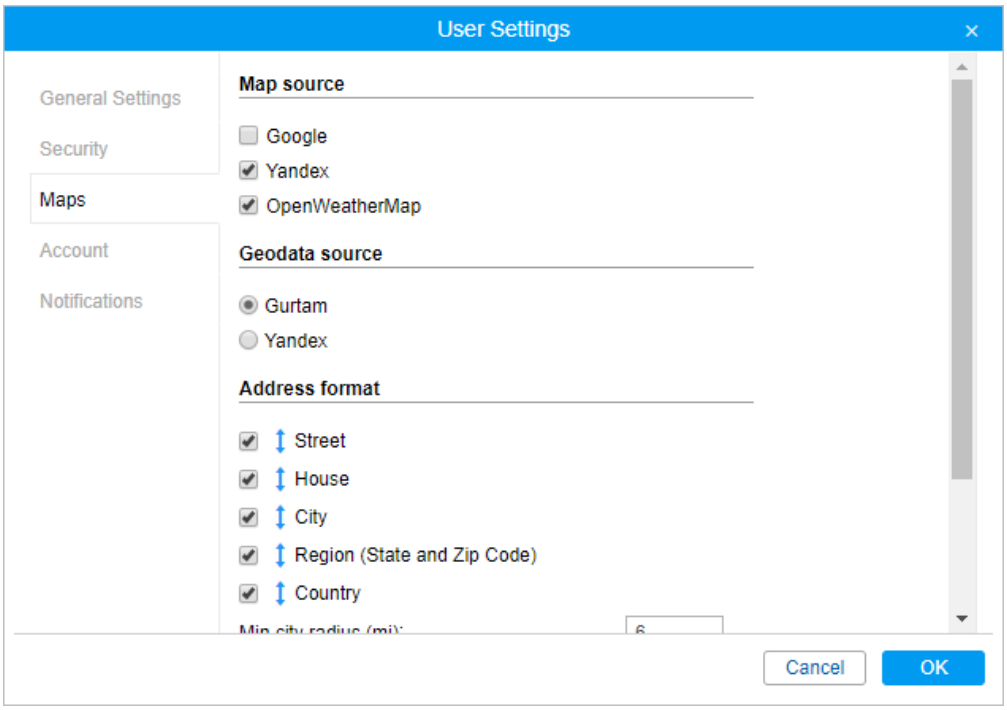
The data of flespi users can be stored in data centres in Russia or the Netherlands. The required region (ru or eu respectively) is selected by the user when authorizing in flespi.

In the user settings in Wialon, the region is displayed automatically for the generated token. If you indicate the token manually, select its region in the drop-down list.



Maps

Maps settings are adjusted in the User Settings dialog on the **Maps** tab.



Map source

Here you can enable or disable map sources selecting them in the list. Changes are applied after clicking **OK** and refreshing the page. Then you can select a map in the maps menu.

The following maps can be used in Wialon: Google, Bing, Kosmosnimki, 2GIS, WikiMapia, Visicom, Yandex, HERE, Regio, Luxena, what3words, MyIndia, ArcGIS, GoMap.az, Mapbox, OpenStreetMap, Amap, Namaa, and such additional layers as OpenSeaMap, OpenWeatherMap, AerisWeather. By default, all address information in Wialon Local is taken from the WebGIS server. However, it is possible to take the address information from the Gurtam Maps cartographic service (for a fee).

If you enable certain map sources, several types of maps are displayed in the menu at once. For example, if you select the Google map source, the menu shows such maps as Google Streets, Google Physical, Google Satellite, Google Hybrid, and Google Street View for tracking on minimaps. For some types of maps, additional layers are available (for example, traffic layer or maritime navigation).

> ⓘ The use of cartographic services is stipulated by the procedures established by the author or by another right holder of such services. When selecting a cartographic service, you confirm that you acknowledge and accept the full responsibility for its possible misuse.

Geodata source

In this section, you can select the source of address information used in the **Monitoring** panel, in the tooltips of units and tracks, in the **Messages** panel, in notifications, and while creating geofences and routes. Possible sources of geodata are Gurtam, Google, Visicom, Yandex, Mapbox, HERE, Luxena, what3words, ArcGIS, Amap. Only the maps that are activated in the site's properties are displayed in the list of available.

> ⓘ If you have selected Google or Yandex as the source of geodata, then in order for the monitoring system to display address information from these sources, you should indicate keys for server requests in the administration system.

If **Google (standard)** or **Yandex (standard) — geocoding** service is activated for the account and Google or Yandex is selected as the geodata source, the information about the location of the unit is shown in the reports in accordance with the format of the maps provider.

For the Gurtam geodata source, it is possible to activate the **MGRS coordinates** option if the user has the **MGRS** service.

⚠ If a geodata source other than Gurtam is chosen, the **Address format** block becomes unavailable.

Address format

Here you can specify the format for displaying address information in tooltips, tools, messages, and other places. Choose which of standard address components should be displayed: country, region, city, street, and house (at least one of these items should be selected). For example, if your units move mainly within the same city or town you can omit the country, region, and city and leave only the street name and house number in addresses. Address components can be put in any order. To change this order, drag components up and down using the arrow-shaped buttons. This format affects addresses mainly in cities/towns/villages.

⚠ Available only for Gurtam Maps.

This format is especially relevant if the units are moving around the city. For addresses outside the city (near roads), the following two settings are important:

- **Max distance from unit** determines that if the unit is on the road or close to it and there is a city/town/village at a specified distance, the address is displayed as the name of the road and the distance to that city (if several cities are found, then to the nearest one).
- **Min city radius** determines that if at a distance specified as **Max distance from unit**, no settlement is found, then the address is bound to some other city. The radius of the city that can get into the address information can be specified in this parameter. It may be necessary, for example, if only large cities should appear in addresses.

Coordinate format

The coordinates of the cursor shown in the lower right corner of the map can be either in degrees or in degrees and minutes. This option **only** influences the cursor's position format.

For the **Map source** and **Coordinate format** blocks, there is a possibility to check all the boxes at once. To do so, hold the **Ctrl** key and check any box of the corresponding block.

Account

The **Account** tab contains the **General** and **Statistics** sections. To switch between them, use the buttons at the top of the tab.

The tab is available only to the users with the **View item and its basic properties**, **View detailed item properties**, and **Query reports or messages** access rights to the account. If the **Query reports or messages** access right is absent, only the **General** section is available.

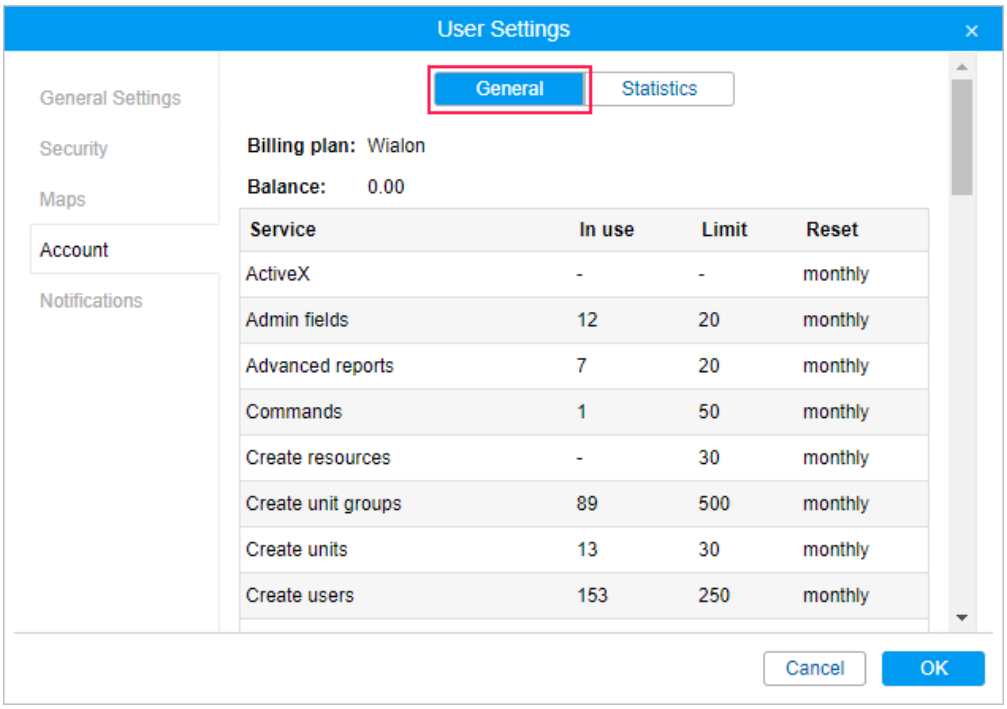
In the **General** section, the name of the billing plan, current balance, and the table with the list of available services are displayed. The table contains the following columns.

Service — the type of service.

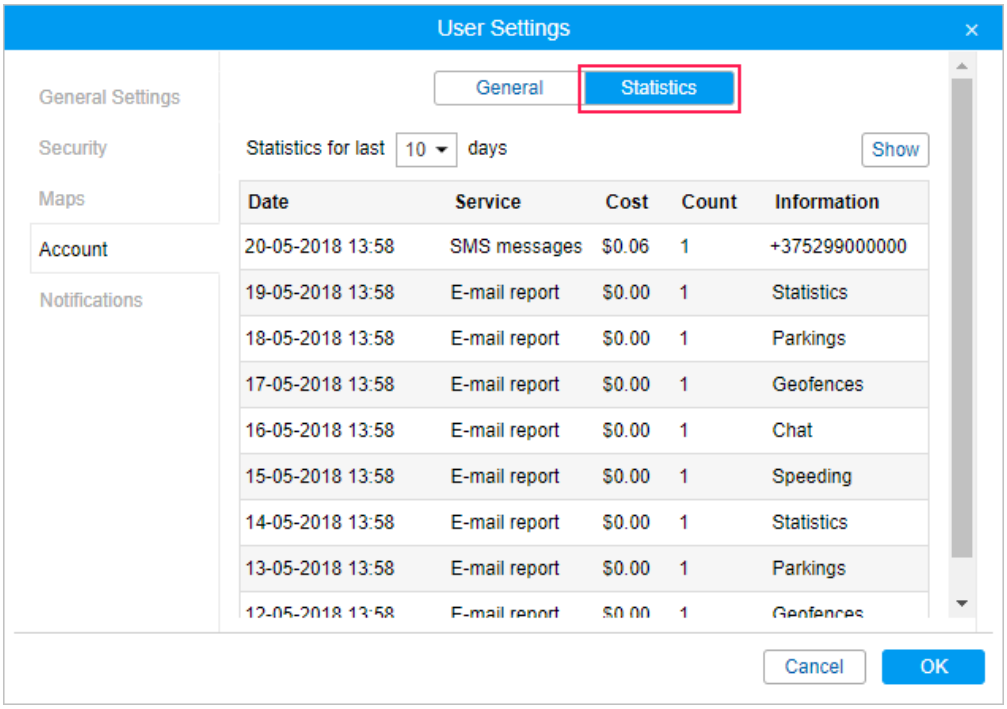
In use — the number of services of the same type in use.

Limit — the maximum number of available services of the same type. A 'zero' value means that the service is unavailable. If there is a dash, there are no restrictions.

Reset — the frequency (per hour, per day, per week, per month) with which the data about the services **In use** is reset.



In the **Statistics** section, you can get information about service charges for the period of up to 60 days. To do this, select the required time interval and press **Show**.

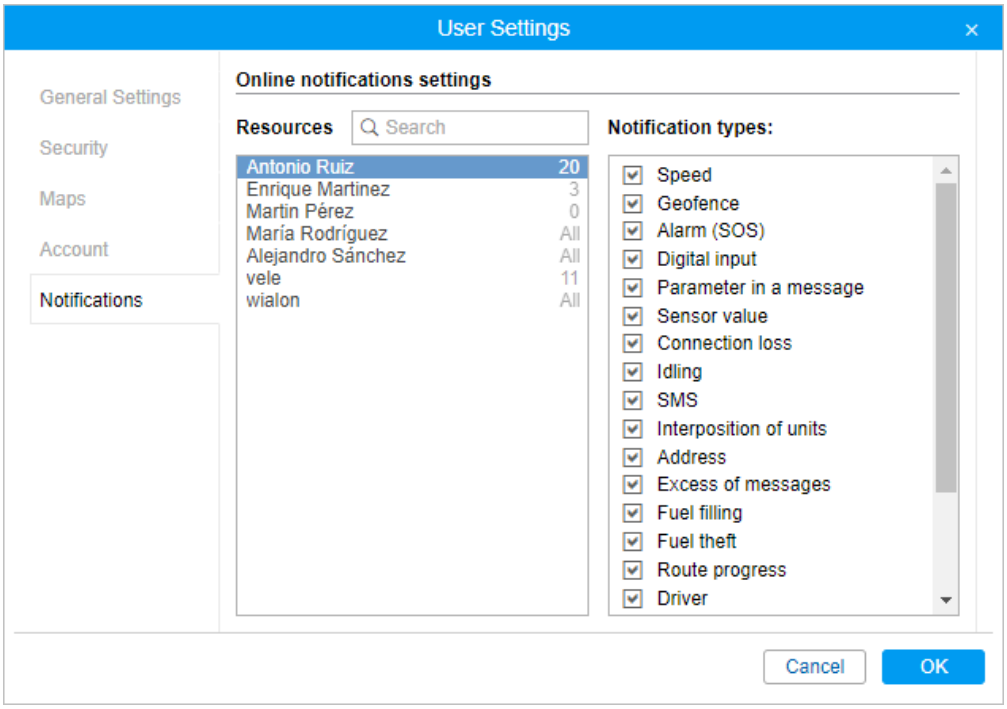


Notifications

Here you can configure the receiving of online notifications for the **Monitoring** panel so that to get them only from certain resources, and not from all the resources you have access to. For each resource, you can also indicate the notification types that should be received.

> The **Notifications** tab is only available to the top users and to the users with dealer rights.

There are two lists on the tab. In the left one, the resources are selected, in the right one — the notification types.

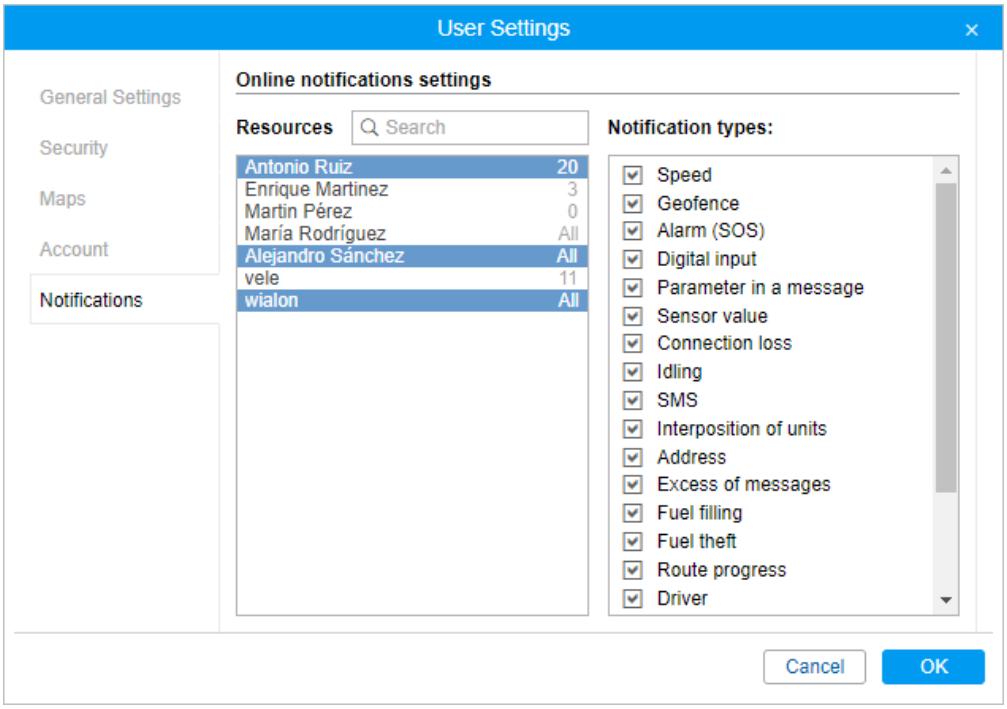


Next to the name of the resource, the number of the notifications selected for it is shown, and in the tooltip of the digital indicator — their list.

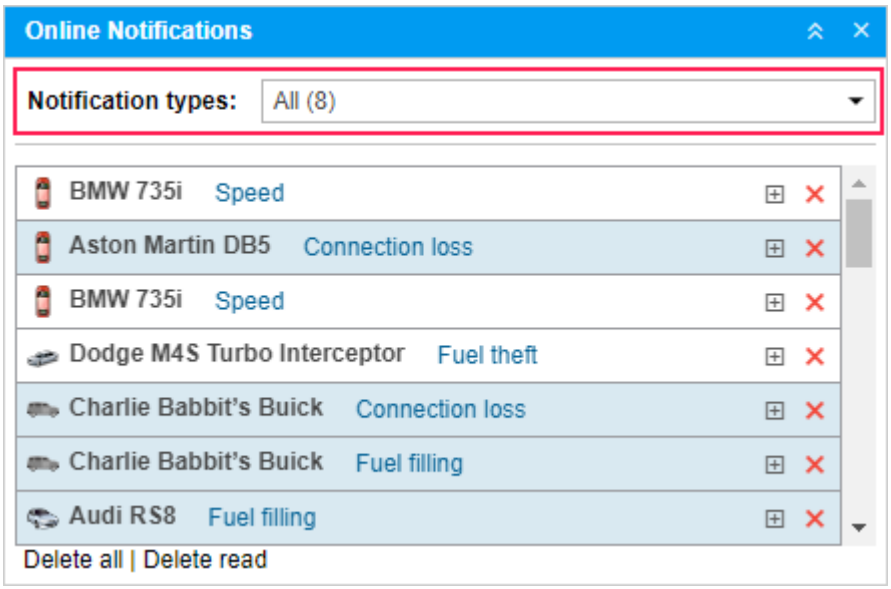
To configure the notifications filtration for a resource, the user needs the **View notifications** access right to it.

By default, all resources and all notification types for them are selected. To modify the list of notifications that should be received from a resource, select it in the list on the left. To quickly find a resource, use the dynamic filter. In the list of notification types, mark the ones you want to receive.

You can configure the notifications filtration so that it is applied to multiple resources at the same time. To do this, select the resources while holding the **Ctrl** key and mark the notification types in the list on the right. A black checkbox next to a notification type means that the settings of the selected resources differ (that is, for some resources, this type is marked and for the others, it is not).



In the online notifications window, there is a filter by notification type which is available to the top-level users and to the users with dealer rights.



Transferring User Settings

Individual settings can be transferred from one user to others or stored in a file.

You can import data from the User settings dialog, **Settings**, **Maps** tabs, and **Monitoring** panel. To do so, you should have the **Edit not mentioned properties** access to a user you import the data to. Most of the user properties can be imported, too (the **General**, **Advanced**, **Custom Fields** tabs). To

import them, you should have the **Change flags for given user**, **Edit not mentioned properties**, and **Manage custom/admin fields** access rights, accordingly. Such unique settings as email, password, account information, access rights, etc. cannot be transferred.

Here is the list of settings that can be chosen for import/export.

Time zone. Time zone and DST.

Date and time settings. Date and time format, first day of week, and the Persian calendar.

Additional information about the unit. Settings from the Show additional information about the unit section (they affect the content of the unit tooltip and unit extended view in the work list).

Monitoring panel configuration. Columns selected in the **Monitoring panel**, settings of **Secondary information** and other monitoring options.

Unit visualization. Settings from the Unit visualization on map section.

Other items on map. Settings from the Other items on map section.

City. The **City** field on the **Settings** tab (important in such tools as Address and Nearest Units).

Address format. Settings for formatting the address from the **Map** tab.

User interface parameters. Log status (open/hidden), shortcuts (on/off), settings for online notifications and messages.

Format of coordinates. Degrees or degrees and minutes.

Map source. The map source selected by the user.

Geodata source. The geodata source selected by the user.

General flags. Checkboxes from the **General** tab of the **User properties** dialog (including host mask).

Custom fields. Custom and administrative fields from the User Properties dialog.

Templates of access rights. Templates of access rights created by this user.

Custom message parameters. Send custom message command settings.

You can also make a **full copy** of a user. It includes not only the parameters mentioned above but also some hidden parameters (such as operational settings for Apps).

> When you import settings to the user, they are applied after the user refreshes the page or performs a login procedure.

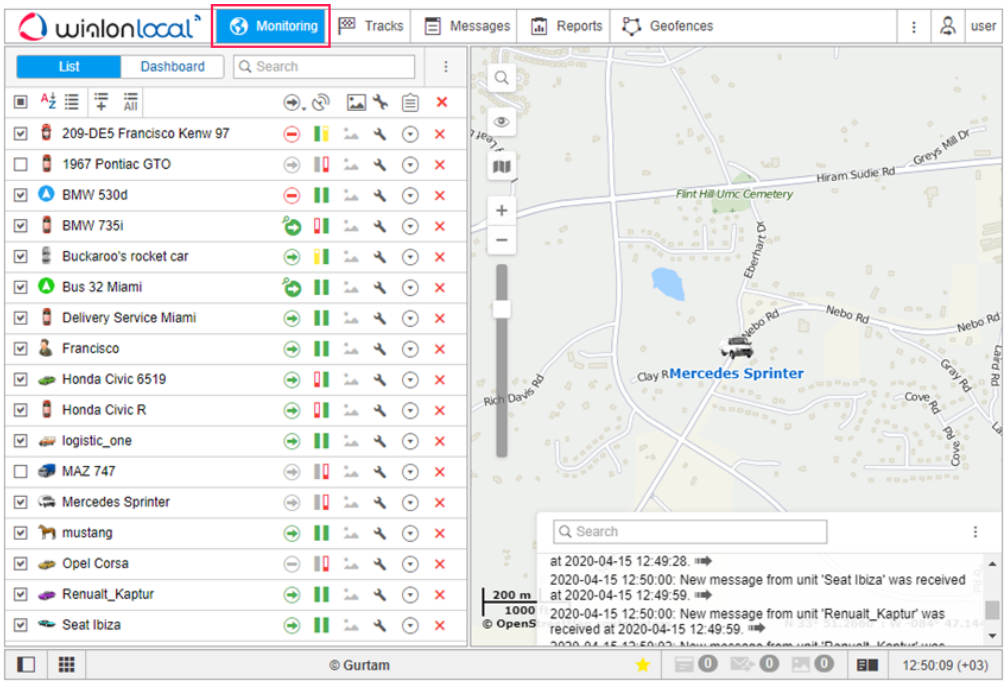
Monitoring

The **Monitoring** tab gives access to the main tracking features. Here you can watch the movement of units on the map, send commands and messages to them, request photos and videos, monitor parameter changes online, etc.

To open the Monitoring tab, click on its heading in the top panel. The heading is displayed if the **Monitoring** item is selected in the main menu customizer. Two modes are available on the tab: List and Dashboard. To switch between them, use the buttons at the top of the work area.

The Dashboard contains summary information about the units from the work list. The following data blocks are displayed here: **Connection state**, **Motion state**, **Geofences with units**, **Latest notifications**, **Mileage**. You can only view information in this mode.

In the **List** mode, you can manage the work list of units and monitor their movement on the map. The work list can contain either all units available to the user or just some of them. You can easily add and remove units from the work list, which does not lead to their removal from the system. To quickly find the required unit in the list, use the dynamic search above it. Next to the name of each unit, there can be icons that allow you to assess the state of the unit or perform certain actions. Above them, in the header of the table, there are icons which allow you to order units according to various parameters. To display the icons in the work list, configure the monitoring options.



To locate a unit on the map, click on its name in the work list. As a result, the map centers and zooms in on the selected unit.

The units are shown on the map if the **Monitoring** layer is activated in the visible layers menu. The map displays only those units that are selected in the work list. You can select all units at once by selecting the check box in the top left corner of the list. To cancel the selection of all units, clear the check box.

You can see the selected units on the map when they are in the visible area. You can move and zoom the map if needed. If the **Show unit icons at map borders** option is activated in the user settings and the unit leaves the visible area of the map, its icon is displayed on the edge of the map. Click on the icon to move to the unit on the map.

In order not to lose the location of the unit on the map, click on the **Watch unit on map** icon ( ). When a new message is received from such units, the map is automatically scaled so that you can see them.

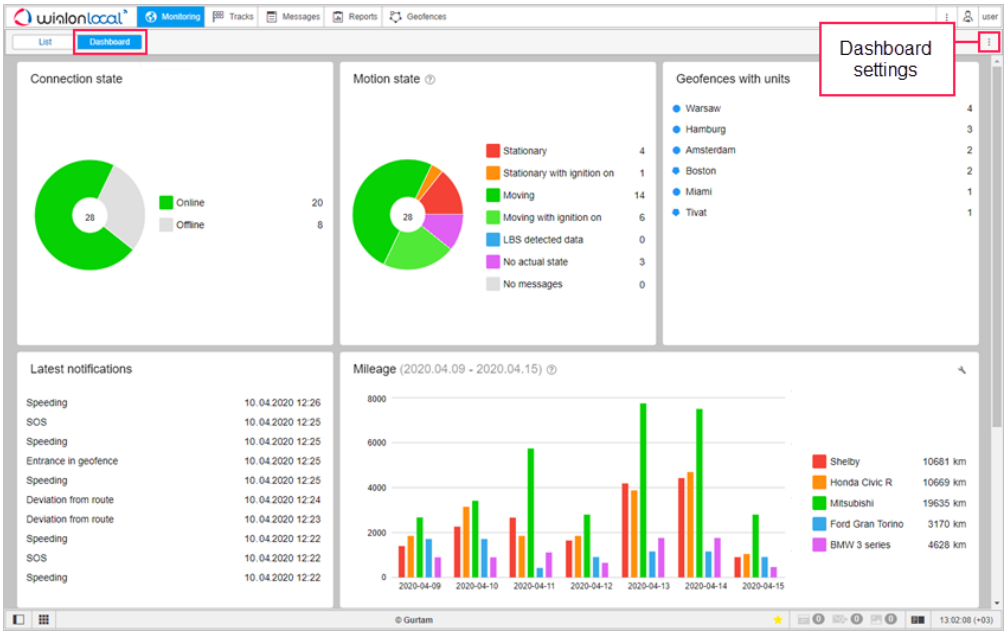
If a unit has a sensor of the **Private mode** type with the **Do not show unit location** option activated, then the location of the unit is not detected during the private mode trips. In this case, the icon is displayed next to its name. When the private mode is used, it is recommended to enable the display of unit names on the map.

Dashboard

The Dashboard contains summary information about the units from the work list. Here you can quickly assess the connection and motion state of the units, see the latest online notifications as well as the geofences where the units are located, and so on. The information is updated as new messages are received from the units.

> ⓘ The Dashboard is available to the users if the **Dashboard** service is activated in their billing plan or account properties in CMS Manager.

To open this page, click on the **Dashboard** button at the top of the work area on the **Monitoring** tab. If the work list on the tab contains 100 or more units, the Dashboard opens automatically when you log in.

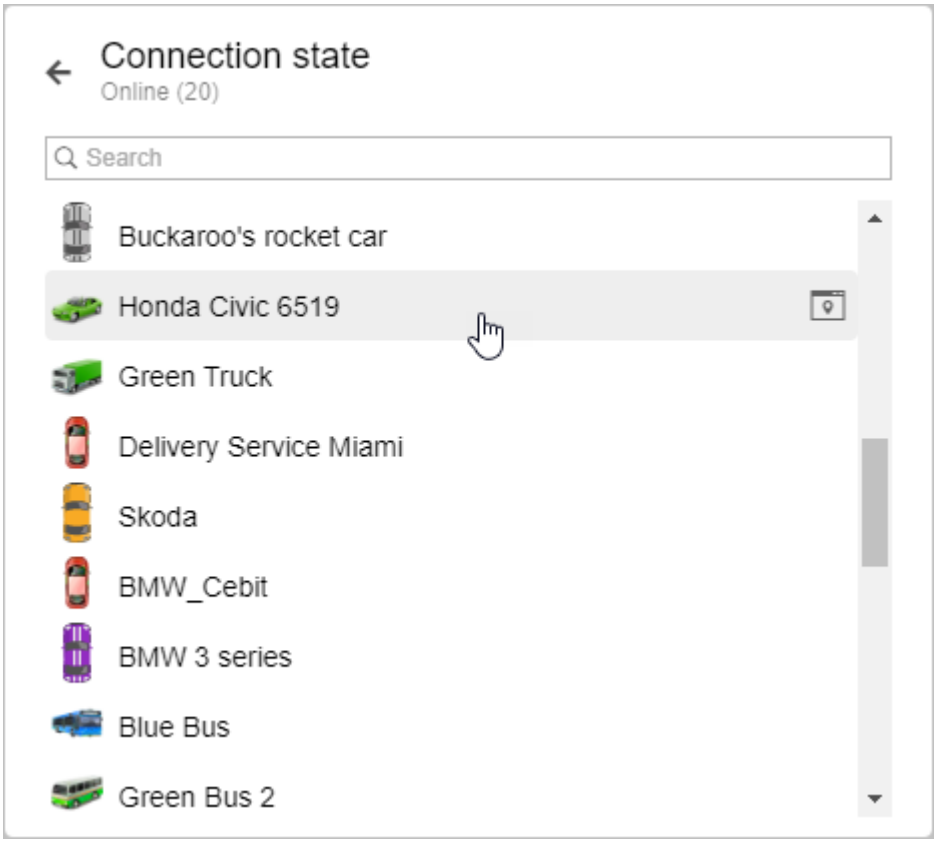


Seven information blocks are available on the page. In the Dashboard settings (⋮), you can select the blocks which should be displayed and change their order by dragging the arrows.

Connection state

This block contains a pie chart with information about the connection state of the units: online or offline. To the right of the chart is its legend, which shows what category is represented by each colour and how many units belong to it. When you point to a sector of the chart, a percentage of units belonging to this category is displayed.

To see the list of units belonging to the category, click on it in the legend.



To quickly find units by name, use the dynamic search above the list. Click on the line with the unit to open its minimap.

Motion state

This block contains a pie chart with the information about the motion state of units. The chart legend shows what category is represented by each colour and how many units belong to it. When you point to a sector of the chart, a percentage of units belonging to this category is displayed.

To see the list of units belonging to the category, click on it in the legend. Above the list is a dynamic search to find units by name. Click on the line with the unit to open its minimap.

Geofences with units

The block is displayed if the **Presence in geofences** option is activated in the User settings. It shows a list of geofences where the units are located at the moment. The following information is indicated for each geofence: type (graphically), name and the number of units.

Click on the geofence name to see the list of all the units located in it. Above the list is a dynamic search to find units by name. Click on the line with the unit to open its minimap.

Latest notifications

The block shows the latest online notifications as well as the date and time they were received. To open a notification, click on its name.

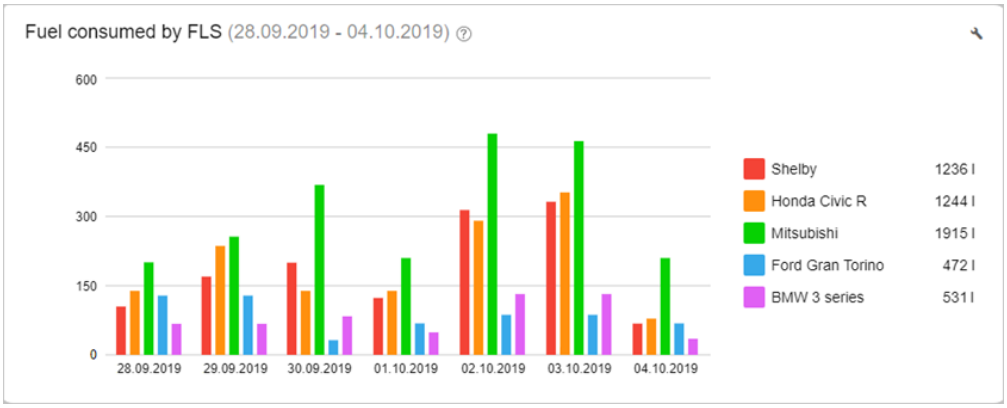
Mileage

This block contains a graph with the data on the mileage of units over the past seven days. The graph legend shows the mileage of the unit and the colour that corresponds to it. When you point to the part of the graph corresponding to one day, you can see a tooltip with the data on the unit mileage for that day.

You can change the list of units which are represented in the graph. To do this, click on the icon and select the required ones. (no more than 5). To quickly find units, use the dynamic search. Then click on the icon to go to the graph.

Fuel consumed by FLS

The graph of this block displays how much fuel was consumed by units and detected by the fuel level sensor (FLS) over the past seven days. The graph legend shows the volume of fuel consumed by the unit and the colour that corresponds to it. If the unit has more than one FLS, the sum of their values is indicated. To see how much fuel was consumed by the units on a certain day, point to the part of the graph corresponding to this day.



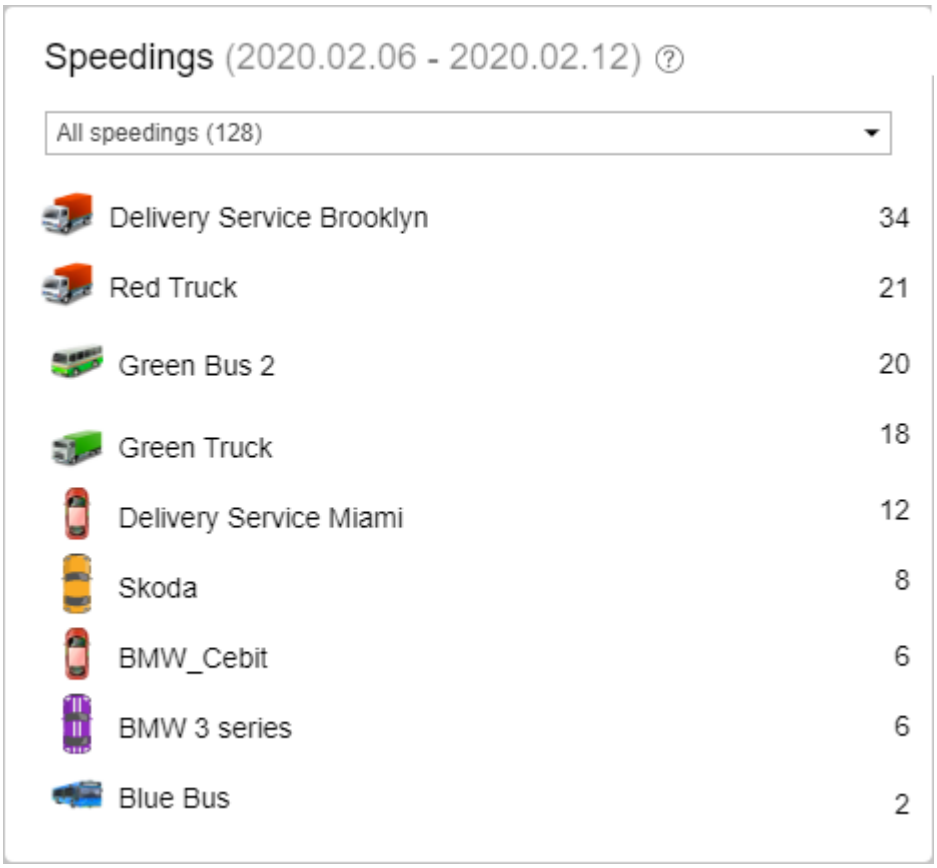
You can change the list of units which are represented in the graph. To do this, click on the icon and select the required ones. (no more than 5). To quickly find units, use the dynamic search. Then click on the icon to go to the graph.

Speedings

This block contains the list of units for which speed limit violations have been detected. Opposite the name of the unit, by default, the number of all its violations is shown. To filter them, select the

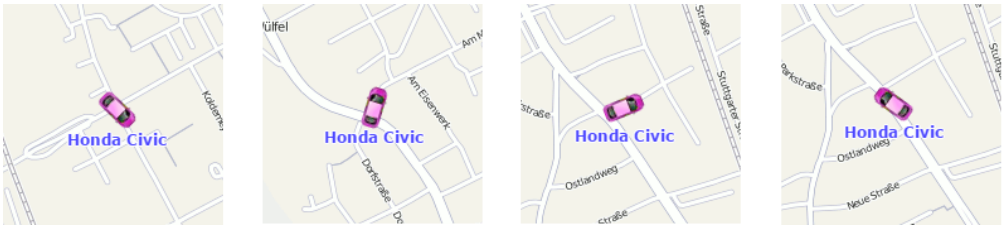
necessary range of values in the drop-down list in the upper part of the block. For example, you can display the number of violations where the speed limit was exceeded by 10 to 20 km/h.

The violations of the unit are shown in the block if the Use limits from roads method of speeding detection is selected on the **Advanced** tab of the unit properties.



Unit on the Map

By default, a unit on the map is displayed by an icon assigned to it which is selected when the unit is configured, and a caption with its name. Icons for units can be selected from a standard set, e. g.  , or you can upload your own image on the Icon tab. In addition, the icon can rotate depending on the course (direction) of the unit. This feature is also defined in the unit properties.

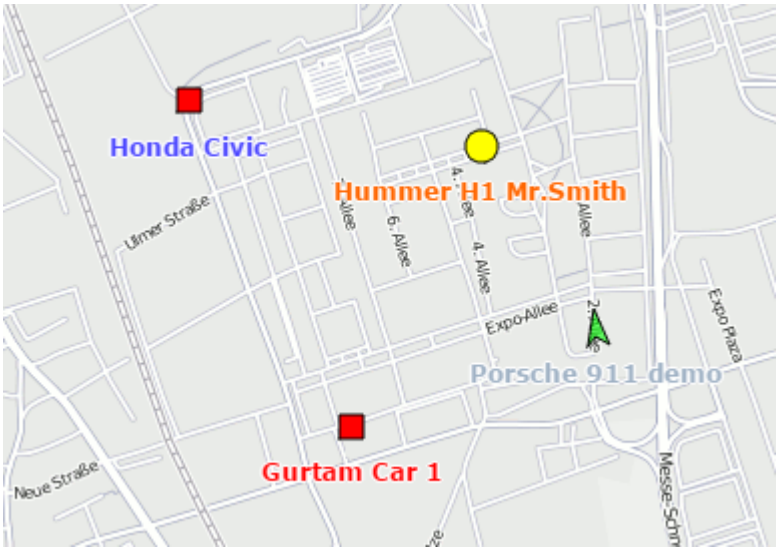


Icons that overlap each other on the map can be replaced by the common icon with a number indicator. To do this, select Display overlapping units in one icon in the **User settings** dialog.

Alternatives for icons

Unit icons can be replaced with the motion state signs. This option is called **Replace unit icons with motion state signs** and is set in the user settings. The following symbols are possible:

- green arrow — the unit is moving, the direction of the arrow indicates the direction of movement;
- red square — the unit is not moving (if there is an ignition sensor, it also means that the unit is standing with the engine off);
- yellow circle — the unit is standing with the engine on (only for units with ignition sensors).



Besides, the colors of these icons (arrow, square, circle) can be different and depend on the value of the sensor. This functionality is adjusted in the Advanced tab of the unit properties. In other words, the shape of the icon is defined by the state (standing still — square, moving — arrow), and the color depends on the sensor value (intervals and colors are adjusted in the sensor properties).

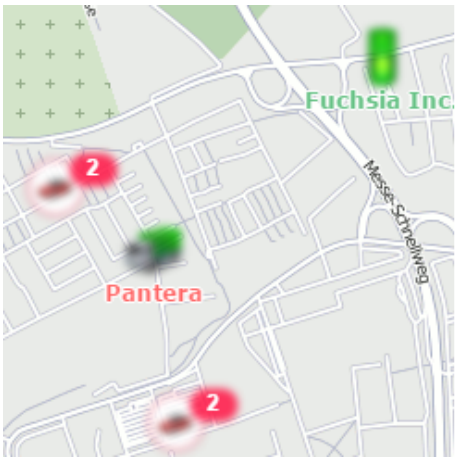
Unit names can be displayed or hidden on the map using the **Unit name** item in the layers menu.

Displaying inactive units

Monitoring units are conventionally divided into active and inactive ones. Inactive units are units that have not received messages with coordinates for more than 48 hours. Other units are considered active.

The system supports the possibility of differentiating unit states on the map. To do this, check the **Blur icons of inactive units** box in the user settings. In this case, inactive units are displayed on the map with blurred icons and transparent names. If the signs of motion are used instead of icons,

then the signs and names are displayed as transparent. If the **Display overlapping units in one icon** box is checked in the **User Settings**, and all the units with overlapping icons are inactive, the icon for them is displayed blurred. Moreover, the icons of drivers or trailers bound to the inactive unit are also blurred until they are unbound.



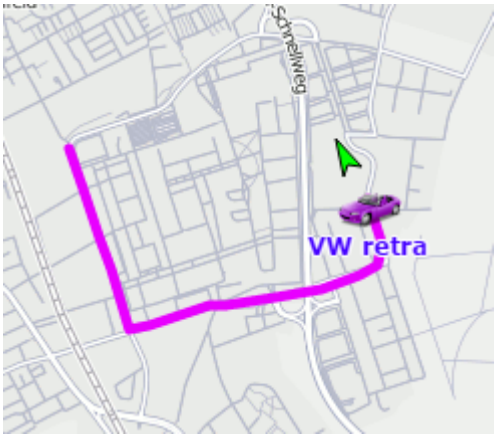
Displaying units with LBS detector

The **LBS detection** is an alternative method of finding units on the map. The accuracy of this method is inferior to determining the location using GPS, but if the unit experiences troubles with the GPS connection you can switch to the **LBS detection** method. To do this, it is necessary to check the Allow positioning by cellular base stations box on the **Advanced** tab of the unit properties dialog. Therefore, if the **LBS detected** data is more recent than the GPS data, it is used to determine the current location of the unit.

When using the **LBS detection**, units are displayed on the map in the following way: the current icon of the unit is placed into a transparent white circle with a red dotted stroke, the brightness of the icon decreases.

Other markings

If the unit is currently in motion, the green arrow shows the direction of its movement, and the unit can be followed by a trace which shows the track for the last few messages. If the unit is stationary (according to the last message), this arrow is not shown. If there was no motion within several last messages or the page has just been loaded, the trace is not displayed. Its length is determined by the data from the last five messages, but you can change this value, as well as adjust color and thickness of the trace in the user settings.



In the layers menu, you can configure the display of the following information about the unit:

- Unit trace — show/hide the trace of the unit;

- Unit name — show/hide the names of the units;
- Driver's name — show/hide the names of the drivers assigned to the units (if there are any);
- Unit movement direction — show hide unit's direction of movement.

If the display of names is enabled both for units and drivers, the drivers' names are shown in parenthesis. The colors of the captions are taken from the unit properties.

The icon to the left of the caption signals that the Do not show unit location option is activated for the unit and the private mode of the trip is detected.

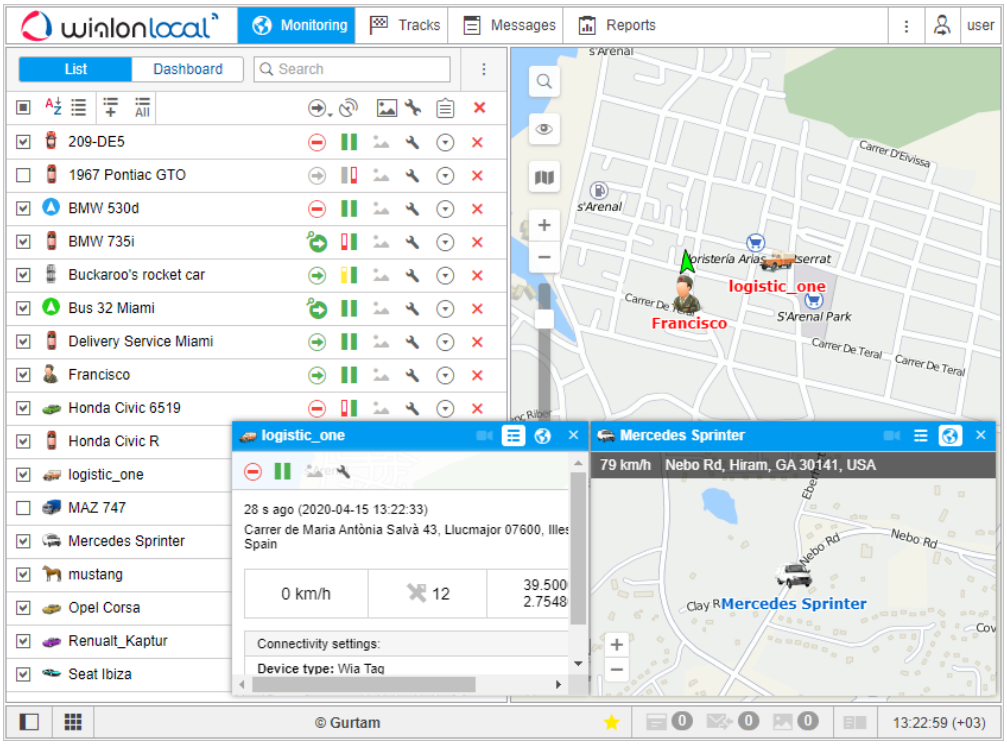
Minimaps

A minimap is an additional window which shows the current information about the selected unit. You can open a minimap in one of the ways below.

Double click on the unit name in the worklist of the **Monitoring** tab. In this case, the map centers on the selected unit.

Double click on the unit on the map. In this case, the map does not center on the selected unit.

> If the server has not received any messages with coordinates from the unit, its minimap is not available.



Minimap modes

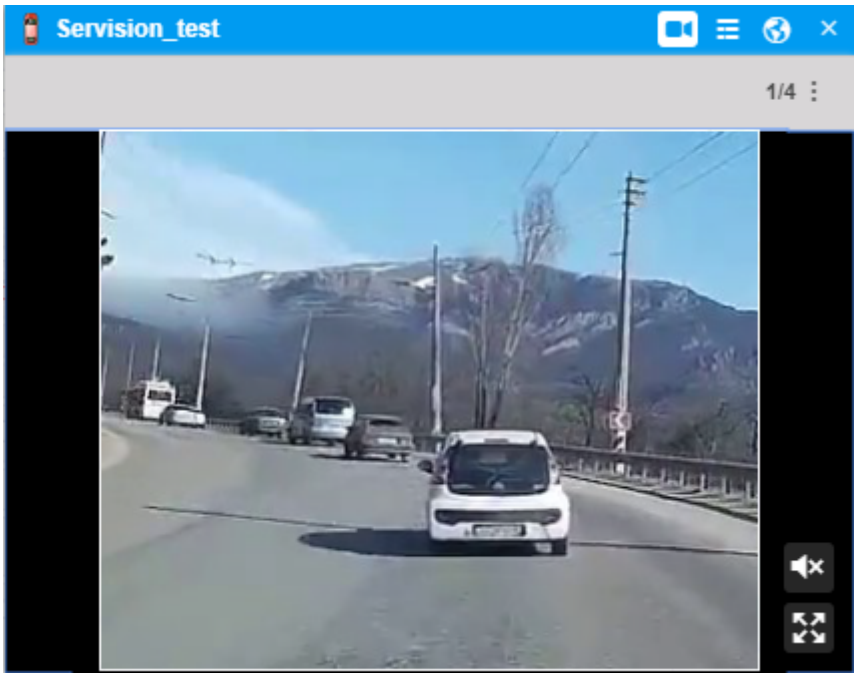
There are three modes available for minimaps: **Video**, **Info**, and **Map**. To switch between them, use the buttons / / in the right corner of the minimap header.

Video

This mode is available if you have the **View connectivity settings** access right to the unit and the **Video** service. The mode allows you to monitor a unit online and watch videos recorded previously.

To access the **Video** mode directly from the **Monitoring** tab, click on the **Video** button next to the unit name in the worklist. To display the button, configure the monitoring options.

At the top of the minimap, there are the **Live** and **Archive** mode switch buttons (on the left), as well as the button to open video display settings (on the right). In the settings, you can select the cameras for video transmission. The maximum number depends on the device settings. You can change the order of cameras by pulling the arrows to the left of their names up or down. By default, the video of the first camera is displayed in the minimap.



The video is displayed in real time. Click on it to pause the broadcast; click again to resume it. The button in the lower right corner of the video allows you To switch to the full-screen mode, click on the button in the lower right corner of the video. In this case, broadcasting from other cameras stops. To enable or disable the sound of the video, use the buttons / .

In addition to the standard player, you can watch video in a third-party player. To do this, open the unit properties and click on the icon next to the **Device type** field on the **General** tab. In the **Device configuration** dialog box, type the IP address of the player in the **IP** field and indicate the

protocol. The protocol of the link to a third-party player should be the same as the protocol of the monitoring site.

Info

To switch to the **Info** mode, click on the button in the minimap header. In this mode, you can see the extended unit information which is selected in the User settings.

Map

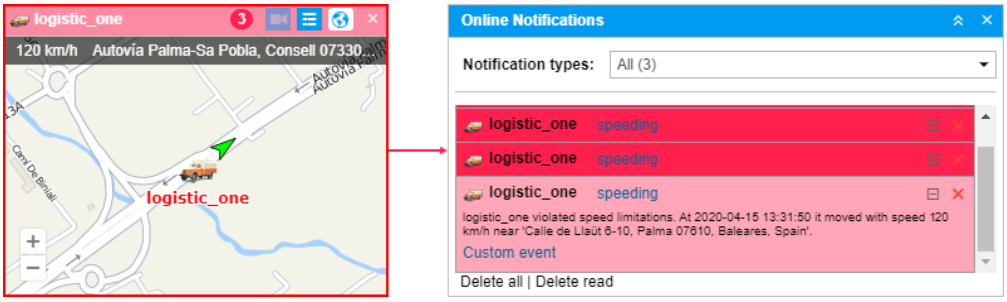
In the **Map** mode, you can see the location of the unit, as well as its speed and address from the last received message. You cannot move the map because it is automatically centered on the last position of the unit. Apart from that, working in the map mode is identical to working with the main map.

In the map mode, you can activate Google Street View or Yandex Panorama using the buttons in the lower right corner. Google Street View is a Google Maps feature that allows you to see panoramic street views of many cities around the world from a height of about 2.5 meters. The service makes it possible to view houses, roads and all the surrounding objects on the street, creating the illusion of virtual presence. At the moment, the service covers North America, Australia, New Zealand, Western Europe, Japan, Indonesia, and Brazil. Yandex Panorama is a panoramic view technology featured in Yandex Maps. At the moment, Yandex Panorama allows you to view the street panoramas of Russia, Ukraine, Belarus, Kazakhstan, and Turkey.

For Google Street View, select Google as a map source User settings. Make sure that the service coverage includes the geographical area you need. For Yandex Panorama, select Yandex as a map source and take into account the coverage of the service.

Online notifications in minimaps

In minimaps, you can view the received online notifications. When a notification triggers, the unit minimap is highlighted in red. If the minimap has been hidden, it is shown automatically upon receiving the notification. To receive and view online notifications in minimaps, select the **Blink minimap** option as a notification action.



In the minimap header, you can see an icon indicating the number of unread notifications. Click on it to view them. Here you can read and delete notifications as in the **Online notifications** window.

To return to the initial mode, click on the icon again. Minimaps are not synchronized with the **Online notifications** window, therefore reading or deleting notifications in a minimap does not lead to any changes in the window of online notifications.

The maximum number of minimaps is nine. If you have nine minimaps opened and a notification is received from another unit, you can view it only in the **Online notifications** window.

Working with minimaps

In the header of every minimap, there is a unit icon and name so that you can simply find the required one. The mode switches and the **Close** button (✕) are also in the header. You can open up to nine minimaps at the same time (one minimap per unit).

You can hide or display all minimaps at once by clicking on the button  in the left corner of the bottom panel. When you go to the **Reports**, **Messages**, and **Routes** tabs, the minimaps are automatically hidden to avoid excessive information. If needed, you can display them by clicking on the button in the bottom panel. When you leave these tabs, the minimaps are shown again automatically.

After logging in to the system, the last layout of minimaps is restored.

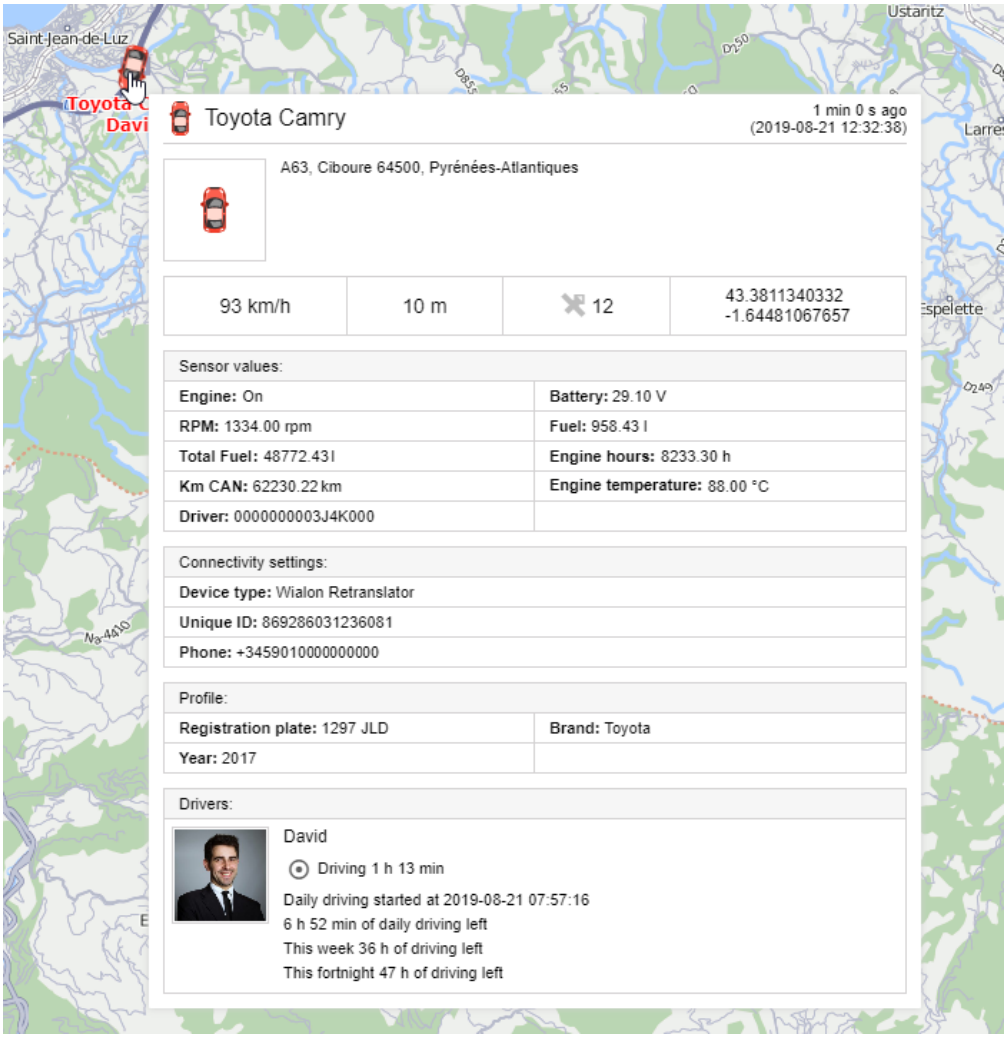
Additional Unit Information

Additional information includes the following: last message, location, presence in geofences, distance to the geofence (if the Distance from unit to geofence option is activated), speed, altitude, coordinates, counters, satellites, connectivity settings, icon, sensor values, parameters, drivers, trailers, custom fields, and maintenance intervals.

You can find additional information in the tooltip of a unit and in the extended unit information of the monitoring panel work list.

Unit tooltip

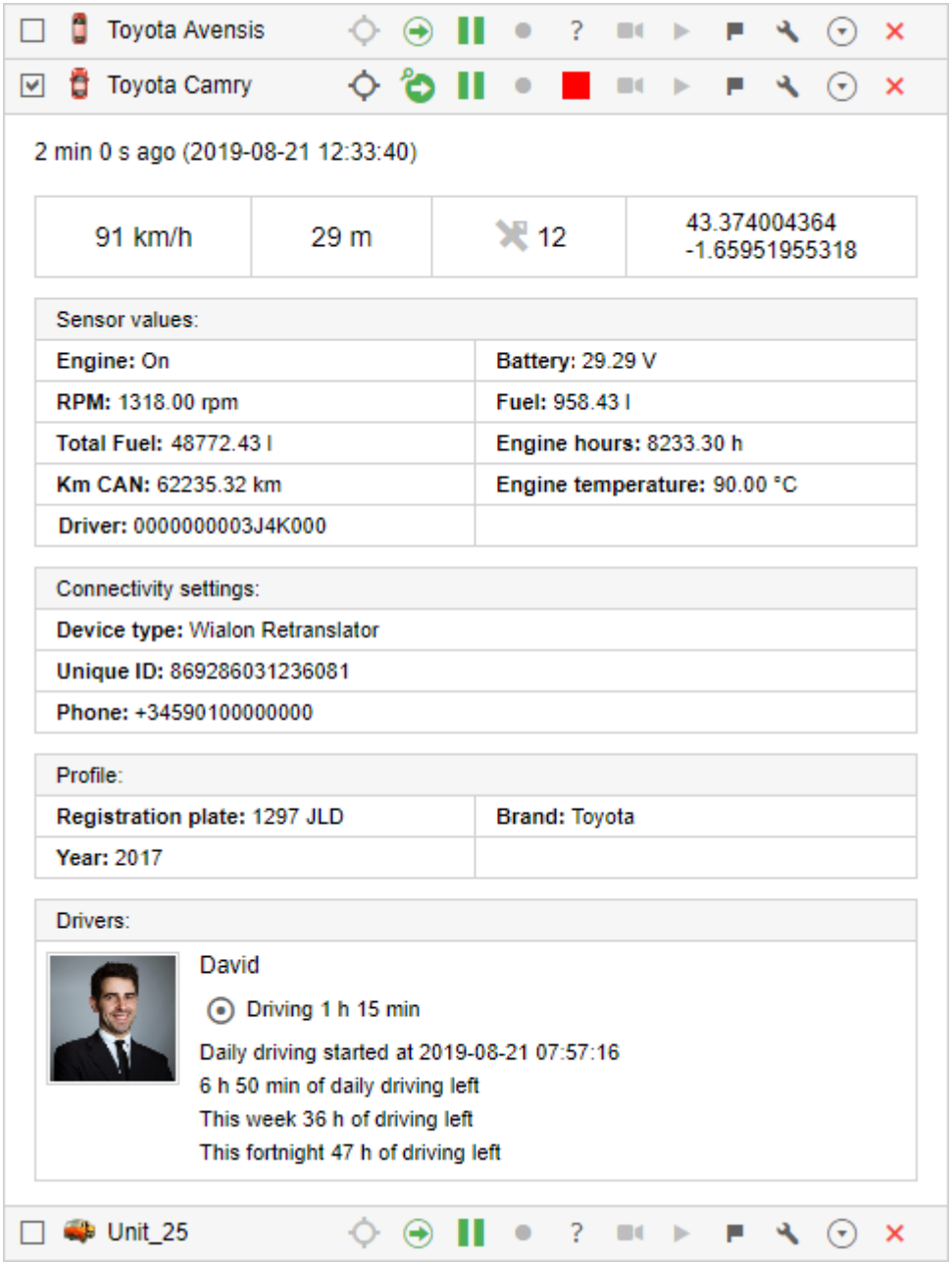
A tooltip to a unit is displayed when you pause on a unit on the map, in the worklist, in some dialog boxes, and so on. You can copy the information from the tooltip by selecting and saving the required fragment to the clipboard. You can select the content for this tooltip in the user settings. The tooltip for the unit may look like this:



The characteristics are displayed in the tooltip in the same order as they appear on the Profile tab of the unit properties.

Extended unit information

Apart from the tooltip, you can obtain additional information about the unit by clicking on the unit icon in the work list of the dashboard (in both modes). Click on the unit's icon in the **Monitoring** panel to see the extended information. The content of the extended unit view is also adjusted in the user settings.



You can apply the extended view to any number of units in the work list. To hide the extended information, click on the unit icon again.

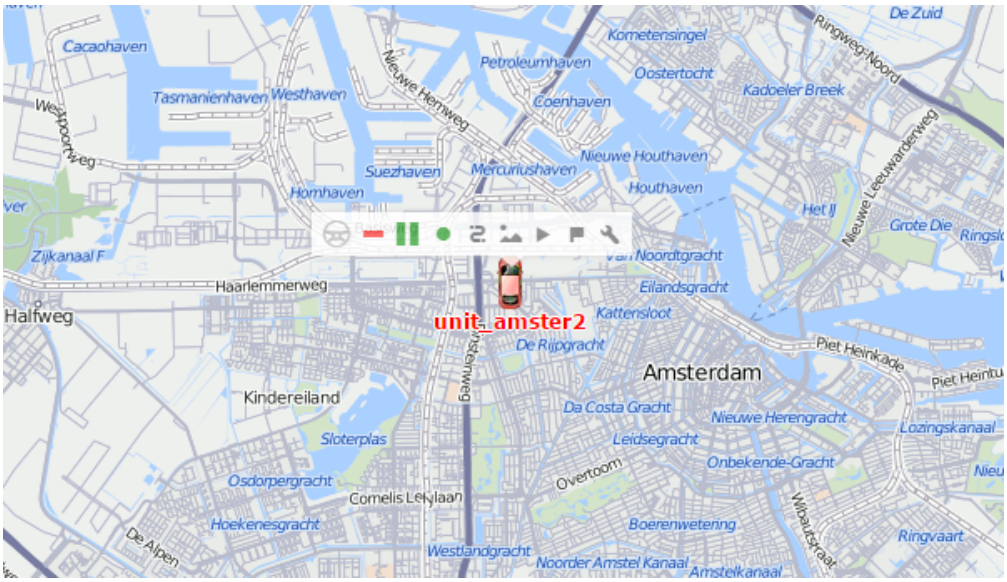
ⓘ Depending on the unit settings, the values indicated in the pop-up window as well as in the expanded display, can be presented in the metric (kilometers, meters, kilometers per hour, liters), American (miles, feet, miles per hour, gallons), or imperial (miles, feet, miles per hour, gallons) systems of measures.

Monitoring options menu

To open the monitoring options menu, click on the required unit on the map. This menu contains the same functionality that is selected in the monitoring options. In addition, regardless of the options selected, the menu always contains the buttons for generating a quick report and building a quick track.

The monitoring menu does not contain the unit location icon, tracking option, and clear list button even if they are chosen as the monitoring options.

When a unit moves, the menu moves with it. It always displays updated information about the unit. To close it, click anywhere outside the menu.



Monitoring Options

All the options that can be found in the **Monitoring** panel are described below. Depending on the tasks assigned, you can choose to display some columns and hide the others. To do this, the **Can change settings** option must be activated in the user properties.

By default, the **Monitoring** panel includes the following options:

- address (in secondary information);
- unit tracking;
- motion state;
- data accuracy;
- connection state;
- quick track;
- properties;
- clear list.

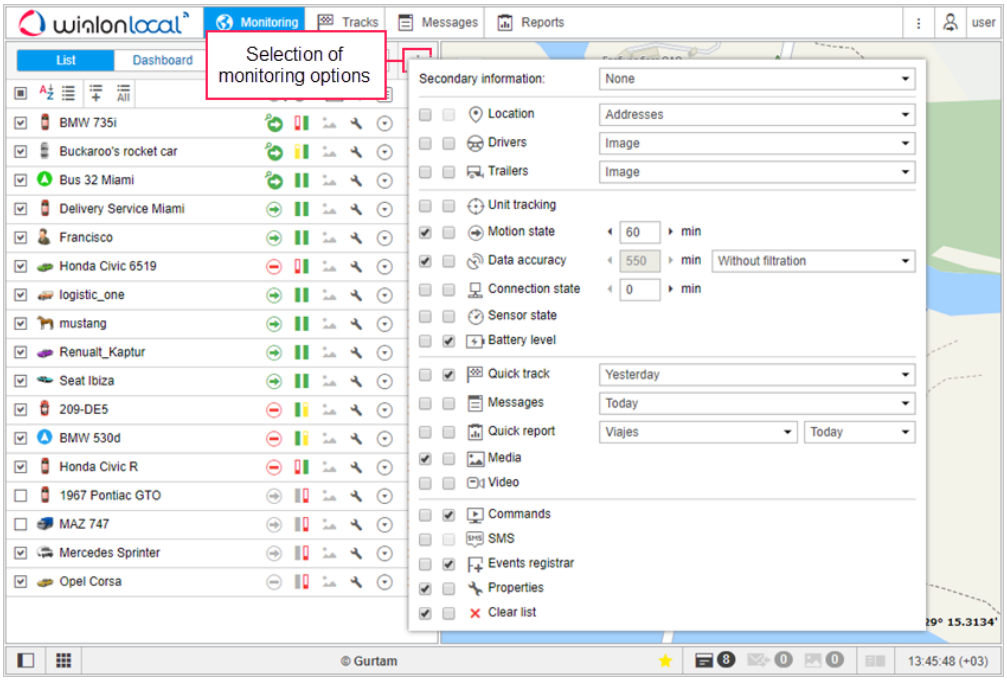
To customize the list, press the ⋮ icon in the upper right corner of the **Monitoring** panel. In the left column, mark the checkboxes that should be displayed in the worklist and in the monitoring options menu. In the right column, you can select the options that are used more rarely — they will be shown in the additional menu and will be available there.

All the options in the **Monitoring** panel can nominally be divided into two types:

Of information. These icons contain some information about the current state of the unit (movement/stop, sensor value, connection state, data accuracy). For additional information, see the tooltip which appears when you point to the icon.

Of action. A click on these options allows performing an action on the unit (event registration, command or report execution, messages query, track building, properties editing, removal from the work list, etc.). As a rule, all further instructions can be found in the corresponding dialog boxes. Active action buttons turn blue when you point to them.

The icons in the upper part of the worklist can also be used. In some cases, it allows you to sort the units according to some properties (e.g. at the top are the moving units, at the bottom — the stationary ones, and vice versa).



Secondary information

All the options in the **Monitoring** panel are divided into 5 sections. The first one contains the **Secondary information** option, which allows displaying the contents of the text columns under the unit names. The following alternatives are possible:

- None;

- Address;
- Geofence;
- Driver's name;
- Driver's phone number;
- Trailer.

When the private mode of the trip is detected (if the unit has the Private mode type sensor with the Do not show unit location option enabled), the information about the last known location during the previous 'business' trip is displayed as the current address or geofence.

Options of information

Next two sections include the options connected with the display of the information about the units. If one or several parameters in the first section (text parameters) are turned on, you can adjust the width of the corresponding columns in the **Monitoring** panel. To do it, hover the mouse cursor over the space between the columns whose width you want to change. When the dotted line appears, drag it to the desired side.

Location

 This column displays the location of the units either in the form of addresses or in the form of geofences. **Resolving** means the address is being searched. **N/A** appears for units whose location is not available, for example, in case a unit has never sent any messages.

Addresses

Depending on the selected format, addresses can be longer (if they include state, region, and other elements) or shorter (e.g., street and building number only).

Geofences

If geofences are chosen to determine the location, once a unit gets into several of them, all the geofences are displayed and separated by commas. They are also sorted by area (from smaller to a larger one) and highlighted in the color selected in the geofence properties. If a unit is outside of all available geofences, the address is displayed as its location. In any case, this column is the widest in the **Monitoring** panel which is why it is not recommended to turn it on if there is not enough space on the screen.

 To determine whether a unit is inside a geofence, the option **Presence in geofences** should be activated in the **General settings** tab. This option is enabled automatically if you select geofences for the location column.

When the private mode of the trip is detected (if the unit has the Private mode type sensor with the Do not show unit location option enabled), the last known location is displayed as the address or geofence instead of the current one and the icon appears in the unit's caption, as well as next to its name in the monitoring panel.

Drivers

The column with the information about the drivers. This column can contain the driver's photo, photo, and name, or photo and phone number depending on the display option chosen in the **Monitoring** panel customizer. The tooltip always contains the photo, name, and phone number of the driver.

— no drivers bound;

— the assigned driver has no photo;

— several drivers are bound to the unit;

— the assigned driver is running out of the allowed driving time (monitored when the Driver activity option is activated in the unit properties on the **Advanced** tab). If a photo is uploaded for the driver, an exclamation mark is displayed to the right of it instead of the icon.

Trailers

The column with the information about the trailers. This column may contain the photo or photo and name of the trailer depending on the display option chosen in the **Monitoring** panel customizer. The tooltip always contains the photo and name of the trailer bound to the unit.

— no trailers bound;

— the bound trailer has no photo;

— several trailers are bound (see more information in the tooltip).

Unit tracking

/ In order to monitor the unit and always see it upon receiving the message, press the tracking icon next to its name. The icon will turn green, and a dot will appear inside of it. The unit should be already checked in the first (**Show on map**) column. If you click the icon in the header, the option will be applied to all the units marked in the first column.

If you activate tracking for **multiple** units, the map is centered and scaled in such a way that all of them are constantly in sight.

Motion state

 This column shows whether a unit is moving or stationary, as well as whether the ignition is on or off (in case there is a corresponding sensor). The motion state is defined on the basis of speed information in the latest message or a real-time motion sensor, if available.

To monitor the unit motion state, it is necessary to indicate the validity period of motion state icons (the corresponding line in the **Monitoring** panel customizer). The validity period is the time interval (in minutes), after which the traffic state signs become inactive. Moreover, when the validity period expires, unit movement directions become hidden. The validity period can take a value from 1 to 999 minutes.

 — the unit is moving (if there is an ignition sensor, this icon also shows that the unit is moving with the engine off, that is, it is being towed or transported);

 — the unit is moving, the ignition is on;

 — the unit is stationary;

 — the unit is stationary, the ignition is on;

 — the last message from the unit was received over an hour ago: the unit was moving;

 — the last message from the unit was received over an hour ago: the unit was stationary;

 — the unit data is received with the help of LBS detection;

 — the data obtained with the help of LBS detection is outdated;

 — there are no messages from the unit.

In case the unit is stationary, the tooltip displays the duration of this state. If the unit has a real-time motion sensor, the information about the duration is absent.

Data accuracy

 This column indicates the data accuracy: how many satellites locked the unit and when the latest message was received. To find out the exact time of the latest information update, hover the mouse cursor over the icon and study the tooltip.

The **first bar** indicates the availability of the satellites:

 green — the satellites are available (see the exact number of the locked satellites in the tooltip);

 red — the satellites are not available;

 grey — the satellites are not available for the period greater than the one indicated in the **Options customizer** menu for the **Motion state** option.

The **second bar** shows the latest data received from the unit.

green — the unit sent the data less than 5 minutes ago;

yellow — the unit sent the data within the last hour;

orange — the unit sent the data in the last 24 hours;

red — no messages for a long period of time;

grey — the object never sent the data.

You can customize the unit filtering in the **Monitoring** panel and/or on the map by the relevance of the latest message. To do this, change **Without filtration** to **Monitoring panel** or **Panel + Map** and specify the filtration interval in minutes. The filtration can affect only the work list in the **Monitoring** panel or both the worklist and the map. Read more about the dynamic work list here.

Actualizer app can help reveal inactive units. This application allows setting any period of inactivity.

Connection state

Shows whether there is a connection with the unit at the moment.

— the unit is connected;

— the unit is not connected.

A unit is considered to be connected if there is a connection to the server using TCP or UDP protocol, or the unit has sent messages within last X minutes. The required number of minutes can be indicated in the corresponding line of the **Monitoring panel** customizer (from 0 to 999). By default, the value is 0. It means that the connection state is determined automatically and does not depend on the time of receiving messages.

Sensor state

This column displays the state of the sensor.

(or any other color) — visualizes the sensor value (the color is set in the sensor properties, and the sensor is selected on the Advanced properties tab);

— text parameters (can be properly adjusted through a custom sensor);

— the option is not activated for this unit;

— the value is unknown.

When placing the mouse cursor over the square, you can see the name of the sensor and its value (or description) in the tooltip.

Battery level

In this column, the the battery level of the device is displayed. There are 4 available states.

— battery level from 0 to 25%;

— battery level from 26 to 50%;

— battery level from 51 to 75%;

— battery level from 76 to 100%.

The exact value of the charge is shown in the icon's tooltip. If there is no proper sensor configured for the unit, then next to its name in this column the ? sign is displayed, the tooltip of which says: **State is unknown**. If the sensor sends an invalid date that cannot be converted into percent using the calculation table, then in the column the ⚠ icon is displayed. In its tooltip, it is written: **Error**.

Options of action

The parameters of the last two sections are designed for the execution of some action on the unit.

Quick track

The buttons allow building a track of unit movements.

— show a track on the map;

— remove a track from the map;

— not enough rights to query tracks for this unit.

When pressing the **Show track** button next to a unit, the track of this unit appears on the map. In the panel settings, you should also specify the interval for track building: **Yesterday**, **Week**, **Month** or **Other** (manual mode). Other parameters (such as line width, annotations, markers, trip detector, etc.) are taken from the Tracks panel. All 'quick' tracks are displayed in the **Tracks** panel where you can manipulate them in the same way as the usual ones: show/hide, remove from the map, etc. Track colors can be set in the unit properties on the Advanced tab.

Messages

Request messages from a unit.

— display messages;

— not enough rights to query messages from this unit.

The requested data is displayed in the **Messages** panel. The standard time interval (**Today**, **Yesterday**, **Week** or **Month**) for the query is set in the **Monitoring** panel customizer. If **Other** is selected, the interval is taken from the **Messages** panel. In this case, only messages with data are loaded, and the style of display is taken from the panel itself.

Quick report

 Quick report execution.

 — execute a report;

 — not enough rights to execute reports for this unit or a report template is unavailable.

The requested report is generated in the panel based on the template selected in the **Monitoring** panel customizer. Standard time interval (**Today**, **Yesterday**, **Week** or **Month**) is also configured there. The time interval can either be standard or **Other**, which means it is taken from the **Report** panel.

Media

 View the latest media files (pictures or video) received from the unit (works for the devices that have such functionality).

 — the button to view media files;

 — no pictures (video) available.

Video

 Opening a mini-window in the mode of video monitoring.

 — click on the button to open a mini-window in the mode of video monitoring;

 — there is no video available for the unit.

Commands

 Buttons to send commands to units:

 — there are available commands;

 — there are available commands, including GPRS commands (using TCP or UDP channel);

 — there are available commands, including GPRS commands, however, the current user does not have enough access rights to execute them;

 — there are no commands available or no rights to execute them.

SMS

Send SMS to the unit or driver (the addressee is selected in the drop-down menu if both options are available). For full functionality, the current user should have the rights to send SMS, as well as the right to **Edit connectivity settings** of the unit.

— send SMS to the unit or driver;

— the user has the right to send SMS, but there are no available phone numbers of the unit or driver.

Events registrar

Manual registration for such events as fuel fillings, maintenance service and other events in the unit history.

— open registrar;

— not enough rights to register events for this unit.

Properties

View unit or unit group properties (depending on the mode of work list display). To open the properties, press the icon next to a unit or a unit group.

Clear list

The buttons used to clear the list. To remove all the units or groups from the list, press the button in the header of the table. The same button is located in front of each unit or group and allows to remove the items individually.

If the options are selected for the additional menu (i.e. checked in the second column of the **Monitoring** panel customizer), you can find them in the column with the icon under the button .

Other

Other buttons and signs that can be found in the **Monitoring** panel.

	The units that are selected for display on the map are checked in the first column of the table. To select all the units, check the icon at the top of the table.

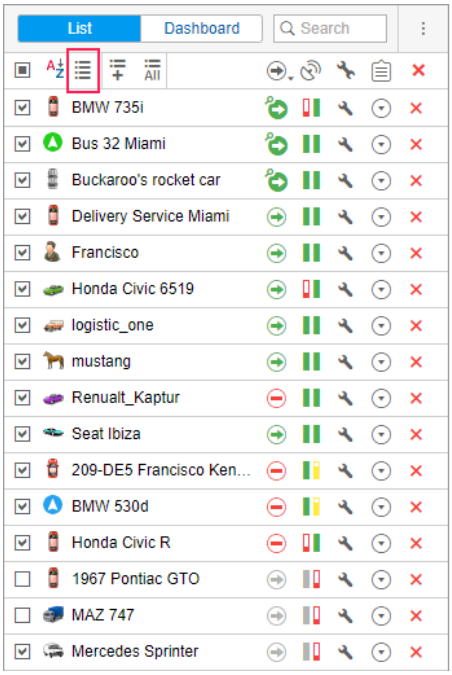
	A switch-button which shows that the items of the work list are sorted by name in direct order.
	A switch-button which shows that the items of the work list are sorted by name in reverse order.
	A switch-button which shows that the worklist displays singular units.
	A switch-button which shows that the worklist displays a tree view of the units (with grouping). Read more about the work list settings.
	The button to find and add the units or groups to the list.
	The button to add all available units or groups to the work list.
	Monitoring panel customizer (columns selection).

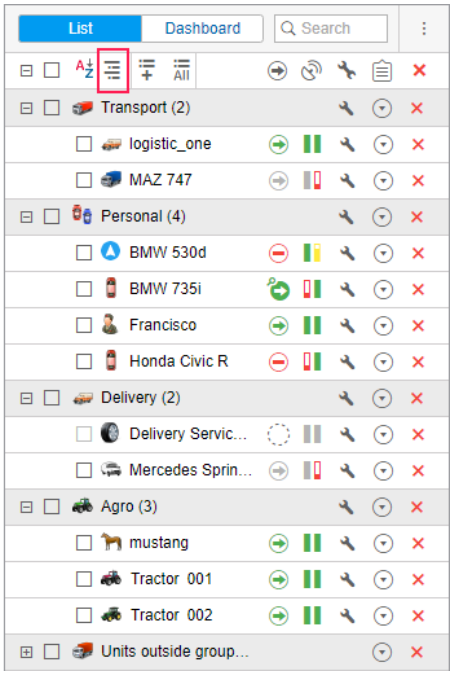
Work List Management

To monitor units, you need to place them in the work list. Only units presented in the worklist can be used to display on the map, as well as to apply various control elements: jobs and notifications execution, reports generating, drivers and trailers assigning, messages or tracks viewing, finding nearest units, etc.

The work list has several display modes:

-  simple list mode;
-  tree-like mode.





Each of these lists is independent, and their settings are stored separately. When you switch between them, all settings that were last applied to this type of list are restored.

To search for the required units in the list, use the dynamic search above it. The search is carried out by unit name, group name, unique ID, device type, and such profile properties of the unit as VIN, vehicle type, registration plate, brand, model, year, and color.

Simple list mode

Adding units to the work list

To add units to the work list, use the following buttons in the header of a list:

- All — add **all** units available;
- — add particular unit(s). The search tool is used.

Moreover, there are alternative ways of adding units to the work list:

- from the Online notifications window (adding a unit that triggered the notification);
- dynamic formation of the list depending on the relevance of the data.

Units created in the monitoring system or CMS Manager are automatically added to the worklist of the monitoring panel of the user-creator (you may need to refresh the page or log in again). If the group view monitoring mode is activated in the worklist, the new unit automatically gets in the group it was added to at creation, or to the **Units outside groups** (if it does not belong to any).

If the filtration on the basis of data accuracy is used and the created unit does not meet the specified conditions, automatic addition to the list does not happen.

Removing units from the worklist

Units can be removed from the worklist individually or all at once:

- — the button next to each unit to remove this particular unit from the list;
- — the button in the header of the list to clear the work list (to remove all units).

Note that deleting units from the work list does not lead to their deleting from the system. They can be added back to the worklist using the ways described above. Units can be deleted from the system in the Units panel.

Sorting

By default, the work list is sorted by names arranged in direct alphabetical order. The order can be reversed. To do this, use the switch button or in the header.

Besides, it is possible to sort units by other attributes such as motion state, connection quality, etc. To do this, use the buttons in the header:

- — sensor state;
- — commands;
- — motion state;
- — last message time;
- — online connection state;
- — media files;
- — quick track;
- — driver information;
- — trailer information.

For instance, to sort units by the motion state, use the button . The list is rearranged in such a way that all the moving units appear at the top of the list, and those that are not moving appear at the bottom. To reverse the motion state order of units, click on the button again.

The presence or absence of certain columns is adjustable in the Monitoring panel customizer.

Tree-like mode

In this mode, work list units are displayed in groups. Next to the name of the group in parenthesis you can find the number of units included in it. To view the units in the group or the current information on them, expand the group (**+** in front of the group name). Any group unit can be removed from the work list (though it is not removed from the group itself).

To add all groups currently not presented in the worklist, click on the **Add all available** button ( ). At the same time, if the list was empty, the groups are added with all the units included in them. If the group has already been present in the worklist, the list of its units remains unchanged.

When you add units that are not included in any group, they are automatically placed in the **Units outside groups** group. Such a group cannot be edited, although it has many characteristics typical of an ordinary unit group.

To expand/collapse a unit group (i.e. show/hide its units), use the +/- button in front of a group name. To display group units on the map, check a corresponding box. To display a particular unit from a group, expand the group and mark the checkbox with this unit.

If at the end of the list when the group is expanded there is the ellipsis (...), this means that not all the group units have been added to the list at the moment. When you hover the cursor over the ellipsis, you can see how many units are not displayed, and add them if necessary.

A tooltip shows the list of all units included in the group.

The following actions can be performed over a unit group from the **Monitoring** panel:

- — commands sending;
- or — unit group's properties viewing/editing.

Searching and adding units

There is a convenient tool for finding units and adding them to the work list. To open the unit search dialog, click on the **Add to the list** button ( ) in the worklist header.

Unit search dialog displays all the available groups (in square brackets) and units in alphabetical order. To add units or unit groups, double-click on them. If the simple list mode has been activated, then single units (one or more) are added to the work list even if you double-click on a group.

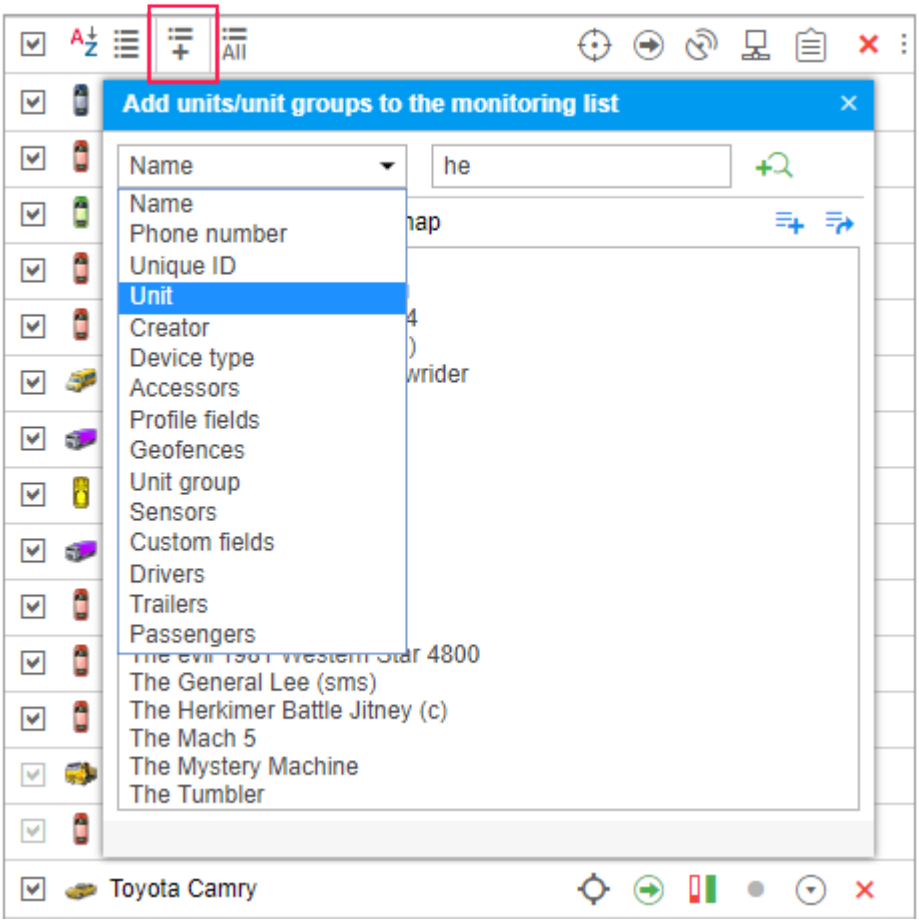
If the tree-like mode has been activated, a group is added to the work list in a collapsed form. To add a unit group with a complete set of units, double-click on a group. To add a unit group with some particular unit, click on this unit then. When you add units that do not belong to any of the groups, they are automatically placed in the **Units outside groups** group .

In order for the added units to be instantly displayed on the map, activate the **Show added units on map** checkbox in the unit search dialog.

Search by criteria

If you have a large number of units/groups, you can use special filters to quickly find the item. The dropdown list contains the following search criteria: name, creator, custom fields, profile fields,

phone number, unique ID, device type, access from the user, geofences, sensor, drivers, trailers, passengers, etc.



Select a search parameter and then type a keyword into the next field. For instance, to find all MANs, select search by name, and in the template field type **man**. All units and groups which names contain the combination of characters **man** (both at the beginning and at the end of the name) will be found and displayed immediately. The comma sign (,) can be applied to string together several requests. For example, to find all MANs and all Ivecos, type *man*, *iveco*.

If you leave the search field empty, all the units that have the selected property (sensors, ID, etc.) will be displayed, for example, all units that have a driver assigned to them. Then you can type a driver's name or code to narrow the search.

Most of the search parameters (except for geofences, drivers, and trailers) are taken from and can be viewed and changed in the unit properties. When using a search by a sensor, not only the name of a sensor can be entered in the template field, but also a part of its description, parameter type or parameter name.

After the first search is complete, you can continue the search on the second (third, etc.) level: search among the results of the previous search. To do this, click **Add to the search list** . The principles of inquiry formation remain the same.

If your search is successful and you want to include the results in the worklist, you can do this with a double click or using the buttons:

- — add a search result to the worklist;
- — replace the existing work list with the search results.

Dynamic work list

The work list in the **Monitoring** panel can be formed dynamically according to the time the last message from a unit was received. Units are removed and added to the list and map automatically. The work list is updated every 10 seconds.

The function can be enabled in the Monitoring panel customizer. Change the **Without filtration** option to **Monitoring panel** or **Panel + Map** and specify the filtration interval in minutes. Then only those units from which data was received during the specified interval will be displayed in the **Monitoring** panel. If the **Panel + Map** option is selected, the units are added not only to the worklist but also to the map.

> With this mode enabled, some functions of the system become unavailable or operate differently.
> Manipulations with the work list (such as searching, adding, and removing units) are impossible.
> The filtration by the time of the last message does not affect the worklist if the treelike view is selected.

Commands

A command is a request that can be sent to a unit. In response, the unit can send its coordinates, take a picture, activate an output, block engine, etc. Available commands depend on the type of device used and its configuration.

To be executed, a command should be configured in unit properties in the corresponding tab. To send a command, the user must have the rights specified in its properties, as well as the **Execute commands** right in relation to the unit.

Standard commands

17 standard commands are reserved in Wialon.

Icon	Command	Name in the system	Parameters
	Query position (request current coordinates of the unit)	query_pos	—
	Block engine	block_engine	—
	Unblock engine	unblock_engine	—
	Activate output	output_on	output number
	Deactivate output	output_off	output number
	Download messages	download_msgs	time interval (from – to)
	Set data transfer interval (how often unit sends data to the server)	set_report_interval	interval in seconds
	Send custom message (to send a non-standard command to a unit)	custom_msg	command text
	Send message to driver	driver_msg	message text
	Send position	send_position	coordinates
	Send route	send_route	checkpoints
	Send waypoints	send_waypoints	checkpoints

Icon	Command	Name in the system	Parameters
	Query configuration	request_configuration	—
	Start/Stop WiaTag	wiatag_service	—
	Upload configuration	upload_cfg	path to configuration file
	Upload firmware	upload_sw	path to firmware file
	Query snapshot	query_photo	—
	Query snapshot from camera	query_photo_cam	camera's number
	Query DDD file (for tachographs)	query_ddd	—

To download the requested configuration file, use the Disketta application (the required file is located in the **Unit** folder). To find out the name of the configuration file, generate a table with messages for the corresponding period.

If your device supports a command that is not mentioned in the list, you can send it as a **Send custom message** command. To do this, you should know the exact name of the command as it is written in the device configuration. If you have a flespi device, a set of commands with adjustable parameters is available for it.

Sending and tracking commands

There are several ways to send a command to a unit.

Manually from the Monitoring panel, including sending the command to a whole group of units.

As a job ran automatically according to a schedule.

As an action for a triggered notification (command is sent when specified conditions are met).

From a mobile device using a plain SMS text message.

From the app for iOS and Android.

Such commands as **Upload configuration** and **Upload firmware** have their own peculiarities. If these commands have been saved for units without selecting a file, sending these commands as a job/notification or sending them to the whole group of units is impossible.

Such commands as **Send route** and **Send waypoints** also have some peculiarities. When you send them, you should manually indicate the route parameters. Therefore, these commands cannot be sent via job or notification.

Information about commands sent to a unit is available:

- in the Messages tab (all commands sent to a unit);
- in the Executed commands report (only successfully executed commands);
- immediately after sending a command — in the log.

Executing commands from the monitoring panel

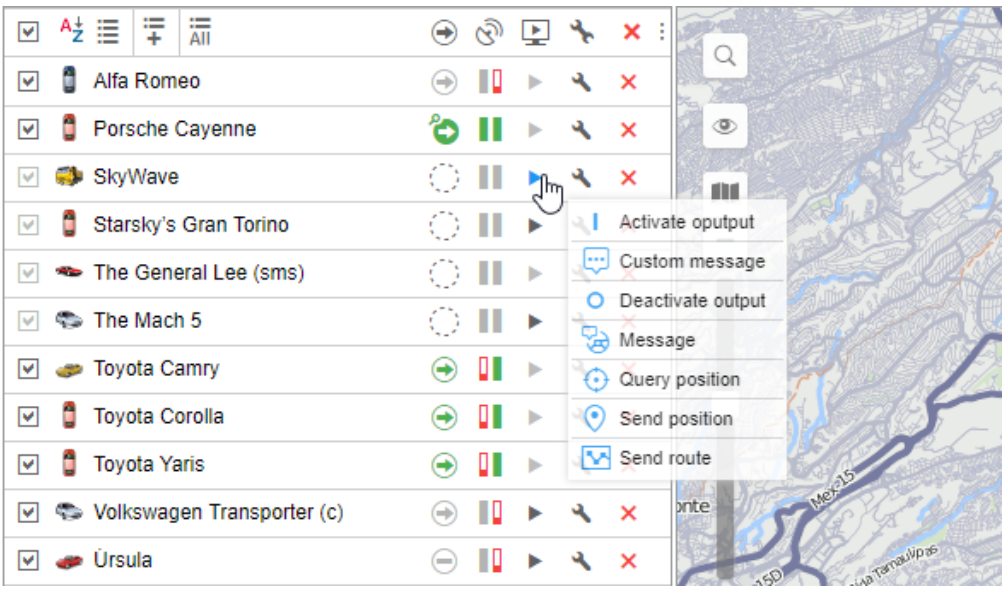
A command can be sent from the **Monitoring** panel. This option must be activated in the Monitoring panel customizer. The button can look as follows:

 there are available commands for the selected unit;

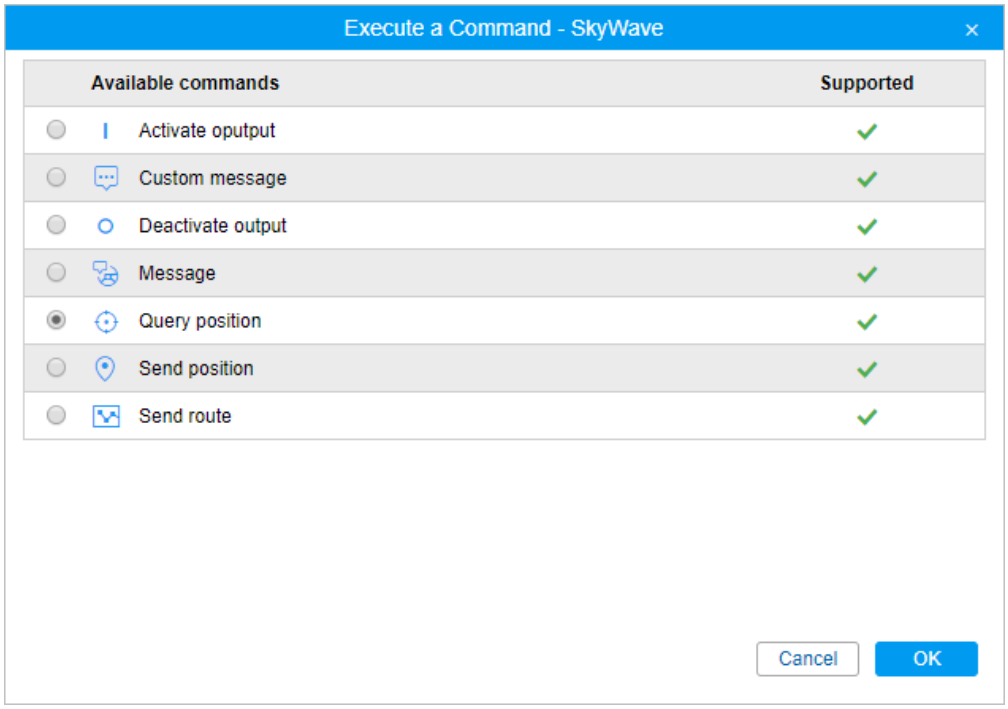
 there are GPRS commands among the available ones;

 or  there are no commands supported by the selected unit or the current user has not enough access to the unit.

Put the cursor over the active button next to the required unit to see the list of available commands. The list can contain only commands configured in Unit Properties => Commands. Furthermore, only commands available at the moment are shown (the availability of link types is important here).



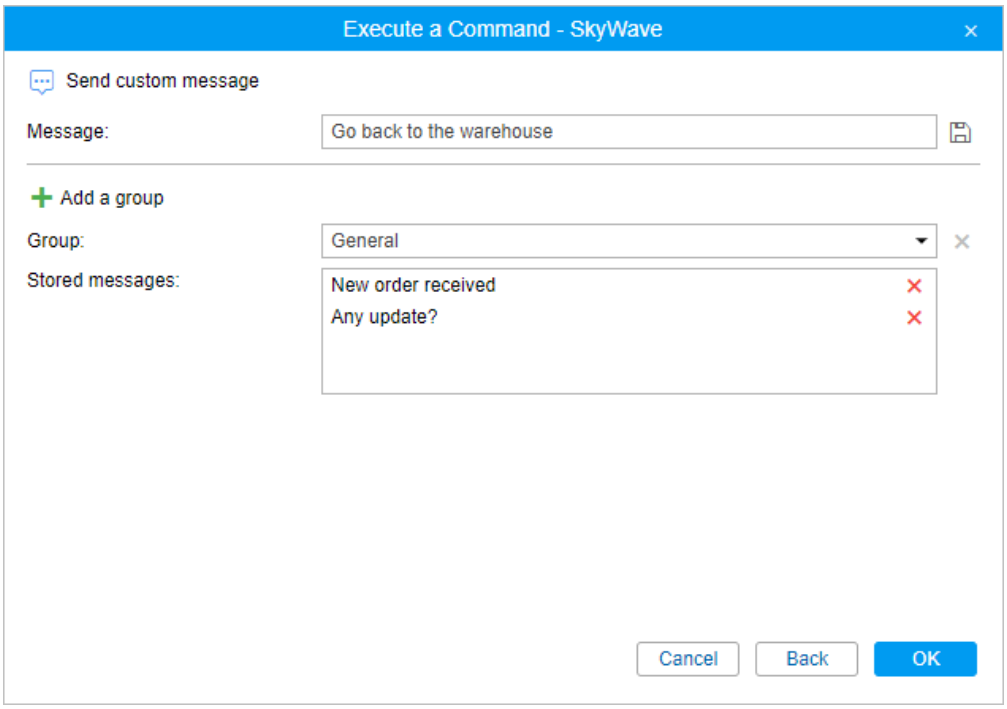
1. Click on the command button ▶ or gprs .
2. Select the required units. This step can be omitted if a command is sent to one unit.
3. Select a command from the list of commands available at the moment. When sending a command to several units, special symbols indicate whether this command can be sent to all selected units or only to some of them:
   - ✔ all selected units support this command;
   - ⚠ not all of the selected units support this command (more information is in the tooltip).



4. If needed, set additional parameters, for example, input/output index, report interval, the path to load a configuration or firmware file, checkpoints of the route, etc.
5. Press **OK**. The command is executed immediately, and its result is reported in the log. To show or hide the log window click on the double-arrow in the right bottom corner of the window.

While executing the **Send custom message** command, it is possible to enter the text in the following ways:

- You can enter the message manually in the corresponding field. To make the search process easier during the next command execution, it is possible to add a message to a group. The principle of working with groups has been described above.
- It is possible to choose a previously saved message. In the drop-down list of groups, choose the one which contains the message. Below, you get the list of available messages. Select the required one and press **OK** to execute the command.

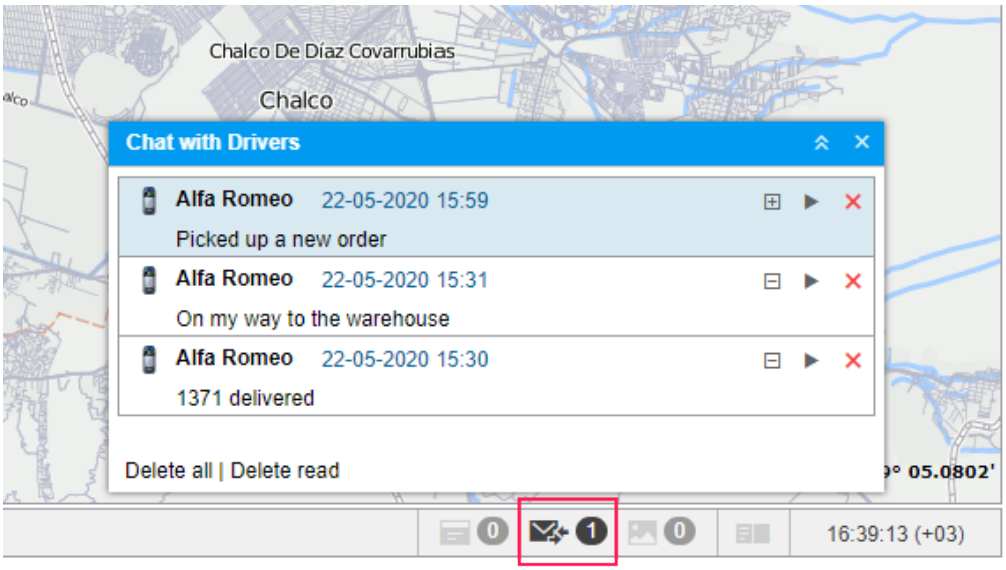


To send a command to a group of units, it is necessary for this command to be registered in the properties of each of these units on the **Commands** tab and have the same name. If, when sent to several units, the command is called the same, but belongs to a different type and the parameters are not specified, then the command is sent without parameters and, as a result, cannot be executed.

Chat with driver

The operator (dispatcher) can exchange messages with drivers. To do this, select the **Send message to driver** command and enter the text.

In case the driver answers, the message appears in a special pop-up window. A new message can be accompanied by a sound (see User settings). If you have unread messages, the number of them is indicated in the red circle next to the chat icon in the bottom panel. If there are any messages in the window (either read or unread), the icon itself is active which means it is colored and can be clicked on.



Newly received messages are added to the top of the list. Unread notifications have a blue background by default. To expand/hide the full text of a message, use the switch button (+/-) or click on the header of the notification outside the text.

When clicking on a message, the map is centered on the place where this message was sent. When clicking on the unit name, the map is focused on its last location.

To delete a message, click on the cross to the right of its title. To delete all the messages or only the read ones, click **Delete all** or **Delete read**, respectively. When you delete all the messages, the window is closed automatically. If you close the window by clicking on the grey cross in the upper right corner, the window does not open automatically when new messages are received. To open it, click on the **Chat with drivers** icon in the bottom panel.

In addition, the window itself can be dragged around the screen and resized. The position and size of the window are remembered until the next opening.

The operator can quickly send a reply to the driver (the **Send messages to driver** command should be configured in the unit properties in advance). Click on the green triangle-shaped button and enter the response text in the dialog box to send it.

Besides, you can generate the report called Chat, which contains all the chat history including the operator and driver messages for the specified period of time.

The automatic appearance of messages from the drivers on the screen can be turned off. To do this, uncheck the **Automatical display popup events** box in the user settings. In this case, the arrival of a new notification will be indicated only by the appearance of a figure in a red background in the bottom panel of the program next to the communication icon. To read the notifications, you need to click on this sign.

It is convenient to communicate with the driver with the help of a specially developed app — Chatterbox. This application allows sending not only commands but also text messages.

Sending route/Sending route points

Using the **Send route** command, you can send a route or route points to a unit.

To execute the command, indicate the name of the route and specify its points. Search for points is carried out in three sources: addresses, geofences, routes. If required, you can use the search filter (buttons to the right of the route name), which allows you to change the set of sources in use. If the button is active, it means the corresponding source is used as a filter.

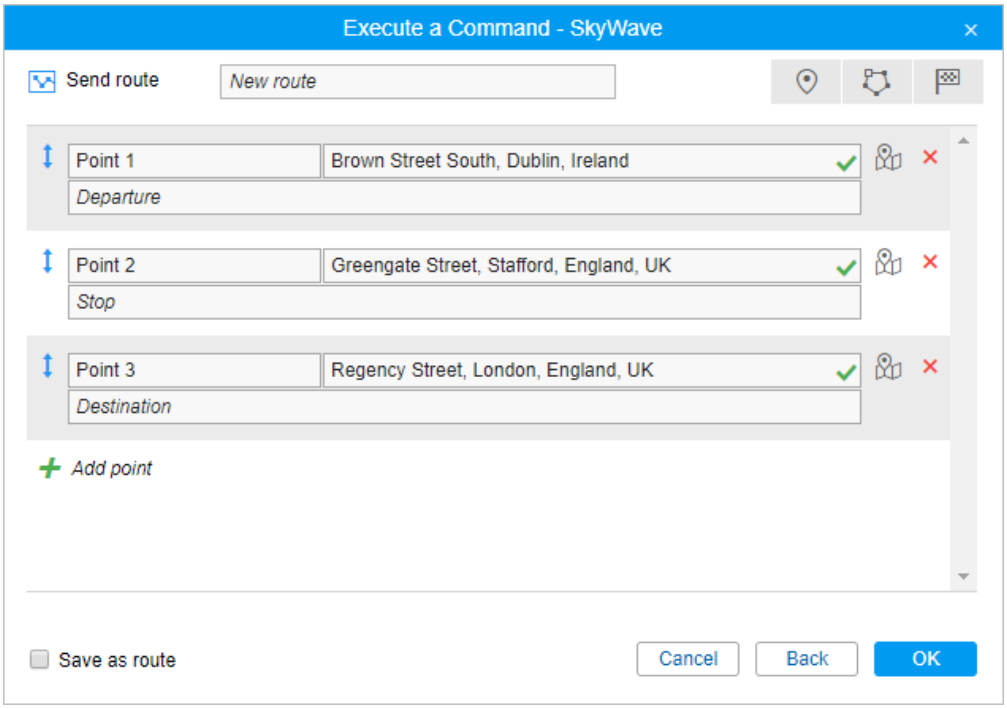
To add a route point, specify its name and location. To search for a location, start typing in the corresponding field. In the dropdown list, depending on the filter in use, you can find the possible options with an indication of the source in which they were found. When adding a point from the geofence of the line or polygon types, the coordinates of the first point are used. If a point is added from a route, all its points are added at once. If moving units are used as points in a route, such points are skipped.

In addition, you can add a checkpoint directly from the map. To do this, click on the icon  to the right of the field. On the map that opens, find the required point and double-click on it. As a result, a point will be added automatically.

After the required point is set, the icon  appears to the right of it. It indicates that there are coordinates of the point and it is valid. Under each point, there is a **Comment** field. By default, it displays the address of the added point. If required, you can edit it and add an arbitrary comment.

You can change the order of route points. To do this, drag the double arrow icon  to the left of the name of the required point up or down.

The points can be saved as a route and then used in the Routes panel of the monitoring system. To do this, enable the **Save as route** option.



Events Registrar

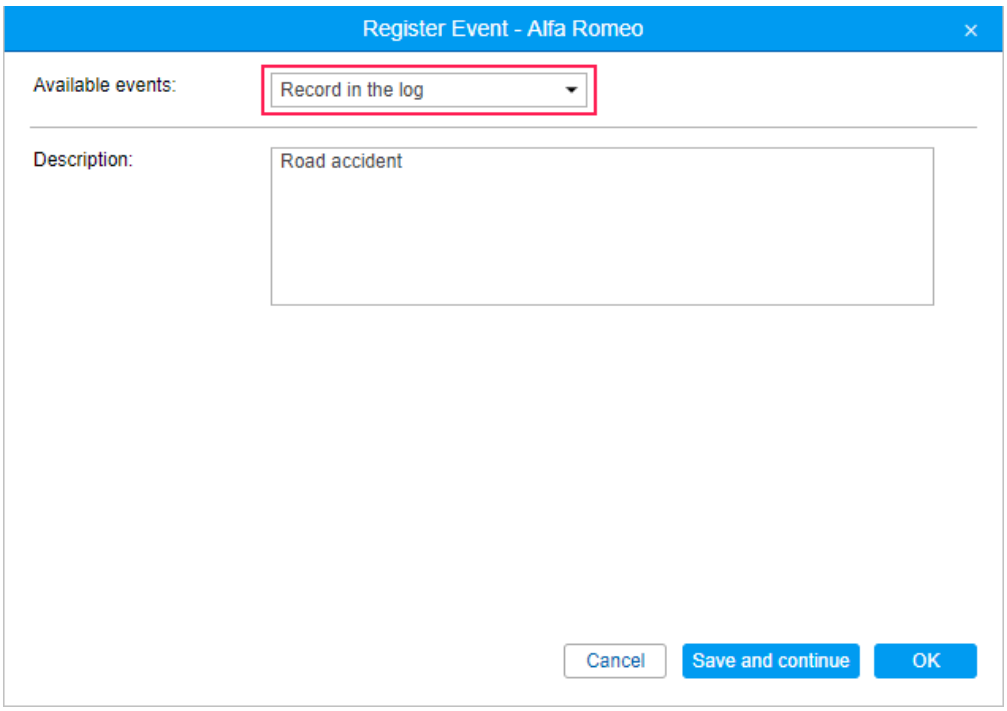
Different events can be registered in the unit history and then shown in the corresponding reports. Some events such as speeding, idling, visits to geofences, sensor values, etc. can be detected automatically by the system with the help of notifications. Other events such as fuel filling, maintenance or any custom events are registered in unit history manually with the help of a special tool — **Events registrar**.

To display the registrar, click on the button in the monitoring panel. If you do not see this button, it can be added with the help of the monitoring panel customizer.

> To register events for a unit, the **Manage events** access right is needed. Otherwise, the registrar button is not active.

In the drop-down menu, select the required type of the event:

- make a record in unit log,
- register custom event,
- register unit status,
- register filling,
- register maintenance work.

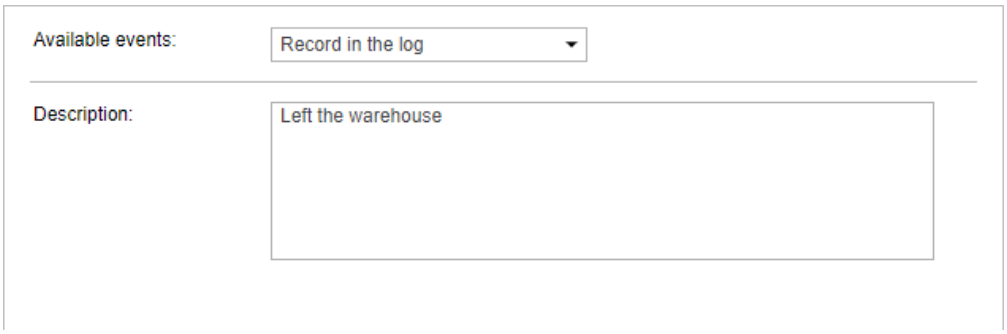


Fill in the required fields and click **OK**. If you need to register several events for one unit, click **Save and continue**. The entry will be added to the log (the corresponding caption appears in the lower-left corner of the dialog), and you can proceed to register the next event.

Units of measurement which you may encounter in the registrar dialog depend on the measurement system set in the unit properties.

Record in the log

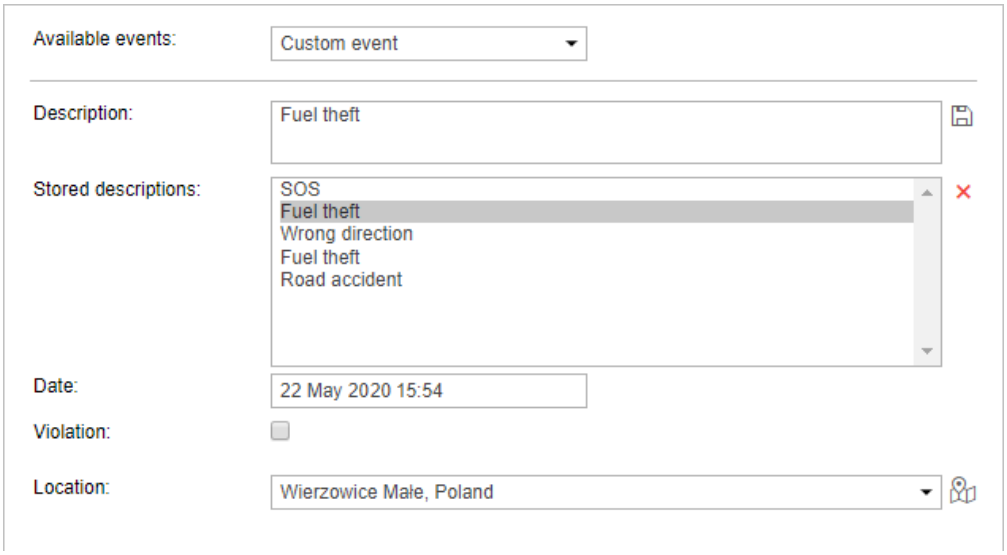
Using this option, you can add any text note to the unit log. It will be labeled as **Manual record** and dated by the time of creation. Such records can be viewed in messages (messages type **Log**) and in reports generated for this unit (query the **Log** table).



To add messages to the log, you should have not only the **Manage events** access but also the **Manage log** access.

Custom event

To register a custom event, enter its name, description, and location. To add the location, click on the icon to the right of it. On the map that appears, double-click on the required position. The address is defined by the maps selected as geodata source in User Settings. Gurtam Maps. In addition, the position can be entered manually. To clear the field, delete the address.

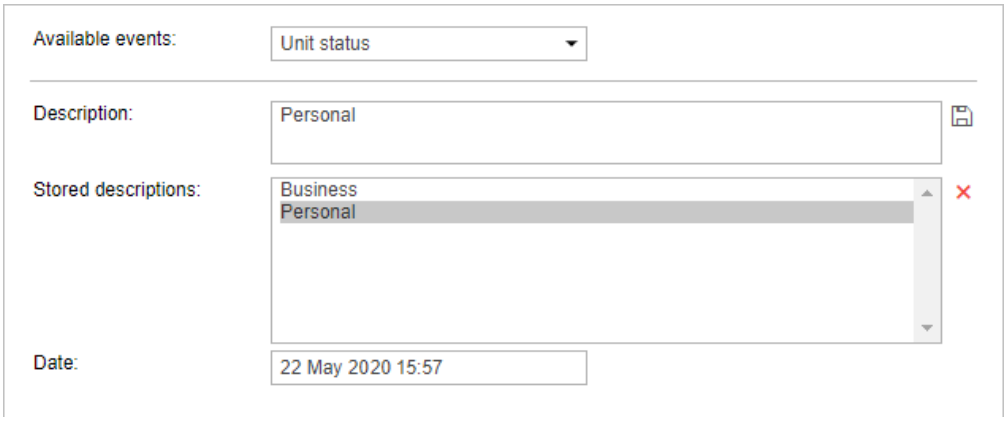


The description of the registered event can be saved. To do this, click on the **Save** icon to the right of it. The saved description appears in the list below. To select an existing description, click on it. To delete a description from the list, select it and click on the **Delete** icon.

If you check the **Violation** option, the event will be registered in the unit history as a violation, otherwise, it will be registered as a simple event. It means this event will appear in different kinds of reports:
Events or Violations.

Unit status

This option allows registering the unit state which can be later displayed in reports. For example, when using a vehicle for personal and official purposes, you can register the start of personal or official use of the vehicle.



To register the unit status, type in a description (you can use the ones saved previously) and, if necessary, change the date and time of the status.

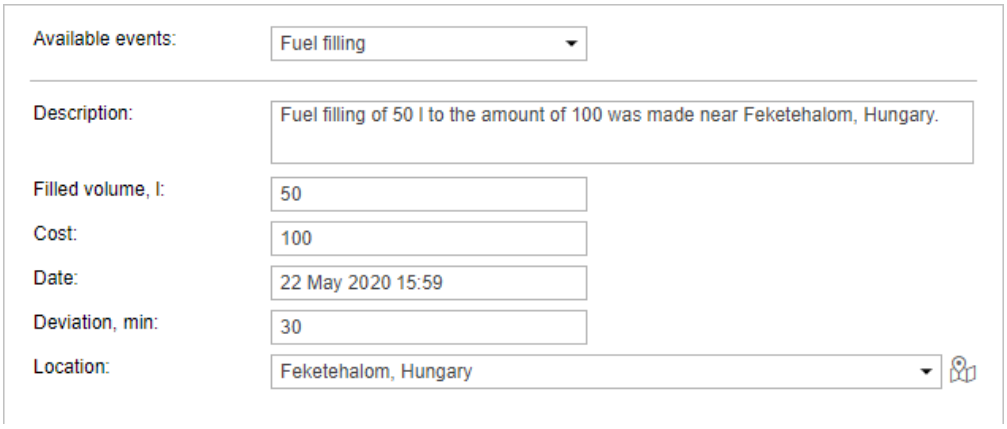
The status can be set automatically (for example, when entering a geofence).

The **Status** column is available in the following tabular reports: Trips, Engine hours, Rides, and Parkings.

Fuel filling

In the **Monitoring** panel, you can manually register fuel fillings for units. Manual registration helps to estimate the difference between the registered fuel filling and the factual one, compare the consumed amount with consumption rates, calculate running costs, etc.

To register fuel filling, select the corresponding event in the drop-down list and fill in the required fields.



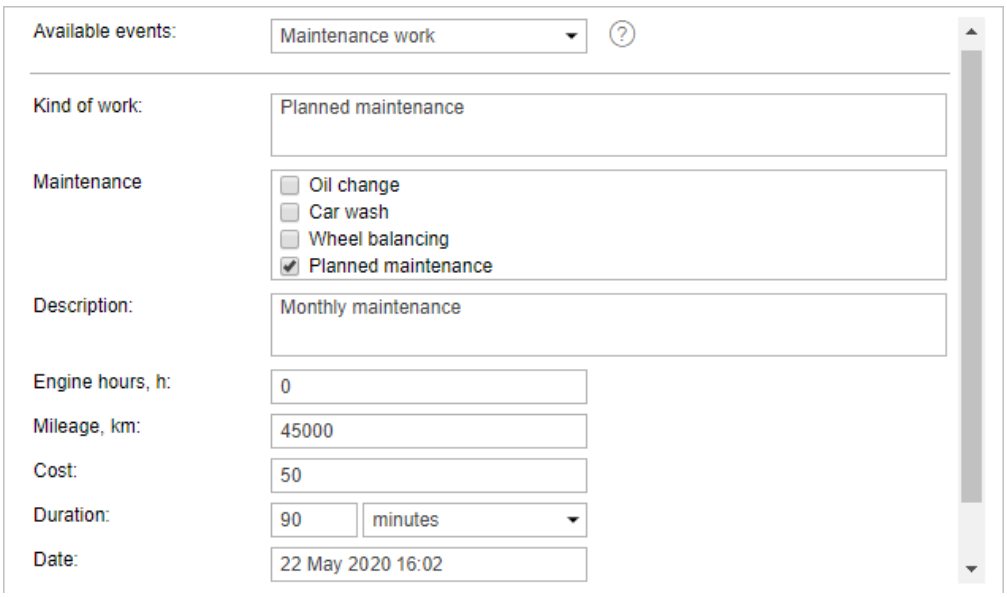
Enter the volume of filled fuel and its cost. Fractional numbers (up to hundredth) can be also used for fuel volume and cost. To enter fractional numbers, use a **period** as the separator. For example, to register fuel filling for 77 dollars and 88 cents, enter **77.88**.

Entered values are automatically added to the **Description** field above. If necessary, you can edit the description manually. Then enter the date and time when the filling took place, possible deviation from this time in minutes and specify the location.

Registered fuel fillings participate in the following reports: Fuel fillings, Events, Utilization cost.

Maintenance work

To register maintenance work, select the corresponding event in the drop-down list and fill in the required fields.



Enter the following data:

- kind of work (type from the keyboard or select from the list below);
- description;
- values of mileage and engine hours counters at the moment of the event (the current values are displayed but you can edit them);
- cost;
- service duration in minutes, hours or days (choose the type of the interval from the drop-down list);
- date and time of maintenance (by default, the current date and time are displayed);
- location (press the **Select Location** icon and double click on the map to specify the position or edit this field manually).

⚠ In the **Mileage** field, it is not possible to enter a value that exceeds 2147483 km.

In the upper part of the dialog, you see the list of service intervals from the Service intervals tab. Check the services that have been carried out. This is required in order for the selected intervals to be zeroed and the countdown to start anew. Keep in mind that if you select any maintenance interval here, the contents of the **Kind of work** field changes correspondingly.

> Registered events are not editable. They can only be deleted from the unit history on the Messages tab (special access is required).

Registered events in reports

Registered fillings and maintenance can appear in the report on events together with other actions. A registered custom event depending on your choice can get in the report on events or report on violations. Both reports have a similar structure.

When transporting registration data to a report on events (violations), the information is distributed among the columns, the contents of which are taken from certain fields of the registration dialog. The table below gives a correspondence between the column of the report and the fields of the registrar.

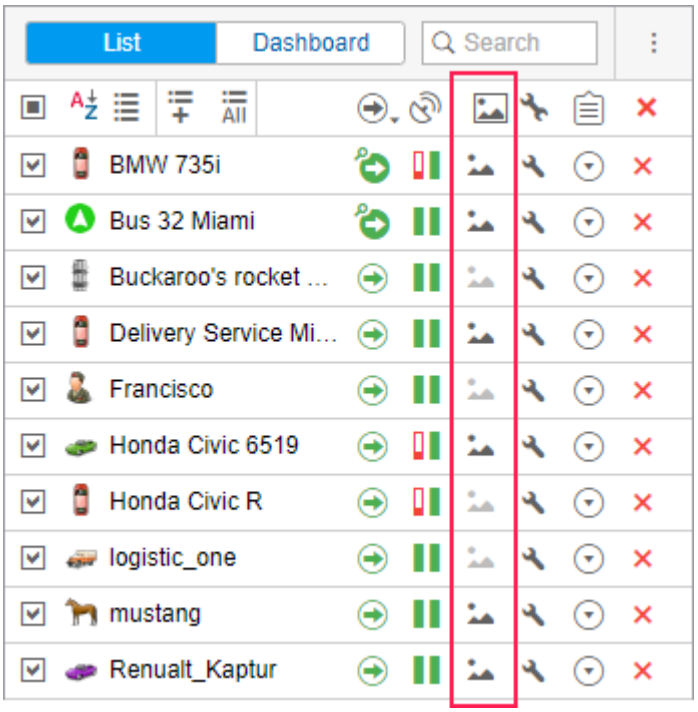
Column Header	Column Content
Event time	Date and time when the event happened.
Time received	Date and time when event was registered.
Event text	Text is taken from the **Description** field. For maintenance, if there is no description, the text can be taken from the **Kind of work** field.
Location	Unit location at the time of the event. It is taken from the coordinates indicated while registering the event (click on the **Select location** button, and double-click on the map).

If any of the above-mentioned fields are not filled out correctly, the corresponding columns will be empty.

Other reports that use registered events are the report on maintenance and utilization costs.

Media Files from Messages

If the equipment supports such an option, units can send pictures or video files. Pictures and videos can be viewed in the **Messages** panel, as well as in the **Monitoring** panel. To display a special column in the **Monitoring** panel, activate the **Media** option in the Monitoring panel customizer.



Click on the **Media** button to open a special window in which you can view pictures and videos. The viewer window contains the latest picture (video), as well as the total number of available pictures (videos) received during the current session.

The above-mentioned way is for viewing pictures (videos) from a particular unit. To view pictures (videos) from **all** units, click on the **Media from units** button at the bottom of the screen. If there are media files available, the button becomes active (blue) and the number of available images (video) is displayed. If the number is in a red background, it means that new images have appeared since the last window was opened.

⚠ In this window, only images (videos) received during the current session are displayed.

To navigate through the images (video files), use the arrows. Between them, you can see the number of the pictures (videos) viewed and the number of available images (videos). Media files are sorted according to the time of their arrival on the server.

The date and time of the picture (video) arrival are displayed above each of them. Below the media file, you can see a unit name and address information from the message.

You can enlarge some media files with the button in the upper right corner. To close a media file viewer, click on the button in the lower right corner.

All images received from the unit can be viewed in reports and messages. Moreover, in messages, you can also view video files.

ⓘ You can get an image from a unit at any time using the **Query snapshot** command.

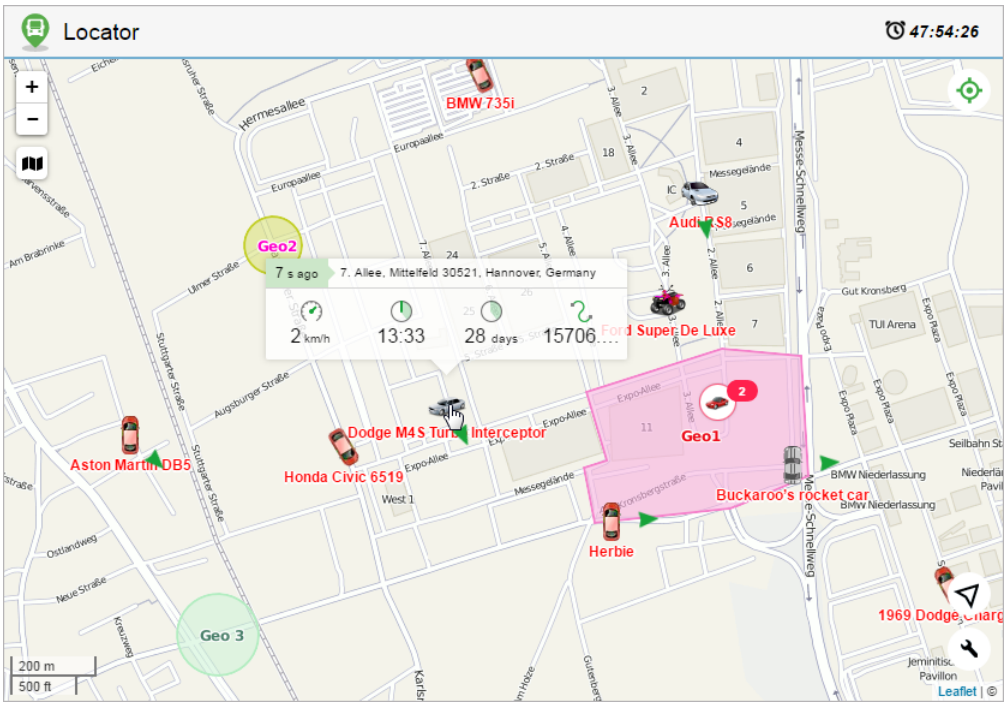
Locator

Locator is used to generate links and share the current location of your units. Conditionally the locator can be divided into two parts — links creation and their viewing. Links are created in the locator dialog window. To open the dialog, choose the corresponding item in the user menu. Viewing is performed on the map of the locator map, which becomes available when clicking on the provided link.

Viewing on the map

Open a link to view the map of the locator where units are displayed along with geofences (if they have been indicated in the link creation settings). Gurtam Maps, OpenStreetMap, and, if available, Google Maps are used to show the location of units. To choose a map layer, point to the icon below the scaling buttons (upper left corner). You can also enable/disable displaying of geofences on the map here.

If the life span of the link is less than 48 hours, it will be shown in the upper right corner of the window.



Units

A unit is presented on the map by its icon. The unit name and movement direction arrows are shown as well (by default). You can also activate units traces (switched off by default). Click on the button in the lower right corner to enable/disable the above-mentioned settings.

By default, the option of tracking all units is activated in the locator, that is, the map is scaled in such a way that all units are in the visible area. To disable this option, click on the icon and cancel the selection of the item **all** in the drop-down list. Select one or more units if you want to track only these ones.

After the unit has been found, you can view its latest data. The data is shown in the window that is opened by clicking on the unit. The amount of provided information depends on the unit state (moving/stationary). If it is moving (movement arrow is an indicator), then the following parameters are shown for it: speed, time of movement, its duration, and covered distance. For a

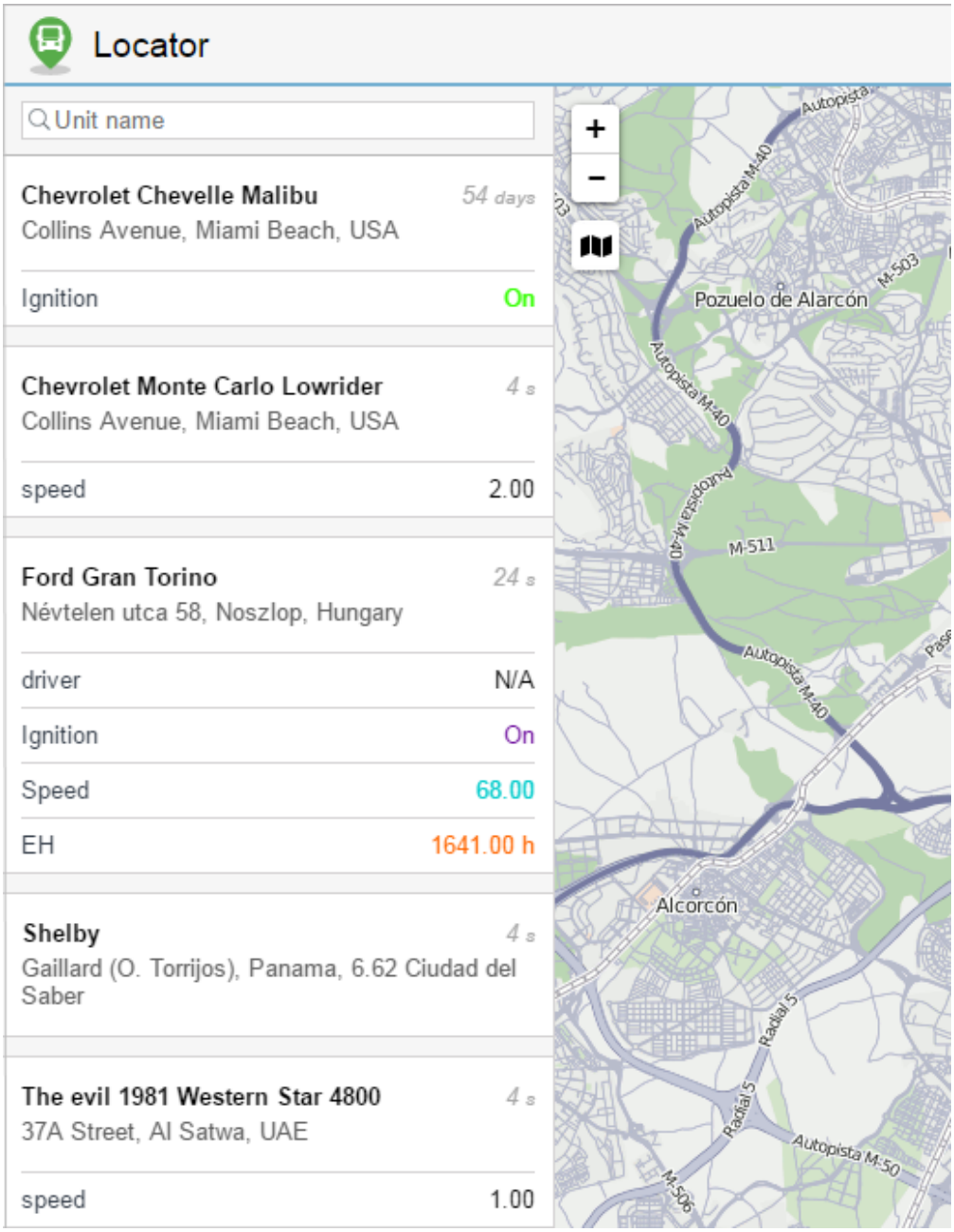
unit which is not moving such parameters as speed and covered distance are irrelevant, therefore only two parameters are shown for it: the time of the start of the stationary state and its duration. Besides, regardless of the unit state the header of the opened window contains such information as the time passed from the last message and address from the last message. Note that upon receiving new messages either position of a unit on the map or its current parameters are automatically refreshed.

If it is necessary to know where the unit (units) was since the launch of the locator, you can generate and view its track. The track is displayed for a period of not more than 24 hours. To do this, click on the button  in the upper right corner and select the required unit from the dropdown list. Afterwards, a track is built, and the map is scaled in order for the whole track to be displayed. If the tracks are built for several units at a time, they are shown in different colors on the map and the map itself is scaled so that they all get in the field of vision. To remove a track from the map, click on the track building button again or uncheck the boxes of the units whose tracks you want to delete. Note that in the locator the track color is selected randomly and it does not depend on any unit settings.

> ⓘ The track of movements can be viewed only if a user indicates such a possibility when creating the link.

Sensors

If sensor masks have been indicated when generating a link, in the left part of the window of the locator there will be a list of units with their names, the time of receiving the last message and the latest location, as well as the names of the sensors, their values and metrics. If for some sensor intervals and colors are set, the adjusted color will be used for showing its value in the list. To find units by name, use the dynamic search above the list.



If you open the locator link on a mobile device, use the buttons and to switch between the **Map** and **Sensors** modes respectively.

Current location

Locator provides a possibility of defining your current location on the map. This is particularly helpful if you use a locator from a mobile device.

To determine your current location click on the button in the lower right corner. Afterwards, the map is scaled and centered on your location.

⚠ Due to browser restrictions, the determination of the current location is only available during the connection via the **https** protocol.

If a particular unit has been chosen using the monitoring tool, and then you click on the location button, both the unit and your current location get into the field of vision. However, as it was stated before, upon arrival of new messages from the unit selected in the monitoring tool, the map continues scaling and centering on it until the monitoring is disabled (select dash from the dropdown list).

Scaling

When the locator is opened, the map is automatically scaled so that all units get into the field of vision. To move around the map, drag it using the mouse.

You can scale the map by scrolling or using zoom buttons (+/-) in the upper right corner. A graduated scale located in the lower left corner helps you understand the distances on the map.

Depending on the scale used and the number of items available, some icons can overlap each other. In this case, the assembly of icons is replaced by the group icon (the number of elements is shown for every group):

— for units;

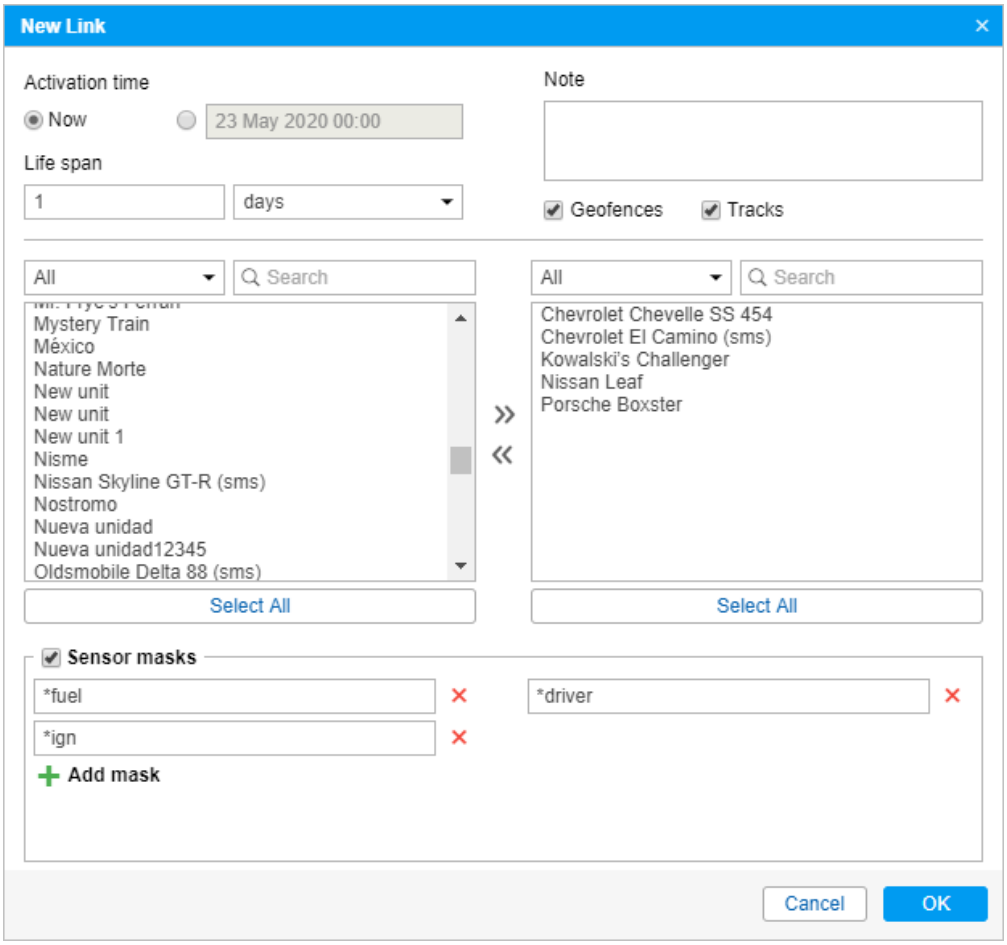
— for geofences.

Click on the group item to see the list of all items (icon + name).

Links creation

Links are generated and edited in the locator dialog, which is accessible through the user menu.

To create a new link, click on the **New link for sharing units** button and fill in the fields of the form.



Indicate the activation time for the link in the upper left corner of the dialog. It can be **Now** or any other moment in the **future** (indicate the date and time in the calendar). Note that the activation time cannot exceed 100 days.

Furthermore, enter the lifespan of the link into the corresponding field. The value can be indicated in minutes, hours, or days (select from the dropdown list). Note that you can specify any value (from 0 to 1000) or make it unlimited (enter 0).

You can enter a note for your link in the upper right corner of the window. This allows distinguishing the link in the general list. Besides, the note (if entered) is shown in the header of the page of the locator itself.

You can also check the **Geofences** box here to share them in the link. Moreover, you can provide the possibility of generating and viewing the track of a unit by activating the **Tracks** checkbox.

ⓘ The user that provides the possibility to view the track of a unit must have the **Query reports or messages** right.

Below, you select the units whose location you want to share. The selection is made in the list on the left. Transfer the required units to the list on the right (use double clicks or the **Add** button).

For the convenience of choosing units or unit groups, the contents of the list can be changed using the filter above it. The following variants are available: **All**, **Units**, **Unit groups**, **Units outside groups**. To find the required unit quickly, you can also use the dynamic filter.

Sensors with their values and metrics can also be shown in the locator. To do this, it is necessary to enable the corresponding option and indicate the masks of the sensors to be displayed.

To generate the link, click **OK**. To dismiss the changes, press **Cancel**.

List of links

Generated links get in the corresponding list containing such information as the start and end time of its operation, how much is left before the expiration date (if the activation time has already come), the number of units, as well as whether geofences and tracks are shown on the map of the locator. When you hover the cursor over the number of units, its list is shown in the tooltip. If there is less than one hour left before the link's expiration, the corresponding line is highlighted in red.

On the right, there are the following buttons:

 — edit link parameters,

 — copy locator,

 — remove link from the list.

Click on the link to open it in a new tab. To copy the URL of a link, click on the button to the right of it.

After expiration, the link is automatically deleted.

When the user password is changed, all locator links are automatically deleted.

Locator integration

Use the following form of code to integrate the locator into your website:

```
<iframe src="link_address&lang=en" width="700" height="400"></iframe>
```

Necessary actions:

- In the link list, click on the icon to the right of the link and copy it.
- Paste the copied link instead of **link_address**.

Such parameters as **width** and **height** stand for the corresponding properties of the integrated window. The **Lang** parameter stands for the language used.

Manipulations with link

As has been described earlier, there are 3 settings for the unit displaying (movement direction, name, 'tails'). Changing these settings the corresponding information is added to the locator's URL:

'Tail' (on/off)

```
&tails=1/0
```

Name (on/off)

```
&labels=1/0
```

Arrow (on/off)

```
&directs=1/0
```

Therefore, to save the applied settings and use them afterwards, it is necessary to utilize not the original link (created in the locator dialog), but the modified one (received when the settings of unit presentation on the map are changed).

Moreover, there is a possibility to select a map source in advance. The information on the map source is added to the locator URL. The procedure is the same for any available map, consider the example of the OpenStreetMap:

```
&map=OpenStreetMap
```

If it is necessary to display the tracks of all available units on the map, use the parameter

```
&build_tracks=all
```

In this case, the map shows the tracks rendered since the creation of the link.

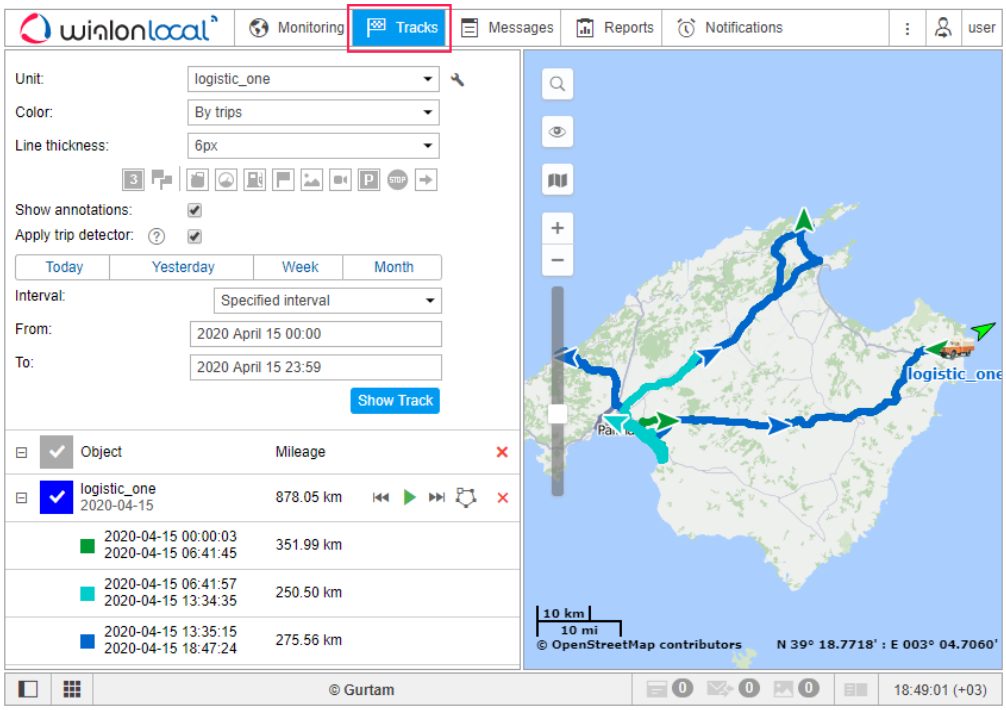
Tracks

The track is a line drawn on the map to show how a unit moved during the indicated period. A track is mapped by the points from where messages came. Each point stores the date and time when the message was received and coordinates at the point, as well as other parameters (speed,

sensors etc.). Besides, markers indicating places of fuel fillings, parkings, and other events can be drawn on the track.

Any number of tracks can be drawn on the map. They can represent different units and various time intervals. To prevent tracks from being confused with each other, you can set different colors for them. Besides, different segments of the track can be of different colors depending on the speed or sensor values.

To open the **Tracks** panel, select a corresponding name in the top panel or click on the necessary item in the main menu customizer.



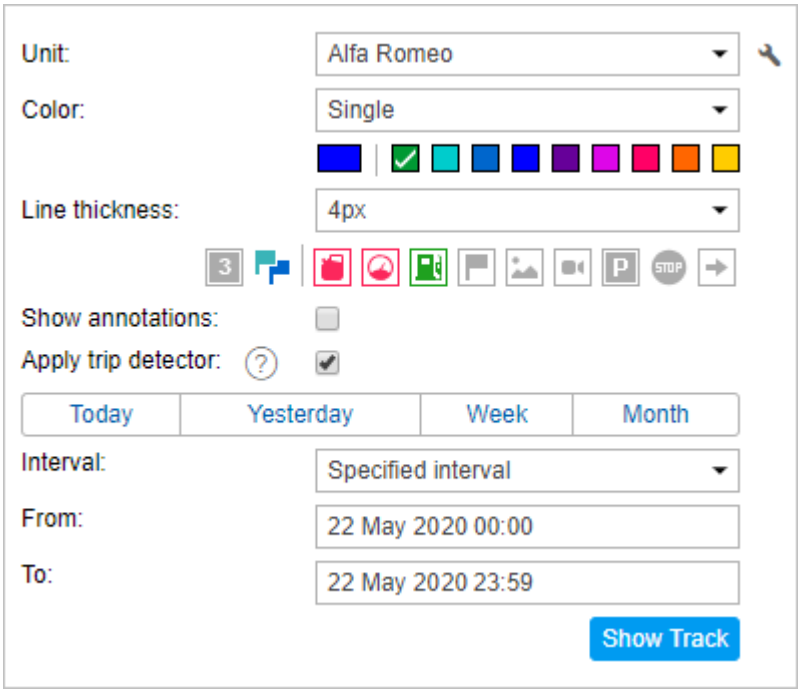
To build a track, it is necessary to have the **Query reports or messages** right towards a corresponding unit.

Mapping a Track

To build a track in the **Tracks** panel, do the following:

1. Select a **unit** in the dropdown list. Its contents depend on the worklist in the **Monitoring** panel and access to the units. In case the worklist is empty (when the dynamic work list is used or when units were deleted from the work list manually), the units to which you possess the corresponding rights are displayed.
2. Adjust the desired parameters for the track (color, thickness, etc.).

3. Define the **time interval** within which you want to get the data.
4. After filling in all the fields, press **Show Track**.



To display the **tracks** on the map, the corresponding layer must be activated.

The principle of interval adjustment is the same as in the reports (see Query and view reports). The third and fourth steps can be combined into one if you use one of the **quick intervals** (the buttons **Today**, **Yesterday**, **Week**, and **Month**).

A point-to-point track that is built according to the preset parameters will appear on the map (if the unit has any messages with the coordinates for the period). If it takes too long for the track to appear on the map, it means you either indicated an interval that is too long or your Internet speed is too low.

If within the indicated period the unit was not moving, there will be no track on the map. However, it can be found in the list of tracks below, and the distance traveled will be 0 km.

A track or its part can be displayed on the map as a dashed line. Such a situation indicates that the data in this part of the track might be inaccurate. For instance, the maximum interval between the messages is exceeded (see the Advanced tab) or the number of satellites is less than 4 (if the validity filtration of messages is disabled).

When the private mode of the trip is detected (if the unit has the **Private mode** type sensor with the **Do not show unit location** option enabled), the **work** trips are connected with the straight dashed line.

Alternative methods to build a track on the map are:

- in the Monitoring panel with the help of quick track buttons;
- in the Messages panel when you view data messages;
- in the Reports panel, if the appropriate option is selected in the report template.

Track Parameters

After you have built a track, it is impossible to change its parameters (time, unit, color, annotations). In case of error, delete the incorrect track and create a new one.

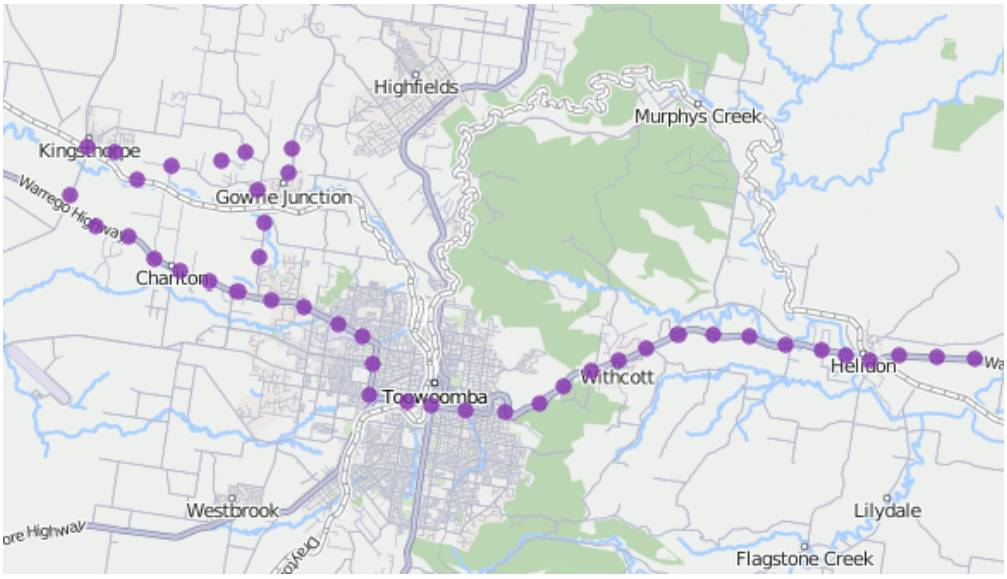
Track color

There are four mutually exclusive color settings for the track: **By trips**, **By Speed**, **By sensor** and **Single**. One of these settings, except the first one, can be initially set on the Advanced tab of the unit settings. If the setting is not specified, the **By trips** option is selected by default in the track panel.

For a **Single** track, you can choose a color in the palette every time you build a track, or, if the color is not specified, for each new track the color will be selected automatically from the color range (it is selected circle-wise). The color is selected in the same manner if the **Single** setting is applied to the unit, and another color is chosen manually from the palette.

Track line thickness

Indicate the **thickness** of the track in pixels (from 1 to 15). A track can be represented as unconnected points (the points from which the messages were received). If you need this option, select the **Points only** option.



Markers

You can enable markers to highlight the places of significant events on the track.

> Markers can be used only if you have access to reports.

The choice of possible markers is the same as in reports:

- fuel thefts,
- speeding,
- fuel fillings,
- events (if a violation took place, the marker is red),
- pictures from messages,
- video from messages,
- parking places,
- short stops,
- initial position,
- final position.

Select the markers before building a track. To activate a marker, just click on its icon to make it colorful. If at least one kind of marker is selected, additional marker options can be applied:

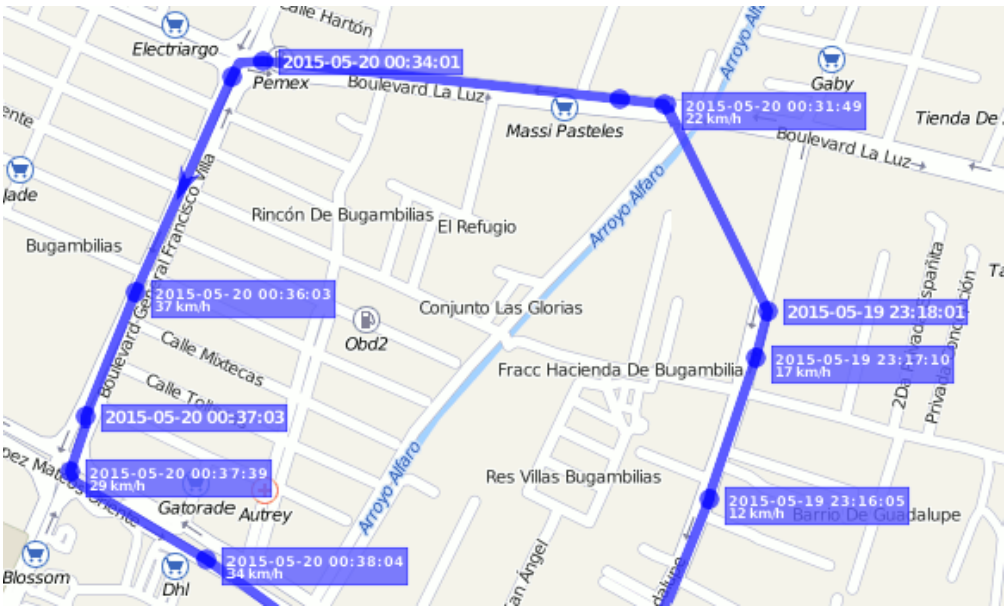
- numbering,
- grouping.

Markers in tracks are drawn and used on the same principles as in reports.

Annotations

Indicate whether you want **annotations** to be displayed. Annotations are hints which are attached to each point of the track to show the date and time when the message was received, as well as the speed of the movement of the unit at that time. Annotations are rather informative but they make the visual perception of the track more complicated. That is why sometimes it is reasonable to switch them off. Full information about any point of the track can be obtained from the tooltip that appears when you hover the cursor over a point.

The system of measures in the annotations depends on the settings of the current user, not on the settings of the unit.



Trip detector

Trip detector checkbox affects the distance value and track visualization. For example, in the places of stops and parkings not a conglomeration of points will be displayed, but just one, and the mileage will include only the intervals detected as trips.

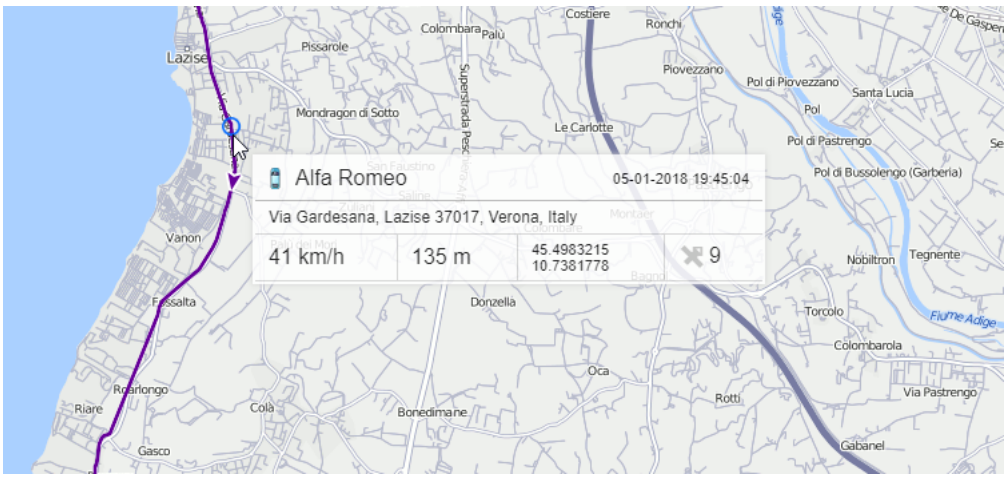
Also, this option allows you to view the trips made within the track. Press the **+** to the left of the track to expand the list of its trips. Click on the required trip to center the map on it. Note that the **Track player** tool works for the whole track. The trip detector is set up in Unit Properties => Trip Detector.

The mileage in tracks can sometimes differ from the mileage in reports (if there are invalid messages within the interval). In such cases, more accurate mileage is provided in reports.

Managing Tracks

You can add tracks on any unit for any time interval. The list of tracks created will be displayed in the work area at the left. To prevent tracks merging, select different colors for them.

Hover the cursor over a track to get accurate information about a specific point of the track (points where messages were received). Messages are searched in the radius of 50 pixels from the cursor. Points found are highlighted by a pulsating circle, and a tooltip appears with the following information: time, address, speed, altitude, coordinates, satellites, and sensor values. Messages with zero speed are marked with bigger points. Measurements used in the tooltip are borrowed from the unit properties (speed in kilometers or miles per hour, altitude in meters or feet), as well as mileage in the list of tracks. The information from the tooltip can be copied to the clipboard.



You can manage tracks in the left part of the window under the **Show track** button. The name of a unit is displayed on the list, as well as the time interval and traveled mileage. Mileage in tracks can sometimes differ from mileage in reports (if there are invalid messages within the interval). In such cases, more accurate mileage is provided in reports.

It is possible to view all created tracks on the map simultaneously or select just some of them. The tracks with marked checkboxes are displayed. Unmark a checkbox to hide the track. Using the checkbox in the header, you can select/unselect all tracks at once. You can temporarily hide all tracks by disabling the corresponding layer in the top panel.

If there are several tracks available, you can sort them by length or name. To do this, click in the header of the list above mileage or name columns. Click again to sort the list in reverse order.

Use the arrows ⏮ ⏭ to quickly locate the initial/final point of the track. To see the whole track and focus the map on it, just click on its name in the list.

To play the track, click on the button ▶. It opens Track Player and launches the playback. The unit icon moves along the track line at the selected speed.

Furthermore, another special tool can be applied to a track — Hittest. It allows you to get the comprehensive information for any point of the track.

To delete a track, click on the button ✕ next to it. Using this button in the header of the list, you can delete all tracks at once.

Moreover, a built track can be saved as a line geofence. To do this, click on the button ⬡. Note that if the number of points of a track is more than 10000, it is saved in several geofences with the same name and a digital index in brackets. For example, **Geofence (1)**, **Geofence (2)**, etc.

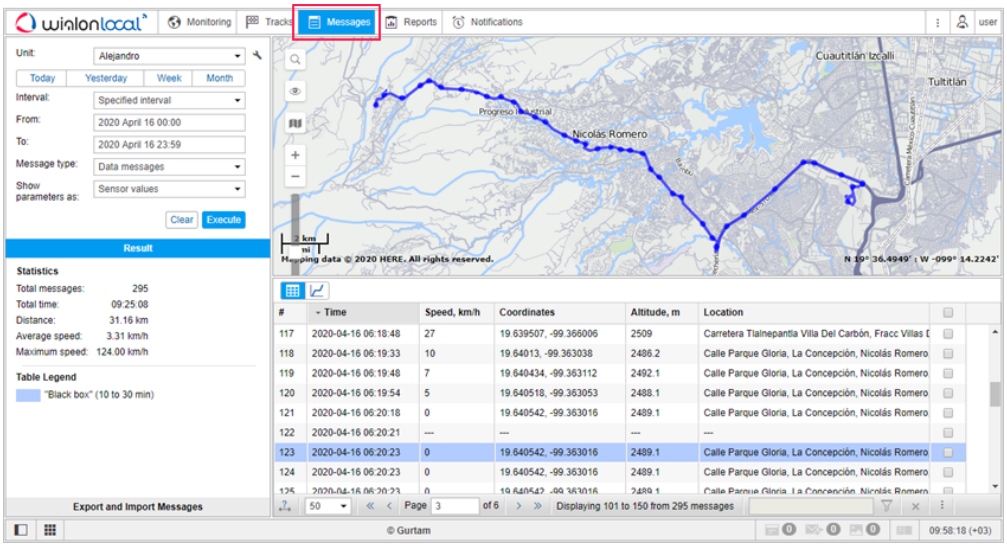
Messages

The data sent by trackers is processed and stored in the database in the form of **messages**.

On the **Messages** tab, you can view all messages received from units (coordinates, parameters, speed, etc.), as well as SMS messages received from them, commands sent to units and events registered in units history. Besides, this data can be exported to a number of formats.

To open the **Messages** tab, select a corresponding name in the top panel or click on the necessary item in the main menu customizer. The workspace of the panel can be divided into four blocks:

- in the left top corner, you can set the parameters of your request;
- in the bottom left part, there is the statistics for current request or a panel to export/import messages;
- in the top right section, there is the map;
- at the lower right section, there are messages themselves.



The sectors can be resized (the left ones — in width, the right ones — both in width and height). To do this, click on the border between them with the left mouse button and while holding it, move the border to the right/left or up/down. At the same time, if less than 10% of the map is left while expanding the lower sector, the map automatically collapses. To return it, press on the line under the top panel.

Working with Messages

Working with messages is query messages, view and filter them, and delete them.

Requesting messages from server

The request is formulated in the Messages, in the top left corner of the window. Specify the following parameters:

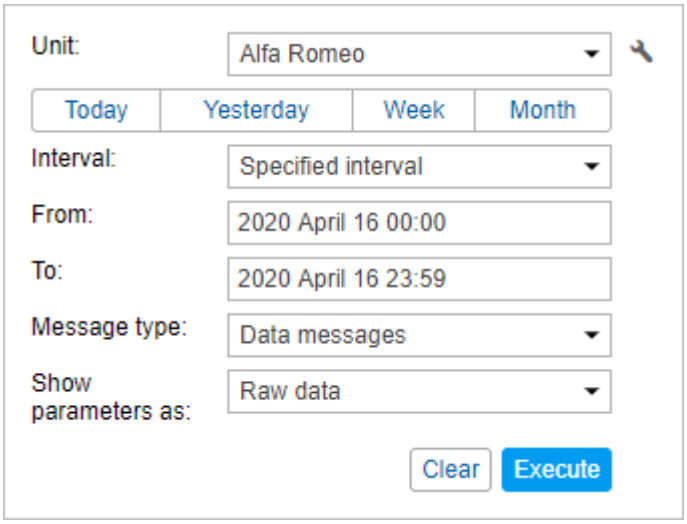
1. Select a unit. The dropdown list contains not all the units available to you, but only the units from the work list of the monitoring panel. In case the worklist is empty (when the dynamic work list is used or when units were deleted from the work list manually), the units to which you possess the corresponding rights are displayed. A button in the shape of a spanner located to the right of the dropdown list serves to open the unit properties.

2. Specify the time interval to show messages for. The principle of interval adjustment is the same as in the reports (see Executing and Viewing Reports). The second and fourth steps can be combined if you choose one of the **quick intervals** (the **Today**, **Yesterday**, **Week**, and **Month** buttons).

3. Select the message type from the dropdown list (each type is described in detail below):

- data messages,
- SMS messages,
- sent commands,
- registered events,
- log.

4. At the end, click **Execute**. The table will be generated in the right part of the window. To clear the table (and the map), press **Clear**.



There are alternative ways to query messages:

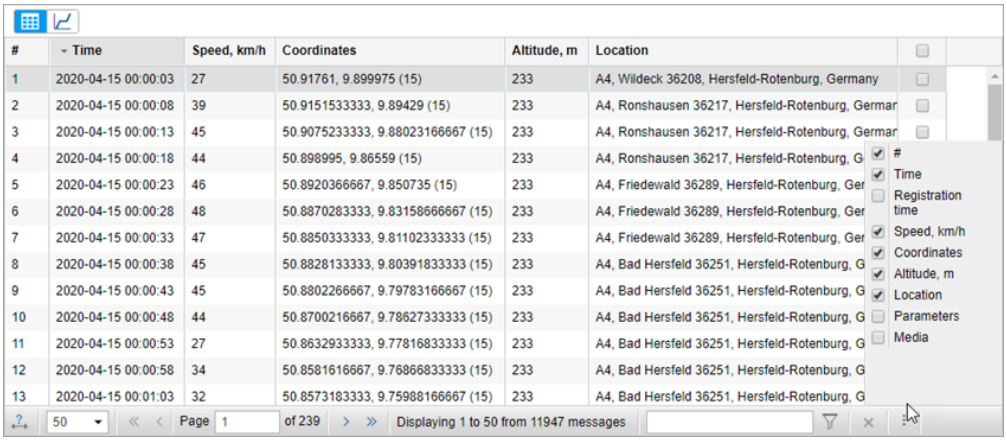
- from the Monitoring panel;
- from the table or chart of the online report.

ⓘ To display the **messages track** on the map, you should check if the corresponding layer is active.

Viewing messages

Messages of any type are displayed in the form of a table.

If a long time interval is selected, there can be many messages. In this case, they are presented on several pages. Use the navigation panel (blue arrows) to move from page to page, or enter the page number manually and press **Enter** to display a certain page. Apart from that, in the dropdown list, you can set the number of messages to be displayed on one page: 25, 50, 100, 500, 1000.



To change the chronological order of the messages, click on the heading of the **Time** column. The current sorting direction is shown by the arrows: ▼ — for the direct order; ▲ — for the reverse one. This setting is remembered by the system and used until you change it manually.

The width of the columns can be adjusted. To do this, move the cursor to the border of the column, click the left mouse button and while holding it, drag the border to the desired direction. If you want to expand the table, click on the **Set column auto width** button so that the letter **A** is displayed there. In this case, the column width will be set according to contents in the cells. To save the column width when moving through the pages, make the button inactive ( ). Note that when loading many messages (500, 1000 per page), it is better to disable the column auto width because it can considerably slow down the loading process especially if the number of parameters differs from one message to another.

The contents of the table are adjustable. It is possible to hide and display any column. To display the columns, click on the button ⋮ in the right bottom corner of the window. Then select the columns you need in the dropdown list. Note that all the columns cannot be hidden simultaneously. If sensors are displayed, each of them has its own column that can be enabled or disabled. By default, only visible sensors are displayed (the rest can be enabled manually).

Messages filter

To quickly find a necessary message, use a special filter.

Data messages (with parameters displayed as raw data) can be filtered by parameter names and parameter values, SMS messages and registered events — by message/event text, sent commands — by values of additional parameters, log — by the description of the action. The filter is disabled for data messages with the parameters shown as sensor values.

The rules for setting the filter were given above. You can use wildcard characters (* or ?) or input your query without them. For example, to find all messages with images enter 'image'. Other available parameters depend on the type of equipment used.

To search for several parameters at once, enter their masks separated by commas. In this case, the results are highlighted in different colors and moved to the beginning of the line. Their order corresponds to the entered masks.

For parameter values, the usage of the the ***** and **?** signs is supported if string values are compared. That is, the search can be specified as: **adc? = 0.5 ***. Only the **=** (equal) and **<>** (not equal) operators are used in this case.

In addition, the filter supports the following operations: **=**, **>**, **<**, **>=**, **<= <>**. For instance, a search can be specified as follows:

- param = 3.1415 (equal);
- param > 3.14 (more);
- param < 3.14 (less);
- param >= 3.14 (more o equal);
- param <= 3.14 (less or equal);
- param <> 3.1415926535 (not equal);
- 2.71 < param < 3.15 (more ..., but less ...).

The ***** and **?** characters can be used for parameter names. Therefore, a search can be specified as: **adc? > 0.5**.

The search of input/output values is carried out according to the principle **if any of the values is equal, greater or less**, that is, the query **I / O <2** will include **I/O = 0/2** among the results since there is a value **0**, which is less than **2**.

To apply the filter, press **Enter** or click on the **Apply** button to the right of the filer. After this, messages that contain the requested parameters or text will be displayed in the table. To remove the filter and show all available messages again, clear the query text field and apply the filter again. If the filter is applied, the number of found (filtered) messages is displayed on the left.

The filter only works on the current page with messages. However, when you go through the pages, the filter is applied to each new page automatically.

Deleting messages

The message can be deleted if you think it is invalid. To do this, you should have the **Delete messages** right to the unit.

In the last column of the table, mark the messages that should be deleted (one or more). Then click on the **Delete** button (✕) and confirm your intentions. If the checkbox in the header of the table is ticked, all messages on the current page will be selected.

After the operation, the newly deleted messages still remain in the table but become inactive. The next time when you load messages, the deleted messages will be completely removed from the database.

It is impossible to delete the last incoming message, as well as the last message with the position (valid coordinates). That is why the delete checkbox for these messages is always dimmed.

Data Messages

If you request messages with data, the table of messages will contain information about the message time, speed, coordinates, location, and available parameters. In addition, in the **Statistics** section, you can find summary information. There you will see the number of messages found upon request, the time from the first to the last message, the distance traveled, the average and the maximum speed. The mileage in messages in some cases may differ from the mileage in the reports (if there are invalid data on the interval). In such cases, the mileage in the reports should be considered more accurate.

There are two ways to display the parameters:

- raw data — all the parameters are displayed in one line in the corresponding column.
- sensor values — each sensor has its individual column in the table, and the values are given according to the calculation table. By default, only visible sensors are displayed but you can enable other sensors manually (see Viewing Messages).

The table of messages has the following columns.

Time — the date and time of the message.

Registration time — the date and time when the message was received on the server (disabled by default).

Speed — the speed of movement of the unit according to the message.

Coordinates — the latitude and longitude of the position of the unit and the number of the locked satellites (indicated in parentheses).

Altitude — sea level elevation. If only zeros are shown, it means the device does not transmit altitude.

Location — the address of the unit when sending the message.

Parameters (if available) — the values of the parameters of all available sensors. The messages can be filtered by parameters. Instead of one column with parameters, columns with sensors can be displayed (if **sensors values** is selected).

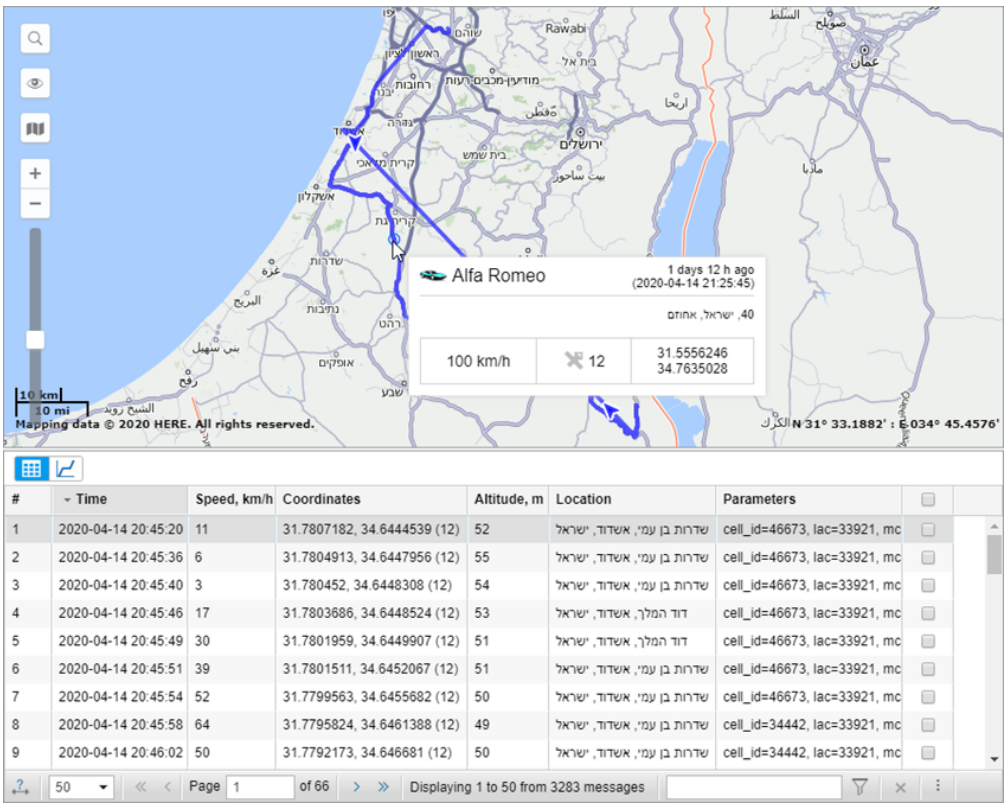
Media — if there is an image or video sent by the unit, in this column you can find the button for viewing the media file. Click **Save as** in the lower left corner of the image file viewer to save it.

Delete — check boxes to delete messages. Select the messages you want to delete and click on the button ✕ at the bottom of the table. The button is displayed only if the user possesses the corresponding rights).

The following messages are highlighted in the table:

- alarm messages,
- messages with position by LBS,
- 'black box' messages,
- imported messages.

The information on each color and the message that corresponds to it is located in the **Legend** section.



#	Time	Speed, km/h	Coordinates	Altitude, m	Location	Parameters
1	2020-04-14 20:45:20	11	31.7807182, 34.6444539 (12)	52	שדרות בן עמי, אשדוד, ישראל	cell_id=46673, lac=33921, mc
2	2020-04-14 20:45:36	6	31.7804913, 34.6447956 (12)	55	שדרות בן עמי, אשדוד, ישראל	cell_id=46673, lac=33921, mc
3	2020-04-14 20:45:40	3	31.780452, 34.6448308 (12)	54	שדרות בן עמי, אשדוד, ישראל	cell_id=46673, lac=33921, mc
4	2020-04-14 20:45:46	17	31.7803686, 34.6448524 (12)	53	דוד המלך, אשדוד, ישראל	cell_id=46673, lac=33921, mc
5	2020-04-14 20:45:49	30	31.7801959, 34.6449907 (12)	51	דוד המלך, אשדוד, ישראל	cell_id=46673, lac=33921, mc
6	2020-04-14 20:45:51	39	31.7801511, 34.6452067 (12)	51	שדרות בן עמי, אשדוד, ישראל	cell_id=46673, lac=33921, mc
7	2020-04-14 20:45:54	52	31.7799563, 34.6455682 (12)	50	שדרות בן עמי, אשדוד, ישראל	cell_id=46673, lac=33921, mc
8	2020-04-14 20:45:58	64	31.7795824, 34.6461388 (12)	49	שדרות בן עמי, אשדוד, ישראל	cell_id=34442, lac=33921, mc
9	2020-04-14 20:46:02	50	31.7792173, 34.646681 (12)	50	שדרות בן עמי, אשדוד, ישראל	cell_id=34442, lac=33921, mc

50 | Page 1 of 66 | Displaying 1 to 50 from 3283 messages

Statistics

The **Statistics** section provides general information about the request.

Total messages — the number of messages for the whole period.

Total time — the interval between the first and the last message of the selected period.

Distance — the distance traveled by the unit within the indicated time interval. Mileage in messages in most cases differs from mileage in reports (if there are invalid messages within the interval). In such cases, more accurate information is provided in reports.

Average speed — the average of all speed values registered during the period.

Maximum speed — the maximum speed registered.

Using the map

The track for the selected period is displayed on the map.

It is generated together with the table. Select the message and click on it. The message will be highlighted in gray, the map will be centered on this point and a blue marker will be set there.

By default, the track is blue, but you can adjust the settings to color the track in accordance with the speed or sensor value. This can be set in the unit properties dialog on the Advanced tab.

When you hover the mouse cursor over the track, the nearest message is searched. If such a message is found within a radius of 50 pixels, the point of receiving the message is highlighted by a pulsating circle, and detailed information is displayed in the pop-up window: the time the message was received, the speed of the unit's movement at that point, altitude, coordinates, number of satellites, readings of sensors.

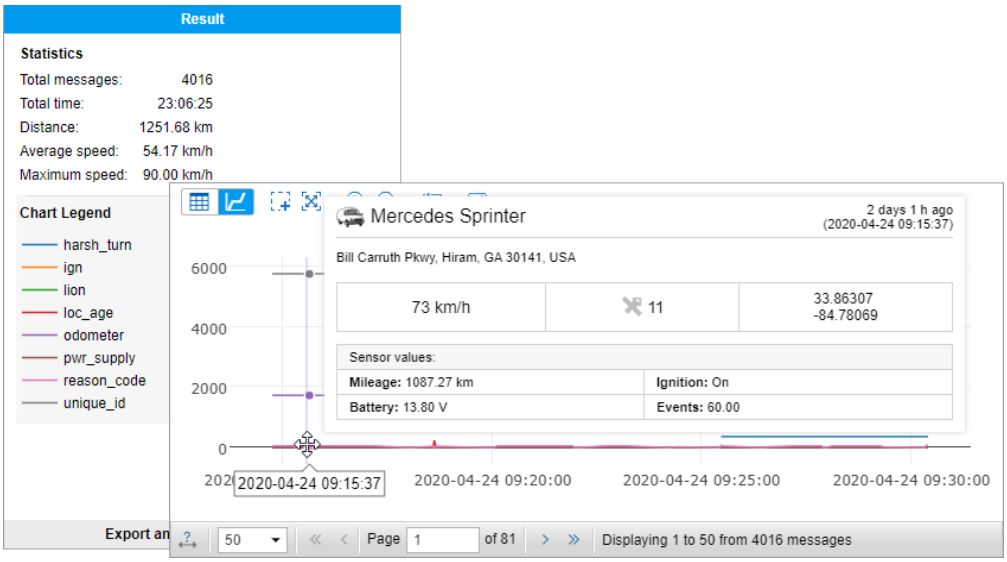
If after the **Messages** panel you switch to other panels, the map layout, as well as all the track lines, is saved. To remove unnecessary graphics, go back to the **Messages** panel and press **Clear**. More information on how to use the map while working with different panels can be found here.

Charts

Besides the table view, some data can be presented in the graphical form. To switch between the modes, use the buttons  and  , correspondingly.

Go to the graphical mode to view the graphs of the parameters contained in the messages. The **Chart Legend** section opens in the work area to the left. Here, select the parameters you want to be displayed. You can check several parameters simultaneously — in such a case the graph contains more than one curve. For convenience, these curves are highlighted in different colors.

In the place of the table with messages, a graph appears, which can be scaled with the mouse. To do this, select the required fragment by holding the left mouse button. Hover over the key points on the graph to view their values. Use blue arrows in the navigation panel to move between the pages of the chart.



SMS Messages

SMS messages can be sent by a unit while executing a command, generating an alarm or in other cases, which depend on the device type. The table generated for this request consists of three columns: the time when the message was received, the text of the message and the SIM card number embedded into the unit. Messages can be filtered by text.

	Time	Text	Phone	
1	2020-03-24 10:00:49 pm	SIGNAL,0002,24/03/20,19:00:46,5354.4342,N,02736.7896,E,18.0km,274.1,A,010000	+375000000000	
2	2020-03-24 10:01:49 pm	PC,0002,24/03/20,19:01:46,5354.8711,N,02736.2582,E,20.0km,326.9,A,010000	+375000000000	
3	2020-03-24 10:02:50 pm	PC,0002,24/03/20,19:02:47,5354.6567,N,02735.7368,E,70.0km,237.6,A,010000	+375000000000	
4	2020-03-24 10:03:50 pm	PC,0002,24/03/20,19:03:47,5354.3469,N,02735.4559,E,80.0km,210.6,A,010000	+375000000000	
5	2020-03-24 10:04:50 pm	PC,0002,24/03/20,19:04:47,5354.2010,N,02735.9707,E,25.0km,118.2,A,010000	+375000000000	
6	2020-03-24 10:05:49 pm	PC,0002,24/03/20,19:05:46,5353.5088,N,02736.7261,E,42.0km,149.8,A,010000	+375000000000	
7	2020-03-24 10:06:50 pm	PC,0002,24/03/20,19:06:47,5353.2661,N,02736.6971,E,42.0km,186.5,A,010000	+375000000000	
8	2020-03-24 10:07:49 pm	SIGNAL,0002,24/03/20,19:07:46,5353.0776,N,02736.2205,E,26.0km,238.6,A,010000	+375000000000	
9	2020-03-24 10:08:49 pm	PC,0002,24/03/20,19:08:46,5352.8552,N,02736.0219,E,80.0km,210.2,A,010000	+375000000000	

Sent Commands

The commands sent to the unit by users are displayed on the **Sent commands** request. There is a special button in the monitoring panel to send commands to units.

The table includes the following columns.

Time — the time when the command was sent to the unit.

User — the login name of the user who performed the command. If there is a dash in this cell, it means you have no access to this user, that is why the login name is hidden.

Command name — the command name as it is written in the unit properties.

Command type — the command type (see the list).

Parameters — for the commands that require additional parameters (message to the driver, input activation/deactivation, report period, custom message, etc.).

Execution time — the time when the command was executed. If the execution failed due to billing limitations (e.g., you ran out of SMS messages), this column contains only dashes.

Channel — the type of connection used to transmit the command (**TCP**, **UDP**, **Virtual**, **SMS**).

	Time	User	Command name	Command type	Parameters	Channel	
1	2020-05-21 01:35:35 pm	user	Send position	Query position		SMS	
2	2020-05-21 01:55:47 pm	user	Deactivate output	Deactivate output	1	SMS	
3	2020-05-23 01:55:53 pm	user	STOP	Block engine		SMS	
4	2020-05-25 00:58:08 pm	user	Message	Send custom message	Route 1675	SMS	
5	2020-05-27 01:58:18 pm	user	Interval	Set data transfer interval	15	SMS	

Registered Events

Different types of events can be registered in the unit history automatically or manually.

Automatic registration is adjusted with the help of notifications. The delivery method must be **Register event for unit**, **Register as violation** or **Register unit status**. In such a manner, you can control geofence visits, connection loss, idling, service intervals, etc.

Manually an event can be registered in the special registrar in the monitoring panel. With this method, you can register fuel fillings, maintenance, unit statuses, and any custom event.

Traffic counter reset and routes statuses can be saved as events.

In the table you see:

- the time when the event was detected (automatic registration) or registered (manual registration);
- type: event (traffic counter reset, events from notifications, some custom events, route control statuses), violation (violations from notifications, some custom events), maintenance (registered manually);
- event text which is taken from the text of notification or from the description entered while registering manually.

	Time	Type	Event text	
1	2020-02-21 06:16:05 am	Violation	Connection o coordinates loss.	
2	2020-02-25 02:00:00 pm	Event	Personal	
3	2020-02-26 04:16:00 pm	Maintenance	Maintenance service 'Electricity check' was registered.	
4	2020-03-07 01:58:00 pm	Event	Accident	
5	2020-03-10 04:20:00 pm	Maintenance	Maintenance service 'Oil change' was registered.	
6	2020-03-20 03:58:00 pm	Event	Fuel theft 20l	
9	2020-03-28 01:57:00 pm	Event	Business	
10	2020-03-30 01:57:00 pm	Maintenance	Maintenance service 'Wheel balancing' was registered.	

Log

Any manipulations with the unit properties or its database are logged in the system automatically. In addition, records can be added to the unit log manually — through the event registrar.

> To see the unit log or add messages to it, you should have not only the **Query reports or messages** access but also **Manage log**.

Any changes in the unit properties are logged, as well as import, export, and removal of messages, assignment or reset of a driver. etc.

The log contains the following information.

Time — the date and time when the change was done.

User — the name of the user who entered the record or changes.

Action — the description of the change performed. Messages can be filtered by the text in this description.

Host — the address of the computer from which the user made the changes (if the action was performed automatically, it can be a **job** or **notification** type entry).

Delete — the button to delete records.

	Time	User	Action	Host	Parameter 1	
1	2020-04-27 04:48:40 pm	user	Unit 'AARON' created	10.192.5	AARON	
2	2020-04-27 04:48:40 pm	user	Command 'Send Command' created	10.192.5	Send Command	
3	2020-04-27 04:48:40 pm	user	Command 'Locate Vehicle' created	10.192.5	Locate Vehicle	
4	2020-04-27 04:48:40 pm	user	Sensor 'RPM' created	10.192.5	RPM	
5	2020-04-27 04:48:40 pm	user	Sensor 'driver' created	10.192.5	driver	
6	2020-04-27 04:48:40 pm	user	Sensor 'Ignition' created	10.192.5	Ignition	
7	2020-04-27 04:48:40 pm	user	Sensor 'Satellite' created	10.192.5	Satellite	
8	2020-04-27 04:48:40 pm	user	Sensor 'Engine Temp' created	10.192.5	Engine Temp	

Unit log can also be presented as a report.

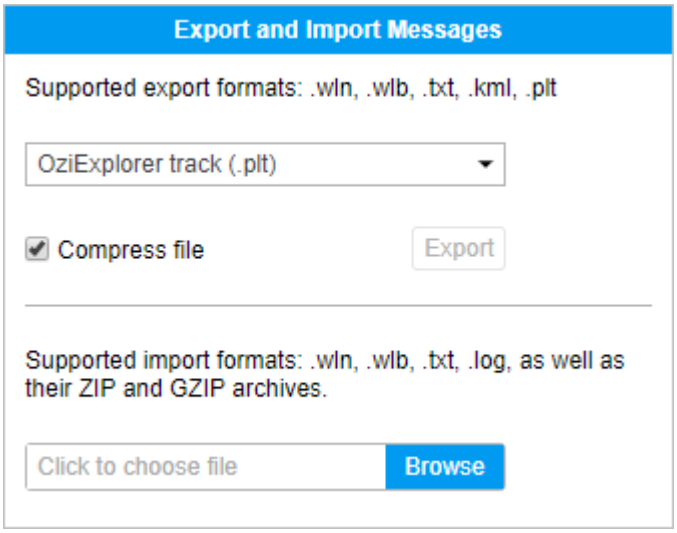
Exporting/Importing Messages

Messages can be imported and exported. It concerns only the messages of the first type, that is, data messages.

> The size limit for the imported file/archive is 64 MB, which, in the case of the archive, is approximately 3.5 million messages.

Export

To export messages to a file, open the **Export and import messages** tab in the lower left section of the window. Select the destination format and click **Export**. Depending on your browser configuration settings, you will be offered to open or save the file. The file with exported messages can be compressed. For this, leave the checkbox **Compress file** marked.



Below are the supported export formats.

OziExplorer track(.plt) — data format of the Ozi Explorer program that stores a track as a list of coordinates of the track points.

NMEA messages (.txt) — a text file of the National Marine Electronics Association. This text protocol is used for marine navigation equipment.

Google Earth (.kml) — an XML-based format used in the Google Earth program to transmit three-dimensional geospatial data.

Wialon messages (.wln) — a format to be used with the Wialon software.

Wialon binary messages (.wlb) — a binary format to be used with Wialon software.

⚠ Parameters (sensors) are not stored when exporting to the **.txt** format.

Import

Saved files on the disk containing messages from the unit can be imported into the units you create. To import messages, select the **Export and import messages** tab in the left section of the window.

Below are the supported import formats.

Raw GPRMC navigator logs in the format defined by NMEA 0183 specification — searched in files with the extension .txt or .log.

Wialon messages — search in files with the extension .wln.

Wialon binary messages — search in files with the extension .wlb.

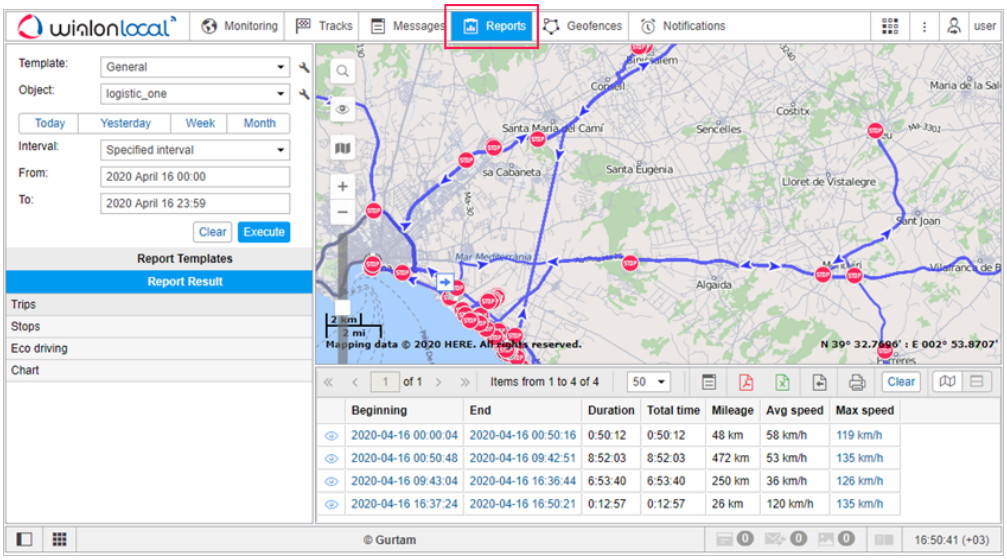
Click on the empty field, specify the file to import the messages from, and click **Upload**.

To speed up and simplify the process, first compress the files with ZIP or GZIP utilities. When uploading is completed, the files will be unpacked and processed on the server. This process can be traced in the log.

Reports

To switch to the **Reports** tab, click on the **Reports** header in the top panel and select the same name item in the main menu customizer.

Reports on the activity of a unit can be presented in the form of tables and graphs. They can be viewed in a browser window, as well as exported to files of various formats.



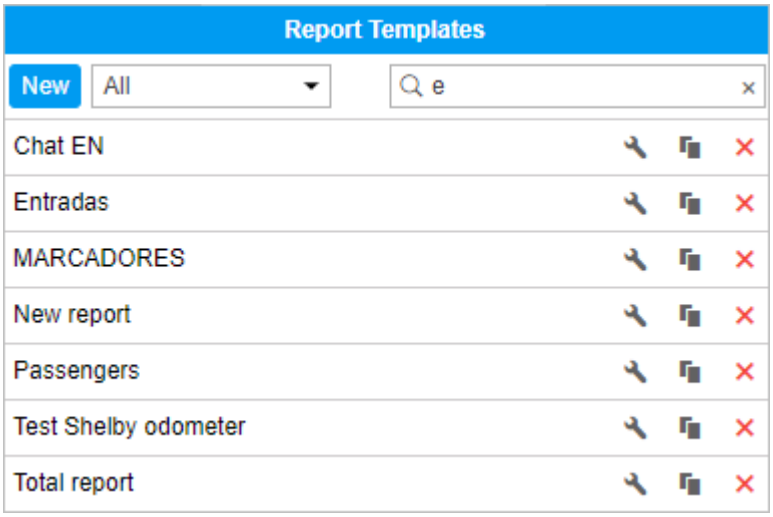
The **Reports** tab window can be divided into four sections:

- in the upper left corner, the report parameters are adjusted;
- in the lower left corner there are report templates. After a report is generated, this section changes to the navigation bar;
- in the upper right section, there is the map (or another chart or table);
- in the lower right section, you see the report itself (tables, charts, images).

The sectors can be resized (the left ones — in width, the right ones — both in width and height). To do this, click on the border between them with the left mouse button and while holding it, move the border to the right/left or up/down. At the same time, if less than 10% of the map is left while expanding the lower sector, the map automatically collapses. To expand it, press the line under the top panel.

Report Templates

A report can only be generated on the basis of a previously created template. A list of all available templates is located in the lower left part of the window under the **Report Templates** header. Here you can create, edit and delete templates for reports, as well as copy and move them from one account to another.



The template contains information about which tables and charts will be included in the report, what kind of content will be presented in the tables, the order of the columns in tables and sections in the report, which graphical elements will be rendered on the map, and many other parameters which define the look of the resulting report.

When you hover the cursor over the name of a template, the tooltip displays its name, the name of the resource to which it belongs (if you have access to more than one), the type of the report, the list of tables and charts that it contains, the list of the bound objects, and description. When you click on a template, it becomes selected in the **Template** field.

The templates in the list are arranged in alphabetical order. When searching for a template, it is convenient to use the dynamic filter. Enter the name of the report or its part into the search field. Additional search parameters are set in the drop-down list, where you can select a particular resource or leave **All**.

The following actions are available:

- or — edit or view a report template (depends on your access level);
- — create a new template using the selected one as the basis;
- — delete a template (if the button is dimmed, you do not have enough rights).

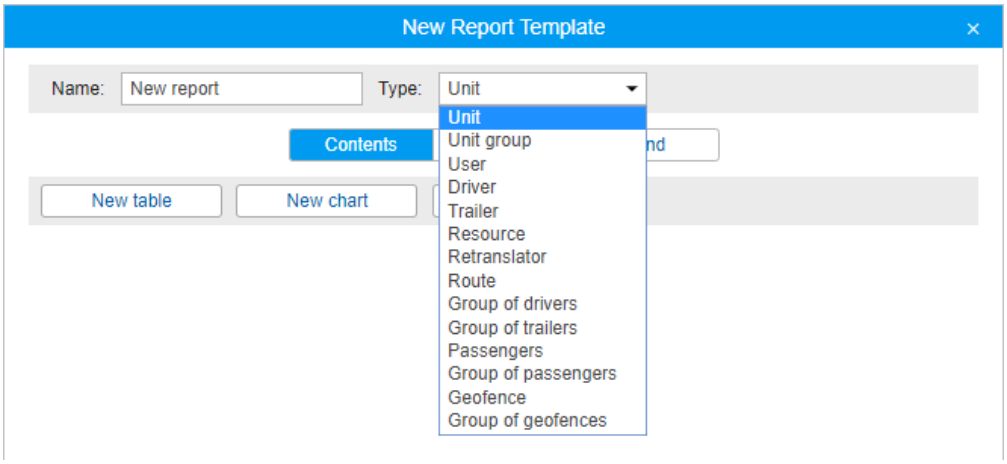
If a template belongs to the resource to which you do not have the **Create, edit, and delete report templates** access right, you will not be able to edit or delete this template.

Creating a report template

To manipulate the report templates, the user should have the **Create, edit, and delete report templates** access right to at least one resource.

To create a new report template, press the **New** button. If you have access to more than one resource, select the required one and click **Next**.

At the top of the report template creation window, you must specify its **name** and select the **type**.



The following types are available.

Unit — the template is used to analyze the data from any single unit.

Unit group — the template is used to analyze the data from several units simultaneously.

User — the template is used to analyze the activity of users.

Driver — the template is used to analyze the work of drivers.

Trailer — the template is used to analyze the use of trailers.

Resource — the template is used to track the changes in the contents of the resource.

Retranslator — the template is used to analyze the work of retranslators.

Route — the template is used to analyze the passing of routes.

Group of drivers — the template is used to analyze the work of several drivers at the same time.

Group of trailers — the template is used to analyze the operation of several trailers simultaneously.

Passengers — the template is used to analyze passenger traffic.

Group of passengers — the template is used to analyze the traffic of the groups of passengers.

Geofence — the template is used to analyze which units have visited a geofence.

Group of geofences — the template is used to analyze which units have visited a group of geofences.

It is not recommended to change the report type later, because when you change the type, all the contents and settings of the template are lost.

Below are the Report Contents, Settings and Bind tabs, on each of which the properties of the future report template are configured.

A list of the content added to the report template is shown below. To rename a component, click on it with the left mouse button and make the necessary changes. The following buttons are available for working with the content list:

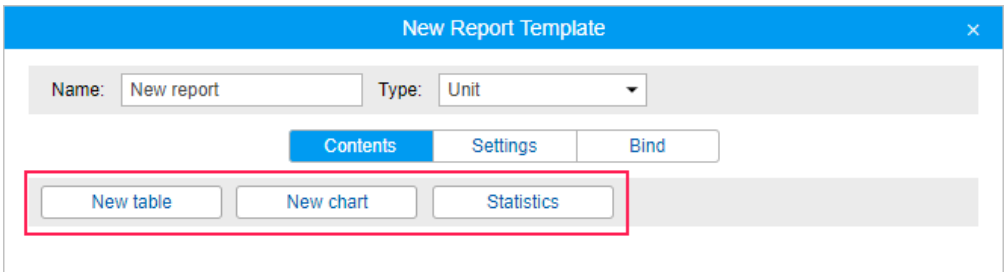
— drag the component up/down;
— edit the properties of the table/chart;
— copy the table/chart;
— delete the component.

Regardless of where the chart is located in the report template, in the list of results of the executed report, all the charts are located under all tables, and the statistics data occupy the top lines.

Report Contents

On the **Contents** tab, you can add tables, charts, or statistics to the report template.

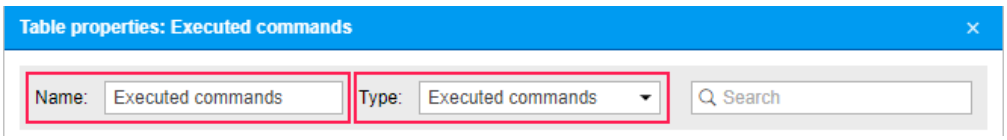
To add the required component, click on one of the three available buttons: New table, New chart, Statistics.



Tables

To add a table to the report template, click on the **New table** button on the Report Contents tab of its properties.

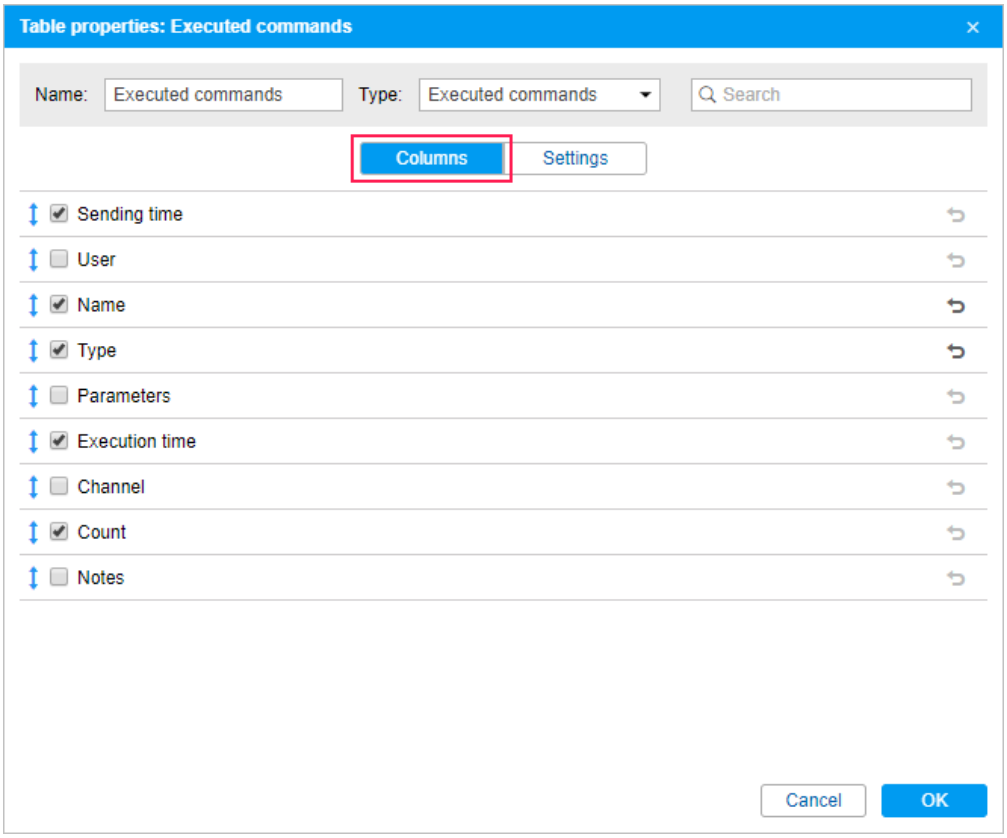
In the **New table** dialog, specify the name and type.



Columns selection

The set of available table types differs depending on the selected type of the report template. The list of tables and their description are presented in the chapters below.

Each type of table has its own set of columns which can be included in it. The list of available ones is shown on the **Columns** tab after selecting the type of table. To quickly find the required one, you can use a dynamic filter. Select the ones you want to see in the report. To select all the columns, press the **Ctrl** button and click on any unselected column. Removing a selection from all the columns works in the same way. The identical principle is used in the settings of the reports, where geofences, events, etc. should be selected.



To change the name of the column, click on it with the left mouse button and edit the text. To return the original name of the column, click on the **Default** icon (the icon is inactive if the name has not been changed).

What is more, the order of the columns can be changed as well. To do this, drag the icon of the double arrow , located to the left of the name of the desired column, up or down.

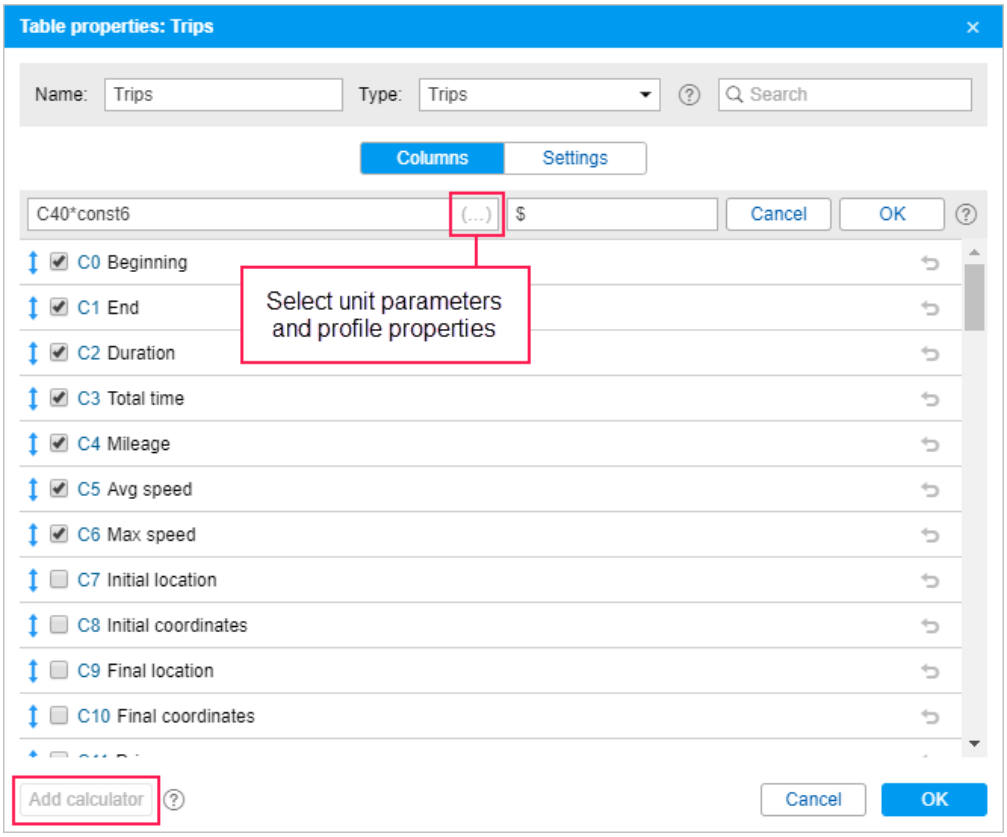
Some alternative types of reports are available as apps:

- iDriveSafe — evaluation of the quality of driving;
- Dashboard — presentation of key indicators of fleet efficiency in a graphical form.

Any number of tables can be added to the template, and the same table can be added to the report several times with different column configurations, data grouping settings, etc.

Calculator

The calculator is available in all the tables except for **Images**, **Video**, and **Statistics**. It allows adding custom columns. To the left of the column names, you can see their indexes (C0, C1, C2 … CN). The indexes **do not change** regardless of the position of the column in the list.



To add a custom column to the table, click on the **Add calculator** button and specify the formula for calculating the value in the column. To do this, you can use:

- indexes of other columns (indicate them manually or click on the necessary ones in the list);
- unit parameters: consumption by rates (**rcoef**), daily engine hours rate (**dehr**), mileage coefficient (**mcoef**), unique ID (**imei**);
- profile properties of the unit formatted as **profile_field(index)**;
- custom fields formatted as **custom_field(name)**;
- constant values formatted as **constX**;
- signs +, -, *, /, () for mathematical operations.

Thus, a formula can look, for example, as follows: **(C1+C2+C7)*const1.5/rcoef**.

You can select the unit parameters and profile properties in the menu that opens when pointing to the '(...)' in the **Formula** field.

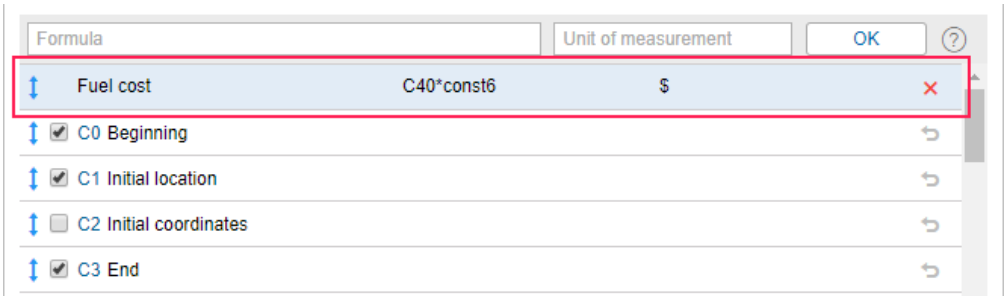
⚠ You cannot use the unique ID and profile properties in the formula together with other components. Otherwise, a dash is displayed in the custom column in the report.

To display a **custom field value** in a custom column, type **custom_field(field name)** in the **Formula** field. Instead of the name, you can use its mask. If the names of several custom fields correspond to the indicated mask, the report shows the value of the field that comes first in the list of custom fields in the properties of the object.

If the custom field value is indicated in numbers (without the unit of measurement), you can use it in the formula together with other components. With another type of custom field values, a dash is displayed in the custom column in the report.

Next, type the unit of measurement (up to 10 characters) in the field to the right and click **OK**. The custom column automatically goes to the top of the list. However, you can change its position in the standard way if necessary. Such columns are highlighted in blue and do not have an index.

ⓘ For time intervals, seconds are used as a unit of measurement in the calculator.

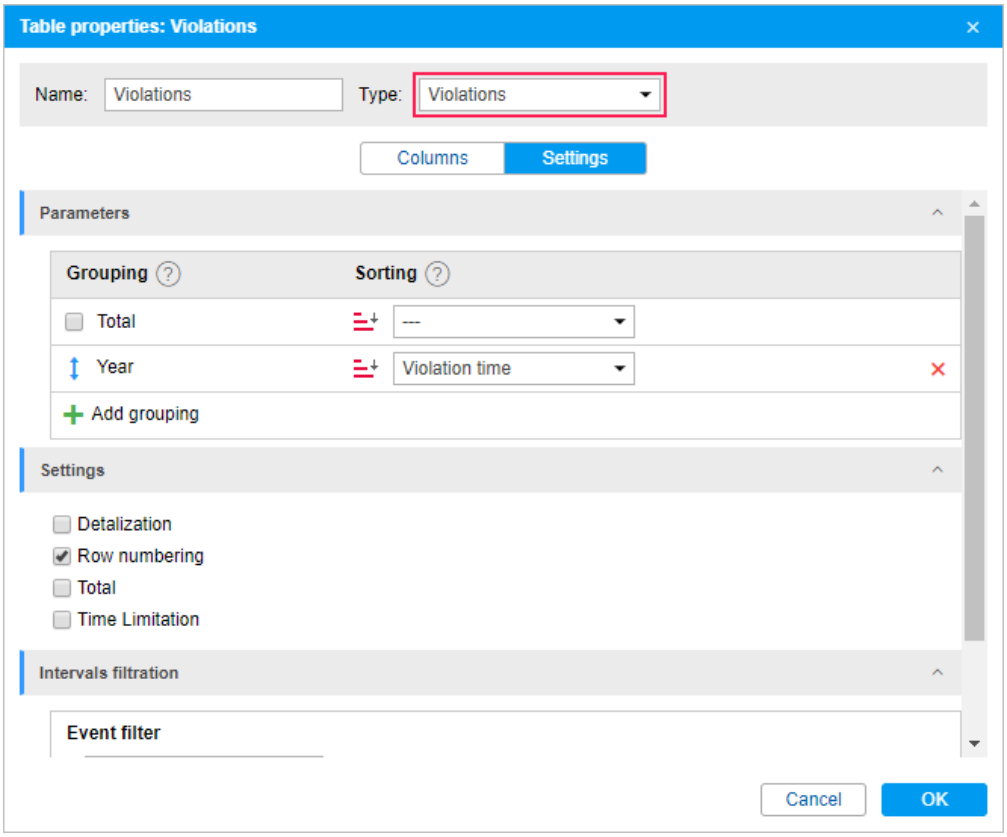


To edit the name, formula, or unit of measurement for the created column, click in the necessary field and make the changes. Click anywhere in the dialog box to confirm the changes.

The value of the custom column in the Total row is calculated in the same way as for other rows, that is, in accordance with the specified formula that uses the values of the column.

Table settings

For each table, in addition to selecting columns, there are additional settings, located in the same-name tab.

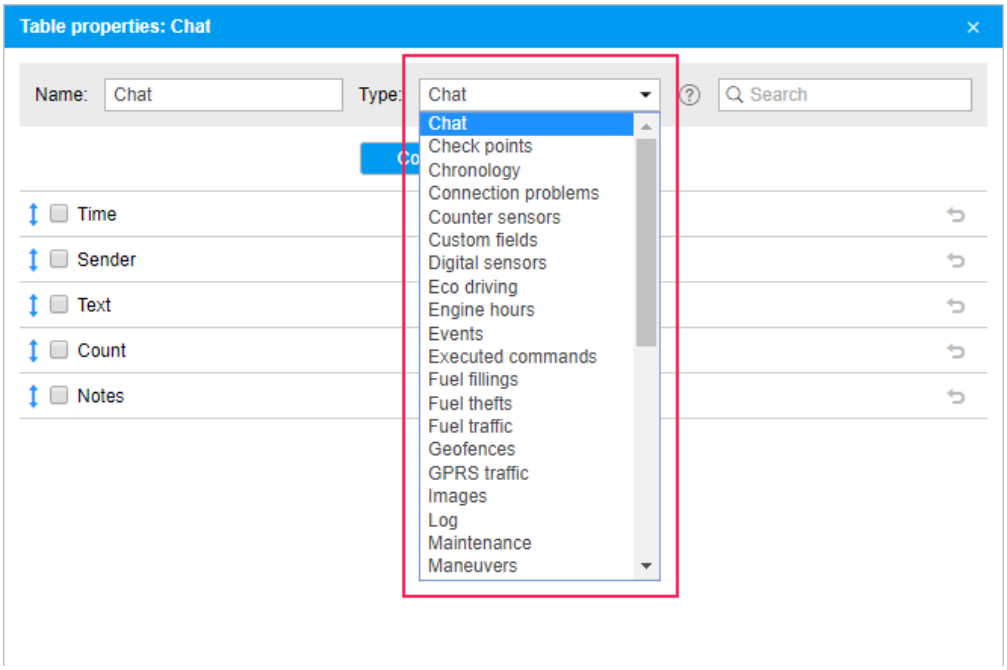


The tab is divided into three sections:

- Parameters;
- Settings;
- Intervals filtration.

Table Types

Below in this section, you can find detailed descriptions of the tables available for units and unit groups.



A template can contain any number of tables and charts. You can even add the same table type several times with different configuration of columns, data grouping, and other settings.

To add any of the tables mentioned above to the template, click the **Add table** button and select the table from the list.

Each table type has its own set of columns that can be included in it. After the table type is selected, the list of available columns is displayed below. Check the columns you would like to include in the resulting table. To select all columns at once, press **Ctrl** and check any box. To deselect all columns, repeat the same operation. This combination works also for the reports where you choose geofences, events, etc.

You can assign other names to column headings. To do this, click on the title and edit the text. In the same way, you can change the name of the table itself (the **Name** text box at the top of the dialog). To restore the default column names, use the **Restore default** button (if it is gray, the current name is default).

Besides, you can change the order of the columns. Drag the double-arrow sign up/down to move them up and down.

Some alternative types of reports are available as applications:

- Dashboard — graphical representation of the key performance indicators of the fleet;
- Eco Driving — assessment of the driving behavior;
- Tacho View — reports on the drivers' work, including infringements;
- Sensolator — visual representation and control of the sensor values of the units with reports on units and their groups.

Account Tree (for a Resource)

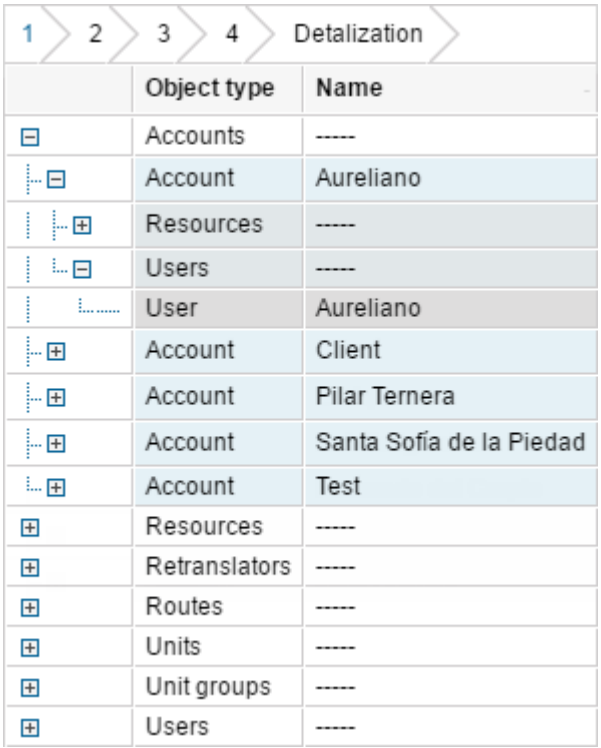
This report provides you with information about the structure of an account. In other words, the table helps you understand which object types the selected account consists of, as well as the hierarchy among these objects.

The table may contain the following columns.

Column	Description
Object type	Accounts, resources, users, units, unit groups, retranslators, routes.
Name	The name of an object.

The type of objects in the report template can be specified. Then only the objects of the selected types are displayed in the report.

In addition, the data are presented more clearly if you group by type of object in the report template.



Chat

This report combines the commands of the **Send message to driver** type sent to the unit and replies from the unit. How chatting with the driver works was written above.

Column	Description
Time	The date and time when the message was received.
Sender	The driver or operator (username is indicated in brackets).
Text	The text of the message.
Count	The number of messages.
Notes	An empty column to add your custom comments after printing or exporting the report.

Time	Sender	Text	Count
2016-04-07 11:34:32	Driver	Order received	1
2016-04-12 11:58:58	Driver	Filled 20 gal.	1
2016-05-20 09:55:50	Operator (user)	Route 45 for today.	1
2016-05-20 09:56:28	Driver	Connection test.	1
2016-05-20 09:59:36	Driver	Route 125. Started at 08:15.	1
2016-05-25 12:18:27	Driver	On the way to warehouse.	1

Check Points

Route points refer to check points indicated when creating a route.

The table can include the following columns.

Column	Description
Point name	The name given to this checkpoint while creating it.
Real arrival	The time when the unit entered the checkpoint.
Scheduled arrival	The time when the unit was supposed to enter the checkpoint according to the schedule.
Initial location	The location at the time of entry.

Column	Description
Real departure	The time when the unit left the checkpoint.
Scheduled departure	The time when the unit was supposed to leave the checkpoint according to the schedule.
Final location	The location at the time of departure.
Result	**Visited** (both entrance and exit were detected), **Entrance only**, **Exit only**, **Skipped**.
Route	The name of the route to which this checkpoint belongs.
Schedule	The name of the schedule.
Round	The name of the round.
Arrival time deviation	Positive value if delayed, negative value if in a hurry in regards to the arrival time set in the point properties.
Departure time deviation	Positive value if delayed, negative value if in a hurry in regards to the departure time set in the point properties.
Presence duration	The time spent at the checkpoint.
Presence mileage	The mileage at the checkpoint.
Section duration	The time spent to travel from the previous checkpoint to the current one.

Column	Description
Section mileage	The mileage from the previous checkpoint.
Count	The number of points.
Driver	The name of the driver (if available).
Trailer	The name of the trailer (if it was bound).
Notes	An empty column for your custom comments.

Point name	Result	Route	Arrival time deviation	Departure time deviation	Presence duration
Westcliff Drive	Visited	Santa Cruz Tour	0:00:00	0:00:44	0:00:00
Punto de control 3	Visited	Santa Cruz Tour Bus Route	0:00:00	0:01:08	0:00:00
Punto de control 2	Visited	Santa Cruz Tour Bus Route	0:00:43	0:00:43	0:01:00
UCSC Campus	Visited	Santa Cruz Tour	-0:02:16	-0:01:36	0:00:40
Metro Station	Visited	Santa Cruz Tour	-0:02:01	-0:01:41	0:00:20
Punto de control 1	Visited	Santa Cruz Tour Bus Route	-0:00:01	-0:00:16	0:00:45
Santa Cruz Boardwalk	Visited	Santa Cruz Tour	-0:01:42	-0:01:32	0:00:10
Punto de control 3	Visited	Santa Cruz Tour Bus Route	0:00:54	0:01:09	0:01:15
Westcliff Drive	Visited	Santa Cruz Tour	-0:00:17	0:00:43	0:01:00

Chronology

The **Chronology** report gives information about all the actions and changes in the unit state during the indicated period of time. Unlike most of the tables that are dedicated to a particular state (parkings, sensors, trips, etc.), this table combines events of various kinds, which allows to see the complete picture of the movement.

The following types of events can be included in the report (in the template select the required):

- Trips,
- Parkings,
- Stops,
- Engine hours,
- Fillings,
- Thefts,
- Events,
- Drivers,
- Trailers,
- Speedings,
- Connection loss,

- Sensor trigger (enter one or two masks to indicate the required sensors; note that when you enter a mask, the sensors are firstly filtered by their type (digital sensors), and then by name).

The following columns can be selected to form the table.

Column	Description
Type	Trip, parking, stop, engine hours, filling (or reg. filling), theft, event (or violation), driver, connection loss, sensor.
Beginning	The time taken from the message that precedes the one in which the beginning of the given state was fixed.
Initial location	The location of the unit at the initial moment.
End	The moment when the detected activity finished.
Final location	The location of the unit at the final moment.
Duration	How long the state lasted.
Description	For trips and speedings — mileage, for events and violations — the text of notification, for engine hours — duration, for drivers — driver's binding/unbinding and name, for fuel fillings and thefts — the volume of fuel and sensor name, for sensors — sensor activation/deactivation.
Notes	An empty column for your custom comments.

Type	Beginning	Initial location	End	Duration	Description
Trip	2015-05-30 06:10:10	Mex-2, San Luis Río Colorado	2015-05-30 07:52:22	1:42:12	Mileage: 128 km
Engine hours	2015-05-30 06:10:10	Mex-2, San Luis Río Colorado	2015-05-30 10:19:13	4:09:03	Duration: 4 hours 9 minutes
Stop	2015-05-30 07:28:05	Mex-2, Sonoita Centro	2015-05-30 07:32:07	0:04:02	-----
Parking	2015-05-30 07:52:22	Mex-2, General Plutarco Elías Calles	2015-05-30 09:58:50	2:06:28	-----
Trip	2015-05-30 09:58:50	Mex-2, General Plutarco Elías Calles	2015-05-30 10:19:05	0:20:15	Mileage: 27 km
Parking	2015-05-30 10:19:05	Mex-2, Puerto Peñasco	2015-05-30 17:08:12	6:49:07	-----
Sensor	2015-05-30 10:19:13	Mex-2, Puerto Peñasco	2015-05-30 10:19:13	0:00:00	Deactivated sensor: Motor
Engine hours	2015-05-30 17:44:42	Mex-2, Puerto Peñasco	2015-05-30 19:38:12	1:53:30	Duration: 1 hours 53 minutes
Sensor	2015-05-30 17:44:42	Mex-2, Altar	2015-05-30 19:38:12	1:53:30	Deactivated sensor: Motor
Trip	2015-05-30 17:48:40	Mex-2, Puerto Peñasco	2015-05-30 19:37:57	1:49:17	Mileage: 131 km

⚠ The system does not calculate the duration of the state for fillings and thefts. Therefore, the beginning and end time for fillings/thefts, as well as the initial and final location coincide in the **Chronology** table, and the duration column displays zero value.

Connection Problems

This kind of report lists the time periods when the system did not receive data from the unit. The parameters for this report are adjusted on the Advanced tab where you set **Maximum interval between messages**.

The following information can be presented in this kind of report.

Column	Description
Beginning	The date and time when connection loss happened.
End	The date and time when the connection was recovered.
Duration	The time interval of connection loss.
Location	The address where the unit was right before the loss of connection.
Count	The number of connection gaps detected in a certain time interval (it is advisable when grouping rows by days/weeks/ months or for reports about groups of units).
Driver	The name of the driver (if available).
Trailer	The name of the trailer (if it was bound).
Notes	An empty column for your custom comments.

If the time passed between receiving the last message for the reporting interval and the end of a report interval exceeds a value of a maximum interval between messages, then a connection loss interval will be added to the report. The beginning of this interval corresponds to the time of receiving the last message, and the end corresponds to the end of a reporting interval.

Beginning	Duration	Location	Count	Driver
2015-05-30 00:00:00	13:38:28	Dózsa György utca 98-106, Noszlop	1	Jon
2015-12-14 16:38:31	15:48:25	Szent István út 2-42, Ajka	1	Jon
2015-12-15 09:12:22	0:18:28	Táncsics utca 26-34, Magyarpolány	1	Samuel
2015-12-15 16:20:23	0:06:36	Szent István út 2-42, Ajka	1	Jack
2015-12-22 21:10:52	0:05:13	Szent István út 2-42, Ajka	1	Jack
2015-12-27 23:34:00	0:17:37	Szent István út 2-42, Ajka	1	Arnold
2015-12-27 23:52:16	0:28:20	Szent István út 2-42, Ajka	1	Jon
2015-12-28 10:37:38	0:05:48	Padragi út 97-125, Padragkút	1	-----

Additional filtration by driver, trailer and geofences/units can be applied to this report.

Counter Sensors

This table shows the operation of the **Counter** type sensors. In the template, set the mask (filter) for sensors or select **All sensors**.

A table can consist of the following columns.

Column	Description
Sensor	The name of the sensor.
Activated	The time of activation.
Deactivated	The time of deactivation.
Duration	Operation time.
Total time	The time from the beginning of the first activation to the end of the last.
Location	The location at the moment of sending the data.

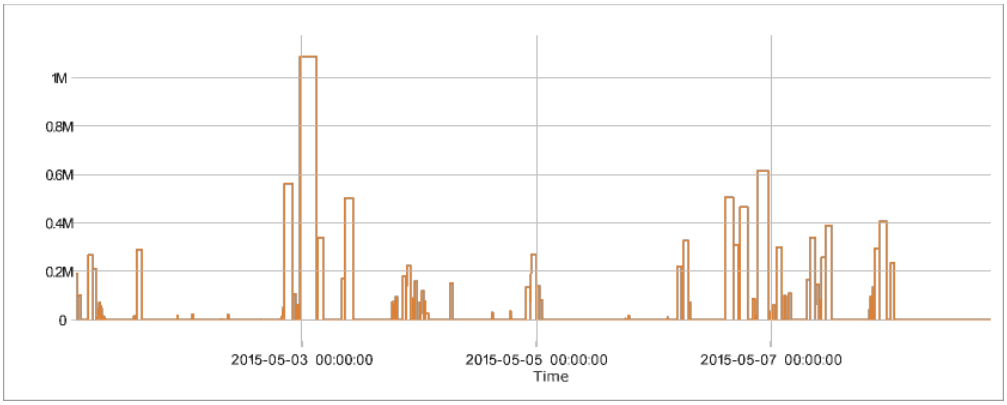
Column	Description
Mileage	The distance traveled for the operation period.
Mileage (adjusted)	Mileage subject to the coefficient set in the unit properties on the **Advanced** tab.
Avg speed	The average speed at this interval.
Max speed	The maximum speed at this interval.
Counter	The value of the counter meter (can be shown with an accuracy of hundreds — see Report Settings –> General).
Geofences/Units	The column that includes the names of the geofences or units which were crossed during a given interval. The required geofences and units should be indicated in the filtration parameters. If at some interval there were several geofences or units like that, in the report there will be the name of the geofence with the smallest area or the name of the unit with the smallest radius of approximation. If the sizes coincide, all the names will be included.
Driver	The name of the driver (if available).
Trailer	The name of the trailer (if it was bound).
Penalties	The penalties calculated for the adjusted Eco Driving criteria.
Rank	The received penalty points converted into a 6-point rating system.
Notes	An empty column for your custom comments.

№	Sensor	Activated	Duration	Location	Mileage	Max speed	Counter
1	Counter sensor	2012-06-25 12:39:20	0:32:06	Joachima Chreptowicza, Augustów	42 km	136 km/h	037
2	Counter sensor	2012-06-25 13:17:02	0:44:24	Mikołaja Kopernika, Grajewo	61 km	141 km/h	732
3	Counter sensor	2012-06-25 14:12:20	0:28:04	Legionów, Łomża	39 km	118 km/h	205
4	Counter sensor	2012-06-25 15:01:42	0:12:52	Stacyjna, Stare Lubiejewo	19.14 km	125 km/h	747
5	Counter sensor	2012-06-25 15:35:30	0:16:46	E67, 0.38 km from Sadzawki	21 km	136 km/h	862
6	Counter sensor	2012-06-25 15:58:38	0:20:52	Tadeusza Kościuszki, Wyszków	29 km	122 km/h	773
7	Counter sensor	2012-06-25 16:19:30	0:48:04	Pułtuska, Serock	66 km	136 km/h	1122
8	Counter sensor	2012-06-25 17:26:00	0:12:16	E30, Sochaczew	18.13 km	145 km/h	521
9	Counter sensor	2012-06-25 17:57:32	0:16:50	Podgrodzie, Łowicz	21 km	115 km/h	998
10	Counter sensor	2012-06-25 18:15:38	0:13:44	Dorzeczna, Głowno	16.85 km	136 km/h	696
11	Counter sensor	2012-06-25 18:29:22	0:43:14	E30, 2.39 km from Zelgoszcz	96 km	158 km/h	105
12	Counter sensor	2012-06-25 19:15:38	0:10:42	E30, Piekło	24 km	167 km/h	518
13	Counter sensor	2012-06-25 19:27:08	0:17:32	E30, Wola Koszucka	38 km	156 km/h	562
14	Counter sensor	2012-06-25 20:04:18	0:10:42	E30, Nagradowice	17.68 km	145 km/h	789
-----	-----	**2012-06-25 12:39:20**	**5:28:08**	-----	**507 km**	**167 km/h**	**6067**

The mileage values are displayed in the table as fractional numbers. However, when exporting to an Excel file the values are rounded.

Intervals filtration can be applied to this table: by duration, mileage, engine hours, speed range, trips, stops, parkings, sensors, drivers, fuel fillings, fuel thefts, and geofences/units.

The value of the counter sensor can be visualized in the chart that shows the operation intervals of the counter and its value. You can learn more about charts here.



Custom Fields

To execute this report, you should have the following access rights to the objects:

- View custom fields;
- View admin fields;
- Request reports and messages.

A report with the **Custom fields** table can be executed for units, unit groups, users, drivers, driver groups, trailers, and trailer groups. The table is a list of names and values of custom fields specified in the properties of the object for which the report is executed.

You can specify custom fields in the properties of:

- unit;
- unit group;
- driver;
- trailer.

In the filer of the table settings, you can select the field type that should be shown in the table: all, general, admin, and also specify the field mask.

The possible columns of the table are listed below.

Column	Description
Name	The name of the field.
Value	The value of the field.
Notes	An empty column where you can leave your own comments after printing or exporting the report.

Name	Value	Notes
Carrying capacity	3 t	
Fuel	Diesel	
SIM card number	90034611294563	
Year	2019	

To get a report on a group of units, drivers or trailers, enable the Detalization option in the table settings. If the **Group itself** option is disabled in the table settings for a unit group, then the report shows customs fields of each unit from the group. If the **Group itself** option is enabled, then only the custom fields of the group are shown.

ⓘ A report on a unit group with the **Group itself** option enabled can only be executed for one group. If several groups are selected in the Object parameter, then the data is shown only for the group you specified first.

Digital Sensors

Usually, digital sensors have two states: on/off, activated/deactivated, and so on. For example, it can be an ignition or cargo load sensor. All sensors are configured on the Sensors tab of the **Unit properties** dialog.

To receive the information about a specific sensor, specify its name or part of the name using wildcard symbols — an asterisk ***** (replaces several characters) or question mark **?** (replaces one symbol). The sensor name cannot contain commas. If the sensor mask is not specified, the information in the table is displayed for all sensors of the unit.

The table can contain the following columns.

Column	Description
Sensor	The name of the controlled sensor.
Activated	The time from the first message that contains information about the activation of the sensor.
Deactivated	The time when the sensor was deactivated.
Duration	The interval when the sensor was on.
Total time	The time from the beginning of the first activation to the end of the last one.
Location	The location of the unit at the moment the sensor was activated.
Final location	The location of the unit at the moment the sensor was deactivated.
Mileage	The distance traveled while the sensor was on.
Mileage (adjusted)	Mileage subject to the coefficient set in the unit properties (the Advanced tab).

Column	Description
Initial mileage	The mileage sensor value at the time the digital sensor is turned on. If the mileage parameter was not saved at the reporting interval, the mileage is counted from zero.
Final mileage	The mileage sensor value at the time the digital sensor is turned off.
Avg speed	The average speed of movement with the sensor on.
Max speed	The maximum speed with which the unit moved with the sensor turned on.
Activations count	The number of activations (can be helpful either in grouping table data by years/months/weeks/days/shifts or for the reports on unit groups).
Driver	The name of the driver (if assigned).
Trailer	The name of the trailer (if assigned).
Penalties	Penalties calculated for the adjusted Eco Driving criteria.
Rank	Penalty points converted to the 6-point rating system.
Avg value of custom sensor	The average value of custom sensor from the moment of digital sensor's activation to its deactivation.
Min value of custom sensor	The minimum value of custom sensor from the moment of digital sensor's activation to its deactivation.

Column	Description
Max value of custom sensor	The maximum value of custom sensor from the moment of digital sensor's activation to its deactivation.
Initial value of custom sensor	The custom sensor value at the moment of digital sensor's activation.
Final value of custom sensor	The custom sensor value at the moment of digital sensor's deactivation.
Notes	An empty column for your custom comments.

If there are several custom sensors, separate columns with average, minimum, maximum, initial and final values are displayed for each of them. The name of each custom sensor and units of measurement (if they were specified when creating the sensor) are indicated next to the name of each of these columns within the parentheses. In case there are no suitable sensors, the columns are not displayed.

Sensor	Activated	Deactivated	Duration	Total time	Location	Mileage
Motor	2015-05-30 06:10:10	2015-05-30 10:19:13	4:09:03	4:09:03	Mex-2, San Luis Río Colorado	155 km
Motor	2015-05-30 16:55:11	2015-05-30 17:14:50	0:19:39	0:19:39	Mex-2, Puerto Peñasco	0.17 km
Motor	2015-05-30 17:44:42	2015-05-30 19:38:12	1:53:30	1:53:30	Mex-2, Puerto Peñasco	131 km
Motor	2015-05-30 20:08:35	2015-05-31 08:34:26	12:25:51	12:25:51	Mex-2, Altar	796 km
Motor	2015-05-31 17:35:05	2015-05-31 17:35:56	0:00:51	0:00:51	Avenida Monte Seir, Fracc Santa Rocío	0.01 km
Motor	2015-05-31 17:45:46	2015-05-31 18:12:54	0:27:08	0:27:08	Avenida Monte Seir, Fracc Santa Rocío	8.64 km
Motor	2015-05-31 18:56:07	2015-05-31 19:15:02	0:18:55	0:18:55	Boulevard Jesús Kumate Rodríguez, Culiacán	8.83 km
Motor	2015-06-01 21:58:49	2015-06-01 22:06:35	0:07:46	0:07:46	Avenida Quinta Poniente, Fracc Santa Rocío	0.62 km
Boton SOS	2015-06-05 03:46:14	2015-06-05 03:46:21	0:00:07	0:00:07	Avenida Monte Seir, Fracc Santa Rocío	0.00 km
Boton SOS	2015-06-05 03:48:01	2015-06-05 03:48:23	0:00:22	0:00:22	Avenida Monte Seir, Fracc Santa Rocío	0.00 km
Motor	2015-06-07 03:40:51	2015-06-07 04:36:00	0:55:09	0:55:09	Avenida Siderita 1461, Ampl Valle Del Pedregal	0.00 km

Intervals filtration can be applied to this table: by duration, mileage, engine hours sensor, engine hours, speed range, trips, stops, parkings, sensors masks, driver, trailer, fuel fillings, fuel thefts, and geofences/units.

Eco Driving

The report provides you with information on how a driver handles the entrusted vehicle. Analysis of the driving behavior can help you extend the life of the vehicle, reduce fuel costs, ensure cargo safety and also understand the reason for any case of emergency.

Before generating the **Eco driving** report it is necessary to indicate settings on the corresponding tab of the unit properties dialog. Eco driving analysis is based on the data received during the trip.

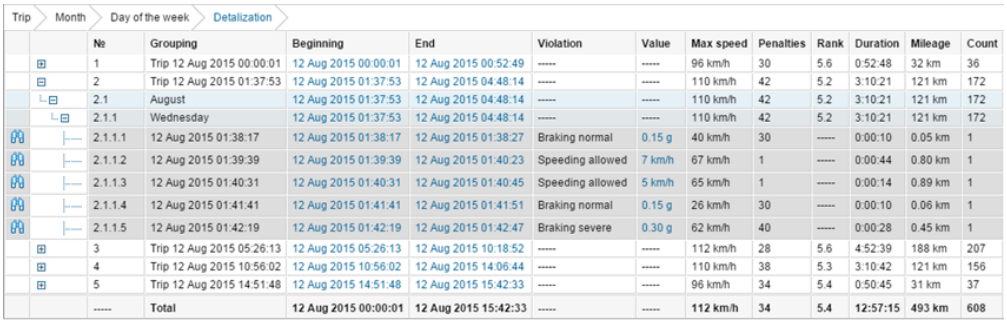
A table may contain the following information.

Column	Description
Violation	The type of violation. When you use grouping, violations with the same name will be merged into one group.
Beginning	The time when violation began.
Initial location	An address of the unit location at the moment of violation beginning.
End	The end time of the violation.
Final location	The address where the unit was located at the moment of the end of the violation interval.
Value	The parameter value during the violation.
Avg speed	The average speed during the violation.
Max speed	The maximum speed during the violation.
Penalties	The penalty value indicated on the Eco driving tab of the unit properties.
Rank	The penalty points converted to a 6-point rating system (can be useful if grouping by years, months, weeks, days, shifts, or trips has been applied).
Rating by violations	An individual index number of a unit/driver calculated on the basis of the committed violations. The lower the rating, the fewer violations are committed.

Column	Description
	⚠ The **Rating by violations** column can be used in the report on unit groups and driver groups only.
Mileage	Mileage for the interval of violation or grouping.
Mileage (adjusted)	Mileage taking into account the coefficient set in unit properties (the **Advanced** tab).
Initial mileage	The mileage counter value at the moment of the beginning of the violation. If the mileage parameter was not saved at the reporting interval, the mileage is counted from zero.
Final mileage	The mileage counter value at the end of the violation interval.
Duration	The duration of the violation or grouping interval. If the speeding is detected by one message, in the line **00:00** is written.
Count	The number of violations of this type.
Avg value of custom sensor	The average value of the custom sensor registered during the violation.
Min value of custom sensor	The minimum value of the custom sensor registered during the violation.
Max value of custom sensor	The maximum value of the custom sensor registered during the violation.

Column	Description
Initial value of custom sensor	The value of the custom sensor at the beginning of the violation interval.
Final value of custom sensor	The value of the custom sensor at the end of the violation interval.
Driver	The name of the driver on this vehicle.

Special attention should be paid to the **Rating by violations** column. It can be used in the report on unit groups and driver groups only. If the column is included in the table, then units/drivers can be placed in the table according to the violations committed (from the lower rating to the highest one). To do this, select the total grouping by rating in the parameters of the report template. The violations rating is calculated by the system on the basis of the eco driving ranks. In case the ranks are similar, the system takes the covered mileage into account. The higher the mileage value with the same rating, the lower the rating by violations is. Note that the system supports the visual marking of the rating fields according to the eco driving rank. To do this, select the colors and the values matching them in the corresponding block of the report template parameters.


Trip > Month > Day of the week > Detalization

	№	Grouping	Beginning	End	Violation	Value	Max speed	Penalties	Rank	Duration	Mileage	Count
⊞	1	Trip 12 Aug 2015 00:00:01	12 Aug 2015 00:00:01	12 Aug 2015 00:52:49	-----	-----	96 km/h	30	5.6	0:52:48	32 km	36
⊟	2	Trip 12 Aug 2015 01:37:53	12 Aug 2015 01:37:53	12 Aug 2015 04:48:14	-----	-----	110 km/h	42	5.2	3:10:21	121 km	172
⊟	2.1	August	12 Aug 2015 01:37:53	12 Aug 2015 04:48:14	-----	-----	110 km/h	42	5.2	3:10:21	121 km	172
⊟	2.1.1	Wednesday	12 Aug 2015 01:37:53	12 Aug 2015 04:48:14	-----	-----	110 km/h	42	5.2	3:10:21	121 km	172
	2.1.1.1	12 Aug 2015 01:38:17	12 Aug 2015 01:38:17	12 Aug 2015 01:38:27	Braking normal	0.15 g	40 km/h	30	-----	0:00:10	0.05 km	1
	2.1.1.2	12 Aug 2015 01:39:39	12 Aug 2015 01:39:39	12 Aug 2015 01:40:23	Speeding allowed	7 km/h	67 km/h	1	-----	0:00:44	0.80 km	1
	2.1.1.3	12 Aug 2015 01:40:31	12 Aug 2015 01:40:31	12 Aug 2015 01:40:45	Speeding allowed	5 km/h	65 km/h	1	-----	0:00:14	0.89 km	1
	2.1.1.4	12 Aug 2015 01:41:41	12 Aug 2015 01:41:41	12 Aug 2015 01:41:51	Braking normal	0.15 g	26 km/h	30	-----	0:00:10	0.06 km	1
	2.1.1.5	12 Aug 2015 01:42:19	12 Aug 2015 01:42:19	12 Aug 2015 01:42:47	Braking severe	0.30 g	62 km/h	40	-----	0:00:28	0.45 km	1
⊞	3	Trip 12 Aug 2015 05:26:13	12 Aug 2015 05:26:13	12 Aug 2015 10:18:52	-----	-----	112 km/h	28	5.6	4:52:39	188 km	207
⊞	4	Trip 12 Aug 2015 10:56:02	12 Aug 2015 10:56:02	12 Aug 2015 14:06:44	-----	-----	110 km/h	38	5.3	3:10:42	121 km	156
⊞	5	Trip 12 Aug 2015 14:51:48	12 Aug 2015 14:51:48	12 Aug 2015 15:42:33	-----	-----	96 km/h	34	5.4	0:50:45	31 km	37
	-----	**Total**	**12 Aug 2015 00:00:01**	**12 Aug 2015 15:42:33**	-----	-----	**112 km/h**	**34**	**5.4**	**12:57:15**	**493 km**	**608**

Note that it is easier to analyze the received report if the grouping option was applied to the report template. The information received in the report can be grouped on the basis of different criteria, such as time (year, month, week, day, shift), type of violation and trips.

Moreover, in addition to grouping an option of detalization can be applied. This option allows viewing the final level of nesting (date and time) inside of grouping. However, take into consideration that a penalty and rank can be given for a violation that occurred at a certain time interval (not immediately). That is why on the final level of nesting (date and time) a dash is given

in the **Rank** column, and the **Penalty** column receives the value indicated on the **Eco driving** tab of the unit properties.

> If you use grouping or add the Total line to the table, the **Duration** and **Mileage** columns show the data on the **trips** (not violations) of the specified time interval.

Penalty scoring system

For each criterion, you can specify penalty points which should be credited for violations. Enter the number of points in the **Penalty** field on the Eco driving tab of the unit properties. The specified points are used when calculating values in the **Penalties** and **Rank** columns in the report. The main peculiarities of the algorithm used for calculating these values in the reports without grouping and with grouping can be found below.

Without grouping

If you don't use averaging, the penalty value (earlier specified on the **Eco driving** tab) is displayed next to every violation in the **Penalties** column of the report. The **Total** line for this column (if available) contains the sum of points for all violations.

If you use averaging (by mileage or by time), the **Penalties** column next to every violation also contains the penalty value that you have specified. The **Total** line for this column contains the sum of points for all violations divided by the number of minutes (averaging by time) or by the number of kilometers (averaging by mileage) in all trips in the report interval (including trips without violations).

With grouping

If you don’t use averaging, the sum of points for all violations in the group is shown for each parameter group in the **Penalties** column. The **Total** line contains the sum of points for all violations.

If you use averaging (by time or mileage), it is applied to each parameter group in the report table. In addition, if the report has the **Total** line, averaging is also applied to the total number of points earned. The averaging algorithm is described above.

Penalty-rank conversion

The **Rank** column of the report contains the value calculated on the basis of the penalty points received. It is a score from one to six. The following algorithm is used to calculate it:

Penalty	Rank
0	6.0

Penalty	Rank
Less than 20	5.9
20–50	5.0–5.9
50–100	4.0–5.0
100–200	3.0–4.0
200–500	2.0–3.0
More than 500	1.0–2.0

Engine Hours

The **Engine hours** report shows how long the unit worked, how much time was in motion, how much fuel was spent for this period. Also, the duration and efficiency of the work of the attachable equipment can be shown.

To generate this report, the unit is supposed to have such sensors as ignition or absolute/relative engine hours sensor. The method of calculating engine hours is set in unit properties on the **General** tab. On the Advanced tab, you can also set **Daily engine hours rate** to calculate utilization and productivity.

In the report template, you can specify the mask for the main engine hours sensor that is used in the report (the **Engine hours sensor** filter). This allows to separate the engines and create a table for each of them.

There are two options that can be used in engine hours report. They are timeout (set for a sensor) and maximum interval between messages (set for a unit). Both options are used to cut off invalid intervals when the amount of engine hours is defined. If values for both timeout and maximum interval between messages are indicated, the system will use the property with the minimum value indicated.

The table can contain the following columns.

Column	Description
Beginning	The time when the engine hours interval begins.
Initial location	The location of the unit when the engine or implement starts working.
End	The time when the engine hours interval ends.
Final location	The location of the unit when the engine or implement ends working.
Engine hours	The value of engine hours at the interval. For an accurate engine hours calculation, the equipment should send a valid parameter value of the engine sensor. In case of receiving an invalid value, it is necessary to replace the sensor with validator using the correct value (for example, 0).
Initial engine hours	The value of the sensor of absolute engine hours at the beginning of the interval. If there is no sensor value on the report interval, the value of engine hours is counted from zero.
Final engine hours	The value of the sensor of absolute engine hours at the end of the interval.
Total time	Duration of the interval. If grouping by days is enabled, it shows the time from the beginning of the first engine hours interval to the end of the last interval.
Off-time	The period of time passed from the end of the previous interval to the beginning of the current one (determined starting from the second interval).

Column	Description
In movement	The interval of time during which the unit moved, that is, the speed value was greater or equal to the one from the Min moving speed field in the trip detector.
Idling	The time when the unit was standing with the engine on. Note that idling cannot be detected if the equipment does not send messages containing speed value.
Mileage	The distance traveled during the operating hours.
Mileage (adjusted)	Mileage subject to the coefficient set in the unit properties (the Advanced tab).
Initial mileage	The value of the mileage sensor at the moment of the beginning of the reporting period.
Final mileage	The value of the mileage sensor at the end of the reporting period.
Avg speed	Average speed during the interval of engine operation.
Max speed	The maximum speed during the interval of engine operation.
Counter	The counter sensor value.
Initial counter	The counter value at the beginning of the interval.
Final counter	The counter value at the end of the interval.
Avg engine revs	The average rate of engine revolutions.

Column	Description
Max engine revs	The maximum rate of engine revolutions.
Avg temperature	The average temperature value registered for the interval of engine operation.
Min temperature	The minimum temperature value registered for the interval of engine operation.
Max temperature	The maximum temperature value registered for the interval of engine operation.
Initial temperature	The temperature value at the beginning of engine hours operation.
Final temperature	The temperature value the end of engine hours operation.
Status	The status of the unit registered during engine hours operation (if there are several, the first one is displayed).
Cargo weight	The average value of cargo weight during the engine hours interval.
Driver	The name of the driver (if assigned).
Trailer	The name of the trailer (if assigned).
Movement productivity	Percentage ratio of engine hours in the movement to the duration of engine hours.

Column	Description
Engine efficiency duration	The duration of the operation of attached equipment (if there is the engine efficiency sensor).
Engine efficiency idling	The engine operation time after deduction of efficiency time (total engine hours subtract engine efficiency duration).
Utilization	The percentage ratio of the duration of engine hours to engine hours rate (engine hours divided by daily engine hours rate indicated in the unit properties in the **Advanced** tab).
Useful utilization	The percentage ratio of the duration of engine efficiency to the engine hours rate.
Productivity	The percentage ratio of the duration of engine efficiency to the duration of engine hours.
Consumed	The volume of consumed fuel detected by any sort of fuel sensor. If several sensors are available, their values sum up.
Consumed by...	The fuel volume detected by a fuel sensor or calculated by math or rates.
Avg consumption	The average fuel consumption by all available fuel sensors.
Avg consumption by...	The average fuel consumption detected by a fuel sensor or calculated by math or rates.

Column	Description
Consumed in motion by...	The fuel volume used in engine hours while moving.
Avg consumption in motion by...	The average consumption in engine hours while moving.
Consumed in idle run by...	The fuel volume used in engine hours during idle running.
Avg consumption in idle run by...	The average fuel consumption in idling.
Avg consumption by... in trips	The average fuel consumption in trips.
Initial fuel level	The fuel level at the beginning of the interval.
Final fuel level	The fuel level at the end of the interval.
Max fuel level	The maximum fuel level during the engine hours interval.
Min fuel level	The minimum fuel level during the engine hours interval.
Penalties	The penalties calculated for the adjusted Eco driving criteria.
Rank	The received penalty points converted into a grade using 6 point scoring system.
Avg value of custom sensor	The average value of custom sensor during the engine hours interval.
Min value of custom sensor	The minimum value of custom sensor during the engine hours interval.

Column	Description
Max value of custom sensor	The maximum value of custom sensor during the engine hours interval.
Initial value of custom sensor	The value of custom sensor at the beginning of the engine hours interval.
Final value of custom sensor	The value of custom sensor at the end of the engine hours interval.
Notes	An empty column for your custom comments.

Beginning	Initial location	End	Engine hours	Total time	Mileage
2015-05-30 06:10:10	Mex-2, San Luis Río Colorado	2015-05-30 10:19:13	4:09:03	4:09:03	155 km
2015-05-30 16:55:11	Mex-2, Puerto Peñasco	2015-05-30 17:14:50	0:19:39	0:19:39	0.17 km
2015-05-30 17:44:42	Mex-2, Puerto Peñasco	2015-05-30 19:38:12	1:53:30	1:53:30	131 km
2015-05-30 20:08:35	Mex-2, Altar	2015-05-31 08:34:26	12:25:51	12:25:51	796 km
2015-05-31 17:35:05	Avenida Monte Seir, Fracc Santa Rocío	2015-05-31 17:35:56	0:00:51	0:00:51	0.01 km
2015-05-31 17:45:46	Avenida Monte Seir, Fracc Santa Rocío	2015-05-31 18:12:54	0:27:08	0:27:08	8.64 km
2015-05-31 18:56:07	Boulevard Jesús Kumate Rodríguez, Culiacán	2015-05-31 19:15:02	0:18:55	0:18:55	8.83 km
2015-06-01 21:58:49	Avenida Quinta Poniente, Fracc Santa Rocío	2015-06-01 22:06:35	0:07:46	0:07:46	0.62 km
2015-06-05 03:37:19	Avenida De Los Hacendados, Penitenciaría	2015-06-07 00:14:13	44:36:54	1 days 20:36:54	1225 km
2015-06-07 03:40:51	Avenida Siderita 1461, Ampl Valle Del Pedregal	2015-06-07 04:36:00	0:55:09	0:55:09	0.00 km
2015-06-07 10:26:49	Avenida Siderita 1461, Ampl Valle Del Pedregal	2015-06-07 10:39:11	0:12:22	0:12:22	0.00 km

For the engine hours report, you can apply intervals filtration by engine hours sensor, duration, mileage, engine hours, speed range, trips, stops, parkings, sensors, sensors masks, driver, trailer, fuel fillings, fuel thefts, and geofences/units. If the engine hours are counted according to the engine hours sensor, it is possible to filter the intervals not only by the duration of their operation (that is the duration of their on-state), but also by the value of the engine hours sent by the sensor itself.

Events

All events registered by the system (including violations) can be shown in the report on events.

Possible ways to register events and assignable types:

Registration method	Event type
Using notifications if the method of delivery is **Register event for unit**	Custom event, violation (if the **Register as violation** option is activated)

Registration method	Event type
Manually using the events registrar	Custom event, violation (if the **Violation** option is activated), unit status, fuel filling, maintenance work
Save, reset, change the values of counters with the help of the corresponding jobs or notifications	Mileage accounting, engine hours accounting, GPRS traffic accounting
Manually using custom events registered from the online notifications window	Custom event, violation (if the **Violation** option is activated)
Automatically, upon completing a route by the unit	Route progress

In the table settings, you can find a filter by event text. Specify the mask to which the event text should correspond to include this event in the report.

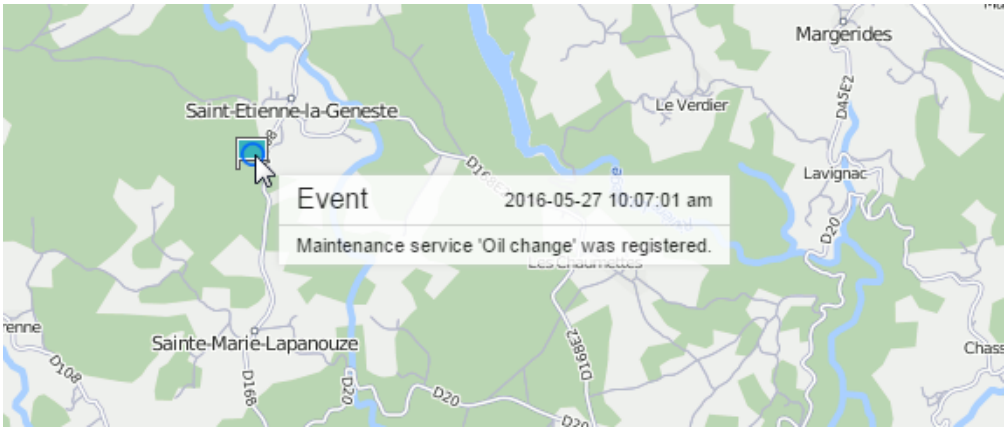
The table can contain the columns listed below.

Column	Description
Event time	The time when the event happened.
Time received	The time when the server received the data.
Event text	The text that was specified when creating a notification or when registering an event manually.
Location	The location of the unit at the moment of the event. If the event is registered manually, the unit's location is detected on the basis of messages received upon event registration. The same is true for the events registered by storing counters' values in the unit properties.

Column	Description
Driver	The name of the driver (if identified).
Count	The count of events.
Notification text	The text available upon registering an event from an online notifications window.
Notes	An empty column for your custom comments.

Event time	Time received	Event text	Location
2015-11-24 15:38:54	2015-11-24 15:38:54	Route 'España': unit is late.	Carretera de Puertollano 2
2015-11-24 15:43:05	2015-11-24 15:43:05	Route 'Nueva ruta1': unit is late.	Carretera de Puertollano 2, Ciudad Real 13002
2016-01-28 09:57:00	2016-03-28 09:57:58	Maintenance service 'Wheel balancing' was registered.	London Road 87-91, Corringham
2016-02-28 09:56:00	2016-03-28 09:56:56	Fuel filling of 50 lt to the amount of 85 was made	Lexham Gardens 48-86, Kensington
2016-03-25 11:31:00	2016-03-25 11:33:02	Maintenance service 'Oil change' was registered.	Luke Lane 1-5, Churchdown
2016-03-28 09:56:00	2016-03-28 09:56:16	Business	-----
2016-03-29 15:19:57	2016-03-29 15:19:57	Mileage counter value is 10 km.	-----
2016-04-11 12:44:23	2016-04-11 12:44:23	Mileage counter value is 200000 km.	-----
2016-05-24 16:06:10	2016-05-24 16:06:10	Mileage counter value is 200000 km.	-----
2016-05-27 10:07:01	2016-05-27 10:11:13	Maintenance service 'Oil change' was registered.	D168, Saint-Etienne-la-Geneste 19160

Besides, you can use special markers for this report: a green flag stands for an event, a red flag — for a violation. In the tooltip, you can find detailed information. You can add the markers of events and violations by activating the option **Event markers** in the settings of the report template (**Map output** section).



Executed Commands

This kind or report lists all the commands that were sent to a unit and successfully executed.

Below are possible columns in the report.

Column	Description
Sending time	The time when the command was sent to the unit.
User	The name of the user who sent the command (hidden if you do not have access rights to the user).
Command name	The name of the command as it is written in the unit properties.
Command type	The type of the command (see the list).
Parameter	The additional parameter in the command (some commands do not have such parameters).
Execution time	The time when the command was executed.
Channel	The type of connection used to execute the command (**TCP**, **UDP**, **Virtual**, **SMS**).
Count	The number of sent commands.
Notes	An empty column for your custom comments.

Sending time	User	Command name	Command type	Parameters	Execution time	Channel
2012-08-02 18:13:07	wialon	45645646	Query position	-----	2012-08-02 18:13:08	SMS
2012-08-02 18:18:33	wialon	Engine on	Unblock engine	-----	2012-08-02 18:18:34	SMS
2012-08-02 18:20:20	wialon	Message 1	Custom message	yahoo!	2012-08-02 18:20:20	Virtual
2012-08-02 18:23:12	user	Where	Query position	-----	2012-08-02 18:23:13	TCP
2012-08-02 18:23:17	user	Where	Query position	-----	2012-08-02 18:23:18	TCP
2012-08-02 18:23:25	user	Fridge yes	Activate output	6	2012-08-02 18:23:25	SMS
2012-08-02 18:24:31	wialon	Message 1	Custom message	hello!	2012-08-02 18:24:31	Virtual
2012-08-02 18:25:34	wialon	Where	Query position	-----	2012-08-02 18:25:35	SMS
2012-08-02 18:25:38	wialon	Where	Query position	-----	2012-08-02 18:25:39	SMS

This is the list of successfully executed commands. To view **all** the commands sent to the unit regardless of their execution, go to the Messages panel.

More details about the commands can be found in the Commands section.

Fuel Fillings

This report shows where and when a vehicle was filled up. The parameters for the report are set in Unit Properties –> Fuel Consumption. This report is generated on the basis of fillings registered manually or detected by sensors. The table cannot be generated if no fuel fillings are found for the indicated time interval.

This report may include the following columns.

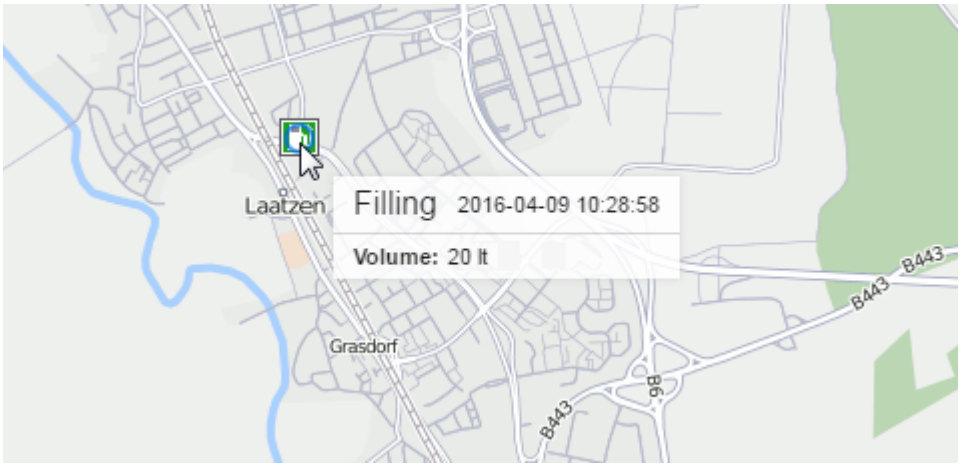
Column	Description
Time	The moment of the most significant change in the fuel level.
Location	The location of the unit at the time of filling (if a filling is registered manually, the location of the unit is detected on the basis of the messages received at the time of filling registration).
Initial fuel level	The fuel level before the filling.
Final fuel level	The fuel level after the filling.
Filled	The volume of filled fuel (the name of the sensor can be indicated in parenthesis).
Registered	The volume of registered fuel.
Difference	The difference between the detected and registered filling volume.
Description	A brief description indicated during the manual registration of fuel filling.
Sensor	The sensor which detected the filling.

Column	Description
Driver	The name of the driver (if identified).
Trailer	The name of the trailer (if one was bound).
Count	The number of fillings.
Counter	The indications of the counter sensor.
Mileage	The mileage sensor value at the moment of filling. If the mileage parameter was not saved throughout the reported period, the mileage is counted from 0.
Avg value of custom sensor	The average value of the custom sensor registered during the filling.
Min value of custom sensor	The minimum value of the custom sensor registered during the filling.
Max value of custom sensor	The maximum value of the custom sensor registered during the filling.
Initial value of custom sensor	The value of the custom sensor registered before the filling.
Final value of custom sensor	The value of the custom sensor registered after the filling.
Notes	An empty column for your custom comments.

Time	Location	Filled	Sensor name	Mileage
2015-12-11 13:21:56	Temasek Boulevard, 3, Singapore	15 l	Fuel level	6.23 km
2015-12-11 13:30:31	East Coast Park Service Road, Singapore	25 lt	Fuel level	14.67 km
2015-12-11 13:49:26	Temasek Boulevard, 3, Singapore	50l	Fuel level	36 km
2015-12-11 14:03:04	Temasek Boulevard, 3, Singapore	14.40 lt	Fuel level	53 km
2015-12-11 14:16:49	Temasek Boulevard, 3, Singapore	35 l	Fuel level	70 km
2015-12-11 14:30:30	Temasek Boulevard, 3, Singapore	24 l	Fuel level	87 km
2015-12-11 14:44:15	Temasek Boulevard, 3, Singapore	43 l	Fuel level	103 km

The intervals filtration by geofences/units, drivers, trailers, filling volume, and sensor masks can be additionally applied to this table. Note that in the case of sensor masks, intervals filtration is only applied to the fuel filling detected by sensors.

You can use special markers for this report to mark places of fillings on the map.



Information on **fuel thefts** can be found here.

Fuel Thefts

In this report, you can find out when, where and how much fuel was stolen. The parameters for this report are set in Unit Properties –> Fuel Consumption.

In the table, you can have the following columns.

Column	Description
Beginning	The date and time when the theft began.
Initial location	The unit location at the time of the beginning of theft.
Time	The moment of the most significant drop in the fuel level.

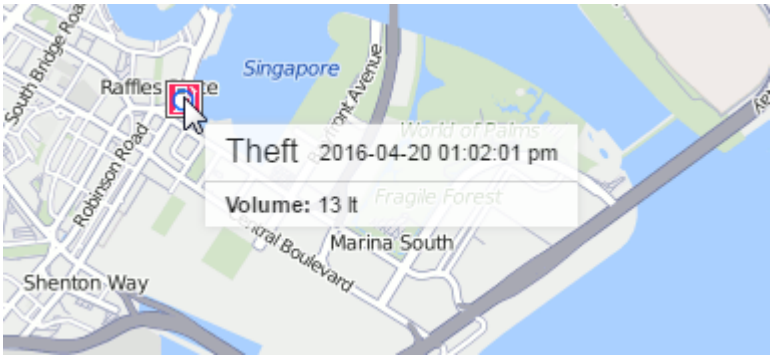
Column	Description
Final location	The location of the unit at the time of the fuel theft (the **Time** column).
Initial fuel level	Fuel level before the theft.
Initial speed	The speed at the time of the beginning of theft.
Stolen	The stolen fuel volume.
Final fuel level	The fuel level after the theft.
Final speed	The speed of movement at the time of the fuel theft (the **Time** column).
Sensor name	The sensor that detected fuel theft.
Driver	The name of the driver (if identified).
Trailer	The name of the trailer (if one was bound).
Count	The number of thefts.
Counter	The counter sensor value.
Mileage	The mileage sensor value at the moment of theft. If the mileage parameter was not saved throughout the reported period, the mileage is counted from 0.
Avg value of custom sensor	The average value of the custom sensor registered during the theft.

Column	Description
Min value of custom sensor	The minimum value of the custom sensor registered during the theft.
Max value of custom sensor	The maximum value of the custom sensor registered during the theft.
Initial value of custom sensor	The value of the custom sensor registered before the theft.
Final value of custom sensor	The value of the custom sensor registered after the theft.
Notes	An empty column for your custom comments.

Beginning	Initial location	Initial fuel level	Stolen	Final fuel level	Sensor name	Driver
2012-11-19 10:26:46	Bemeroder Straße	125.04 lt	42.54 lt	82.50 lt	fuel_10	987654
2012-11-23 11:09:47	Alte Kronsbergstraße	130.20 lt	52.85 lt	77.34 lt	fuel_10	987654
2012-11-26 12:46:23	Giesener Straße	103.12 lt	20.62 lt	82.50 lt	fuel_5	987654

The intervals filtration by geofences/units, driver, trailer, and theft volume can be additionally applied to this table.

Special markers can be shown on the map in the places of thefts.



Information on **fuel fillings** can be found here.

Fuel Traffic

This report is designed to display the data about fuel fillings and thefts, as well as the intervals of operation of the counter sensor of the unit in one table. For each type of activity (fuel filling, theft, counter operation) you can customize its intervals filtration in the parameters of the table.

Beginning	Duration	Location	Type	Volume	Sensor name	Filled	Deviation	Notes
2021-02-03 08:24:06	0:07:44	Windy Bank Lane, Dewsbury, England	Counter	25 l	DFM	-----	-----	
2021-02-03 08:52:51	0:09:52	Windy Bank Lane, Dewsbury, England	Counter	45 l	DFM	-----	-----	
2021-02-03 09:16:49	0:03:23	Windy Bank Lane, Dewsbury, England	Counter	78 l	DFM	-----	-----	
2021-02-03 09:22:28	0:03:06	Windy Bank Lane, Dewsbury, England	Counter	51 l	DFM	-----	-----	
2021-02-03 09:25:51	0:02:54	Windy Bank Lane, Dewsbury, England	Theft	105 l	FLS	95	10	
2021-02-03 09:28:45	0:00:16	Windy Bank Lane, Dewsbury, England	Counter	34 l	DFM	-----	-----	
2021-02-03 09:29:01	0:00:26	Windy Bank Lane, Dewsbury, England	Counter	29 l	DFM	-----	-----	
2021-02-03 09:49:27	0:08:38	Windy Bank Lane, Dewsbury, England	Counter	28 l	DFM	-----	-----	

If in the filtration parameters there are other selected units and at the moment of activity they were close to the unit for which the report is executed, the algorithm of fuel fillings analysis is run. Thus, when executing, for example, a report on a tanker, one can see not only its fuel activity, but also the amount of fuel received by the units near it (at least one message from such units should be received during the activity interval from a distance less than the radius specified in the filtration parameters).

Date | Detalization

	Grouping	Beginning	End	Duration	Location	Sensor	Output volume	Unit	Filled	Deviation	Driver
⊞	2021-06-04	08:02:33	08:03:34	0:01:01	Taubenholzweg, Lehrte 31275, Hannover, Germany	DFM	50 l	Tractor 1	50.10 l	-0.10 l	Richard
⊞	2021-06-05	08:05:04	08:05:59	0:00:55	Taubenholzweg, Lehrte 31275, Hannover, Germany	DFM	49.40 l	Tractor 1	49.40 l	0 l	Richard
⊟	2021-06-06	07:56:10	08:06:25	0:02:43	Taubenholzweg, Lehrte 31275, Hannover, Germany	DFM	142 l	Tractor 1	143 l	-1.22 l	Richard
┆	2021-06-06 07:56:10	07:56:10	07:57:07	0:00:57	Taubenholzweg, Lehrte 31275, Hannover, Germany	DFM	49.50 l	Tractor 1	49.40 l	0.10 l	Richard
┆	2021-06-06 08:04:39	08:04:39	08:06:25	0:01:46	Taubenholzweg, Lehrte 31275, Hannover, Germany	DFM	92 l	Tractor 2	94 l	-1.32 l	Michael

Read about setting the parameters used in the report in the Fuel consumption and Sensor properties sections.

The **Fuel traffic** report may include the following columns.

Column	Description
Beginning	Depending on the type (see below) — the activation time of the sensor, the time of the fuel filling or theft.
End	Depending on the type — the deactivation time of the sensor, the time of the fuel filling or theft.
Duration	The time from the beginning to the end (0 for fuel fillings and thefts).
Location	The position of the unit while sending the data (is associated with the **End** field).

Column	Description
Type	The kind of the current activity determined by the system (filling, theft, counter operation).
Volume	Depending on the type — the quantity calculated by the counter sensor or the data from the **Filled** or **Stolen** columns taken from the columns of the same name in the corresponding tables.
Sensor name	The name of the sensor by which the type was determined.
Geofences/Units	The column that includes the names of the geofences or units with which an intersection was recorded during a given interval. Necessary geofences and units are indicated in the filtration parameters. If there are several geofences or units that have been triggered, the report displays the name of the geofence with the smallest surface or the name of the unit with the smallest radius of approximation. If the sizes coincide, all the names are included.
Filled	The sum of the fuel fillings (if any) of the units shown in the **Geofences/Units** column. Only the fillings registered automatically and the time of which is within the interval from **Beginning** to **End** are taken into account.
Deviation	The difference between the values of the **Volume** and **Filled** columns.
Driver	The name of the driver assigned to the unit on the current interval.
Notes	An empty column where you can introduce your custom comments after you have printed or exported the report.

Geofences

To generate a report on geofences, you should select one or several geofences in the parameters of the table. In this report, you can use both the geofences from the resource in which the report template is created and the geofences from other resources to which the user has the **View geofences** access right. The resource is selected in the dropdown list above the list of geofences. It is also possible to select the **All** option — the list will contain the geofences from all the resources to which the user has the necessary access right. The geofences in the list are sorted by name. To quickly find one, use the dynamic filter.

The following columns can be selected for this table.

Column	Description
Geofence	The name of the geofence.
Type	Polygon, line, circle, unit (if units are selected instead of geofences in the report template).
Area	The total area of the geofence (if the metric system is used, the area will be indicated in hectares).
Perimeter	The perimeter of the geofence. The perimeter for a line is its length (line thickness is not taken into account).
Description	Description of the geofence (taken from the geofence properties).
Time in	The time when the unit entered the geofence.
Time out	The time when the unit left the geofence.
Duration in	The duration of the visit.

Column	Description
Total time	The time from the beginning of the first visit to the end of the last one.
Parkings duration	The time spent in parkings.
Off-time	The time between the previous visit and the current one (is defined starting from the second visit of the geofence).
Mileage	Mileage inside the zone.
Mileage (adjusted)	Mileage subject to the coefficient set in the unit properties (on the **Advanced** tab).
Counter	The value of the counter sensor.
Initial counter	The counter value when entering the geofence.
Final counter	The counter value when exiting the geofence.
Avg engine revs	The average rate of engine revolutions.
Max engine revs	The maximum rate of engine revolutions.
Avg temperature	The average temperature value registered inside the geofence.
Min temperature	The minimum temperature value registered inside the geofence.

Column	Description
Max temperature	The maximum temperature value registered inside the geofence.
Initial temperature	The temperature value when entering the geofence.
Final temperature	The temperature value when leaving the geofence.
Off-mileage	The mileage traveled from the previous visit.
Off-mileage (adjusted)	The mileage traveled from the previous visit subjected to the coefficient.
Avg speed	The average speed with which the unit moved in the geofence.
Max speed	The maximum speed with which the unit moved in the geofence.
Driver	The name of the driver (if available).
Trailer	The name of the trailer (if one was bound).
Visits	The number of visits (can be helpful either in grouping table data by years/months/weeks/days/shifts or for the reports on unit groups).
Consumed	The amount of consumed fuel detected by any sort of fuel sensor. If several sensors are available, their values sum up.

Column	Description
Consumed by ImpFCS/AbsFCS/InsFCS/FLS/math/rates	The volume of consumed fuel detected by a fuel sensor (such as impulse/absolute/instant fuel consumption sensor, fuel level sensor) or calculated by math or rates. More details about fuel in reports can be found here.
Avg consumption	The average fuel consumption by any sort of fuel sensor. If several sensors are available, their values sum up.
Avg consumption by ImpFCS/AbsFCS/InsFCS/FLS/math/rates	The average fuel consumption by one of the methods mentioned above.
Penalties	The penalties calculated for the adjusted Eco driving criteria.
Rank	Penalty points converted to a 6-point rating system.
Avg value of custom sensor	The average value of the custom sensor registered inside the geofence.
Min value of custom sensor	The minimum value of the custom sensor registered inside the geofence.
Max value of custom sensor	The maximum value of the custom sensor registered inside the geofence.
Initial value of custom sensor	The value of the custom sensor registered when the unit entered the geofence.

Column	Description
Final value of custom sensor	The value of the custom sensor registered when the unit left the geofence.
Notes	An empty column for your custom comments.

Geofence	Type	Perimeter	Time in	Duration in	Mileage	Max speed
Grot	Polygon	17.50 km	2013-01-15 16:01:00	0:03:00	6.28 km	45 km/h
Furnaces ITK	Line	20.98 km	2013-01-15 16:04:00	0:02:00	2.88 km	35 km/h
Garage	Circle	8.53 km	2013-01-15 16:11:00	0:04:00	7.20 km	47 km/h
Furnaces ITK	Line	20.98 km	2013-01-15 16:24:02	0:01:59	6.17 km	56 km/h
Settlement	Circle	18.85 km	2013-01-15 16:24:02	0:01:59	6.17 km	56 km/h
Grot	Polygon	17.50 km	2013-01-15 16:30:01	0:03:00	6.28 km	45 km/h
Furnaces ITK	Line	20.98 km	2013-01-15 16:33:01	0:02:00	2.88 km	35 km/h

Instead of geofences, you can select units in the report's template. Additionally, indicate the radius for these units (in meters). In this case, the units are considered as **moving geofences**, and the activity of the selected unit is analyzed with respect to these moving geofences. The **Query reports or messages** access is required to these units.

The intervals filtration by duration, mileage, engine hours, speed range, trips, stops, parkings, sensors, drivers, trailers, fuel fillings, and thefts can be applied to this table.

Geofences can be displayed on the map. To do this, activate the Render geofences option in the report template.

> Note that the monitoring system provides a possibility to detect a geofence visit at its intersection with the segment of the trip track. This option can be enabled in the advanced settings of the report template.

See related reports — Non-visited geofences, Rides.

GPRS Traffic

This report is executed if a unit has registered events of GPRS traffic counter reset or traffic storage was adjusted with the help of a corresponding job.

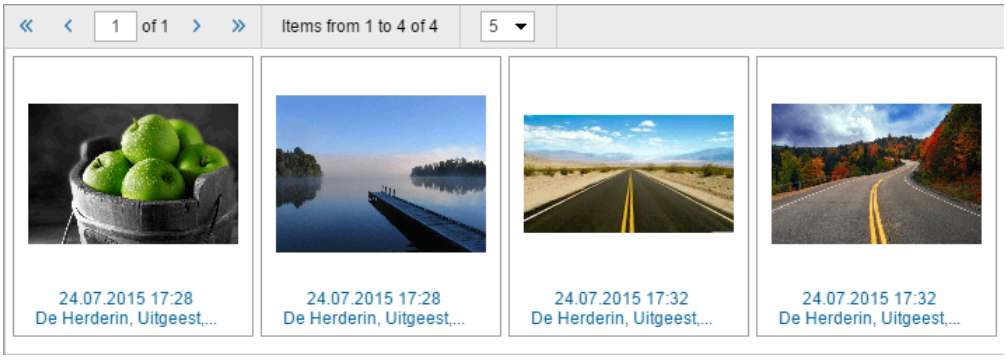
Column	Description
Time	The time when the counter value was registered.

Column	Description
Current value	The value at the moment of registration.
Absolute value	The total size of GPRS traffic at the moment of registration.
Reset	Determines whether the reset of GPRS trafic was detected. **Yes** — detected, **No** — not detected.
Notes	An empty column for your custom notes.

Time	Current value	Absolute value	Reset	Notes
2017-07-20 12:14:02	6.39 MB	0 B	No	
2017-07-20 12:29:02	350 KB	0 B	Yes	
2017-07-20 12:44:02	500 KB	0 B	Yes	
2017-07-20 12:59:02	350 KB	0 B	No	
2017-07-20 13:14:02	68 KB	0 B	No	
2017-07-20 13:29:02	6.39 MB	6.39 MB	Yes	
2017-07-20 13:44:02	0 B	6.39 MB	Yes	
2017-07-20 13:59:02	0 B	6.39 MB	Yes	

Images

This report shows all the images received from a unit. Click on the image to open it. Click **Save as** in the lower left corner of the image file viewer to save it.



Moreover, every image contains additional information, such as the date, time, and the place of sending the image. Click on this information to center the map on the location of the unit at the moment of sending the image. The location is shown on the map with the blue marker.

In addition, you can use special markers for this report.

Log

To execute this report, you should have the following access rights to the objects:

- Manage object log;
- Request reports and messages.

A report with the **Log** table can be executed for units, unit groups, users, resources, retranslators, and routes. This table contains records about changes made by users in the properties of the object or its contents. Unlike the log of the monitoring or management system, the report doesn't show records about errors, receiving messages from a unit, etc.

You can add the following columns to the **Log** table:

Column	Description
Time	The time of making (saving) the change.
User	The name of the user who made the change. In order for the report to show only changes made by a specific user, specify their name or name mask in the filter of the table settings.
Item name	The name of the object the properties or contents of which were changed. ⚠ The **Item name** column is only used in the reports on users.
Item type	The type of the object the properties or contents of which were changed. Possible types: unit, unit group, user, resource, retranslator, or route.
Action	The description of the change made.
Host	The address of the computer (device) from where the user made changes or from where the job or notification configured by them was triggered.
Notes	An empty column where you can leave your own comments after printing or exporting the report.

Below is an example of the **Log** table for a resource.

Time	User	Item type	Action	Host
2012-07-13 12:42:31	Duremar	Resource	Job 'locate' switched on.	10.1.3.11
2012-07-13 12:42:31	Duremar	Resource	Job 'locate' updated.	10.1.3.11
2012-07-13 12:54:44	user	Resource	Job 'SMS SIM's' switched off.	10.1.3.11
2012-07-13 13:23:22	user	Resource	Job '1_fish-004-picasso' created.	10.1.3.11
2012-07-13 13:47:22	Duremar	Resource	Job '1_fish-004-picasso' updated.	10.1.3.11
2012-07-13 14:33:08	Duremar	Resource	Notification 'Idles' updated.	10.1.3.11
2012-07-16 16:17:58	user	Resource	Job 'locate' switched off.	10.1.3.11
2012-07-16 16:18:00	user	Resource	Job '1_fish-004-picasso' switched off.	10.1.3.11
2012-07-16 17:55:22	Duremar	Resource	Driver 'Vodilla Duremara' created.	10.1.3.11
2012-07-16 17:59:00	Duremar	Resource	Driver 'VodDur' deleted.	10.1.3.11
2012-07-16 17:59:46	user	Resource	Access rights for user 'Duremar' changed	10.1.3.11

The **Log** table for the user shows both information about their actions regarding the system objects, and the actions of other users on them. Also, the report has the **Item name** column, which is not available in the **Log** tables for other objects.

Time	User	Item name	Item type	Action	Host
2012-07-19 11:58:28	Duremar	user	Resource	Notification 'Idles' updated.	10.1.3.11
2012-07-19 11:58:28	Duremar	user	Resource	Notification 'SMS ctrl' updated.	10.1.3.11
2012-07-19 11:58:28	Duremar	user	Resource	Notification 'Уведомление о входе в зону' updated.	10.1.3.11
2012-07-19 11:59:35	Duremar	Duremar	Resource	Notification '32489' created.	10.1.3.11
2012-07-19 12:03:50	Duremar	SMS Sim004	Unit	Mileage counter changed from 888 km to 32489 km	notification
2012-07-19 12:03:56	Duremar	SMS Sim004	Unit	Mileage counter changed from 32489 km to 32489 km	notification
2012-07-19 14:02:36	user	Duremar	User	User flags changed.	10.1.1.3
2012-07-19 14:02:36	user	Duremar	User	Custom field 'wer' deleted	10.1.1.3

In the settings of the **Log** table for a unit group, the **Group itself** option is available. If it is disabled, the log shows changes for individual units that are part of the group or groups. To execute such a report, you should activate the Detalization option.

	Unit	Time	User	Item type	Action	Host	Count
⊟	123test	2012-07-19 10:20:29	user	Unit	Messages imported	10.1.3.11	3
	123test	2012-07-19 10:20:29	user	Unit	Messages imported	10.1.3.11	1
	123test	2012-07-19 11:30:43	user	Unit	Access rights for user 'Duremar' changed	10.1.3.11	1
	123test	2012-07-19 11:48:25	user	Unit	Custom field 'pole 2' created	10.1.3.11	1
	Picasso	-----	-----	-----	-----	-----	-----
⊞	SMS Sim004	2012-07-19 10:21:31	user	Unit	Messages imported	10.1.3.11	8
⊞	SMS Sim007	2012-07-19 10:25:10	user	Unit	Messages imported	10.1.3.11	3
	SMS Sim011	-----	-----	-----	-----	-----	-----

If the **Group itself** option is enabled, the log shows the changes made to the unit group as a system object. Data is shown only for one unit group, even if several groups are selected in the **Object** parameter (only the first one in the list is taken into account).

Time	User	Item type	Action	Host
2012-07-19 14:06:55	user	Unit group	Units in group updated.	10.1.1.3
2012-07-19 14:06:55	user	Unit group	Access rights for user 'user007' changed	10.1.1.3
2012-07-19 14:06:55	user	Unit group	Unit icon changed	10.1.1.3
2012-07-19 14:06:55	user	Unit group	Custom field 'Satus' created	10.1.1.3

Maintenance

The Maintenance table contains the list of the service works performed during the indicated period and registered by the user for the selected unit.

The following columns can be included in the table.

Column	Description
Service time	The date and time indicated at the time of registration.
Registration time	The date and time when the event was registered.
Kind of work	The information taken from the **Kind of work** field.
Comment	The information taken from the **Description** field.
Location	The location indicated at registration.
Duration	The duration of technical work.
Cost	The cost of service.
Mileage	The value of the mileage counter at the time of maintenance.
Engine hours	The value of the engine hours counter at the time of maintenance.
Count	The number of services.

Column	Description
Notes	An empty column for your custom comments.

Service time	Kind of work	Location	Cost	Mileage	Engine hours
2012-10-15 18:24:00	TO-1	A9, Pegnitz	387.00	2193 km	2 days 7:00:00
2012-11-17 18:26:00	TO-2	-----	122.77	4610 km	7 days 21:00:00
2012-12-28 18:29:00	TO-1	A9, Pegnitz	403.00	5107 km	13 days 21:00:00
2012-12-04 16:19:00	Total condition	-----	58.00	7599 km	26 days 2:00:00
2013-02-04 16:18:00	Oil change	-----	67.00	7599 km	26 days 2:00:00
2013-02-04 16:19:00	Maintenance	Willy-Brandt-Platz	99.00	7599 km	26 days 2:00:00

If the row in the table is blue, it means that the location was indicated on the map during the registration.

Messages Tracing

The main objective of this report is to facilitate the work with the parameters from the messages. That is why the parameter values are presented not as a single data array but have a particular structure. It means that every parameter is located in its own column.

Along with the parameter values, this report can include other columns.

Column	Description
Time	The date and time when the message was sent.
Speed	The speed of a unit from the received message.
Coordinates	The coordinates of the unit.
Location	The location of the unit at the time when the message was sent.
Value	The value of the parameter sent in a message.
Driver	The name of the driver (if available).

Column	Description
Trailer	The name of the trailer (if one was bound).
Notes	An empty column to add your custom comments after printing or exporting the report.

№	Time	Speed	Coordinates	Location	device_status	hdop	mileage	pwr_ext	pwr_int
1	03.06.2015 02:00:03	12 km/h	36.893184 : -119.764280	USA, Fresno, E Sarazen Avenue	131458	1.04	580125.00	12.08	0.10
2	03.06.2015 06:00:00	12 km/h	36.893184 : -119.764280	USA, Fresno, E Sarazen Avenue	131458	1.04	580125.00	12.04	0.10
3	03.06.2015 06:06:25	14 km/h	36.893184 : -119.764280	USA, Fresno, E Sarazen Avenue	143746	1.04	580125.00	14.21	0.10
4	03.06.2015 06:06:51	27 km/h	36.893264 : -119.765128	USA, Fresno, E Sarazen Avenue	160134	1.54	580125.00	14.07	0.11
5	03.06.2015 06:06:54	19 km/h	36.893236 : -119.765256	USA, Fresno, E Sarazen Avenue	160134	1.16	580125.00	14.16	0.11
6	03.06.2015 06:06:55	22 km/h	36.893156 : -119.765336	USA, Fresno, N Ponderosa Dr	160134	1.04	580125.00	14.12	0.11
7	03.06.2015 06:06:57	27 km/h	36.893028 : -119.765344	USA, Fresno, N Ponderosa Dr	160134	1.51	580125.00	14.17	0.11
8	03.06.2015 06:07:15	45 km/h	36.891404 : -119.765352	USA, Fresno, N Ponderosa Dr	4354438	0.98	580125.00	14.15	0.10
9	03.06.2015 06:07:21	38 km/h	36.890688 : -119.765288	USA, Fresno, N Ponderosa Dr	4354438	1.03	580125.00	14.05	0.11
10	03.06.2015 06:07:29	23 km/h	36.890340 : -119.765152	USA, Fresno, N Millbrook Avenue	4354438	0.97	580125.00	13.98	0.10
11	03.06.2015 06:08:30	76 km/h	36.880464 : -119.768816	USA, Fresno, N Fort Washington Rd	4354438	0.97	580125.00	13.96	0.11
12	03.06.2015 06:09:18	63 km/h	36.874244 : -119.773840	USA, Fresno, N Fort Washington Rd	4354438	0.96	580125.00	13.90	0.10
13	03.06.2015 06:09:27	59 km/h	36.873620 : -119.775352	USA, Fresno, N Fort Washington Rd	4354438	0.97	580125.00	13.93	0.11
14	03.06.2015 06:10:08	29 km/h	36.872368 : -119.778968	USA, Fresno, N Friant Rd	4354438	0.96	580125.00	13.96	0.10
15	03.06.2015 06:10:11	35 km/h	36.872168 : -119.779080	USA, Fresno, N Friant Rd	4354438	1.40	580125.00	13.85	0.11

Note that you can click on a link in such columns as **Time**, **Coordinates** and **Speed** to view the position of a unit on the map.

⚠ This table cannot be generated for unit groups.

Orders

This kind of report displays detailed information about orders that were used while creating the route in the Logistics app.

ⓘ To generate a report, activate the **Orders** service first.

The table can contain the following columns.

Column	Description
Name	The name of the order.
Time from	The time from which the order should be delivered (the beginning of the delivery interval).

Column	Description
Time to	The time until which the order should be delivered (the end of the delivery interval).
Estimated arrival time	The approximate time of arriving at the destination point (system calculation).
Actual arrival time	The actual time of arriving at the destination point.
Deviation	The difference between the actual and estimated arrival time.
Departure time	The time when the unit left the point of the route.
Estimated mileage	The approximate distance to the destination point (system calculation).
Actual mileage	The actual distance to the destination point.
Estimated time to point	The approximate time for covering the distance between the previous and current destination points (system calculation).
Actual time to point	The actual time spent on covering the distance between the previous and current destination points.
Fuel consumed	The amount of fuel spent on delivery.
Avg temperature	The average temperature over the delivery period.
Min temperature	The minimum temperature value registered for the interval of delivery.

Column	Description
Max temperature	The maximum temperature value registered for the interval of delivery.
Initial temperature	The temperature value at the beginning of delivery.
Final temperature	The temperature value at the end of delivery.
Status	The status of the order delivery (confirmed/rejected/not set).
Comment (confirmation)	The comment entered when setting the status.
Comment (order)	The comment added to the order.
Tags	Keywords added to the order.
Address	The address of the delivery point.
Weight	Total weight of goods in the order.
Volume	The quantitative value (for example, items) of the order indicated at its creation.
Cost	The total cost of goods in the order.
Client name	The name of the client.
Driver	The name of the driver.
Files	The number of files attached to the order.

Order	Estimated mileage	Actual mileage	Status	Comment	Weight	Volume	Cost
Order1	3.20 km	3.50 km	Confirmed	no problem	250 kg	5	300
Order2	4.32 km	4.35 km	Confirmed	no problem	100 kg	2	500
Order3	5.38 km	4.82 km	Rejected	nobody home	600 kg	10	1000
Order4	15.27 km	13.19 km	Confirmed	no problem	50 kg	1	25
Order5	4.76 km	3.62 km	Confirmed	no problem	75 kg	2	240
Order6	5.50 km	5.35 km	Confirmed	no problem	111 kg	111	111
Order7	7.14 km	4.77 km	-----	-----	222 kg	222	22
Order8	13.37 km	13.19 km	-----	-----	45 kg	15	70
Order9	3.77 km	3.62 km	-----	-----	44 kg	44	44
Order10	5.03 km	5.25 km	Confirmed	-----	150 kg	3	600
Order11	3.85 km	3.80 km	Confirmed	-----	230 kg	5	170

Additional parameters can be selected for this kind of report. In other words, the report on orders can be generated on the basis of orders of the selected type. The available types of orders are described below.

Column	Description
All orders	All orders for the indicated time period.
Visited	The arrival of a courier to the address is fixed, or the status is set.
Visited late	Orders are visited and fixed with a delay, or the status is set with a delay.
Fulfilled	The arrival of a courier to the address is detected and fixed, the **Confirm** status is set.
Rejected	The orders for which the **Reject** status is set.
Visited without status	The arrival of a courier to the address is detected, the status is not set.
Non-visited	The arrival of courier to the address is not detected.

Non-visited Geofences

This report gives the list of geofences that were not visited during the indicated time period.

In the parameters of the table, select one or several geofences. In this report, you can use both the geofences from the resource in which the report template is created, as well as the geofences from other resources to which the user has the **View geofences** access right. The resource is selected in the dropdown list above the list of geofences. It is also possible to select the **All** option — then the list will contain the geofences from all the resources to which the user has the necessary access right. The geofences in the list are sorted by name. To quickly find one, use the dynamic filter.

Suppose, we have 11 points (geofences) that a unit should visit every day. We would like to find out whether there are geofences which were ignored within the work week from June 1 to June 5. To do this, we enable grouping by days (with detalization), select necessary geofences and columns for the table.

Column	Description
Geofence	The name of the geofence.
Type	The type of geofence: line, polygon, or circle.
Area	The total area of the geofence (if the metric system is used, the area is indicated in hectares).
Perimeter	The perimeter of the geofence.
Count	The number of geofences that were skipped.
Description	The information from the same-name field of the geofence's properties.
Notes	An empty column for your custom comments.

From this report, we see that on June 1 **Point 11** and **Point 7** were ignored, on June 4 — **Point 2**, and on June 5 — five geofences. June 2 and 3 are absent, which means that all the predefined geofences were visited on those days. You can click on the names of the geofences to move the map to their first point.

1 2	№	Date	Geofence	Type	Perimeter	Count
⊟	1	2012-06-01	-----	-----	-----	2
┆	1.1	-----	Point 11	Circle	2.09 km	1
┆	1.2	-----	Point 7	Polygon	1.47 km	1
⊟	2	2012-06-04	-----	-----	-----	1
┆	2.1	-----	Point 2	Circle	2.09 km	1
⊟	3	2012-06-05	-----	-----	-----	5
┆	3.1	-----	Point A	Line	152.82 m	1
┆	3.2	-----	Point 2	Circle	2.09 km	1
┆	3.3	-----	Point B	Line	813.81 m	1
┆	3.4	-----	Point 11	Circle	2.09 km	1
┆	3.5	-----	Point 7	Polygon	1.47 km	1

When the table is applied to a unit group, you can find one more parameter in the report template — **Consider group as a whole**. When the box is checked, a group report is structured in the same way as an individual report, and the information is given for each separate unit from the group. When the **Consider group as a whole** checkbox is marked, the report structure is different — you get the list of geofences that were not visited by any units from the group.

Parkings

Parkings are estimated according to the parameters set in the Trip Detection when configuring a unit. To get the information as accurate as possible, it is advised that you configure each parameter individually for every piece of equipment.

A parking is an interval of time when the following conditions are met.

- Insignificant speed. The speed detected must fall in the range from 0 to the **Minimum moving speed**. When this speed is reached, the behavior of the unit is regarded as a movement (=trip), if by the time and distance traveled it corresponds to the trip definition (the **Minimum trip time** and **Minimum trip distance** parameters). The parking, respectively, ends. However, if the time or distance traveled does not fit the scope of the trip, the parking is prolonged.
- Sufficient time interval. This speed must continue for a period of time (and not less than **Minimum parking time**). If this time is not reached, the behavior of the unit is not regarded as parking, but as a stop.
- Insignificant location change. As it has been noted above, parking is also considered an insignificant movement in space, that is, a movement that does not exceed the **Minimum trip distance** parameter, if it is equal to or greater than the **Minimum parking time** parameter.

The following information is presented in this kind of report.

Column	Description
Beginning	The time when the parking started.
End	The time when the parking ended.
Duration	The time interval of a parking.
Total time	The time from the beginning of the first parking to the end of the last parking.
Off-time	The time interval from the end of the previous parking to the beginning of the current parking (defined starting from the second parking).
Location	The address where the unit was stationary. If there was an insignificant movement detected, the initial address is used.
Coordinates	The coordinates of the unit during the parking (in decimal degrees).
Driver	The name of the driver (if available).
Trailer	The name of the trailer (if one was bound).
Counter	The values of the counter sensor.
Initial counter	The counter value at the beginning of the parking.
Finale counter	The counter value at the end of the parking.

Column	Description
Avg temperature	The average temperature value registered for the parking interval.
Min temperature	The minimum temperature value registered for the parking interval.
Max temperature	The maximum temperature value registered for the parking interval.
Initial temperature	The temperature value at the beginning of the parking interval.
Final temperature	The temperature value at the end of the parking interval.
Avg weight	The average weight value registered for the parking interval.
Min weight	The minimum weight value registered for the parking interval.
Max weight	The maximum weight value registered for the parking interval.
Initial weight	The weight value at the beginning of the parking interval.
Final weight	The weight value at the end of the parking interval.
Status	The status of the unit registered during the current parking interval (if there are several, the first one is displayed).

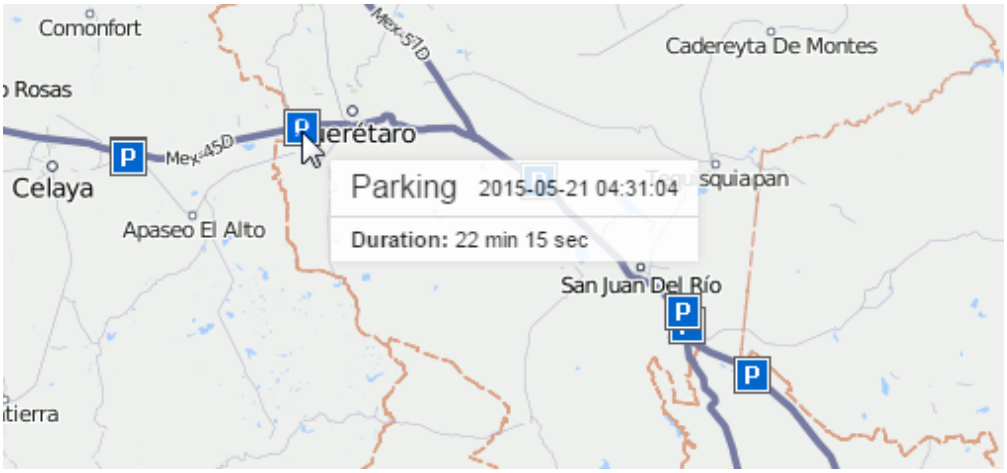
Column	Description
Count	The number of parkings (useful when grouping rows by years/months/weeks/days/shifts or for the reports on unit groups).
Notes	An empty column for your custom comments.

№	Beginning	End	Duration	Total time	Location
1	2015-05-01 00:06:56	2015-05-01 01:25:48	1:18:52	1:18:52	Mex-45D, Apaseo El Grande
2	2015-05-01 02:45:42	2015-05-01 04:18:04	1:32:22	1:32:22	Mex-45, Azteca
3	2015-05-01 05:55:09	2015-05-01 06:06:16	0:11:07	0:11:07	Mex-45D, Encarnación De Díaz
4	2015-05-01 06:22:27	2015-05-01 06:29:32	0:07:05	0:07:05	Mex-45D, Encarnación De Díaz
5	2015-05-01 07:50:26	2015-05-01 07:58:31	0:08:05	0:08:05	Boulevard A Zacatecas, Jesús María
6	2015-05-01 08:02:34	2015-05-01 13:37:56	5:35:22	5:35:22	Circuito Aguascalientes Norte, Jesús María
7	2015-05-01 15:16:01	2015-05-01 22:27:38	7:11:37	7:11:37	Libramiento, Res Tepeyac
8	2015-05-01 22:40:47	2015-05-01 23:39:36	0:58:49	0:58:49	Calle Productividad, Lagos De Moreno
9	2015-05-01 23:52:45	2015-05-02 01:28:18	1:35:33	1:35:33	Calle Productividad, Lagos De Moreno
10	2015-05-02 01:50:33	2015-05-02 07:22:04	5:31:31	5:31:31	Libramiento, Res Tepeyac

See Data in reports to learn how time (duration) can be formatted.

The intervals filtration (by parking duration, sensor state, driver, trailer, fuel fillings/thefts, and geofences/units) can be applied to this table.

The parkings can be displayed on the map. To make use of this feature, select Parking markers in the report template.



Parkings should be distinguished from stops.

Profile

This kind of report shows the profile information indicated on the corresponding tab of the unit properties dialog.

The following columns can be included in the table.

Column	Description
Name	The name of an element.
Value	The indicated value.
Notes	An empty column for your custom comments.

Name	Value
Axles	2
Brand	VW
Cargo type	any
Carrying capacity, t	1.5
Color	red
Depth, mm	1500
Effective capacity	500
Gross vehicle weight	2.5
Height, mm	1500
Model	Multivan
Registration plate	0123oo7
Vehicle type	van
VIN	19YUA31581L000000
Width, mm	1500
Year	2010

Rides

Wialon can track rides between geofences if one of them (or several) is set as the starting point, and the other (or several) as the final one. The rides are displayed in a report under the following conditions:

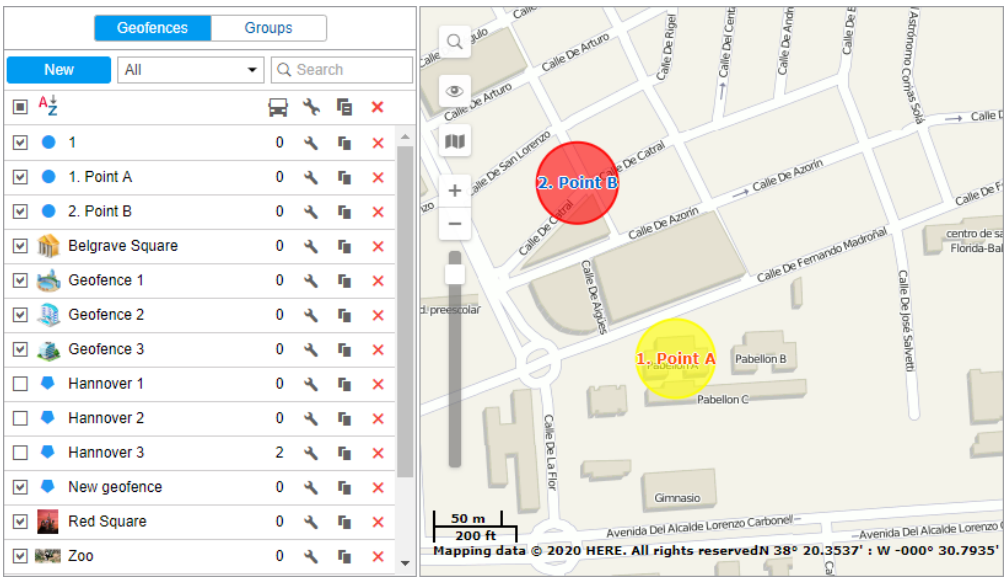
- the unit has left the starting point and has entered the final one;
- according to the detector, there have been trips between the starting and final points.

This report is useful, for instance, to control the transportation of cargo from one place to another in several trips.

Preparing geofences

To get a report on rides between geofences, you must first create geofences that determine the beginning and end of the ride. The beginning and the end can be the same geofence if the ride starts and ends in one place, for example, if you need to transport cargo from point A to point B

and this will take more than one trip. Create two geofences and then specify them as the starting and ending points in the report template.



Ride parameters

When you create a report template for rides, you can set additional parameters for it.

Allow circle ride

Activate this option if the beginning and end of the ride should be in the same point. In this case, a certain geofence or unit should have both checkboxes selected (the beginning and end of the ride).

Show the rides finished with a stop

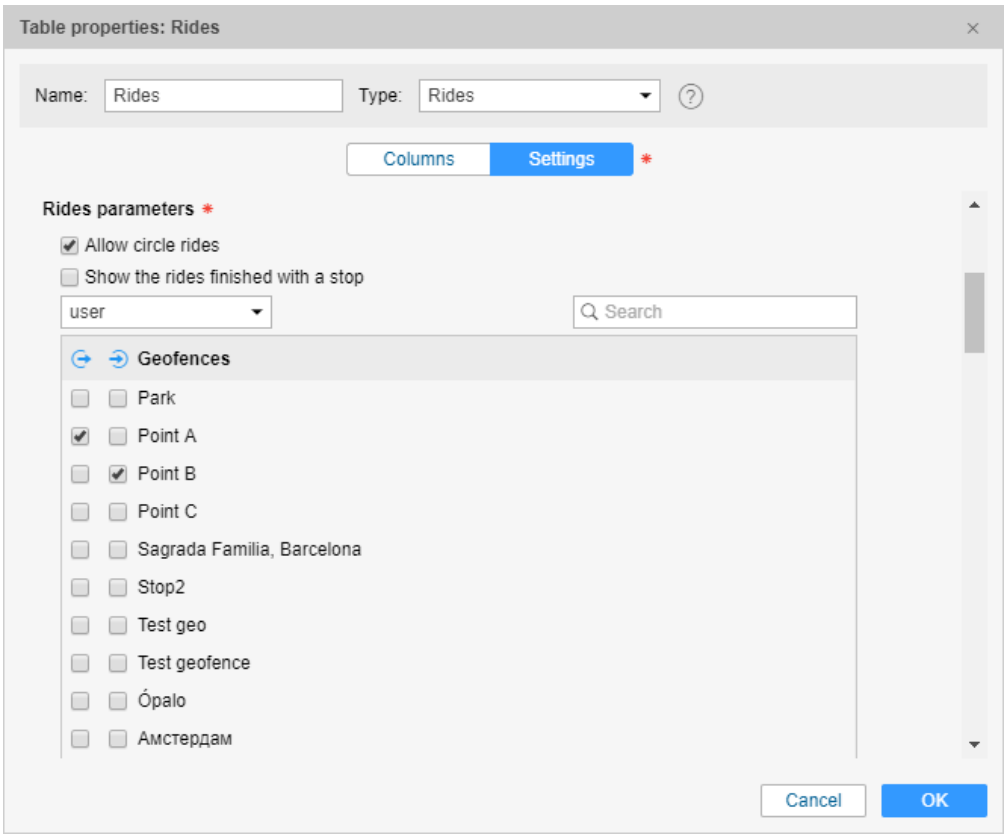
This can be used as an additional filter. If this option is selected, only visiting the geofences with a stop at the final point are considered the end of the ride. Note that a stop is considered to be a unit state in which its speed is less than the minimum moving speed indicated in the trip detector. A ride begins when a unit leaves the starting point. If a unit enters the final destination (after the beginning of the ride has been detected), but does not make a stop there, the ride continues.

Starting and terminal points

In this section, you choose which geofences and units will be analyzed in the report. You can not only use the geofences from the resource in which the report template is created but also the geofences from other resources to which the user has the access right **View geofences**. The resource is chosen in the dropdown list above the geofences' names. It is also possible to choose the **All** option — then the list will contain the geofences from all the resources to which the user has the necessary access right. The geofences in the list are sorted by name. To quickly find one, use the dynamic filter.

In addition, you can use units as 'moving geofences'. For them, you can additionally set the radius of the unit zone. Both geofences and units are arranged in alphabetical order. To quickly find the required item, use the filter. What is more, the beginning of the trip may be in the unit zone, and the end — in the ordinary geofence. For instance, three cars work in the field and harvest, and one takes the crop to the warehouse.

If a unit simultaneously gets into several geofences (unit zones) specified as starting or terminal points of the trip, the geofence (unit zone) with the smallest area is included in the report.



If the **Counter** column is selected for the table, you can indicate its mask in the **Sensors masks** field on the **Settings** tab. Besides, intervals filtration can be applied to this table: by duration, mileage, engine hours, speed range, trips, stops, parkings, sensor state, driver, trailer, fuel thefts, fillings, and geofences/units.

Note that the monitoring system provides a possibility of detecting geofence visit in case a trip intersects a geofence by any segment of its track. This option can be enabled in the advanced settings of a report template.

Report on rides

The report on rides gives the list of all performed rides. The table can contain the following information.

Column	Description
Ride	This column specifies the start and end point of movement (names of geofences or units are hyphenated).
Ride from	The departure geofence.
Ride to	The destination geofence.
Beginning	The date and time when the ride began.
End	The date and time when the ride ended.
Mileage	The distance traveled during the ride.
Mileage (adjusted)	Mileage subject to the coefficient set in unit properties (**Advanced** tab).
Ride duration	The amount of time spent to perform the ride.
Total time	The time from the beginning of the first ride to the end of the last one.
Parkings duration	The total amount of time spent on parkings during the trip.
Avg speed	The average speed calculated for the ride.
Max speed	The maximum speed registered during the ride.

Column	Description
Driver	Driver's name (if identified).
Trailer	Trailer's name (if bound).
Counter	The counter sensor value (can be helpful either in grouping table data by years/months/weeks/days/shifts or for the reports on unit groups).
Initial counter	The counter value at the beginning of the trip.
Finale counter	The counter value at the end.
Avg temperature	The average temperature value registered during a ride.
Min temperature	The minimum temperature value registered during a ride.
Max temperature	The maximum temperature value registered during a ride.
Initial temperature	The temperature value at the beginning of a ride.
Final temperature	The temperature value at the end of a ride.
Count	The number of rides.
Status	The unit status registered during the current ride (if there are several, the first one is displayed).

Column	Description
Cargo weight	The average value of cargo weight during the ride.
Consumed	The volume of consumed fuel detected by any sort of fuel sensor. If several such sensors are available, their values sum up.
Consumed by ImpFCS/AbsFCS/ InsFCS/FLS/math	The volume of consumed fuel detected by a fuel sensor (such as impulse/absolute/instant fuel consumption sensor, fuel level sensor) or calculated by math.
Avg consumption	The average fuel consumption by any sort of fuel sensor. If several such sensors are available, their values sum up.
Avg consumption by ImpFCS/AbsFCS/ InsFCS/FLS/math	The average fuel consumption during the ride detected by one of the methods mentioned above.
Initial fuel level	The fuel level at the beginning of the ride.
Final fuel level	The fuel level at the end of the ride.
Max fuel level	The maximum fuel level.
Min fuel level	The minimum fuel level.
Penalties	The penalties calculated for adjusted Eco driving criteria.
Rank	The received penalty points converted into a grade using a 6-point scoring system.

Column	Description
Notes	An empty column for your custom comments.

Ride	Beginning	End	Ride duration	Mileage	Driver	Trailer	Consumed
Settlement - Furnaces ITK	2012-08-16 18:27:20	2012-08-17 08:11:32	13:44:12	9.68 km	Eric Claptonon	trailer 3t	0.97 lt
Grot - Furnaces ITK	2012-08-18 14:04:26	2012-08-18 14:05:26	0:01:00	1.75 km	Eric Claptonon	trailer 3t	0.18 lt
Garage - Furnaces ITK	2012-08-18 20:56:36	2012-08-18 21:01:24	0:04:48	8.15 km	Mister X	trailer 3t	0.82 lt
Grot - Furnaces ITK	2012-08-18 21:07:06	2012-08-19 11:39:08	14:32:02	15.00 km	Mister X	trailer 3t	1.50 lt
Settlement - Furnaces ITK	2012-08-26 16:24:04	2012-08-27 18:04:50	1 days 1:40:46	10.21 km	Eric Claptonon	trailer 3t	1.02 lt

More information on unfinished rides can be found here.

Rounds (for unit)

If any routes were assigned to a unit and events about routes were stored in the unit history, a report based on these events can be generated.

Column	Description
Route	The name of the route given during its creation.
Schedule	The name of the schedule on the basis of which the route was created.
Round	The name of the round.
Beginning	The start time of the round (activation time or entrance in the first check point).
Initial location	The unit location at the beginning of the route.
End	The end time of the round (entrance to the last point).
Final location	The location of the last check point of the route visited by the unit.
Result	**Finished** (the route was activated successfully, and later on the entrance to the last point was detected), **Not finished** (the last point was not visited) or **Aborted** (the

Column	Description
	round has been removed from the table manually or its expiration time has been reached).
Skipped points	The number of skipped check points (a detailed report can be generated — Check points).
Duration	The time taken to perform the route.
Total time	The time from the beginning of the first route to the end of the last route.
Mileage	The distance traveled while performing the route.
Avg speed	The average speed on the route.
Max speed	The maximum speed on the route.
Count	The number of routes.
Driver	The name of the driver (if available).
Trailer	The name of the trailer (if bound).
Notes	An empty column for your custom comments.

Route	Beginning	Initial location	End	Mileage
Santa Cruz Tour Bus Route	01.04.2016 00:00:44	Oxford Way 320, Santa Cruz, CA 95060, USA	01.04.2016 00:05:34	3.98 km
Santa Cruz Tour	01.04.2016 00:00:49	David Way, Santa Cruz, CA 95060, USA	01.04.2016 00:08:24	7.21 km
Santa Cruz Tour	01.04.2016 00:08:29	Pacific Avenue 802, Santa Cruz, CA 95060, USA	01.04.2016 00:20:44	11.67 km
Santa Cruz Tour Bus Route	01.04.2016 00:09:09	Laurel St Ext, Santa Cruz, CA 95060, USA	01.04.2016 00:17:54	7.87 km
Santa Cruz Tour	01.04.2016 00:20:49	Pacific Avenue 802, Santa Cruz, CA 95060, USA	01.04.2016 00:33:04	11.67 km
Santa Cruz Tour Bus Route	01.04.2016 00:21:29	Laurel St Ext, Santa Cruz, CA 95060, USA	01.04.2016 00:30:14	7.87 km
Santa Cruz Tour	01.04.2016 00:33:09	Pacific Avenue 802, Santa Cruz, CA 95060, USA	01.04.2016 00:45:24	11.67 km
Santa Cruz Tour Bus Route	01.04.2016 00:33:49	Laurel St Ext, Santa Cruz, CA 95060, USA	01.04.2016 00:42:34	7.87 km
Santa Cruz Tour	01.04.2016 00:45:29	Pacific Avenue 802, Santa Cruz, CA 95060, USA	01.04.2016 00:57:44	11.67 km
Santa Cruz Tour Bus Route	01.04.2016 00:46:09	Laurel St Ext, Santa Cruz, CA 95060, USA	01.04.2016 00:54:54	7.87 km
Santa Cruz Tour	01.04.2016 00:57:49	Pacific Avenue 802, Santa Cruz, CA 95060, USA	01.04.2016 01:10:04	11.67 km

More information on how different route statuses are defined (route beginning, route end, point skipped, point visit, etc.) can be found here.

In a report template, you can indicate **name masks** for schedules and routes. In this case, only those rounds that correspond to the specified route or schedule name mask will be included in the report. You can use both filters separately or simultaneously.

In addition, you can apply intervals filtration by duration, mileage, engine hours, speed range, trips, stops, parkings, sensors, driver, trailer, fuel thefts and fillings.

Rounds (for route)
If the route was completed by some units, then on the basis of this data it is possible to build a corresponding report. It can include the following columns.

Column	Description
Beginning	The start time of the round (activation time or entrance in the first checkpoint).
Last activity	The time of receiving of the latest data concerning this round.
Round	The name of the round.
Schedule	The name of the schedule.
Order	The order of checkpoints.
Unit	The name of the unit that performed the round. If several units are assigned to the round during its creation, dashes are displayed in the report.
Status	**Finished** (the route was successfully activated, and the entrance to the last point was subsequently recorded), **Not finished** (the last point was not visited) or **Aborted** (the round has been removed from the table manually or its expiration time has been reached).

Column	Description
Points	The total number of checkpoints in the route (a detailed report can be generated — Check points).
Skipped	The number of checkpoints skipped.
Visited	The number of checkpoints visited.

Beginning	Round	Schedule	Unit	Status	Points	Skipped	Visited
2012-09-18 11:35:00	11:35 POA	11-50	SMS Sim012	Finished	4	1	3
2012-09-18 12:12:00	1234p 12-13	12-13	SMS Sim012	Finished	4	0	4
2012-09-18 12:39:00	1234p 12:43 - 12:59 12:39:00	12:43 - 12:59	SMS Sim012	Finished	4	0	4
2012-09-18 15:08:00	1234p 1KT - 4KT	new var 0	SMS Sim012	Finished	4	0	4
2012-09-18 15:17:00	5834-577	new all 0	SMS Sim012	Finished	4	0	4
2012-09-19 09:59:00	1234p 1KT - 4KT	10:00 - 10:10	SMS Sim012	Finished	4	0	4
2012-09-19 10:09:00	1234p 10:10 - 10:20	10:10 - 10:20	SMS Sim012	Finished	4	0	4
2012-09-19 11:49:00	POA-1408 11-50	11-50	SMS Sim012	Finished	4	2	2

The report type should be **Route**.

Sensor Tracing

This table shows sensor values at certain points in time. The table can be exported in MS Excel where you can build any custom charts based on the data provided.

The report can include **all messages** or take a value in a time interval (like take a value every 10 minutes). One or the other alternative is chosen when configuring report template. If tracing interval is indicated, the system will search and display sensor value from the message which is the closest to the necessary point in time.

Below are the available columns.

Column	Description
Speed	The speed of the unit from the message from which the value was taken.

Column	Description
Coordinates	The coordinates of the unit from the message.
Location	The location of the unit at the moment of sending the message with the sensor's value.
Sensor	The name of the sensor.
Time	The time of the message from which the value was taken.
Value	The value (numbers only).
Formatted value	The value based on the indicated units of measurement or the value of the text sensor.
Driver	The name of the driver (if available).
Trailer	The name of the trailer (if bound).
Notes	An empty column for custom notes.

Sensor	Time	Value	Formatted value
Internal battery	2015-03-26 01:00:18	4.31	4.31 V
Battery Torton	2015-03-26 01:00:18	13.36	13.36 V
SOS button	2015-03-26 01:00:18	0.00	Off
Incidents	2015-03-26 01:00:18	-----	-----
Motor	2015-03-26 01:00:18	1.00	On
Odometer GPS	2015-03-26 01:00:18	78684.16	78684.16 km
Signal GSM	2015-03-26 01:00:18	21.00	21.00

Activate the appropriate checkbox to get a separate column for each sensor. This option is available only in reports for single units, not for unit groups. If you choose this option, the columns **Values** or/and **Formatted value** will be generated for each sensor individually. This allows exporting sensor values to MS Excel and eventually building various charts and diagrams on this basis.

If you activate the options **Each sensor in separate column** and **Skip invalid values** simultaneously, only the lines that have at least one sensor's value is shown in the generated report. The lines without any sensor's value are not shown. The name of a column containing formatted values is marked by a special symbol (*). Formatted value fields may contain textual information (in brackets) indicated for value intervals.

Time	Internal battery	Battery Torton	Internal battery*	Battery Torton*
2015-03-26 01:00:18	4.31	13.36	4.31 V	13.36 V
2015-03-26 02:00:39	4.31	13.27	4.31 V	13.27 V
2015-03-26 03:08:06	4.31	13.27	4.31 V	13.27 V
2015-03-26 04:08:09	4.31	13.45	4.31 V	13.45 V
2015-03-26 05:08:41	4.30	13.45	4.30 V	13.45 V
2015-03-26 06:09:23	4.29	13.41	4.29 V	13.41 V
2015-03-26 07:10:06	4.29	13.41	4.29 V	13.41 V
2015-03-26 15:12:25	4.28	13.08	4.28 V	13.08 V
2015-03-26 19:36:32	4.30	13.36	4.30 V	13.36 V

In addition, you can choose a driver/trailer and geofences/units to be controlled (see intervals filtration for details).

Invalid values

If a received value is out of range (the bounds are indicated in sensor properties), then a dash (-----) is displayed in the lines with the values of the sensor. To exclude such rows, check the **Skip invalid values** option in the report template.

The cases when a sensor sends text values (as opposed to numeric) or no values at all are also considered **invalid**.

In order for the text parameters to be recognized as valid and displayed in the **Formatted value** column, activate the Text parameters option when creating a custom sensor.

SMS Messages (for a Unit)

In this report, you can view all SMS messages received from a unit in a specified period. The report can contain the following columns.

Column	Description
Time received	The date and time when the data was received by the server.
SMS text	The text of the message.

Column	Description
Count	The number of messages.
Notes	An empty column for your custom comments.

Time received	SMS text	Count
2015-05-30 00:00:05	PC,0002,29/05/15,21:00:02,5352.7099,N,02736.5601,E,10.0km,117.2,A,010000	1
2015-05-30 00:01:04	SIGNAL,0002,29/05/15,21:01:01,5352.8849,N,02736.7341,E,16.0km,32.8,A,010000	1
2015-05-30 00:02:05	PC,0002,29/05/15,21:02:02,5353.0823,N,02737.2334,E,55.0km,58.7,A,010000	1
2015-05-30 00:03:04	PC,0002,29/05/15,21:03:01,5352.6586,N,02737.6424,E,43.0km,152.9,A,010000	1
2015-05-30 00:04:04	PC,0002,29/05/15,21:04:01,5352.5111,N,02737.5737,E,58.0km,197.8,A,010000	1
2015-05-30 00:05:05	PC,0002,29/05/15,21:05:02,5352.3752,N,02738.2606,E,20.0km,111.1,A,010000	1
2015-05-30 00:06:05	PC,0002,29/05/15,21:06:02,5352.1704,N,02738.8358,E,10.0km,123.7,A,010000	1
2015-05-30 00:07:05	SIGNAL,0002,29/05/15,21:07:02,5352.8444,N,02739.3751,E,33.0km,27.7,A,010000	1
2015-05-30 00:08:05	PC,0002,29/05/15,21:08:02,5353.1712,N,02739.0478,E,41.0km,332.0,A,010000	1

SMS Messages (for a Resource)

This report provides a possibility to view information about all the SMS messages sent by users of any resource for the indicated period of time. The report may contain the following columns.

Column	Description
Time	The time of sending a message.
Account	The account from which the message was sent.
Phone	The phone number to which the message was sent.
Count	The number of messages sent.
Parts	The number of parts a message consists of.

Time	Account	Phone	Parts	Count
2019-02-28 02:35:11	[redacted]	[redacted]	2	1
2019-02-28 05:54:56	[redacted]	[redacted]	1	1
2019-02-28 05:55:07	[redacted]	[redacted]	2	1
2019-02-28 05:55:12	[redacted]	[redacted]	1	1
2019-02-28 07:25:31	[redacted]	[redacted]	1	1
2019-02-28 11:10:56	[redacted]	[redacted]	2	1
2019-02-28 11:16:11	[redacted]	[redacted]	2	1
2019-02-28 11:18:30	[redacted]	[redacted]	2	1
2019-02-28 11:42:11	[redacted]	[redacted]	1	1

Speeding

This kind of report shows speed limitation violations. The speed limit depends on the method for determining the speeding selected in the properties of the unit on the Advanced tab. The following information can be presented in this kind of report.

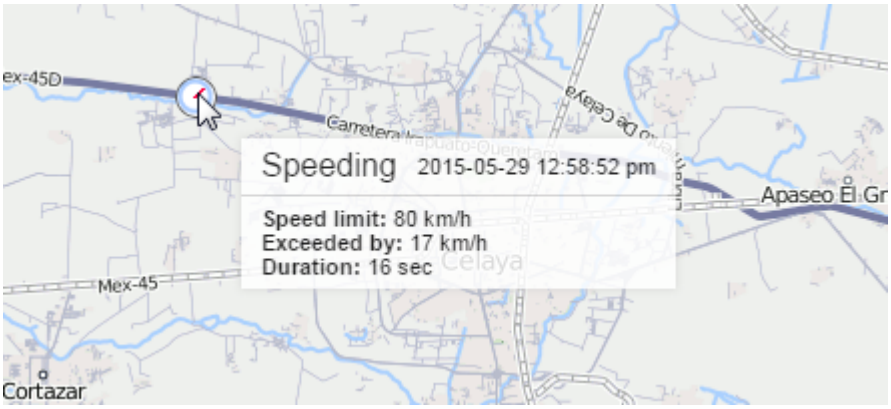
Column	Description
Beginning	The date and time when the speed limit was exceeded.
Location	The location of the device at the moment of speeding.
Duration	The time interval during which the unit was moving with an excessive speed. If the speeding was determined by one message, in the line **00:00** is written. In order the speeding to be determined also by one message, it is necessary to indicate **0** as the minimum speeding time in the advanced properties of the unit.
Total time	The time from the beginning of the first speeding to the end of the last speeding.
Max speed	The maximum speed within the period of speeding.
Speed limit	The maximum allowed speed on a particular road section or in the unit properties.

Column	Description
Mileage	The distance traveled with the exceeded speed.
Mileage (adjusted)	The mileage subject to the coefficient set in unit properties (the **Advanced** tab).
Initial mileage	The mileage sensor value at the moment of the beginning of speeding. If no saving of mileage parameter was made through the reported period, the mileage is counted from 0.
Final mileage	The mileage sensor value at the end of the speeding interval.
Avg speed	The average speed within the interval.
Driver	The name of the driver (if identified).
Trailer	The name of the trailer (if bound).
Count	The number of speed violations.
Notes	An empty column for your custom comments.

Beginning	Duration	Max speed	Speed limit	Mileage	Driver
2015-05-01 00:02:44	0:00:09	95 km/h	80 km/h	0.21 km	Jon
2015-05-01 02:28:31	0:01:16	104 km/h	80 km/h	2.15 km	Jon
2015-05-01 04:23:18	0:00:59	96 km/h	60 km/h	1.55 km	-----
2015-05-01 04:34:14	0:00:17	103 km/h	90 km/h	0.52 km	-----
2015-05-01 06:40:59	0:00:58	97 km/h	90 km/h	1.50 km	Ben
2015-05-01 07:04:55	0:00:07	97 km/h	90 km/h	0.22 km	-----
2015-05-01 07:05:47	0:04:12	96 km/h	60 km/h	6.37 km	Ben
2015-05-01 14:23:47	0:03:42	105 km/h	90 km/h	6.20 km	Josh

Intervals filtration (by speeding duration, mileage, driver, geofences/units) can be applied to this table.

You can use special markers for this report:



Other means to control speed are described in Notifications.

Stops

A stop is one or more consecutive messages with a zero speed. Stops can be registered at lights, intersections, in traffic jams, etc.

Stops should be distinguished from parkings. Parameters to detect trips, parkings, and stops are adjusted in the trip detector. If there are several messages in succession, they are united in one stop. If total time of such a stop reaches **Minimum parking time**, it is registered as a parking (not a stop).

The following information is presented in this kind of report.

Column	Description
Beginning	The time when the stop started.
End	The time when the stop ended.
Duration	The total time of the stop.
Total time	The time from the beginning of the first stop to the end of the last stop.
Off-time	The time from the end of the previous stop to the beginning of the current one (to be defined beginning from the second stop).

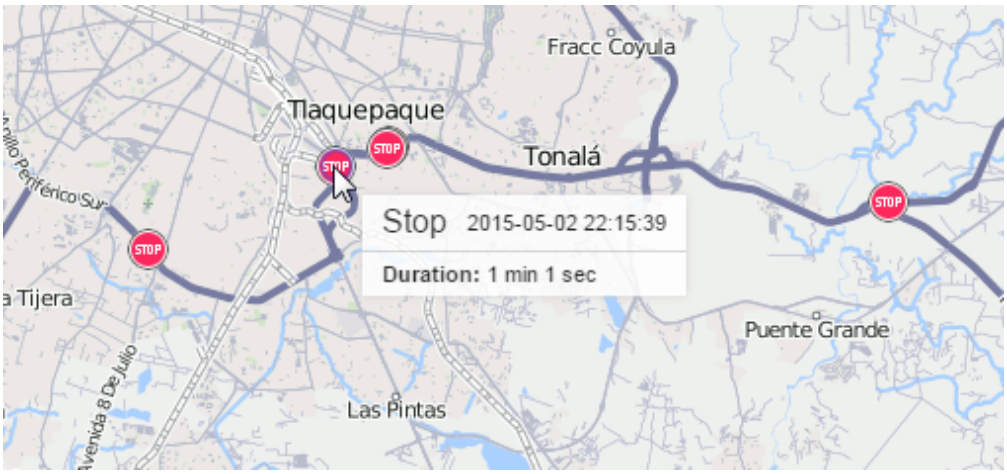
Column	Description
Location	The address where the unit stopped.
Coordinates	The coordinates of the unit at the moment of a stop (in decimal degrees).
Driver	The name of the driver (if available).
Trailer	The name of the trailer (if bound).
Count	The number of stops.
Counter	The counter sensor values (can be helpful either in grouping table data by years/months/weeks/days/shifts or for the reports on unit groups).
Notes	An empty column for your custom comments.
Avg weight	The average weight value registered for the stop interval.
Min weight	The minimum weight value registered for the stop interval.
Max weight	The maximum weight value registered for the stop interval.
Initial weight	The weight value at the beginning of the stop interval.
Final weight	The weight value at the end of the stop interval.

№	Beginning	End	Duration	Location	Driver	Trailer
1	2012-06-25 13:11:26	2012-06-25 13:14:02	0:02:36	Grajewo, Mikołaja Kopernika	Spider Man	Milk can
2	2012-06-25 13:16:10	2012-06-25 13:17:02	0:00:52	Grajewo, Mikołaja Kopernika	Spider Man	Milk can
3	2012-06-25 14:01:26	2012-06-25 14:01:30	0:00:04	Zjazd, Łomża	Spider Man	Milk can
4	2012-06-25 14:03:28	2012-06-25 14:03:38	0:00:10	Łomża, Wojska Polskiego	Spider Man	Milk can
5	2012-06-25 14:04:14	2012-06-25 14:04:16	0:00:02	Łomża, Wojska Polskiego	Spider Man	Milk can
6	2012-06-25 14:06:38	2012-06-25 14:06:40	0:00:02	Łomża, Legionów	Spider Man	Milk can
7	2012-06-25 14:07:36	2012-06-25 14:07:38	0:00:02	Łomża, Legionów	Spider Man	Milk can
8	2012-06-25 14:11:14	2012-06-25 14:12:20	0:01:06	Łomża, Legionów	Spider Man	Milk can
9	2012-06-25 14:40:24	2012-06-25 14:41:54	0:01:30	Stare Lubiejewo, Ogrodowa	Spider Man	Milk can
10	2012-06-25 15:52:14	2012-06-25 15:55:06	0:02:52	Wyszków, Białostocka	Spider Man	Milk can
11	2012-06-25 15:58:06	2012-06-25 15:58:38	0:00:32	Wyszków, Tadeusza Kościuszki	Spider Man	Milk can
12	2012-06-25 17:07:30	2012-06-25 17:07:34	0:00:04	62, 0.85 km from Wyszogród	Spider Man	Milk can

See Data in reports to learn how time (duration) can be formatted.

Intervals filtration (by stop duration, sensor state, driver, trailer, fuel fillings and thefts) can be applied to this table.

This kind of report can be supplemented with the corresponding markers on the map.



Summary

The **Summary** tabular report allows you to display a variety of generalizing data related to the reporting interval and, at the same time, not tied to any conditions (such as trips, sensor operation, geofence visits, etc.). In other words, the summary report processes all the messages for the indicated period, regardless of how long the unit worked and was in motion.

The following columns can be included.

Column	Description
Mileage in trips	The mileage at the interval taking the trip detector into account.

Column	Description
Mileage in all messages	The mileage for the reporting interval by the mileage counter.
Mileage (adjusted)	The mileage at the interval by the mileage counter multiplied by the mileage coefficient.
Avg speed	The average speed at the interval.
Max speed	The maximum speed at the interval.
Move time	The duration of trips.
Engine hours	The time of engine hours operation.
Engine efficiency duration	The duration of operation of the attached implements (if there is an engine efficiency sensor).
Parkings	The total time of parkings at the interval.
Counter	The counter sensor value.
Initial counter	The counter value at the beginning of the interval.
Final counter	The counter value at the end of the interval.
Avg value of custom sensor	The average value of custom sensor at the interval.
Min value of custom sensor	The minimum value of custom sensor at the interval.
Max value of custom sensor	The maximum value of custom sensor at the interval.

Column	Description
Initial value of custom sensor	The custom sensor value at the beginning of the interval.
Final value of custom sensor	The value of the custom sensor at the end of the interval.
Difference	The difference between the final and initial values of the custom sensor.
Utilization	The percentage ratio of the duration of engine hours to the engine hours rate (engine hours divided by daily engine hours rate indicated in the unit properties on the Advanced tab).
Useful utilization	The percentage ratio of the duration of engine efficiency to the engine hours rate.
Productivity	The percentage ratio of the duration of engine efficiency to the engine hours duration.
Consumed	The volume of consumed fuel detected by any sort of fuel sensor. If several such sensors are available, their values sum up.
Consumed by...	The volume of consumed fuel detected by a fuel sensor (such as impulse/absolute/instant fuel consumption sensor, fuel level sensor) or calculated by math or rates. Besides, in the report template (in the settings) you can specify additional parameters to calculate fuel: for the whole interval, in trips or in engine hours.

Column	Description
Avg consumption	The average fuel consumption by all available fuel sensors.
Avg consumption by...	The average fuel consumption by any fuel sensor or calculated by math or rates.
Avg mileage per unit of fuel by...	The average mileage per unit of fuel based on the indications of a particular sensor.
Initial fuel level	The counter value at the beginning of the interval.
Final fuel level	The counter value at the end of the interval.
Total fillings	The number of the detected fuel fillings.
Total thefts	The number of the detected fuel thefts.
Filled	The volume of filled fuel (only fuel fillings detected by a sensor).
Stolen	The volume of stolen fuel.
Penalties	The penalties calculated for the adjusted Eco driving criteria.
Rank	The received penalty points converted into a grade using a 6-point scoring system.

Mileage in trips	Mileage in all messages	Avg speed	Max speed	Move time	Parkings
59051 km	59232 km	80 km/h	103 km/h	30 days 11:26:57	12:32:51

> If there are several custom sensors, separate columns with average, minimum, maximum, initial and final values and difference are displayed for each of them. The name of each custom sensor and units of measurement (if they were specified when creating the sensor) are indicated next to the name of each of these columns within the parentheses. If required, you can indicate the name masks of custom sensors in the Intervals filtration section of the **Settings** tab.

Fuel can be calculated for the whole interval, in trips or in engine hours, which is selected in the additional parameters of the table. This option affects such columns as **Consumed...** and **Avg consumption...**.

As additional settings, you can specify masks for sensors (fuel, counters), including the engine hours sensor.

The Retrieve Intervals option is available for this table if grouping by shifts is configured for it or if a value in the field **Summary by:** is selected.

The **Summary** table is presented by one row — the summarized data for a selected period of time. However, the report template parameters for this table contain an individual option — **Summary by**. This option allows selecting a time interval (shifts/days/weeks/months) according to which the table data is arranged. This option can be used either in the reports for units or in reports for units groups.

Often a value received from the analog sensor may differ from the corresponding value in the **Total** row. It is stipulated by the analog data leaping, and application of grouping by days/weeks/months towards the values received as a result of processing such data. In other words, the analog data values (with or without leaps) are divided into intervals and then summarized. That is why the value of the summarized intervals can be sufficiently different from the value not divided into intervals. And since the values in the **Total** row are not divided into intervals, you can receive the difference compared to the values from the analog sensors. For example, calculating fuel, a value in the **Consumed by FLS** column may differ from the corresponding value in the **Total** row.

Trips

The **Trips** report shows the intervals of movement with the indication of time, location, and other parameters such as speed, mileage, fuel, and many others. The intervals of movement (trips) are detected according to the parameters set on the Trip detection tab and adjusted for each unit individually.

The following columns can be included in this report.

Column	Description
Beginning	The date and time when the trip began.
Initial location	The address where the device was at the beginning of the trip.
Initial coordinates	The geographical coordinates of the location of the unit at the beginning of the trip (in decimal degrees).
End	The date and time when the trip ended.
Final location	The address where the unit was at the end of the trip.
Final coordinates	The geographical coordinates of the location of the unit at the end of the trip (in decimal degrees).
Driver	The name of the driver (if assigned).
Trailer	The name of the trailer (if assigned).
Passengers count	The number of passengers transported within a trip.
Duration	The time interval of the trip.
Total time	The time from the beginning of the first trip to the end of the last trip.
Off-time	The period of time passed from the end of the previous trip to the beginning of the current one (defined beginning from the second trip).

Column	Description
Following off-time	The period of time passed from the end of the current trip to the beginning of the next one.
Engine hours	The time of the operation of engine hours during the trip.
Mileage	The distance traveled by unit during the whole trip.
Mileage (adjusted)	The mileage taking a coefficient set in unit properties (the Advanced tab) into account.
Urban mileage	The distance traveled in the urban area.
Suburban mileage	The distance traveled in the suburban area (that is at high speed). The urban/suburban speed line is indicated in **Unit properties** on the Advanced tab (the **Urban speed limit** setting).
Initial mileage	The mileage sensor value at the beginning of the trip. If the mileage parameter was not saved throughout the reported period, the mileage is counted from 0.
Final mileage	The mileage sensor value at the end of the trip.
Toll roads mileage	The distance that the unit passed during the trip on the roads on which the Platon system is used.
Toll roads cost	A sum of money (in RUB) for the toll roads mileage calculated on the basis of the covered distance and the Platon tariff.

Column	Description
Avg speed	The average speed within the trip.
Max speed	The maximum speed registered within the interval.
Trips count	The number of trips at the interval (can be useful if you have enabled grouping by years/months/weeks/days/shifts or if you run the report for a unit group).
Counter	The counter sensor value.
Initial counter	The counter value at the beginning of the trip.
Final counter	The counter value at the end of the trip.
Avg engine revs	The average rate of engine revolutions.
Max engine revs	The maximum rate of engine revolutions.
Avg temperature	The average temperature value registered in a trip.
Min temperature	The minimum temperature value registered in a trip.
Max temperature	The maximum temperature value registered in a trip.
Initial temperature	The temperature value at the beginning of a trip.
Final temperature	The temperature value at the end of a trip.
Status	The unit status registered during the current trip (if there are several, the first one is displayed).

Column	Description
Cargo weight	The average value of cargo weight during the trip.
Messages count	The number of messages that formed the trip.
Consumed	The volume of consumed fuel detected by any sort of fuel sensor. If several such sensors are available, their values sum up.
Consumed by...	The volume of consumed fuel detected by a fuel sensor or calculated by math or rates.
Rates deviation by...	The difference between consumed fuel detected by a sensor and consumption rates. If a number in this cell is negative, it means the detected consumption does not exceed the indicated rates.
Avg consumption	The average fuel consumption by any sort of fuel sensor. If several such sensors are available, their values sum up.
Avg consumption by ImpFCS/AbsFCS/InsFCS/FLS/math/rates	The average fuel consumption during the trip detected by one of the methods mentioned above.
Avg consumption in idle run by...	The average fuel consumption during the idle run.
Avg mileage per unit of fuel by...	The average fuel consumption (per one liter/gallon) detected by one of the methods mentioned above.
Initial fuel level	The fuel level at the beginning of the trip.
Final fuel level	The fuel level at the end of the trip.

Column	Description
Max fuel level	The maximum fuel level during the trip.
Min fuel level	The minimum fuel level during the trip.
Penalties	The penalties calculated for the adjusted Eco driving criteria.
Rank	The received penalty points converted into a grade using a 6-point scoring system.
Avg value of custom sensor	The average value of custom sensor during the trip.
Min value of custom sensor	The minimum value of custom sensor during the trip.
Max value of custom sensor	The maximum value of custom sensor during the trip.
Initial value of custom sensor	The custom sensor value at the beginning of a trip.
Final value of custom sensor	The custom sensor value at the end of a trip.
Notes	An empty column for your custom comments.

⚠ Availability of the **Toll roads mileage** and **Toll roads cost** columns is stipulated by a special service. Contact your service provider if you would like to use this functionality.

Beginning	Initial location	End	Final location	Duration	Mileage	Consumed
2012-07-16 11:38:14	Velden am Wörther See, Seecorso	2012-07-16 11:59:06	Velden am Wörther See, Am Corso	0:20:52	2.20 mi	0.09 gal
2012-07-16 12:29:06	Velden am Wörther See, Klagenfurter	2012-07-16 12:41:14	Tibitsch, Süd-Autobahn	0:12:08	3.99 mi	0.17 gal
2012-07-16 12:51:16	Tibitsch, Süd-Autobahn	2012-07-16 16:11:00	Brünner-Bundesstraße, Hobersdorf	3:19:44	223 mi	9.48 gal
2012-07-16 16:41:16	Brünner-Bundesstraße, Hobersdorf	2012-07-16 18:34:28	Přerov, Polní	1:53:12	101 mi	4.28 gal
2012-07-16 19:22:26	Přerov, Polní	2012-07-16 22:31:12	E75, Słostowice	3:08:46	196 mi	8.34 gal
2012-07-16 22:45:48	E75, Słostowice	2012-07-16 23:36:32	Łódź, Romualda Traugutta	0:50:44	47 mi	2.00 gal
2012-07-17 12:06:32	Łódź, Brzezińska	2012-07-17 14:24:48	Warszawa, Trakt Brzeski	2:18:16	89 mi	3.77 gal
2012-07-17 15:47:00	Stara Miłosna	2012-07-17 18:12:58	E30, Kozula	2:25:58	94 mi	3.98 gal

See Data in Reports to find more about formatting time, mileage, fuel, etc.

Also, the intervals filtration by duration, mileage, engine sensor, engine hours, speed range, stops, sensors, driver, trailer, and geofences/units can be applied to this table.

The tracks of the trips can be displayed on the map. To make use of this feature, in the report template, select the options connected with the rendering of tracks on the map.

Unfinished Rides

See the Rides topic to learn how to prepare rides for this report.

A ride is considered to be unfinished when the unit leaves the starting point, and then, not having visited any of the final points, again appears in the point marked as the beginning. It can be the same zone from where the unit left (if circle rides are not allowed) or some other geofence with a starting point mark.

The following columns are available for the report.

Column	Description
Ride	The departure and destination point.
Ride from	The departure point.
Ride to	The destination point.
Beginning	The date and time when the ride began.
End	The date and time when the ride ended.
Mileage	The distance traveled during the ride.
Mileage (adjusted)	The mileage subject to the coefficient set in the unit properties on the **Advanced** tab.
Ride duration	The amount of time it took to perform the ride.

Column	Description
Total time	The time from the beginning of the first ride to the end of the last ride.
Parkings duration	The time spent on parkings.
Avg speed	The average speed calculated for the ride.
Max speed	The maximum speed registered during the ride.
Driver	Driver's name (if identified).
Trailer	Trailer's name (if bound).
Counter	The counter sensor value.
Initial counter	The value of a counter at the moment of leaving a departure geofence.
Final counter	The value of the counter at the moment of entering a destination end.
Count	The number of rides (can be helpful either when grouping the table data by years/months/weeks/days/shifts or for the reports on unit groups).
Status	The unit status registered during the current ride (if there are several, the first one is displayed).
Consumed	The volume of consumed fuel detected by any sort of fuel sensor. If several such sensors are available, their values sum up.

Column	Description
Consumed by ImpFCS/AbsFCS/ InsFCS/FLS/math/rates	The volume of consumed fuel detected by a fuel sensor (such as impulse/absolute/instant fuel consumption sensor, fuel level sensor) or calculated by math or rates. More information on fuel in reports can be found here.
Avg consumption	The average fuel consumption by any sort of fuel sensor. If several such sensors are available, their values sum up.
Avg consumption by ImpFCS/ AbsFCS/InsFCS/FLS/math/rates	The average fuel consumption during the ride detected by one of the methods mentioned above.
Initial fuel level	The fuel level at the beginning of the ride.
Final fuel level	The fuel level at the end of the ride.
Max fuel level	The maximum fuel level.
Min fuel level	The minimum fuel level.
Penalties	The penalties calculated for the adjusted Eco driving criteria.
Rank	The received penalty points converted into a grade using a 6-point scoring system.
Notes	An empty column for your custom comments.

Ride	Beginning	End	Ride duration	Mileage	Parkings duration	Driver
Furnaces ITK - Furnaces ITK	2012-06-11 19:13:16	2012-06-12 09:43:56	14:30:40	13.60 km	13:58:18	Mister X
Furnaces ITK - Furnaces ITK	2012-06-12 18:28:42	2012-06-13 08:18:24	13:49:42	8.40 km	13:41:40	Mister X
Furnaces ITK - Furnaces ITK	2012-06-13 08:21:06	2012-06-13 10:05:10	1:44:04	4.80 km	1:35:36	Mister X
Furnaces ITK - Furnaces ITK	2012-06-14 08:19:54	2012-06-14 09:44:06	1:24:12	4.54 km	1:15:20	Mister X
Furnaces ITK - Furnaces ITK	2012-06-14 18:45:30	2012-06-14 18:46:02	0:00:32	0.09 km	0:00:00	Mister X
Furnaces ITK - Furnaces ITK	2012-06-14 18:46:02	2012-06-15 08:16:32	13:30:30	19.18 km	12:42:24	Mister X
Furnaces ITK - Furnaces ITK	2012-06-15 08:18:32	2012-06-15 16:55:08	8:36:36	9.55 km	8:31:14	Mister X
Furnaces ITK - Furnaces ITK	2012-06-15 17:01:02	2012-06-15 17:15:04	0:14:02	8.16 km	0:00:00	Mister X
Furnaces ITK - Furnaces ITK	2012-06-15 17:16:06	2012-06-15 17:16:22	0:00:16	0.32 km	0:00:00	Mister X
Furnaces ITK - Furnaces ITK	2012-06-15 17:48:14	2012-06-15 17:48:28	0:00:14	0.29 km	0:00:00	Mister X
Furnaces ITK - Furnaces ITK	2012-06-16 10:57:56	2012-06-16 10:58:08	0:00:12	0.27 km	0:00:00	Mister X
Furnaces ITK - Furnaces ITK	2012-06-16 11:04:26	2012-06-16 11:04:42	0:00:16	0.31 km	0:00:00	Mister X
Furnaces ITK - Furnaces ITK	2012-06-16 11:06:34	2012-06-16 14:24:02	3:17:28	7.57 km	2:38:16	Mister X

See the Rides section to find out more information about the additional parameters for **Unfinished rides**.

Upcoming Maintenance

The upcoming maintenance table contains the list of service works set for a unit and the status of their execution. A table may include the following columns.

Column	Description
Service interval	The name of the scheduled maintenance work indicated on the Service intervals tab of the unit properties dialog in the **Service name** field. The work should be repeated throughout a particular interval indicated in the **Service intervals** tab.
State	The overall state of the execution of the service work. In other words, it is the remaining or expired interval of mileage, engine hours, and days.
State by mileage	The remaining or expired mileage interval.
State by engine hours	The interval of the remaining or expired engine hours.
State by days	The interval of the remaining or expired days.
Description	The information taken from the corresponding field on the **Service intervals** tab.

Column	Description
Frequency	The interval (mileage, engine hours, or days) that shows how often vehicle maintenance should be performed.
Notes	An empty column for your custom comments.

Service interval	State	Description	Frequency
Oil change	10 days expired; 1 km left; 1 h left	Oil + pair of hands	1 km; 1 h; 1 days
Full diagnostics	59 days expired; 7 h left; 1 km left	Inspection, consumables	10000 km; 7000 h; 20 days
Hydraulics service	15 days expired; 5 h expired; 6 km left	Better call Saul	6000 km; 5000 h; 50 days
Electricity check	25 days expired; 5 h left; 70 km expired	Tesla service station	7000 km; 5000 h; 100 days

There is no need to indicate the time interval for the **Upcoming maintenance** report generation because this table provides you with information on all the indicated service works regardless of the time period.

Moreover, the individual parameters of grouping (without any connection to the time intervals) are used in the **Upcoming maintenance** table. The data can be grouped on the basis of the state (planned/expired maintenance), service interval, or unit (for reports on unit groups).

Utilization Cost

The table on utilization costs unites two kinds of expenses: maintenance and fillings. Both of these features have their own detailed tables (see Maintenance and Fuel fillings). This table is designed to show running costs.

Only fillings registered manually in a special Events registrar get here (fillings detected by a fuel sensor are not considered).

The table can be composed of the following columns.

Column	Description
Time	The date and time that were indicated during the registration.
Registration time	The date and time when the event was registered.

Column	Description
Expense item	Either maintenance or filling.
Description	The custom description specified at registration.
Location	The location specified at registration (together with comments entered manually).
Cost	The service or filling cost.
Count	The number of services and/or fillings.
Notes	An empty column for your custom comments.

№	Time	Expense item	Description	Location	Cost
1	2012-11-16 16:03:00	Maintenance	Oil change	Lindenstraße	33.00
2	2012-11-22 16:08:00	Filling	Fuel filling of 55 lt to the amount of 27.33 was made.	-----	27.33
3	2012-11-30 16:10:00	Filling	Fuel filling of 59 lt to the amount of 29.07 was made.	-----	29.07
4	2012-12-13 16:11:00	Filling	Fuel filling of 57 lt to the amount of 28.44 was made.	-----	28.44
5	2013-01-02 16:00:00	Maintenance	Total condition	Hasselweg, Müllingen	588.00
6	2013-02-01 16:12:00	Filling	Fuel filling of 70 lt to the amount of 33.09 was made.	-----	33.09
7	2013-02-04 16:09:50	Filling	Fuel filling of 69 lt to the amount of 30 was made.	-----	30.00

Blue rows mean that the location on the map was indicated during the registration.

Video

This report provides you with a list of video files received from a unit. The report contains the fixed number of columns.

Column	Description
Time	The time a video file was received.
Location	The location of a unit when sending a video file.
Video	An icon that opens a video.

Time	Location	Video
2015-07-22 15:44:38	Berliner Ring, Wandlitz 16348, Barnim, Germany	
2015-07-22 15:46:04	E26, Wittstock/Dosse 16909, Ostprignitz-Ruppin, Germany	
2015-07-22 15:54:00	E26, Fehrbellin 16833, Ostprignitz-Ruppin, Germany	
2015-07-22 15:54:26	Berliner Ring, Hohen Neuendorf 16556, Oberhavel, Germany	
2015-07-22 15:54:48	Berliner Ring, Neuenhagen bei Berlin 15366, Märkisch-Oderland, Germany	
2015-07-22 17:16:19	Soltauer Straße, Neu Wulmstorf 21629, Harburg, Germany	
2015-07-22 17:16:33	E22, Rosengarten 21224, Harburg, Germany	
2015-07-22 17:16:40	E22, Seevetal 21218, Harburg, Germany	
2015-07-22 17:16:51	E22, Seevetal 21220, Harburg, Germany	
2015-07-22 17:17:47	E26, Rastow 19077, Ludwigslust-Parchim, Germany	

Violations

Violations are a particular case of events. The report on violations gives the list of violations detected and registered in the unit history.

Violations can be recorded in two ways:

- with the help of notifications if **Register as violation** is selected as an action;
- with the help of manually registered custom events if they have the **Violation** box checked.

To make a report on a particular kind of violations, enter a mask in the report template to filter the text/description of violations (such as **speed**, **accident**, **temperature**, etc.). Only the messages whose text corresponds to the given mask are added to the table.

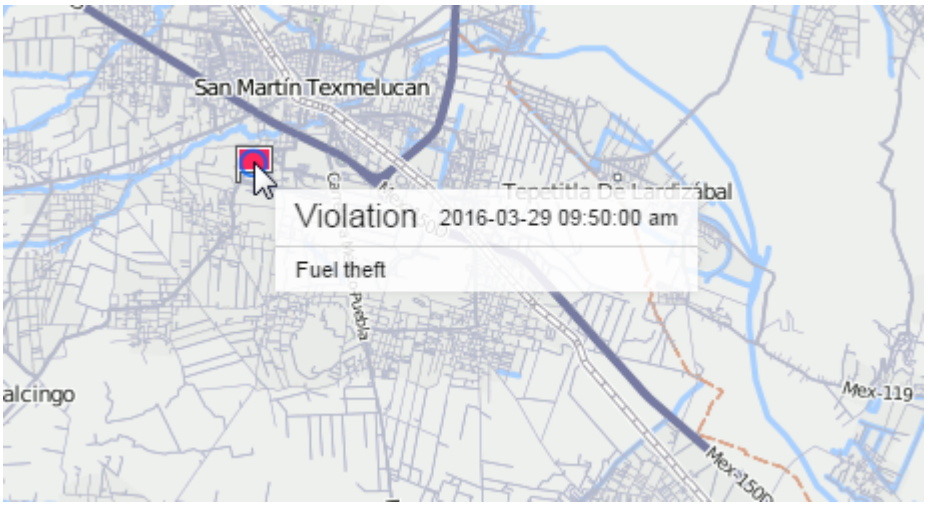
The following information can be presented in this kind of report.

Column	Description
Violation time	The time when the violation happened.
Time received	The time when the server received the data.
Violation text	The text of the notification or the description of the event.
Location	Unit location at the moment of violation.
Driver	The name of the driver (if identified).
Count	The number of violations.

Column	Description
Notes	An empty column for your custom comments.

Violation time	Time received	Violation text	Location
2015-08-21 06:16:05	2015-12-04 12:10:17	Connection o soordinates loss.	-----
2016-03-28 15:06:00	2016-03-28 15:07:10	Ful theft 40 l.	Amecameca
2016-03-29 09:44:00	2016-03-29 09:45:02	Unit violated speed limitations.	Avenida del Infante Don Luis 17-25, Boadilla del Monte 28660
2016-03-29 09:50:00	2016-03-29 09:50:41	Fuel theft 30 l.	Carretera El Moral, El Moral

In addition, you can use special markers for this report.



Visited Streets

This report shows what streets were visited and when. Highways, roads, and other places with available addresses are also considered as streets in this report.

The following columns can be presented in this kind of report.

Column	Description
Street	The name of the street, road, highway, etc.
Initial location	The place where the first message from this street was received. It can be the same as the previous cell or more detailed (for example, it can additionally contain a house number).
Beginning	The time when the unit started moving along the street.

Column	Description
End	The time when the unit left the street.
Duration	The total time the unit was on the street.
Mileage	The distance that was traveled by the unit while moving along the street.
Mileage (adjusted)	The mileage subject to the coefficient set in advanced unit properties. More information about mileage in the report can be found here.
Avg speed	The average speed while moving along the street.
Max speed	The maximum speed detected while moving along the street. More information about speed in reports can be found here.
Streets count	The number of performed visits (can be helpful if there is grouping by years/months/weeks/days/shifts).
Notes	An empty column for your custom comments.

Street	Beginning	End	Duration	Mileage	Max speed
Mex-45D	2015-05-01 00:00:52	2015-05-01 01:49:04	1:48:12	39 km	106 km/h
Carretera Irapuato-Queretaro	2015-05-01 01:49:04	2015-05-01 02:00:12	0:11:08	16.52 km	98 km/h
Mex-45D	2015-05-01 02:00:12	2015-05-01 02:40:39	0:40:27	42 km	105 km/h
Mex-45	2015-05-01 02:40:39	2015-05-01 04:45:22	2:04:43	43 km	103 km/h
Carretera León-Silao	2015-05-01 04:45:22	2015-05-01 04:57:30	0:12:08	16.62 km	99 km/h
Calle Torrejón De Ardoz	2015-05-01 04:57:30	2015-05-01 04:57:35	0:00:05	0.14 km	74 km/h
Boulevard Aeropuerto	2015-05-01 04:57:35	2015-05-01 04:57:48	0:00:13	0.30 km	73 km/h
Carretera León-Aguascalientes	2015-05-01 04:57:48	2015-05-01 05:19:45	0:21:57	31 km	116 km/h
Mex-45D	2015-05-01 05:19:45	2015-05-01 06:40:39	1:20:54	74 km	118 km/h
Mex-45	2015-05-01 06:40:39	2015-05-01 07:14:02	0:33:23	23 km	97 km/h
Boulevard José María Chávez	2015-05-01 07:14:02	2015-05-01 07:19:55	0:05:53	1.39 km	33 km/h

When clicking on a green cell in the table, the map is moved so that to display a point where the unit entered or left the indicated street, or reached the maximum speed.

Sometimes there can be gaps in cells. This means that only one message was received on this street, and therefore it is difficult to determine the length of time it was on the street, the mileage, and the average and maximum speed.

Intervals filtration by duration, mileage, engine hours, speed range, trips, stops, parkings, sensors, fuel fillings, and thefts can be applied to this table. For example, you can display only the streets where a particular sensor was turned on or the streets where the sensor was turned off. To specify the sensor, you can set a mask for it. This function is convenient, for example, for snow removal equipment — it allows you to know that the car did not just pass along the street, but had the brushes on.

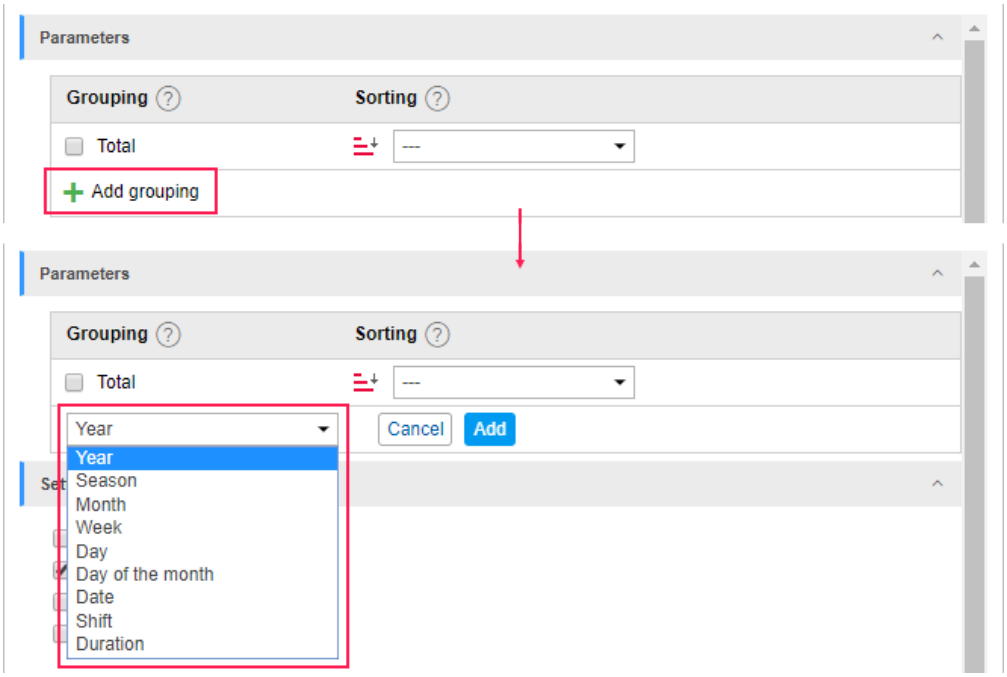
Parameters

In the **Parameters** section, you can configure the grouping and sorting of the report data.

Grouping

Grouping is the arrangement of information based on the indicated characteristics.

When adding a new grouping, click **Add grouping**, select a time interval in the appeared drop-down list and click **Add**.



From the available time intervals (year, season, month, week, day of the month, day, date, shift, duration), select those based on which you want to group the tabular data. Grouping can be either single- or multi-level. Multi-level grouping implies that there are several groupings for different time intervals. When using it, it is required to assign a hierarchy (specify nesting). For example, the grouping can be as follows: tabular data is grouped by year, within each year by months, and within

months by days. Nesting is adjusted by dragging the intervals in the **Grouping** column up or down, with the elements above in the list containing the ones that are located below.

If grouping by such intervals as season and duration is selected, at the bottom you can find a special block where it is necessary to set values for the intervals.

For seasons

Enter the name of the season, for example, summer, autumn, etc. Afterwards, use the drop-down lists to specify its duration. Note that the duration of the season is a period from the beginning of the first specified month to the end of the last. The minimum duration of the season is one month. Thus, if the **Wintry** season lasts during February, in both drop-down lists you must select **February**. To activate the season, click the **Add** button. The maximum number of seasons is 12.

For duration

For each interval of duration, you must enter a name (for example, interval 1), then specify the duration in seconds, minutes, hours or days (select from the drop-down list), and also activate it by clicking the **Add** button. The maximum number of duration intervals is 5. Using the **Trips** report as an example, let us look at how the use of duration intervals influences the presentation of the report data. The following periods are indicated: **Short trips** — up to 15 minutes, **Medium-term trips** — up to 1 hour, **Long trips** — up to 3 hours. Information in the report will be presented in the following way: short trips — from the minimum trip time indicated in the trip detector up to 15 minutes, medium-term trips — from 15 minutes up to 1 hour, long trips — from 1 up to 3 hours.

Depending on the report type, besides standard groupings (by time intervals), additional groupings can be used as well (for example, by geofence, route, sensor, user, event, action type, violation type, trips, streets). In this case, the grouping works **by the name** of the element.

Sorting

Sorting is the distribution of information in a table in descending or ascending order based on the selected characteristics.

Sorting allows distributing the grouped data by any selected column of the report table.

Next to each added grouping interval, in the **Sorting** column, there is a drop-down list where you can specify the column included in the report so that the data will be sorted by the specified characteristic (column) within the grouping. The selected sorting criterion is applied to the subsequent (nested) grouping level. In addition, to the left of the drop-down list, there is an icon with the help of which you can set the direction of sorting (from smaller to greater and vice versa).

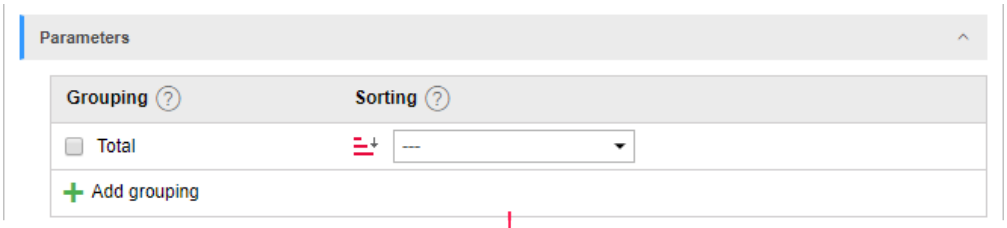
Tabular data can be sorted even if the grouping is absent. To do this, in the drop-down list in front of the **Total** interval select the sorting parameter and also set the direction of grouping.

Example

Let us consider the example of grouping and sorting use.

We create a report on trips. In this report, we are interested in maximum speed, duration, and mileage. Mark these columns. In addition, the information should be grouped by years, months and dates; the dates, in turn, should be sorted by the maximum speed (from high to low).

By default, there is no grouping, i.e. without adding grouping or sorting settings, we would get a detailed report where an individual line would correspond to each criterion. These lines would be arranged in chronological order or according to the sorting, indicated next to the **Total** grouping.



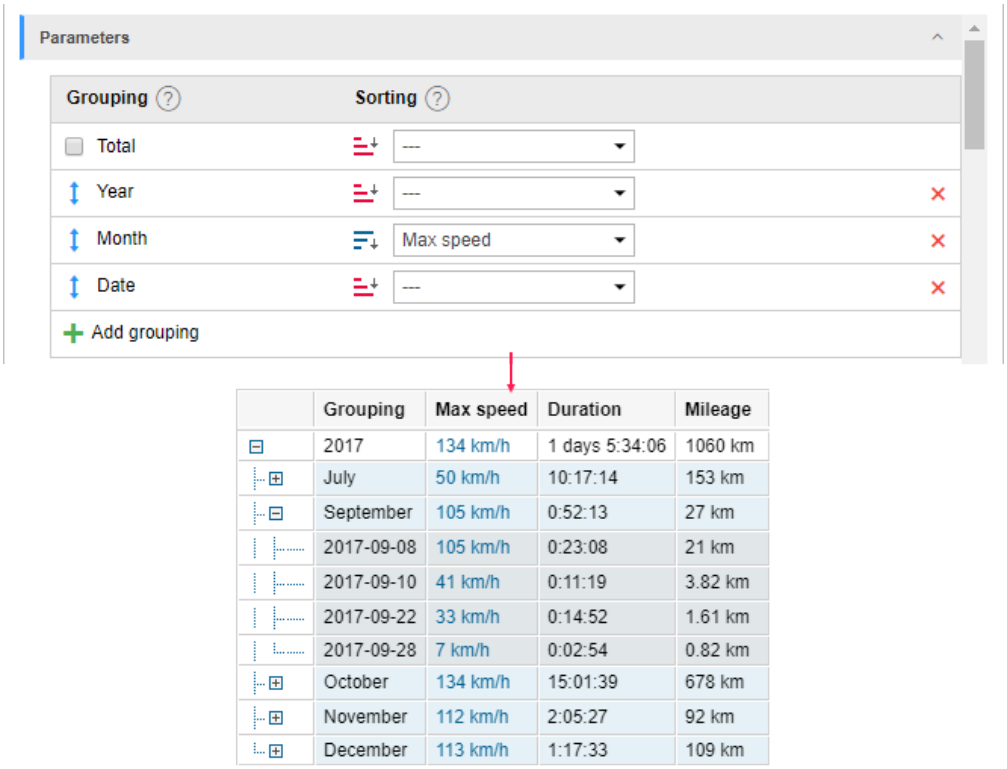
Max speed	Duration	Mileage
15 km/h	0:08:41	0.46 km
40 km/h	0:22:44	2.08 km
41 km/h	0:06:24	1.75 km
28 km/h	0:17:01	2.54 km
33 km/h	0:12:21	3.07 km
41 km/h	0:26:06	2.79 km
29 km/h	0:12:33	1.74 km
27 km/h	0:12:17	0.38 km
41 km/h	0:07:23	1.67 km
50 km/h	0:27:31	8.16 km
49 km/h	0:38:11	9.54 km
105 km/h	0:23:08	21 km

In order to get the result that corresponds to our task, we need to add the **Year**, **Month** and **Date** groupings. If necessary, we can move the grouping criteria to the desired position in the list (we need the Year –> Month –> Date sequence).

Next, we determine the sorting criteria and the direction. Since we want to set sorting for the level nested in months (for dates), we select the corresponding criterion from the drop-down list of months. Then click the icon of sorting direction to adjust it from a bigger to a smaller value.

By default, the data is sorted in chronological order.

The report looks as follows:



	Grouping	Max speed	Duration	Mileage
⊟	2017	134 km/h	1 days 5:34:06	1060 km
⊞	July	50 km/h	10:17:14	153 km
⊟	September	105 km/h	0:52:13	27 km
	2017-09-08	105 km/h	0:23:08	21 km
	2017-09-10	41 km/h	0:11:19	3.82 km
	2017-09-22	33 km/h	0:14:52	1.61 km
	2017-09-28	7 km/h	0:02:54	0.82 km
⊞	October	134 km/h	15:01:39	678 km
⊞	November	112 km/h	2:05:27	92 km
⊞	December	113 km/h	1:17:33	109 km

Compared to the table for which the grouping and sorting settings are not specified, this table has two additional columns. The first one is a column containing the '+' and '-' buttons, which help show/hide nesting levels. The second is the **Grouping** column, which shows the levels themselves. The information in the table is grouped by years, and by clicking on the **plus** the next levels of grouping (months, dates) are opened. The dates are sorted by the maximum speed (from high to low).

Time intervals and their use in reports

Total — the highest level of grouping (cannot be moved). If it is checked, the report contains a grouping with the resulting data (the total duration of any state, the total number of registered events, etc.) in which all the subsequent groupings are nested (if there are any).

Year — the grouping of the information in the table by years.

Month — the grouping of the information in the table by months.

Week — the grouping of the information in the table by weeks. The number of the week is displayed (e.g. week 26, etc.).

Day — the grouping of the information in the table by days of the week (e.g. Monday, Tuesday, etc.).

Day of the month — the grouping of the information in the table by days of the month (e.g. the 1st, 2nd, etc. day of the month).

Date — the grouping of the information in the table by dates.

Shift — the grouping of the information in the table by shifts.

When grouping data, the events that **began** in the interval are included in it. To determine the duration of an event, its entire duration is taken into account, even if it has already ended in another interval. That is why in the **Duration** column there may be values exceeding the size of the interval itself.

When grouping the table data, it makes sense to use the **Total time** column, which, unlike the **Duration** column, shows not the sum of the intervals (e.g. the total time of all trips), but the time from the beginning of the first interval to the end of the last one. This allows, for instance, to calculate the total time of the working day (convenient for travel sheets).

Retrieve intervals

The **Retrieve intervals** option is applied only to reports with grouping by shifts. If the option is activated, the report displays only those **parts of trips** which have overlapped the shifts on the specified interval. If the option is deactivated, the report shows all the trips which have overlapped the shifts at least partially on the specified interval, and these trips are included in the report **from beginning to end**.

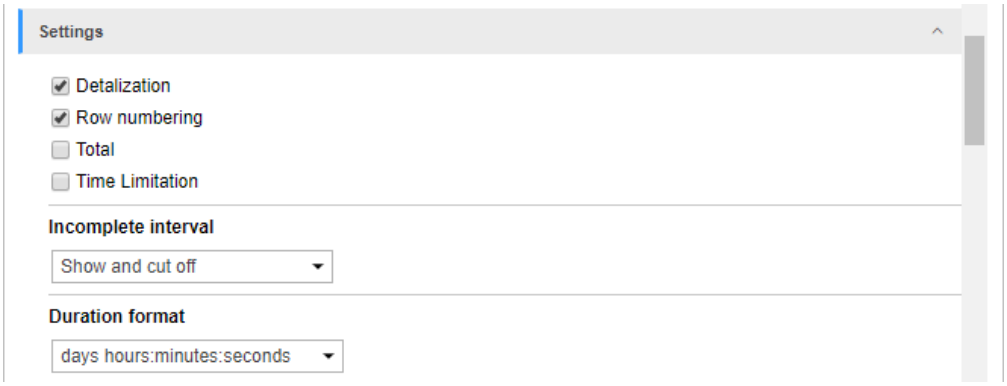
Settings

The following settings are available in this section:

- detalization,
- row numbering,
- total,
- time limitation,
- incomplete interval,
- duration format.

These settings are universal for all the table types. However, individual parameters can be applied to some of them, which is described for each table separately.

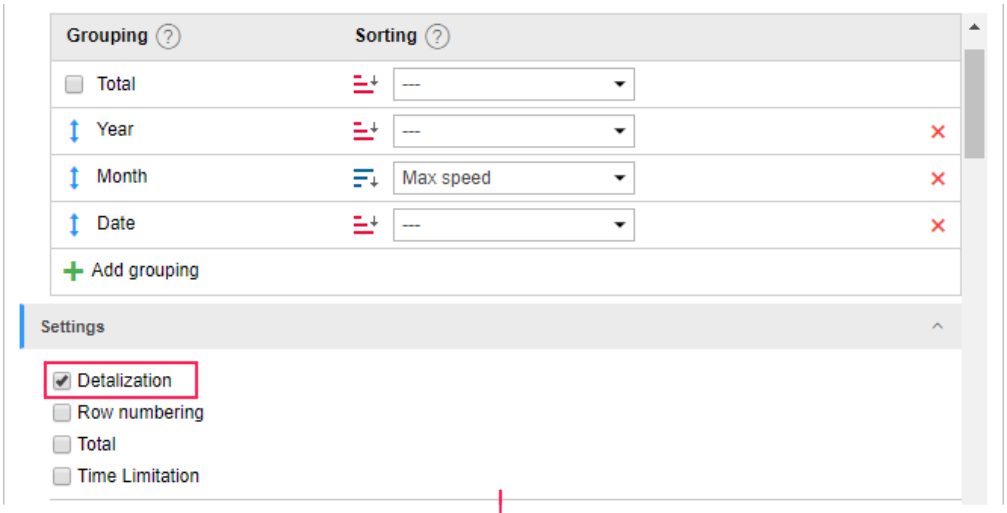
> ⓘ Some tables have fields obligatory for submission. For instance, events should be marked in the **Chronology** table. The **Settings** tab of such tables and the required fields or blocks in it are marked with a red **asterisk**.

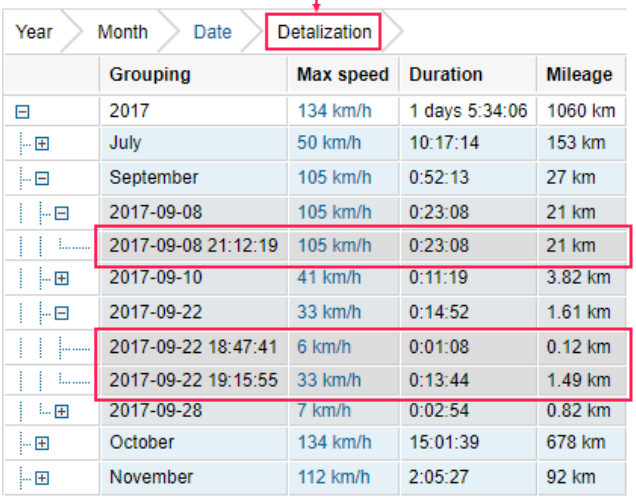


Detalization

Reports with grouping can be extended using the detalization option. Detalization gives an opportunity to move to a final level of nesting (date and time). To view the final level of nesting, you can open ('+' at the beginning of the line) all the previous levels one-by-one, or click on the corresponding level of nesting.

We can add detalization in the report (check the corresponding box in the table parameters), suggested below as an example of grouping and sorting use. Since in this example we already have grouping by years, months and dates, the detalization will allow us to expand the level of nesting right before the time of the event (hours, minutes, seconds).





It should be noted that sorting is applied to the nested level. Since the detalization is the final level of nesting, you can also set the sorting for detalization in the list of groupings in a similar way.

The detalization function is applied only to the grouped tables, not the detailed ones. The exception is the reports on groups of units, drivers, trailers, and passengers, as the grouping by units is provided in them by default.

Row numbering

Numbering is an additional (always the first) column and can be added to the table of any type.

№	Max speed	Duration	Mileage
1	15 km/h	0:01:34	0.14 km
2	40 km/h	0:08:36	0.54 km
3	41 km/h	0:08:41	0.46 km
4	28 km/h	0:22:44	2.08 km
5	33 km/h	0:06:24	1.75 km
6	41 km/h	0:04:27	0.27 km
7	29 km/h	0:31:30	1.65 km
8	27 km/h	0:08:18	0.84 km
9	41 km/h	0:17:01	2.54 km
10	50 km/h	0:12:21	3.07 km
11	49 km/h	0:04:50	0.49 km
12	105 km/h	0:34:51	1.52 km
13	41 km/h	0:26:06	2.79 km

If grouping is used in the table, numbering becomes multilevel. The main level is the numbering of the main lines with the help of integers. The nested level is the numbering of hidden lines according to the **number of the main line — point — number of the nested line** scheme.

Year > Month > Date

	№	Grouping	Max speed	Duration	Mileage
⊟	1	2017	134 km/h	1 days 5:34:06	1060 km
⊞	1.1	July	50 km/h	10:17:14	153 km
⊟	1.2	September	105 km/h	0:52:13	27 km
	1.2.1	2017-09-08	105 km/h	0:23:08	21 km
	1.2.2	2017-09-10	41 km/h	0:11:19	3.82 km
	1.2.3	2017-09-22	33 km/h	0:14:52	1.61 km
	1.2.4	2017-09-28	7 km/h	0:02:54	0.82 km
⊞	1.3	October	134 km/h	15:01:39	678 km
⊟	1.4	November	112 km/h	2:05:27	92 km
	1.4.1	2017-11-06	112 km/h	1:16:31	60 km
	1.4.2	2017-11-04	95 km/h	0:43:33	32 km
	1.4.3	2017-11-22	4 km/h	0:05:23	0.15 km
⊞	1.5	December	113 km/h	1:17:33	109 km

Total

This option allows you to add the last line that contains the resulting data: the total duration of a certain state, the total number of registered events, the maximum, minimum, or average arithmetic value, and so on

Year > Month > Date

	№	Grouping	Beginning	End	Duration	Engine hours	Mileage	Trips count
⊟	1	2014	14.11.2014 09:27	31.12.2014 10:17	20:41:30	20:46:51	1132 km	56
⊟	1.1	November	14.11.2014 09:27	28.11.2014 10:35	6:33:38	6:34:56	334 km	20
	1.1.1	14.11.2014	14.11.2014 09:27	14.11.2014 09:50	0:23:02	0:23:02	27 km	1
	1.1.2	15.11.2014	15.11.2014 22:34	16.11.2014 00:08	0:41:12	0:41:12	47 km	2
	1.1.3	17.11.2014	17.11.2014 09:25	17.11.2014 14:12	0:35:55	0:35:55	30 km	3
	1.1.4	19.11.2014	19.11.2014 09:33	19.11.2014 20:02	0:51:19	0:51:19	54 km	2
	1.1.5	20.11.2014	20.11.2014 08:58	20.11.2014 09:06	0:08:48	0:08:48	4.65 km	5
	1.1.6	21.11.2014	21.11.2014 09:04	21.11.2014 19:42	1:23:06	1:24:24	30 km	5
	1.1.7	22.11.2014	22.11.2014 16:41	22.11.2014 17:34	0:39:11	0:39:11	32 km	2
⊞	1.2	December	01.12.2014 09:44	31.12.2014 10:17	14:07:52	14:11:55	798 km	36
	-----	Total	14.11.2014 09:27	31.12.2014 10:17	20:41:30	20:46:51	1132 km	56

In online reports, the **Total** line is always at the bottom of the window, regardless of the number of pages in the table and the position of the scrollbar.

The **Total** line does not display information for fields with text or another type of data which cannot be summarised. The information for the data on location is not displayed either, except for the information about the initial and final location in reports on units. For the initial location, the one that was detected first at the report interval is displayed; for the final location, the one that was detected last.

ⓘ If you add the **Total** line to the Eco driving table, the **Duration** and **Mileage** columns show the data on **trips** (not violations) for the specified time interval.

Time limitation

This function allows indicating which time intervals, days of the week, days, months must be included in the report. For instance, if you check only the working days of the week and working hours or only odd days of the month, etc., only they will be included in the report.

There are two time-limiting algorithms, which depend on the **Cut off intervals** options:

If the option is not activated, then the state (for example, the trip) that started within the specified interval, but ended beyond its limits, **does not terminate**. As a result, its duration is fully included in the report.

If the option is activated, then the state (for example, the trip) that started inside the interval, but ended beyond its limits, **terminates**. As a result, the report includes only its duration within the specified interval, and the rest is 'cut off'.

Example

The interval from 9:00 to 18:00 is selected as the time limitation interval. Two trips were registered: the first - from 7:50 to 12:00, the second - from 13:00 to 18:20.

According to the first algorithm (the **Cut off intervals** option is not activated), only the trip that started within the time limitation interval will be included in the report as a whole. That is, in the report, we get one trip lasting from 13:00 to 18:20.

According to the second algorithm (the option the **Cut off intervals** option is activated), the report will include two trips that are on the specified interval - from 9:00 to 12:00 and from 13:00 to 18:00.

To apply a limitation equal to the whole day, you need to set the interval from 00:01 to 23:59.

Incomplete interval

The **Incomplete interval** option does not apply to all intervals of the table, but only the last (trips, sensor operation, etc.), since its ending does not always coincide with the end of the reporting period. To display this interval, the following options are provided:

Show and cut off

The interval is displayed in the report and in the ending column has the time of the last message for the reporting period;

Do not show in report

The incomplete interval is not displayed in the report;

Show and mark as incomplete

The interval is displayed in the report and has the label **Unknown** in the ending column.

Duration format

In tables where the duration is encountered, you can select the format for displaying it. The following options are available:

days hours:minutes:seconds

When displayed in the report, it is displayed as follows: **5 days 12:34:56**.

hours:minutes:seconds

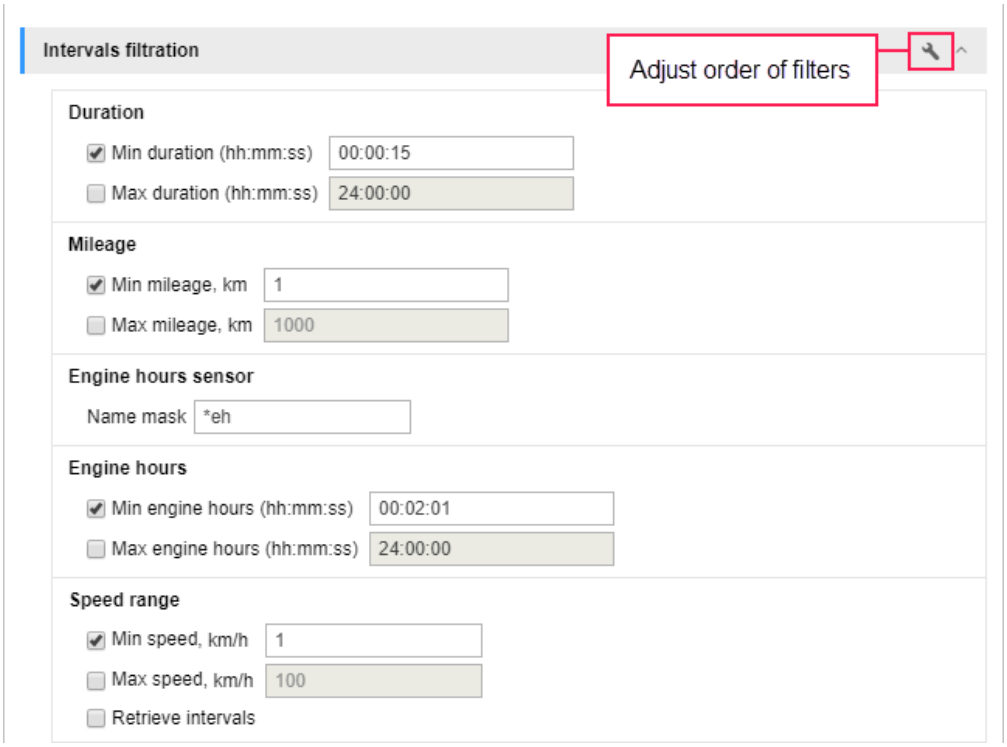
In the report, the duration is displayed as follows: **132:34:56**, that is, the hours are not combined in days (if there are more than 24). The option affects not only the cells but also the **Total** row.

hours (with two decimal places)

The duration in the report is displayed as **3.45** instead of **3:27**.

Intervals Filtration

Most table reports in the Wialon system involve retrieving time intervals which meet certain criteria from the unit's history. These are reports on trips, parkings, stops, engine hours, rounds, geofences and visited streets, reports on the operation of sensors and speeding, and others. For such reports, additional filtering options are provided, which specify the conditions for displaying information in the table.



Available parameters of filtration vary depending on the type of report and allow you to limit the range of intervals that fall within it. For instance, the report does not include trips, stops or speeding intervals, if their duration is less than the minimum duration specified in the intervals filtration. It is also possible to display only visited geofences in which parking has been detected or during which the sensor was turned on. All possible filters are described below.

You can use the filters separately and in combination with one another. The filters are applied to the data in the order in which they are located in the **Intervals filtration** section of the table settings. You can change the order of filters by clicking on the icon .

All filters except the mileage filter work only with integer values.

Additional parameters

The filter is available for the Eco driving table. When the **Show all trips** option is activated, all trips, not just trips with violations, are included in the report for units with customized eco-driving parameters.

Counter sensor value range

This filter can only be used for the **Counter Sensors** and **Fuel Traffic** tables. It allows displaying in the report the intervals at which the messages with values that are within the specified limits are received.

Custom fields masks

The filter is available for the Custom fields table. Here you can indicate the masks that must be applied to the names of the custom fields and their values.

Custom sensors masks

In the filter you can indicate the masks of custom sensors, that should be taken into account when generating a report. The filter is available in the **Digital sensors**, **Geofences**, **Fuel fillings**, **Fuel thefts**, and **Eco driving** tables.

Driver

The filter allows displaying the intervals at which the unit had a particular driver or group of drivers or did not have any driver at all. To display only those intervals at which a particular driver was in control of the unit, select the **With driver** option. In the field below, enter:

- the name of the driver — to display only those intervals at which the driver worked alone;
- the name of the driver in the format **name*** — to display also those intervals at which other drivers worked as well (besides the required driver).

All intervals with the driver are displayed in the report, regardless of whether the driver was present throughout the whole interval or just at the beginning, end, or in the middle of it.

If you select the **Driver group** option, the report shows only those intervals at which the vehicle was driven by any driver of a group (the mask can also be specified). To display only the segments with the indicated driver or group, activate the **Retrieve intervals** option.

If you select the **Without driver** option, the report shows only those intervals that contain segments without drivers. You can also retrieve these segments.

Duration

In the filter, you can specify the minimum and/or maximum duration of the interval.

Engine hours

The minimum and/or maximum duration of engine hours. In addition, the engine hours sensor mask can be specified in the **Engine hours sensor** filter.

Engine hours sensor

In this filter, you can specify a mask for the name of the engine hours sensor. It affects the calculation of engine hours in the tables which have the corresponding columns, as well as the engine hours filter if it is turned on.

Event filter

This filter is only available for the **Events** table. If it contains an event mask, only the events that satisfy it are included in the report. When the option **Custom events only** is activated in the filter,

only custom events registered manually from the online notification window are shown in the report.

Fuel fillings

The filter allows displaying intervals **with** or **without fuel fillings** in the report. In the first case, you can additionally specify the minimum and maximum volume of fillings, and also activate the **Sum up fillings** option. Summing up assumes that only those intervals fall into the report, the amount of fillings on which falls within the specified limits.

Fuel thefts

The filter allows you to display in the report intervals with fuel thefts or without them. In the first case, you can additionally specify the minimum and maximum amount of theft, and also activate the **Sum up thefts** option. Summing up assumes that only those intervals where the amount of thefts falls within the specified limits get into the report.

Geofences/Units

This filter is divided into two parts. In the first one, you can specify the geofences by which the intervals should be filtered. In order to consider the position of the unit in any geofence or outside of it, set the radio button to the left of its name in the list from the **None** position to the 'Inside' or 'Outside', respectively. In addition to individual geofences, you can also specify their groups. It is the same as specifying each geofence which belongs to the group.

> The number of geofences in a group is dynamic, that is, it changes when you change the list of geofences which belong to it. These changes are taken into account when building the report.

In the second part of the filter, units are selected in the same way. Thus, it is possible to get the intervals of the unit's location inside or outside the zone of another unit. The size of the zone is defined by the **Radius** parameter. Only those units to which you have the **Query messages or reports** access right are displayed.

To quickly search for geofences and units in the list, the dynamic filter is available. To select all units in a column, hold the **Ctrl** key.

When determining the time of intersection of a unit with geofences or zones of other units, the Maximum interval between messages option is taken into account from the **Advanced** tab of the unit's properties.

The **Retrieve Intervals** option is available in the filter. It allows you to remove the segments inside/outside of the specified geofences or units from the intervals.

In the filters by geofences/units in the **Sensors** section for the Fuel Traffic table, the **Include only units with tank fuelling box** option is available. It allows you to display in the report results only those units that were near the unit on the specified interval and had registered fillings.

Merge intervals condition

In this filter, which is available for the **Counter Sensors** and **Fuel Traffic** tables, you must specify a timeout. If you generate a timeout between some intervals less than or equal to the indicated one, the intervals are merged. In this case, firstly the merger is carried out, and then the filtration on the basis of remaining parameters is executed.

Mileage

In the filter, you can specify the minimum and/or maximum mileage within the interval. It can use both integer and fractional values. Use a period as the separator for fractional values.

Parkings

The filter allows you to display only those intervals within which there were parkings, or only those within which there were none. Select the **With parkings** or **Without parkings** option from the drop-down list. In the filter, you can also specify the minimum length of parking. As a result of using this option, the report on geofences, for example, displays only such visited geofences in which a parking period of at least the specified duration was detected. The **Sum up intervals** option allows you to summarize the time of parking, that is, show in the report, for example, only those geofences, the **total** number of parkings in which was not less than the specified time.

Sensors

The filter allows to display intervals in the report table with the sensor turned on or off, and, additionally, specify the minimum and/or maximum duration of such intervals. In order for each interval to be shown in a separate row of the table, check the **Retrieve intervals** option. Intervals can also be summed if the maximum and/or minimum duration of the sensor on/off state is specified. To specify a certain sensor, whose turning on/off should be taken into account, specify its mask in the **Sensors mask** filter. If several masks are specified, only those intervals at which all these sensors were simultaneously turned on/off are selected. If the sensor masks are not specified, the report takes into account all sensors of the unit.

⚠ The intervals filtration of the **With sensor on** type works only for the digital sensors.

Sensors masks

Here you can indicate the masks of the sensors that should be taken into account when generating a report. The specified masks affect the **Sensors** filter, the values of the **Counter**, **Initial counter**, and **Final counter** columns as well as the values of the columns related to engine revolutions,

temperature, and fuel (if selected in the report template). They also affect the values of custom sensors if the **Custom sensors masks** filter is not available in the table settings.

If you want to indicate the mask of the engine hours sensor, specify it in the **Engine hours sensor** filter.

Speed

In the filter, you can set the minimum and/or maximum speed within the interval. As a result, the report shows the intervals at which the speed that falls within the given limits is met at least once. If you want only those segments within which the speed does not leave the specified limits to get in the report, activate the **Retrieve intervals** option in the filter.

Stops

This filter allows you to display only those intervals at which there were stops or only those at which there were no stops. To do this, select either the **With stops** or **Without stops** option from the drop-down list. If the filter is not used, the report displays all the intervals, regardless of whether there were any stops or not.

Trailer

Intervals filtration by the presence or absence of trailers assigned to the unit. Works similarly to the filtration by the driver.

Trips

The filter allows you to display only those intervals that intersect with trips (it is not required for the entire trip to be a part of the interval) or only those that do not intersect with the trips. It is convenient to use the **Trips** filter, for example, in the report on geofences: in order to cut off excess visits to the same geofence during the unit's parking (when the coordinates are unsteady), select the **With trips** filter.

Violation

The filter is available in the **Eco driving** table and allows to enter the name masks of the violations that are to be taken into account while generating a report.

Charts

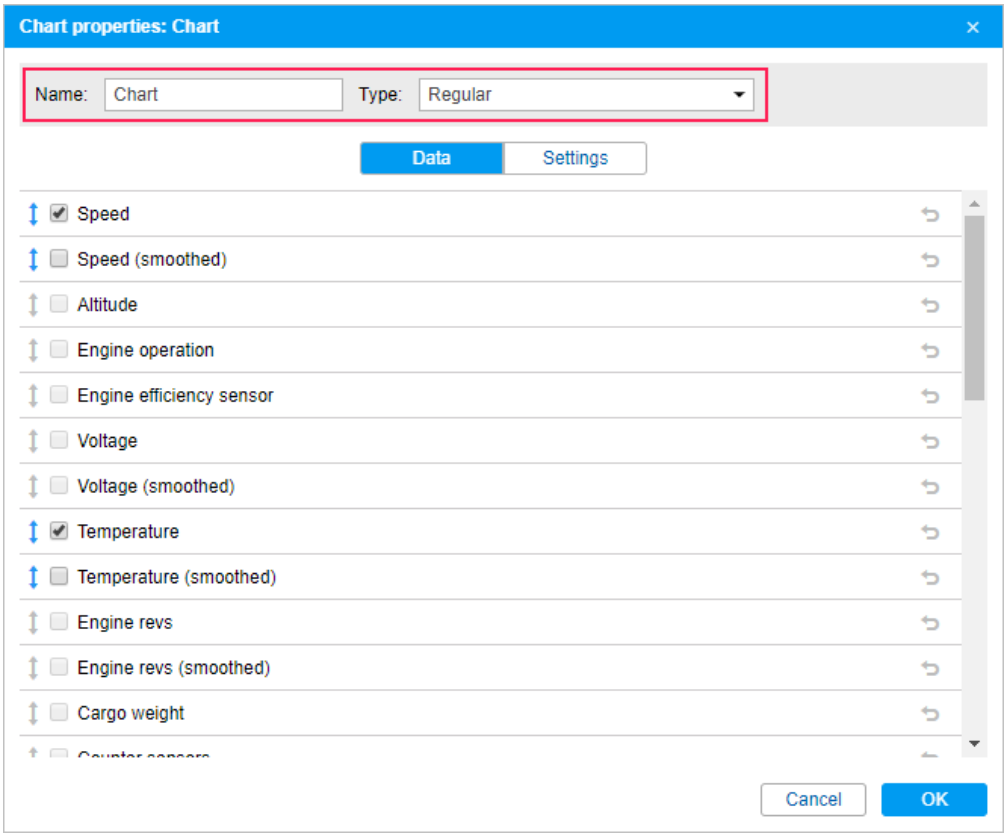
In addition to the tabular form, some information in the report can be presented in the form of a chart. For example, a chart may reflect a change in fuel level or speed at a given time interval, the parameters of sensors, etc.

To create a chart, the corresponding equipment must be installed and configured on the unit (this does not concern charts for speed and altitude). To create and configure sensors, see the Units → Sensors section.

To add a chart to the report template, click on the **New Chart** button on the Report Contents tab of its properties.

> ⚠ Charts can only be added to reports of the **Unit** and **User** type.

In the dialog for creating a new chart, specify its name and select the type.



Below are the **Data** and **Settings** tabs where you can specify the parameters of the chart.

Types of Charts

As with the tables, there are several **types** of charts:

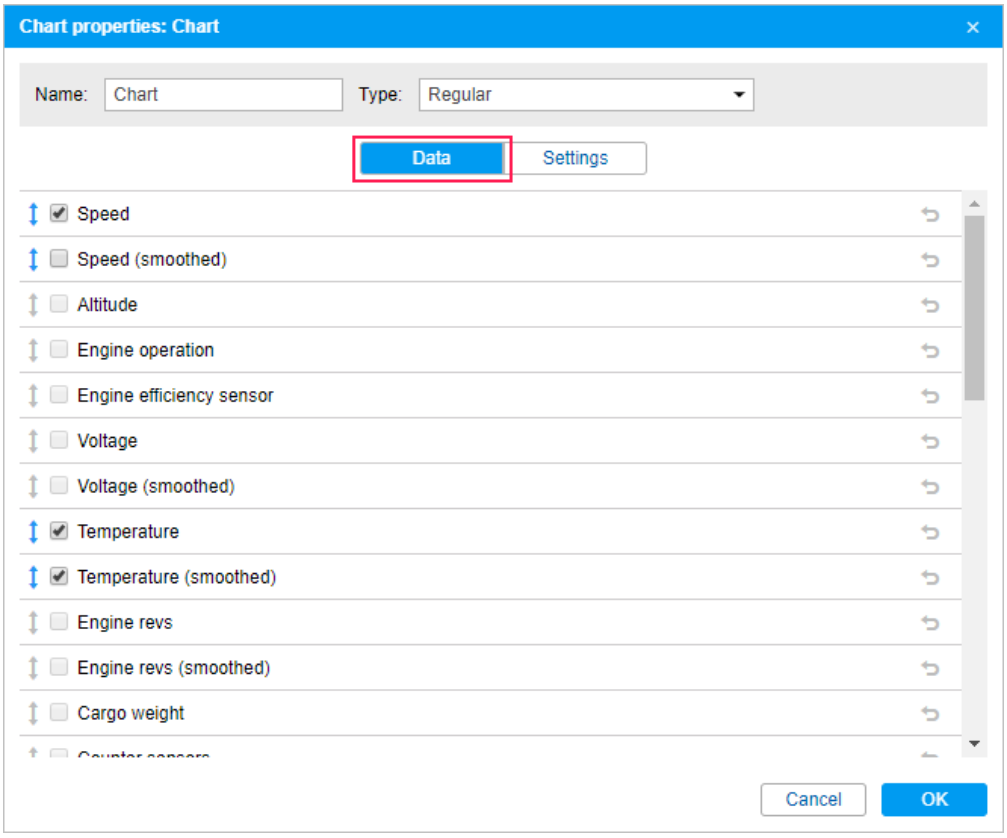
- Regular;
- Processed fuel level;
- Speed/Fuel consumption.

Regular charts

The charts of this type differ in that the X-axis always lays time, and the data for the Y-axis is selected on the **Data** tab from the list:

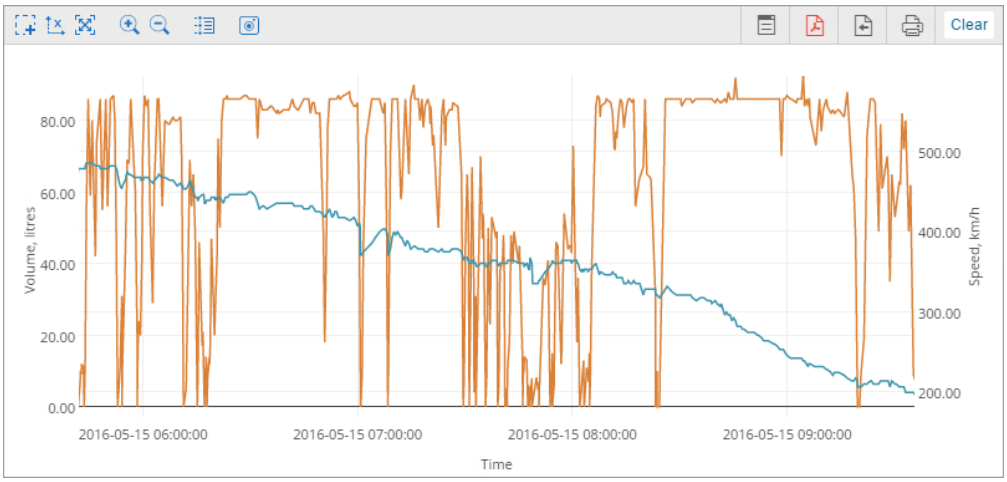
- Speed (km/h or mph);
- Altitude (meters or feet);
- Engine operation (on/off);

- Engine efficiency sensor;
- Voltage (volts);
- Temperature (degrees Celsius);
- Engine revs (rpm);
- Cargo weight;
- Counter sensor;
- Custom sensors;
- Custom digital sensors (on/off);
- Absolute mileage;
- Mileage in trips;
- Instant mileage;
- Fuel level (liters or gallons);
- Processed fuel level (liters or gallons);
- Fuel consumption by ImpFCS;
- Fuel consumption by AbsFCS;
- Fuel consumption by InsFCS;
- Fuel consumption by FLS;
- Fuel consumption by math;
- Fuel consumption by rates.



You can simultaneously select two points. In this case, the chart will contain two curves, for example, speed and engine revs. You can select even more points but note that only two variables can exist in one chart in addition to time. It means if Y-axis represents speed scale on the left and temperature scale on the right, nothing can be added to this graph. But if Y-axis represents speed scale on the left and consumption by ImpFCS on the right, it is still possible to add consumption by AbsFLS and other methods, since they are all measured in the same metrics.

The picture below shows the speed chart combined with the fuel level chart. To receive such a chart, it is required to set the chart type as **Regular** and select the **Speed** and **Fuel level** data.



Each curve on a chart is assigned its own color. On the left, in the **Report result** block, you can specify which color corresponds which curve. Their names are taken from the report template. In addition to the name for the curves, the units of measurement are also indicated.

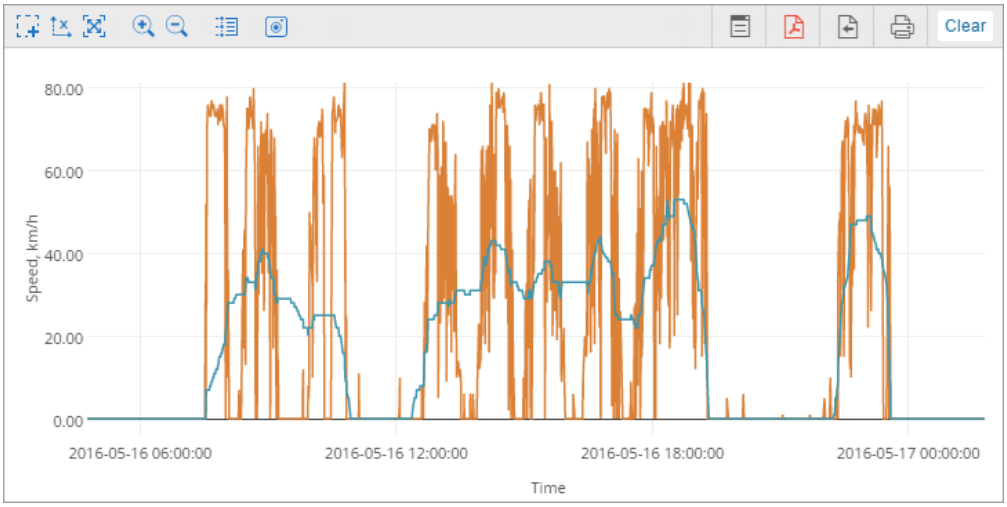
The names of the lines of the chart can be changed in its properties in the report template. However, if the curve is built based on some sensor, then it is given the name of the sensor.

Click on the curve name in the **Report result** section to enable/disable its display on the chart.

Smoothing

Almost all charts of the **Regular** type are provided in two forms: raw and smoothed (**smoothed** is indicated in parentheses after the name). Smoothing affects the style of the chart display. The chart without smoothing is built straight from a message to message, and, as a result, has an angular outline. If you choose smoothing, the chart has a smoother outline. The level and algorithm of smoothing for all charts are the same.

Below is an example of a chart in which a raw speed chart is displayed with an orange line, and a blue one shows a smoothed chart.

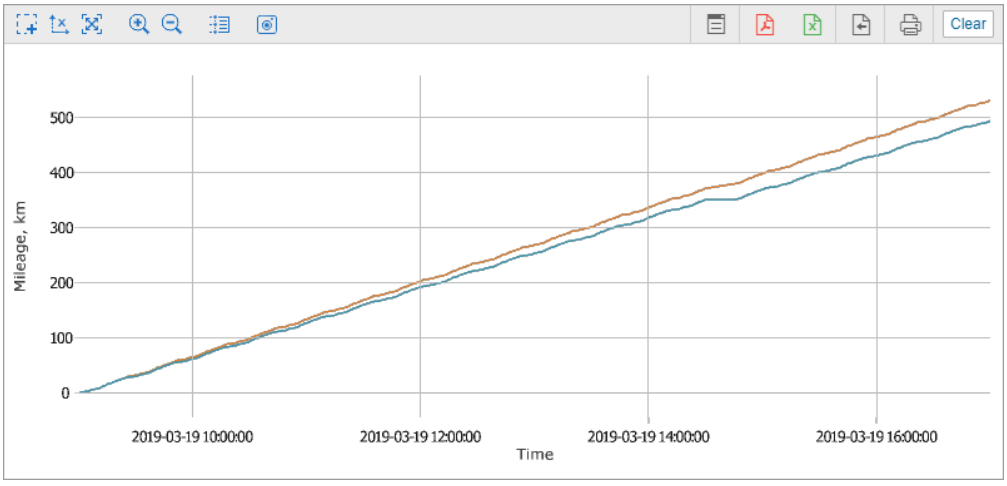


Fuel level charts

Fuel level chart represents 'raw' data, whilst in the **Processed fuel level** chart, the filtration is applied.

Mileage charts

Four kinds of mileage charts can be created: absolute mileage, mileage in trips, instant mileage, and instant mileage smoothed. The first two show how mileage changed (increased) over time. Absolute mileage chart is built on the basis of all messages, which means that any inaccuracy and outlying data affect the resulting chart. Mileage in trips chart displays the data taking trip detector settings into account. Below you see the chart with curves for absolute mileage (blue) and mileage in trips (orange).

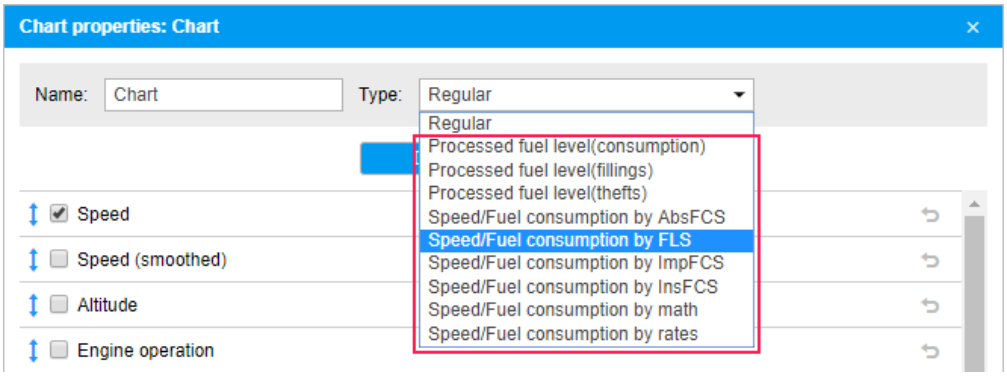


The **Instant mileage** chart represents the data in the **mileage from the previous message to the current one** form, that is the difference in the distance between two adjacent messages. This kind of chart can be useful to detect excessive mileage during connection loss, or to detect made-up additions to the mileage in cases where it is determined by special sensors (see the settings of the mileage counter in the unit properties). Instant mileage can be smoothed.

Special charts

Along with the regular charts, the following charts are available:

- Processed fuel level
- Speed/Fuel Consumption by...



Settings for these charts are fixed and cannot be changed. Editing is available only for the name of the chart. Also, it is possible to select the required sensors (indicate the mask of the sensor).

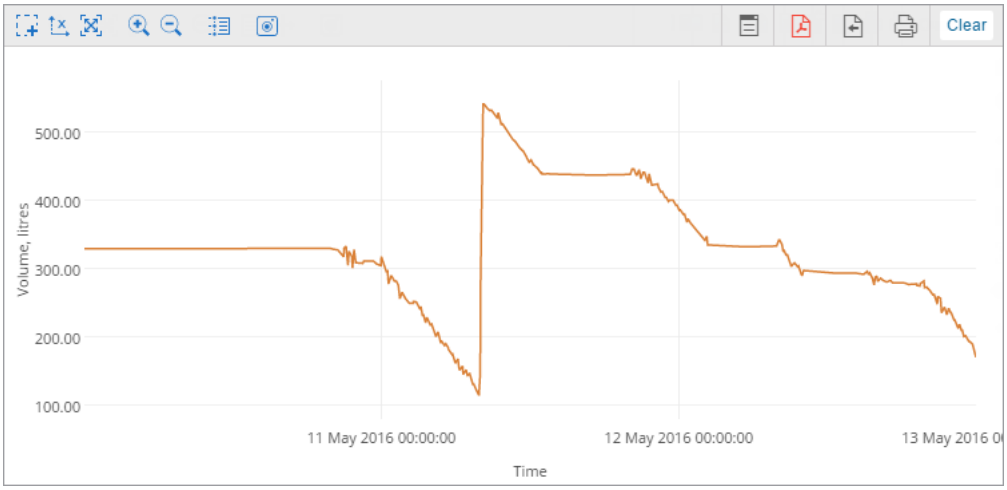
Processed fuel level

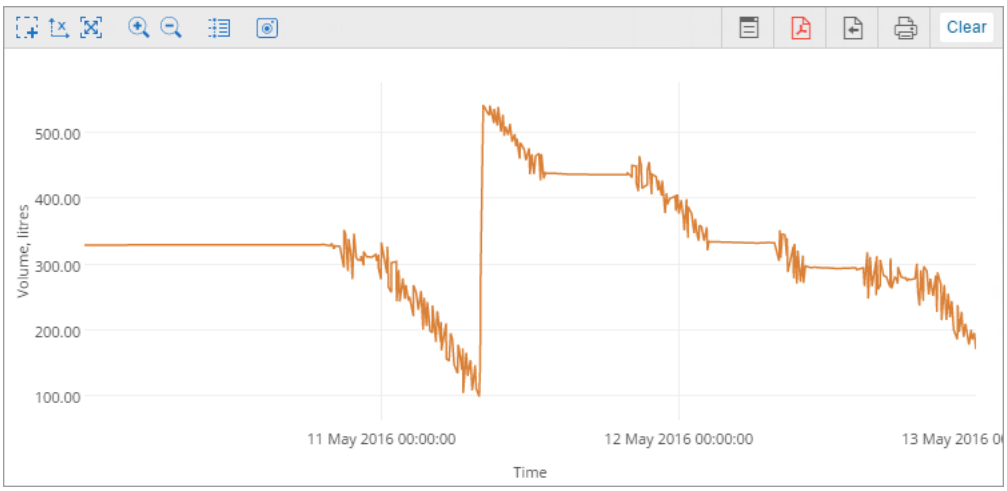
The **Processed fuel level** chart shows the values which are used while calculating fuel level, fillings and thefts in tables.

The chart shows the dependence of fuel level on mileage (mileage/liters). It can also show the dependence of the fuel level on time (time/liters) if the Time-based calculation of fuel consumption option is turned on in the unit settings.

In both cases the chart is processed taking the filtration into account, which is set on the **Fuel Consumption** tab (the **Filter fuel level sensors values** option) or in the sensor properties.

Below are two fuel level charts: the first one is processed (time-based FLS and filtration are on, the filtration level is 25), and the second one is not processed.





A special **Processed fuel level** chart should be distinguished from two similar regular charts.

Regular **Fuel level** chart represents the **raw** data (no filtration is applied). The **Time-based fuel level sensors consumption** checkbox does not affect the chart.

Regular **Processed fuel level** chart represents the dependence of filtered and smoothed on the basis of mileage data from time.

These regular charts can represent data only in the **Time/Fuel level** form. At the same time, it is possible to overlay other charts, such as, for instance, the voltage chart.

Speed/Fuel consumption chart

This chart shows the dependence of average fuel consumption on speed. The data for it is taken from fuel consumption sensors of different types (such as impulse, absolute, instant) or fuel level sensor, or predefined consumption by math or rates. The corresponding calculation methods must be specified in the properties of the unit in the Fuel consumption tab.

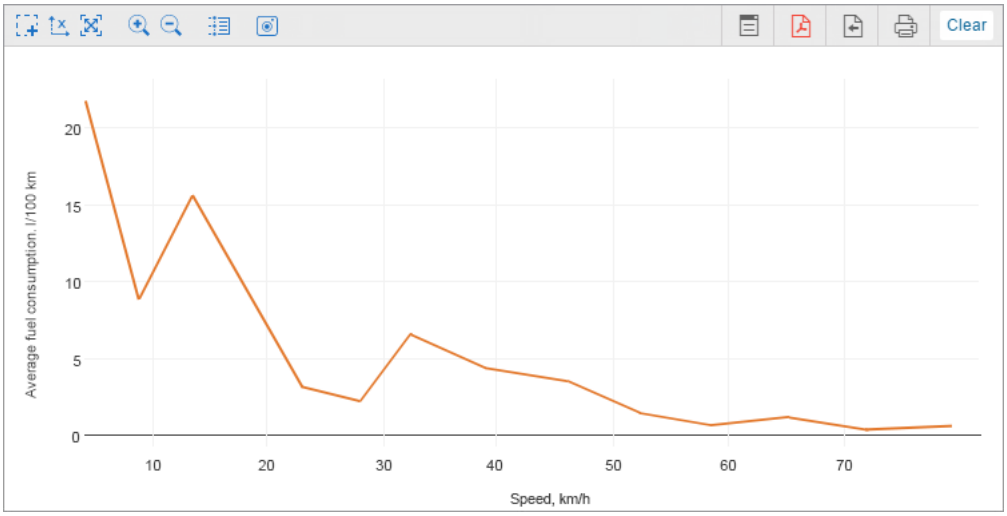
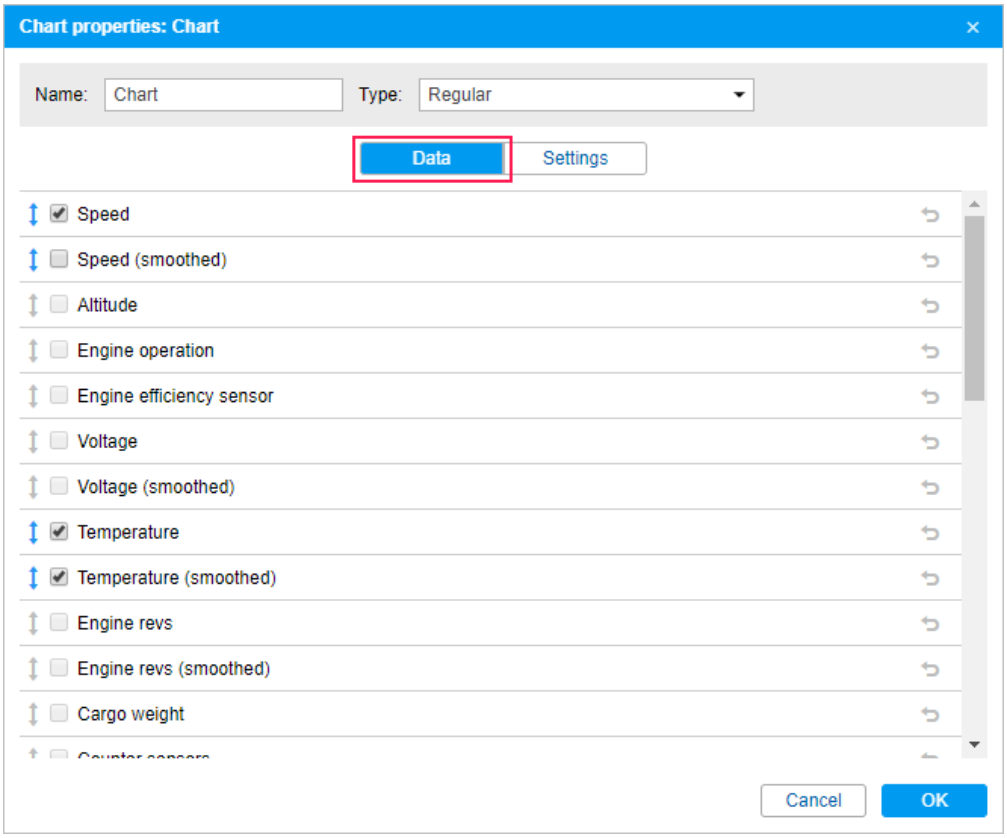


Chart Properties

There are two tabs in the chart properties: Data and Settings.

Data selection

On the **Data** tab, you can select the curves that should be displayed in the chart. The selection is only available for charts of the Regular type.



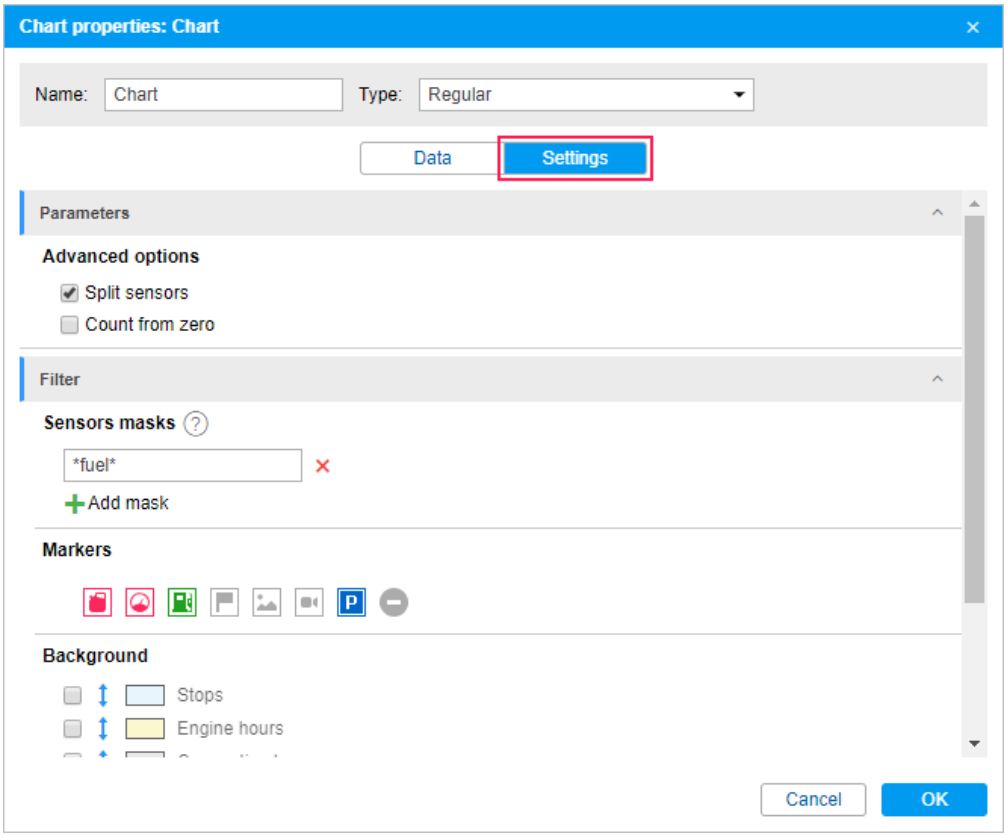
Mark the curves you want to see in the report. Two points can be checked simultaneously. In this case, two curves are displayed, for instance, speed and engine revs. There can be more curves, but only if there are no more than two variables in the chart, besides time.

To change the name of the point, click on it with the left mouse button and edit the text. To return the original name, click on the **Default** icon ( ). The icon is inactive if the name has not been changed.

In addition, it is possible to change the order of the items. To do this, drag the icon , located to the left of the required curve, up or down.

Chart settings

In addition to selecting columns, the settings are available on the same-name tab.



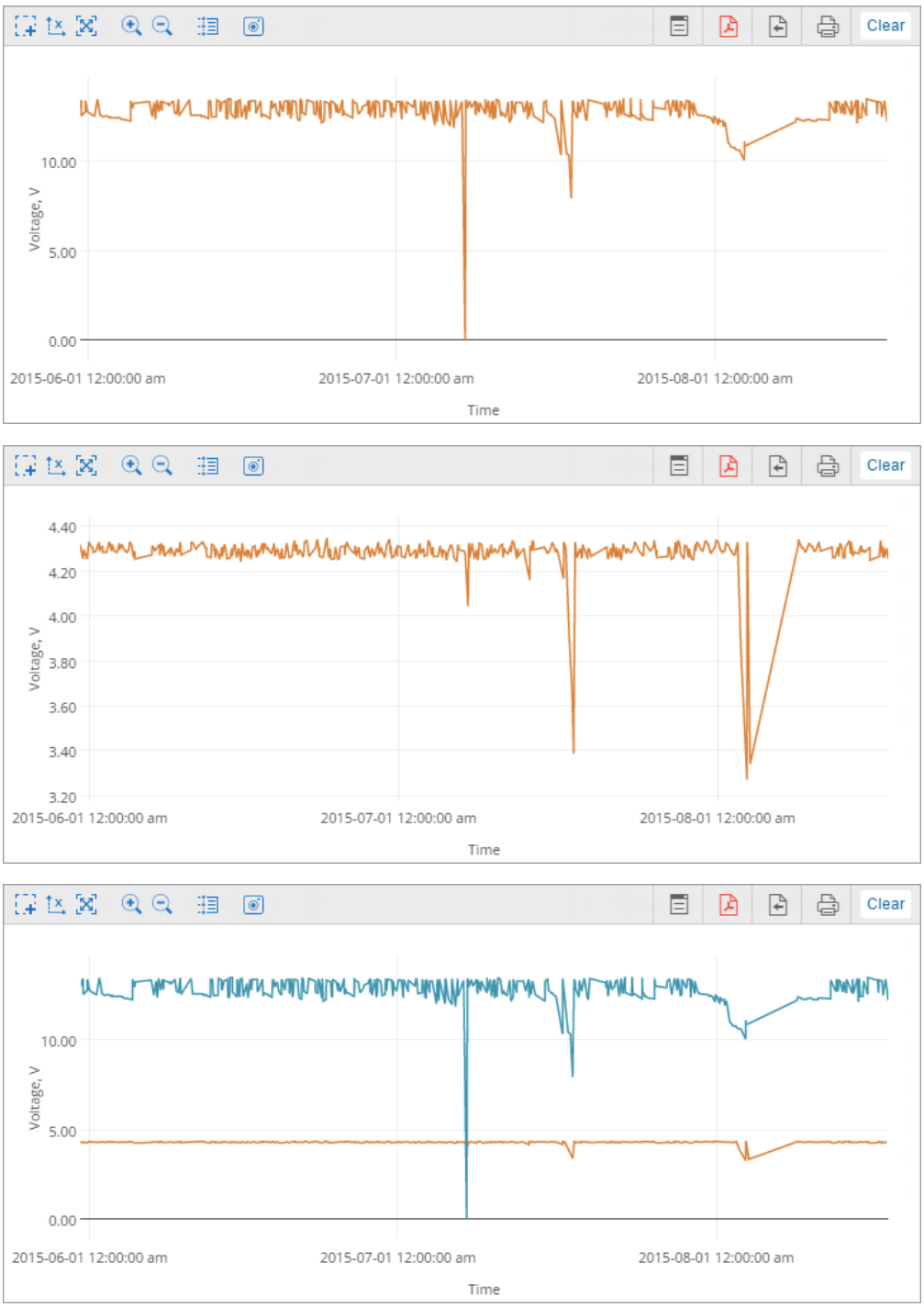
The tab is divided into two sections:

- Parameters;
- Filter.

Parameters
In the **Parameters** section, it is possible to activate the **Split sensors** and **Count from zero**.

Split sensors

If a unit has several sensors of the same type and you need to create a chart for this type, then by default the curves of such sensors are displayed in the same chart. Check the **Split sensors** option to create an individual chart for each sensor. For example, for a unit with two voltage sensors, external and internal, a chart with two curves (the option is not checked) can be built, as well as two charts with one curve (if the option is checked).

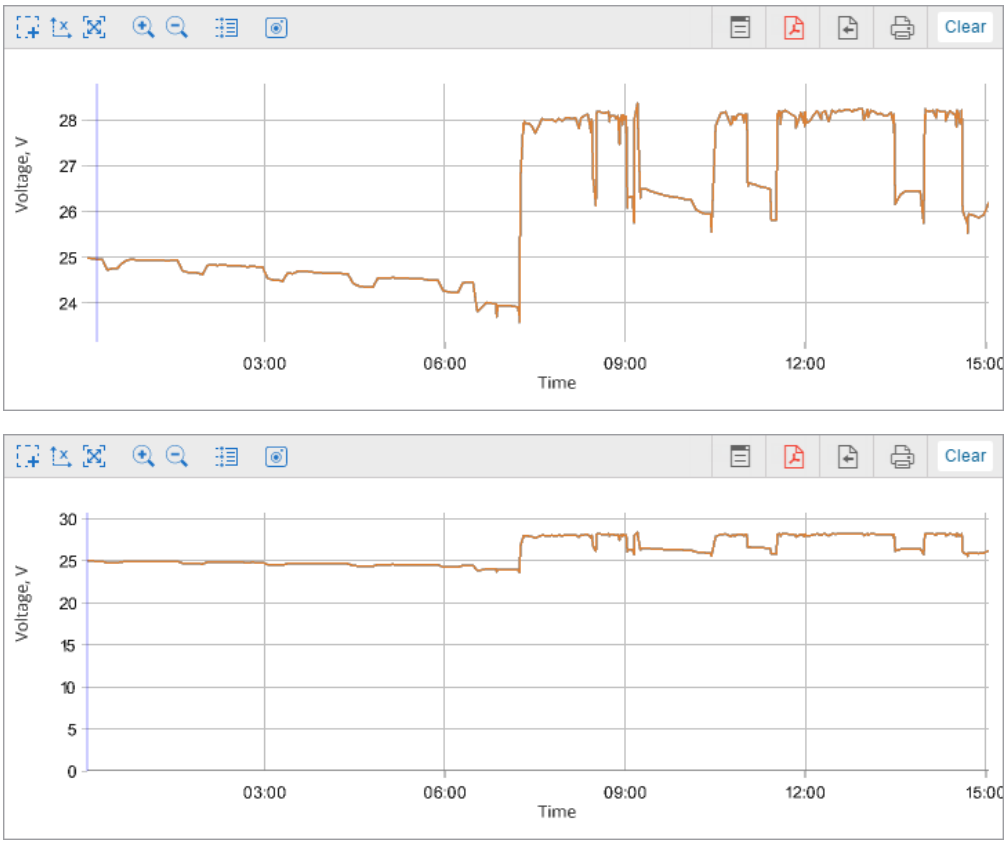


If for the data points selected for a chart there are several sensors, the upper one is split. Let us assume that a unit has two voltage sensors and two temperature sensors, and you are building a voltage/temperature chart for it. If the **Split sensors** option is off, you will get one chart with four curves in it. If the **Split sensors** option is on, you will get two charts with three curves on each: one chart will contain the first voltage sensor and both temperature sensors, and another one will contain the second voltage sensor and both temperature sensors.

Count from zero

The **Count from Zero** option is responsible for scaling the chart. By default, the range of the Y scale depends on the range of values falling within the specified interval. That is, if, for example, the temperature fluctuates from 3 to 5 degrees, then the reading on the Y scale starts at 3, and the curve, in this case, occupies the maximum space on the chart. If the **Count from zero** option is activated, the Y-axis on the graph is always built from zero to the largest value (if the values are negative, then from the lowest value to zero).

The image below shows an example of two voltage charts for the same unit within the same time interval. The first chart is regular, the second — with the **Count from zero** option turned on.



Filter

The following settings are available in the **Filter** section:

- Sensor masks;
- Markers;
- Background;
- Line color.

Sensor masks

This option allows you to specify the sensors on the basis of which the chart should be built. The option does not influence the **Speed**, **Altitude**, **Fuel consumption by math** charts, as they can be built regardless of whether a unit has sensors or not.

Specify the mask of the required sensor. To do it, enter its full name or part of the name. You can use special characters: ***** (replaces any number of characters) or **?** (replaces one character). The name of the sensor cannot contain commas.

If the masks are not specified, the sensors of the required for building the chart type are determined automatically.

Markers

This option allows specifying the event markers, which should be displayed in the chart. Here, the same markers are used as for the events on the map.

The setting of graphical elements filtration influence the display of markers and backgrounds.

Background

The intervals of such events as stops, parkings, trips, connection losses, and work of engine hours can be used as a chart background. Using these backgrounds you can correlate a chart value and an interval to which it corresponds. Different colors can be assigned for the event intervals. To select a color, click on the color box, choose the color from the palette and click **OK**.

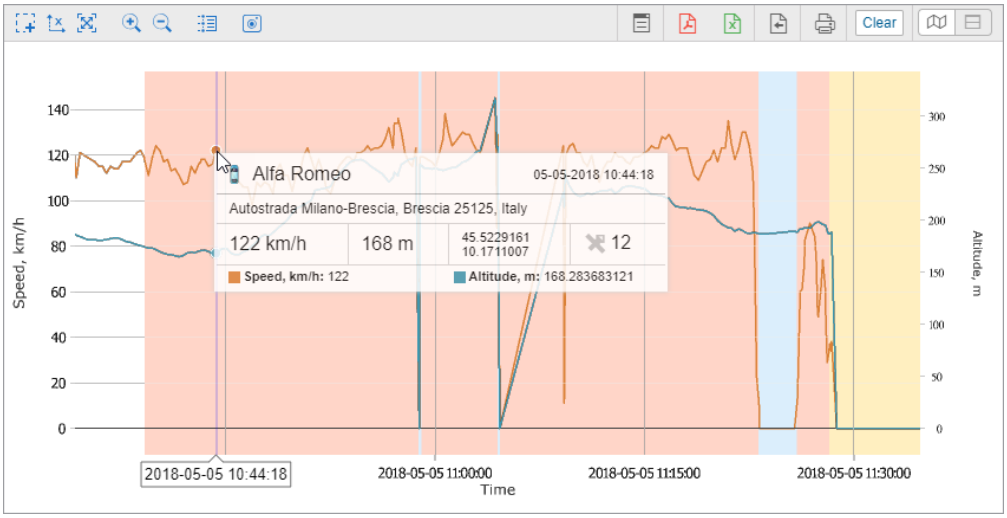
The background of the event intervals is opaque and has a display priority, that is, the interval above is overlapped by the lower ones. To change the priority, drag the desired interval of events up or down using the double arrow icon to the left of the name of the desired interval.

Line color

This section allows using the sensor's color scheme to display the line of a corresponding chart. To apply the sensor's color scheme, indicate its mask in the field opposite the curve name (the fields correspond to the items selected on the Data tab). If no mask is indicated, the default colors are used.

Working with Charts

It is possible to scale, move the charts and view the information about individual points.



The line of the chart can be dashed at the segments where the interval between messages is greater than the value specified in the Maximum interval between messages parameter.

Above the chart, there is a toolkit with useful buttons:

Area selection	Click on this button to scale (zoom in) any selected area. Hold the left mouse button and select the required area. This operation can be repeated multiple times.
Lock/unlock Y-axis	Switching from work with a single axis (X) to multiple axes (XY).
Autoscaling	Return to the original scale of the chart.
Zoom in/ zoom out	The buttons change the scale of the chart by fifty percent with respect to the visible zone. The center of the chart remains fixed.
Messages/ point tracing	Switching between these modes makes it possible to look through the information on one chart or on all available ones by hovering the cursor.

	⚠ Sensor values in the tooltip are calculated on the basis of one message. If a sensor or its validator uses data from the previous message, the value of this sensor will be displayed incorrectly in the toSPToltip.
Save as PNG	The button allows you to save the visible area of the chart along with the coordinate axes in PNG format.
Lock charts	This button is displayed in the Dual report view mode. Activating this button allows applying the same actions to the charts simultaneously.

If the X-axis shows time, you can click any place of the chart to move to the corresponding location on the map.

Transfer from chart to messages

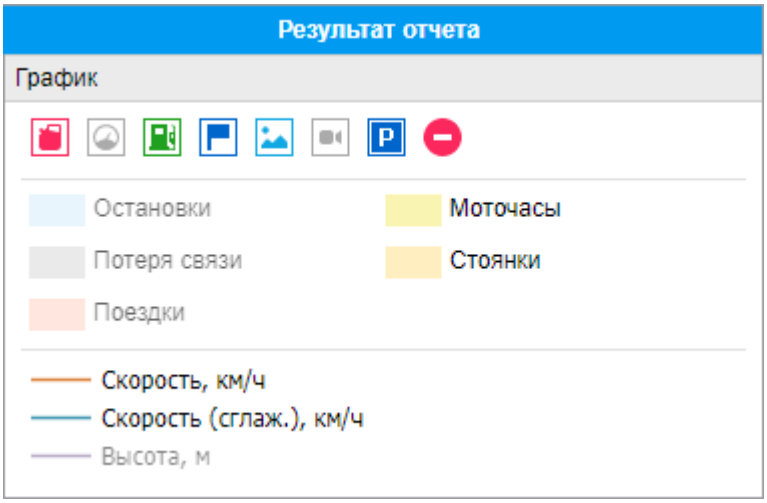
This function is useful for analyzing the source data from the unit. In order to request messages from the unit from the chart, click on the **Transfer to messages** button ( ) located on the right side of the toolbar. Click the left mouse button anywhere in the chart. As a result, you will go to the message panel with open data for the period specified in the report. Other functionality works in the same way as transfer from tabular report to messages.

When switching between charts, the state of the button automatically changes to the original one.

The rest of the buttons work the same as in the table reports.

Chart legend

A chart legend can be found in the work area. The legend is divided into sections and contains information about the selected charts and their properties. Click on the name of the element in the legend to enable or disable its display in the chart (by default, all are displayed).



Statistics

Statistics is a table consisting of two columns where the first one contains the parameters you have chosen, and the second one shows their values.

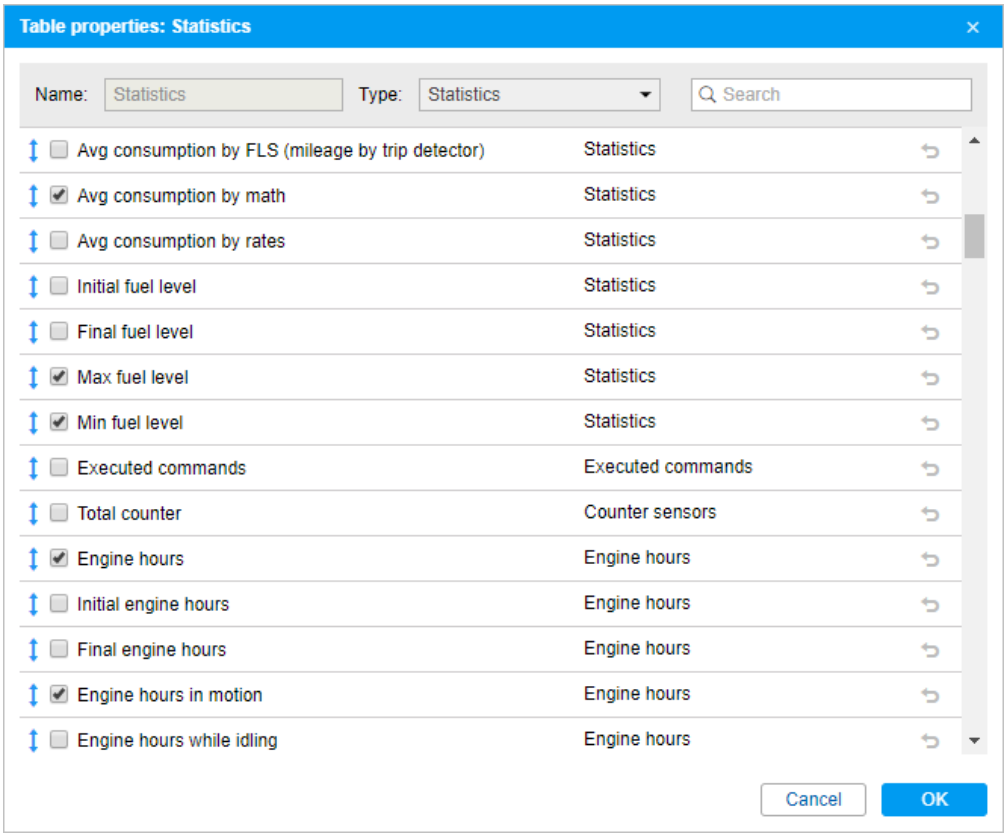
Events count	43
Executed commands	7
Parking time	386 days 3:28:31
Parkings count	139
Stops count	303
Move time	5 days 12:04:27
Mileage in trips	9093 km
Mileage (adjusted)	9093 km
Urban mileage in trips	1202 km
Suburban mileage in trips	7891 km
Initial mileage	0.00 km
Final mileage	9229 km
Average speed in trips	69 km/h
Max speed in trips	125 km/h
Trips count	139

The statistics table gives information on the report as a whole, for example, on the beginning and end of the report interval, the number of messages, the name of the unit, the time zone, the time of report execution, and other statistics, depending on the selected type of template.

To add the statistics table to a report template, click on the **Statistics** button on the Report Contents tab of its properties.

In the dialog window of the **Statistics** table properties, mark the points you want to include in the table. To find the required ones, use the dynamic search, located in the upper right corner. Search

is carried out both by the name of the line (the left column) and by the subgroup to which it belongs to (right).



To change the name of a table item, click on it with the left mouse button and make the changes.

To cancel changes, click on the **Default** button ( ). This button is inactive if the name has not been changed.

You can also change the order of the rows. To do this, drag the double arrow button to the left of the name of the line.

The statistics table is added to the list of contents of the report template. It always goes first and cannot be moved.

The following items are available for display in the statistics table for the reports of the **Units** type.

Statistics

Report — the name of the report template.

Unit — the name of the unit.

Report execution time — the time of report generation when a user executed the report online or it was generated automatically as a job or notification.

Interval beginning — the beginning of the reporting interval.

Interval end — the end of the reporting interval.

Time zone — the time zone as it is set in user settings.

Messages — the messages analyzed within the reporting period.

Mileage in all messages — the mileage in all messages according to the selected mileage counter (without filtration by the trip detector).

Consumed — the amount of consumed fuel detected by any sort of fuel sensor. If several such sensors are available, their values sum up.

Consumed by ImpFCS/AbsFCS/InsFCS/FLS/math/rates — the amount of consumed fuel detected by a fuel sensor (such as impulse/absolute/instant fuel consumption sensor, fuel level sensor) or calculated by math or rates.

Consumed by ImpFCS/AbsFCS/InsFCS/FLS/math/rates in motion — the amount of fuel consumed during the movement of the unit calculated by the methods described above. The movement is considered those intervals in which the speed value was greater or equal to the one from the Min moving speed field in the trip detector.

Consumed by ImpFCS/AbsFCS/InsFCS/FLS/math/rates without motion — the amount of fuel consumed during the time when the unit was without movement calculated by the methods described above.

Avg consumption — the average fuel consumption by any sort of fuel sensor. If several such sensors are available, their values sum up.

Avg consumption by ImpFCS/AbsFCS/InsFCS/FLS/math/rates — the average fuel consumption in trips detected by one of the methods mentioned above. It can be presented either as liters per 100 kilometers or miles per one gallon. The whole mileage of the reported interval is normally taken for these calculations. However, average consumption by FLS can take either all mileage or mileage by the trip detector.

Initial fuel level — the fuel level at the beginning of the interval.

Final fuel level — the fuel level at the end of the interval.

Max fuel level — the maximum fuel level.

Min fuel level — the minimum fuel level. More information about the fuel in reports can be found here.

Engine hours

Engine hours — the duration of the engine hours. It can be calculated by the engine hours sensor or by the ignition sensor depending on the unit properties.

Initial engine hours — the value of the engine hours at the beginning of the interval.

Final engine hours — the value of engine hours at the end of the interval.

In movement — the time interval during which the unit was in motion.

Idling — a total time interval during which the unit did not move with the engine running (idling).

Mileage in engine hours — the distance traveled during the engine hours operation.

Initial mileage in engine hours — the value of the mileage sensor at the moment of the beginning of the reporting period.

Final mileage in engine hours — the value of the mileage sensor at the end of the reporting period.

Avg engine revs — the average rate of engine revolutions.

Max engine revs — the maximum rate of engine revolutions.

Avg temperature in e/h — the average temperature during the engine hours.

Engine efficiency duration — the duration of the attached implements operation (if there is an engine efficiency sensor).

Engine efficiency idling — the engine hours minus the engine efficiency time.

Utilization — the duration of the engine hours work divided by the engine hours rate, indicated on the **Advanced** tab of the device properties.

Useful utilization — the duration of the engine efficiency divided by the engine hours rate.

Productivity — the duration of the engine efficiency divided by the engine hours duration.

Consumed in e/h — the volume of the consumed fuel detected by any sort of fuel sensor. If several such sensors are available, their values sum up.

Consumed by ImpFCS/AbsFCS/InsFCS/FLS/math/rates in e/h — the fuel volume used during the engine hours. It can be detected by a fuel sensor (such as impulse/absolute/instant fuel consumption sensor, fuel level sensor) or calculated by math or rates. More information about the fuel in reports can be found here.

Avg consumption in e/h — the average fuel consumption by any sort of fuel sensor. If several such sensors are available, their values sum up.

Avg consumption by ImpFCS/AbsFCS/InsFCS/FLS/math/rates in e/h — the average fuel consumption in the engine hours determined in accordance with a fuel sensor readings or calculated by math or rates.

Consumed by ImpFCS/AbsFCS/InsFCS/FLS/math/rates in motion — the average fuel consumption in motion.

Avg consumption by ImpFCS/AbsFCS/InsFCS/FLS/math/rates in motion — the amount of fuel consumed at idle determined in accordance with a fuel sensor readings or calculated by math or rates.

Consumed by ImpFCS/AbsFCS/InsFCS/FLS/math/rates in idle run — the fuel volume used in the engine hours during idle running determined in accordance with a fuel sensor readings or calculated by math or rates.

Avg consumption by ImpFCS/AbsFCS/InsFCS/FLS/math/rates in e/h in trips — the average fuel consumption during the work of engine hours in trips determined in accordance with a fuel sensor readings or calculated by math or rates.

Events

Events count — the number of registered events.

Fuel fillings

Total filled — the volume of fuel filled during the reporting interval.

Total registered — the registered fuel volume regardless of binding to sensors and calculation methods.

Difference — the difference between the registered and detected fillings.

Total fillings — the number of fuel fillings detected within the reporting period.

Fuel thefts

Total fuel stolen — the total volume of stolen fuel.

Total thefts — the number of thefts detected within the reporting period.

SMS messages

SMS messages — the number of SMS messages received from a unit.

Speedings

Initial mileage — the mileage sensor reading at the time of the start of the first speeding at the reporting interval. If there is no mileage sensor, the mileage is counted from 0.

Final mileage — the mileage sensor reading at the end of the speeding interval.

Parkings

Parking time — the total duration of parkings for the reporting period. Parking is determined by the trip detector. If it is disabled, the number of parkings is counted as zero.

Parkings count — the number of parkings for the reporting period.

Trips

Move time — the total duration of all trips.

Engine hours — the engine hours value.

Mileage in trips — the total distance traveled in all trips.

Mileage (adjusted) — the total mileage of the movement intervals determined by the trip detector, multiplied by mileage coefficient (the setting in the additional properties of the unit).

Urban mileage in trips — the distance traveled at a speed that is defined as the speed in the city.

Suburban mileage in trips — the distance traveled at a speed that is defined as the speed outside the city. Urban speed limit is configured in the additional settings of the unit.

Initial mileage — the mileage sensor value at the beginning of the reporting interval (it makes sense if there is an absolute odometer).

Final mileage — the mileage sensor value at the end of the reporting interval.

Toll roads mileage — the distance that a unit traveled during the trip on the roads on which the **Platon** system is used.

Toll roads cost — a sum of money (in RUB) for the toll roads mileage calculated on the basis of the covered distance and the **Platon** tariff.

Average speed in trips — the average speed in trips (total mileage divided by the time of travel).

Maximum speed in trips — the maximum speed registered during the trips.

Trips count — the number of trips.

Consumed in trips — the volume of consumed fuel detected by any sort of fuel sensor. If several sensors are available, their values sum up.

Consumed by ImpFCS/AbsFCS/InsFCS/FLS/math/rates in trips — the fuel consumed in trips. It can be detected by a fuel sensor (such as impulse/absolute/instant fuel consumption sensor, fuel level sensor) or calculated by math or rates. More information about fuel in reports can be found here.

Rates deviation by ImpFCS/AbsFCS/InsFCS/FLS in trips — the difference between the fuel consumption detected by a sensor and the fuel consumption rates.

Avg consumption in trips — the average fuel consumption by any sort of fuel sensor. If several such sensors are available, their values sum up.

Avg consumption by ImpFCS/AbsFCS/InsFCS/FLS/math/rates in trips — the average fuel consumption in trips determined in accordance with a fuel sensor readings or calculated by math or rates.

Avg mileage per unit of fuel by ImpFCS/AbsFCS/InsFCS/FLS/math/rates in trips — the average fuel consumption presented as **kilometers per liter** or as **miles per gallon**.

Violations

Violations count — the number of violations registered within the reporting period.

Executed commands

Executed commands — the number of commands sent to a unit.

Unit latest data

All the items in this section do not depend on the reporting interval. The latest information is taken at the moment of the report execution.

Mileage counter — the mileage counter value.

Engine hours counter — the engine hours counter value.

GPRS traffic counter — the consumed traffic.

Unit last location — the latest unit location detected (address or coordinates).

Last message time — the time when the latest message from the unit was received.

Visited streets

Streets count — the number of visits of streets.

Maintenance

Total maintenance duration — duration of all registered services.

Total maintenance cost — total cost of all maintenance works.

Services count — the number of services performed.

Typically, for all of the points mentioned above, you can make more detailed reports, presented in the form of tables or charts, described above.

Utilization cost

Total utilization cost — the total cost of all registered service works and fuel fillings.

Count of services and fillings — the total number of all registered service works and fuel fillings.

Counter sensors

Total counter — the sum of values of all sensors of the **counter** type.

Images

Images — the number of images received from unit. And if there are any, the resulting report contains a section with all the received images for the reporting period. Supported format is JPEG.

Eco driving

Penalties — the overall penalty for various Eco Driving criteria for the reporting period.

Rank — the received penalty points converted into a grade using a 6-point scoring system.

Video

The list of video files received from a unit.

Orders

Total orders — the total amount of orders within the indicated time period.

Orders visited — orders in which the arrival of a courier to an address is detected or any status is set.

Orders visited in time — orders in which the arrival of a courier to an address is detected on time (in advance) or any status is set.

Orders visited late — orders in which the arrival of a courier to an address is detected late or any status is set late.

Non-visited orders — orders in which the arrival of a courier to an address is not detected.

Orders fulfilled — orders in which the arrival of a courier to an address is detected, the **Confirm** status is set.

Orders fulfilled in time — orders which are fulfilled on time (in advance), the **Confirm** status is set.

Orders fulfilled late — orders which are fulfilled late, the **Confirm** status is set.

Orders visited without status — orders in which the arrival of a courier to an address is detected, a status is not set.

Orders rejected — orders for which the **Reject** status is set.

Order's avg time (estimated) — the ratio of the time calculated by the system for the delivery of all orders to the total number of orders.

Order's avg time (actual) — the ratio of time spent delivering orders to a total amount of orders.

Avg time deviation in orders — the difference between the actual and estimated average time for delivery of an order.

Order's avg mileage (actual) — the ratio of a distance covered by a courier to a total amount of orders.

Order's avg weight — the ratio of the total weight of orders to their total number.

Order's avg volume — the ratio of the total volume of orders to a total amount of orders.

Order's avg cost — the ratio of total cost of orders to a total amount of orders.

Avg fuel consumption for an order — the ratio of a total amount of fuel consumed to a total amount of orders.

Orders' estimated mileage — the total distance calculated by the system for the delivery of orders.

Orders' actual mileage — the total distance covered by a courier delivering orders.

Fuel consumed in orders — the total amount of fuel consumed while delivering orders.

Orders' total weight — the overall weight of all created orders.

Orders' total volume — the overall volume of all created orders.

Orders' total cost — the overall cost of all created orders.

Moreover, the following data may be included in the statistics for orders:

- Percentage of orders visited in time;
- Percentage of orders visited late;
- Percentage of non-visited orders;
- Percentage of orders fulfilled in time;
- Percentage of orders fulfilled late;
- Percentage of orders visited without status;
- Percentage of orders rejected.

If the report is executed not for the unit, then, depending on the type of the report template, the statistics include the data listed below.

Report template type	**Statistics data**
Unit group	Statistics: Report; Group; Interval beginning; Interval end; Report execution time.

Report template type	Statistics data
User	Statistics: Report; User; Interval beginning; Interval end; Report execution time; Logins: Time spent on site; Logins count.
Driver	Bindings: In movement; Idling; Statistics: Report; Driver; Interval beginning; Interval end; Report execution time; Orders: Total orders; Orders visited; Orders visited in time; Orders visited late; Non-visited orders; Orders fulfilled; Orders fulfilled in time; Orders fulfilled late; Orders visited without status; Orders rejected; Percentage of orders visited in time; Percentage of orders visited late; Percentage of non-visited orders; Percentage of orders fulfilled in time; Percentage of orders fulfilled late; Percentage of orders visited without status; Percentage of orders rejected; Order's avg time (estimated); Order's avg time (actual); Avg time deviation in orders; Order's avg mileage (actual); Order's avg weight; Order's avg volume; Order's avg cost; Avg fuel consumption for an order.
Trailer	Statistics: Report; Trailer; Interval beginning; Interval end; Report execution time.
Resource	Statistics: Report; Resource; Interval beginning; Interval end; Report execution time; SMS sent; SMS available.
Retranslator	Statistics: Report; Retranslator; Interval beginning; Interval end; Report execution time.
Route	Statistics: Report; Route; Interval beginning; Interval end; Report execution time.
Group of	Bindings: In movement; Idling; Statistics: Report; Group of drivers; Interval beginning; Interval end; Report execution time.

Report template type	Statistics data
drivers	
Group of trailers	Statistics: Report; Group of trailers; Interval beginning; Interval end; Report execution time.
Passengers	Statistics: Report; Passenger; Interval beginning; Interval end; Report execution time.
Group of passengers	Statistics: Report; Group of passengers; Interval beginning; Interval end; Report execution time.

⚠ The number of text messages that are displayed in the fields of the **Resource** template does not depend on the interval of report execution. The information is displayed for the period corresponding to the **Reset** option on the Services tab of the tariff billing properties.

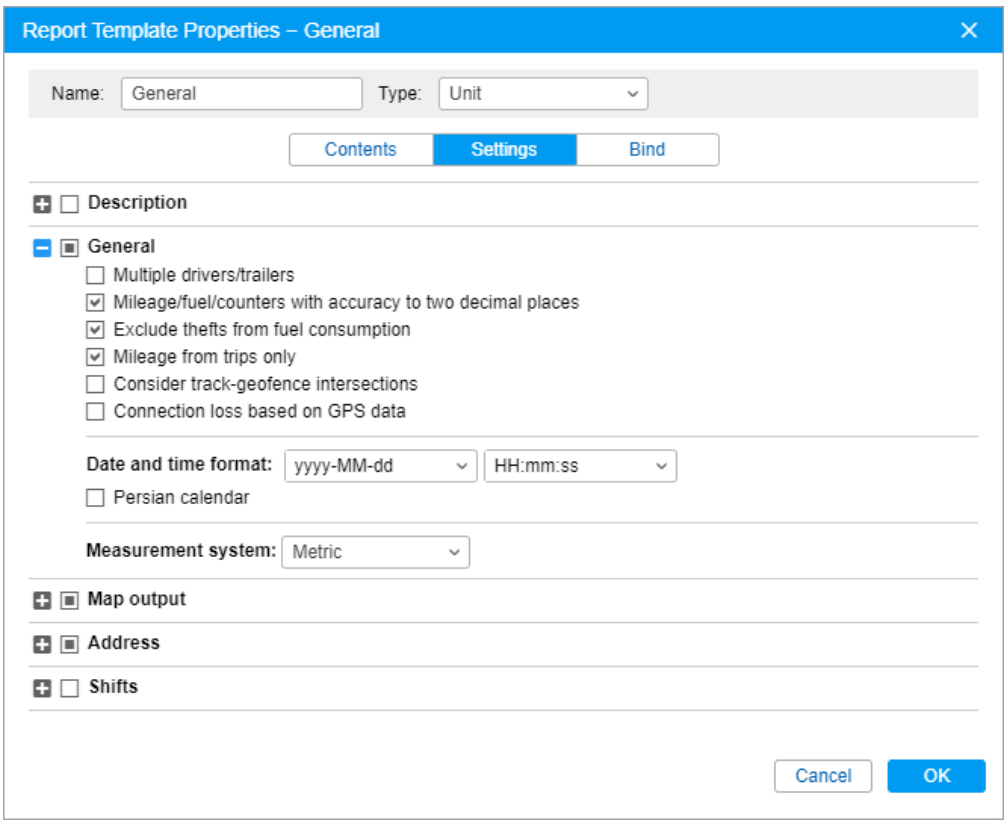
As a rule, for all of the above points, you can make more detailed reports in the form of tables or charts, described above.

Report Settings

On the **Settings** tab of the report template creation dialog, the following sections may be present depending on the type of the template:

- Description,
- General,
- Map output,

- Address,
- Shifts.



Click on the **+** button to the left of the name of the required section in order to make the adjustment. If you want to activate all the items included in the section, check its name.

Description

In the **Description** section, you can type a text which is displayed in the tooltip when pointing to the name of the report template. The text should not contain more than 10,000 characters.

General

In the **General** section, the format of the date and time, the measurement system, and also, depending on the type of the report, a number of other options are activated, described below.

Multiple drivers/trailers

This option is useful if a table added to the report template contains such columns as **Driver** or **Trailer**. If the box is not checked, then, regardless of the number of drivers/trailers appointed to a unit for the particular interval (trip, parking, etc.), only the first one is shown in the table. If the box is checked, then all the drivers/trailers appointed to a unit for the particular interval are shown in the table.

Mileage/fuel/counters with accuracy to two decimal places

This option allows you to always see all the mileage, fuel and sensor values to within two decimal places. If the option is not activated, the default settings are used: mileage is less than 20 and fuel less than 50 is output to the nearest hundredth, and the values above are indicated in whole numbers; any values of the sensor counters — only integers.

ⓘ If you see **0.00** in a cell, it means the initial value had thousands or even smaller fractions, which can be seen if you export report to XML, CSV or Excel.

Exclude thefts from fuel consumption

This option can be useful if you want to ignore thefts when calculating fuel consumption in different tables and statistics. By default, however, thefts are considered a part of fuel consumption. That is if the option is enabled, such columns as **Consumed by FLS** and **Average consumption by FLS** are calculated without considering fuel thefts.

Mileage from trips only

This option affects mileage calculation. If the checkbox is not marked, the mileage is calculated according to all messages without any filtering. If the checkbox is marked, only the part of the mileage that is considered a trip is taken into account.

Consider track-geofence intersections

This option allows detecting a visit to a geofence in case the trip had an intersection with the geofence by any segment of its track. This option can be applied to such reports as Geofences, and Rides.

Connection loss based on GPS data

This option can be applied to the **Connection problems** and **Chronology** tables, as well as to charts when selecting the background for connection loss. If the checkbox is marked, time intervals with no messages from units or messages without coordinates are shown in the corresponding reports or in charts. If no checkbox is marked, you can see only time intervals without messages.

Skip empty rows

This option allows hiding the rows without any data.

Mileage and fuel with accuracy to two decimal places

This option allows you to always see all the mileage and fuel values with an accuracy of two decimal places. If the option is not activated, the default settings are used: mileage less than 20 and fuel less than 50 are displayed to the nearest hundredth, and the values above — as whole numbers.

Date and time format

This option allows you to select a convenient format for displaying the date and time. Initially, the date and time mask parameters are taken from the User Settings dialog. However, they can be changed at your discretion.

Persian calendar

This option makes it possible to use the Persian solar calendar in the resulting report for the fields with the indicated date.

Measurement system

This option defines the metrics for such parameters as mileage, speed, fuel, and temperature in reports.

> ⓘ Depending on the measurement system selected in the report template for which the intervals filtration has been applied, you should remember that the values of filtration parameters are not converted into the corresponding values of another measurement system. Nonetheless, the metrics are changed to the corresponding metrics of the selected system. For example, if you have 50 kilometers mileage and 100 kilometers per hour speed, after choosing the US measurement system, you receive 50 miles mileage and 100 miles per hour speed.

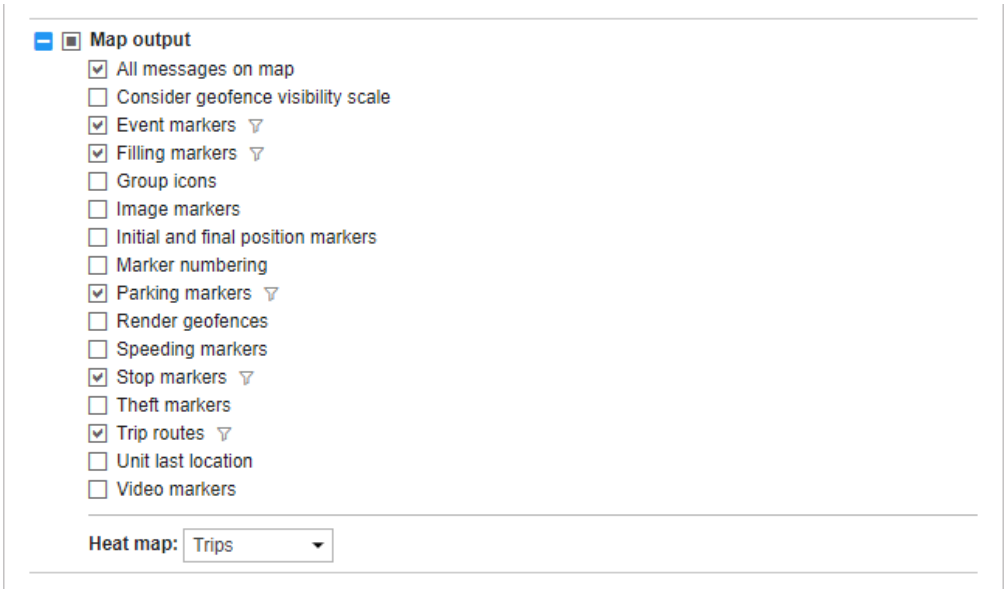
Map Output

The lines of the online report, which contain information about the location of the unit at the time of an event, are highlighted in blue. If you click on the line with the left mouse button, the message is marked on the map with a special marker, and the map, in turn, is centered on its location. A similar option works for some **Regular** charts (where the X scale represents time): when using the trace tool, you move to the message on the map.

Some elements can be drawn on the map as a part of the report. They can be selected in the **Map output** section of the report template dialog. These can be tracks traveled by unit, geofences, as well as special markers in the form of small icons which can be put in the places of events, fillings, thefts, speedings, etc. All this is configured when creating or editing a report template on the Settings tab in the **Map output** section.

Some data can also be displayed in the form of a heat map. Its color varies from blue (minimum) to red (maximum) depending on the amount of data. In the drop-down list of the **Heat map** field, select one of the options:

- all messages;
- stops;
- trips;
- speedings;
- parkings.



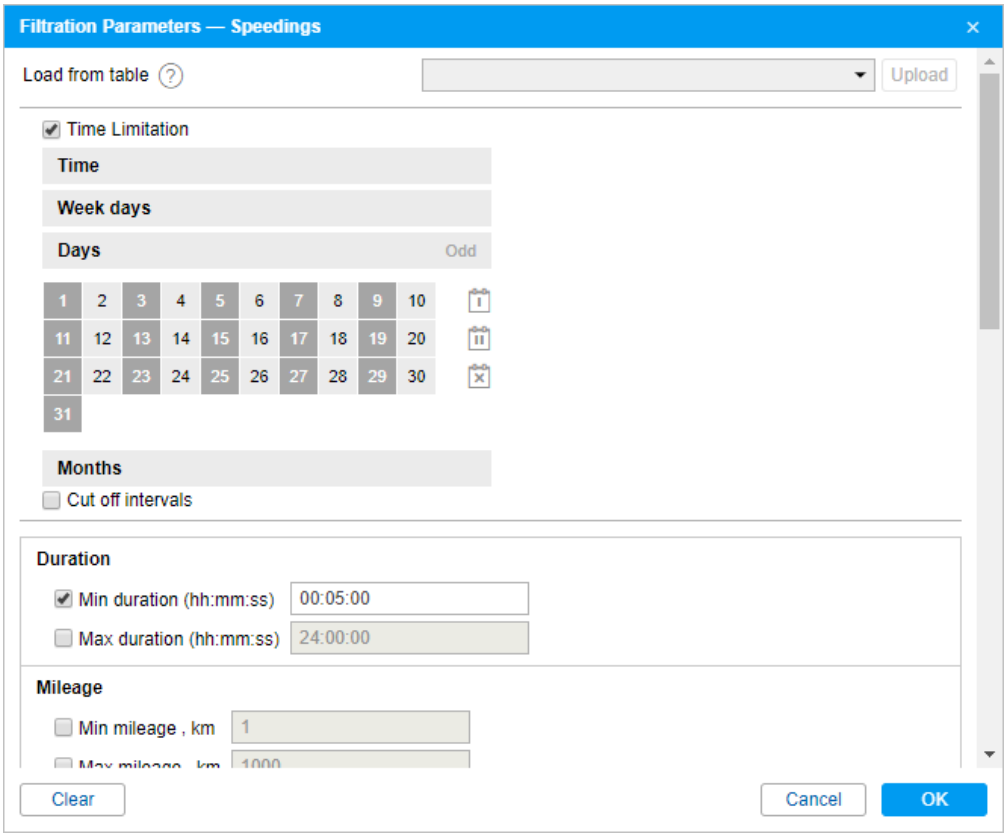
All graphical elements are shown for the current report. If generating a new report, all tracks and markers from the previous report are erased and replaced by new. When switching to other panels, all graphical elements from the current online report, as well as a map position and zoom remain on the map. To remove them, return to the **Reports** panel and click the **Clear** button. Alternatively,

the graphics of any panel can be hidden or displayed again. To do this, check the corresponding boxes in the horizontal menu. More information about using map with different panels can be found here.

Graphical elements filtration

Intervals filtration is supported for some graphical elements (e.g. markers of speedings, events, fillings, thefts, parkings, and stops, as well as trip routes) adjusted upon working with a report template. To set intervals filtration means to indicate parameters considered for displaying graphical elements on the map. The values of filtration parameters are indicated for each element individually. A set of available filtration parameters for such an element corresponds to a set used for the intervals filtration in a similar-type table.

To open the filtration parameters dialog, it is necessary to click the corresponding icon ( ) to the right of a graphical element. Note that to set the filtration parameters, it is required to check the box of a corresponding graphical element first.



If intervals filtration has been already set for a table of the corresponding type, and such a filtration needs to be set for displaying graphical elements on the map as well, you can facilitate a process of indicating the filtration parameters by uploading those applied to the table. To do so, select a corresponding table in the drop-down list (the first line of the dialog) and click **Upload**.

To reset the indicated filtration parameters, click **Clear**. To leave the dialog without applying changes, press **Cancel**. To apply selected settings, click **OK**.

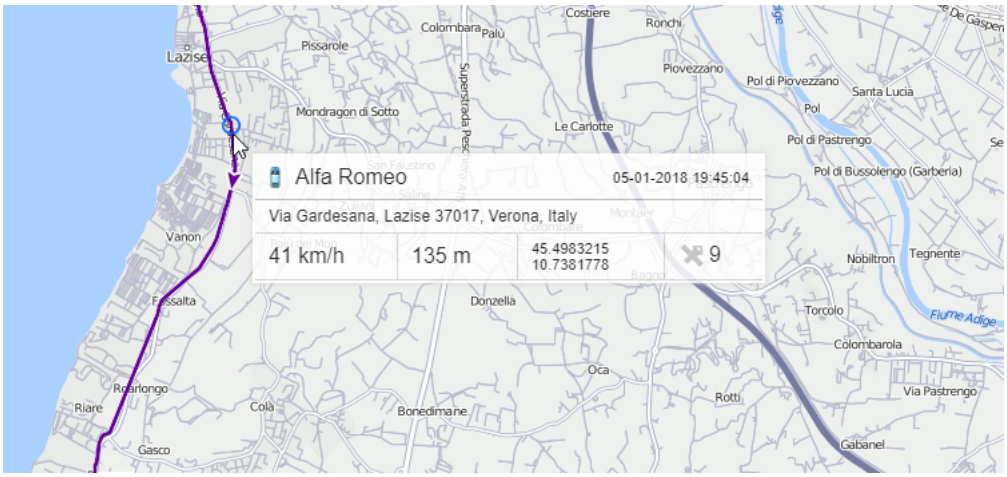
> The filtration set for displaying graphical elements on the map also affects the corresponding markers and backgrounds chosen for charts.

Tracks in reports

The routes traveled by a unit in a selected period of time can be shown on the map. To do this, select one of the options: **Trip routes** or **All messages on map** in the report template dialog. In accordance with the first option, only the intervals considered as trips (according to the Trip Detector) are displayed as tracks with different colors. In the case of the **All messages on map** option, all the messages with valid coordinates are converted into a track regardless of trips, parkings, stops, etc. If in the unit history there are intervals where the connection was lost (there were no messages for a long time) or coordinates were not determined in messages, such intervals are displayed with a dashed line.

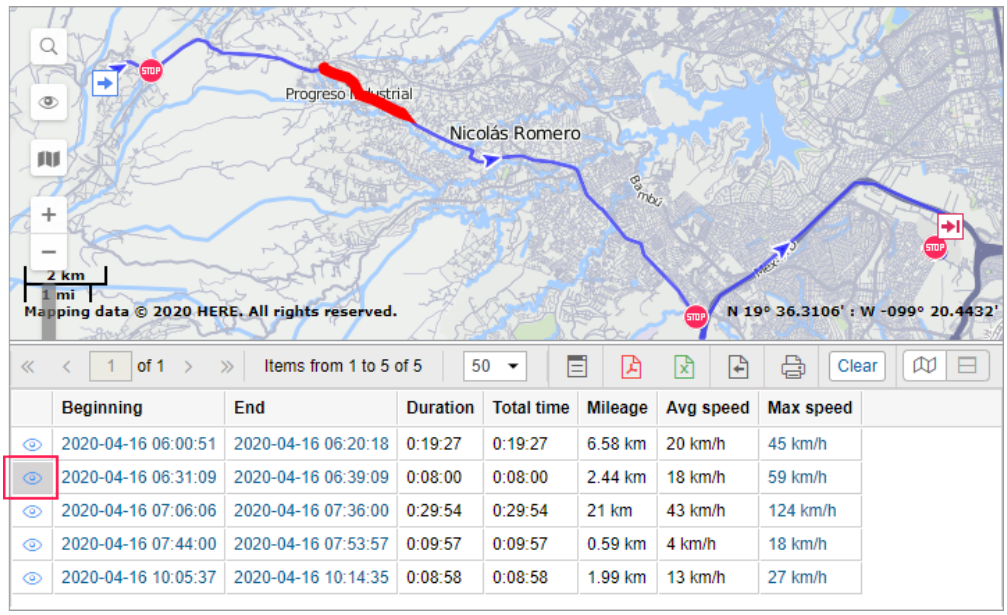
You can configure the track color (by trips, single, by speed or by sensor) in the Track colors section on the **Advanced** tab of the unit properties. When the **All messages on map** option in the report template is enabled, the color setting by trips does not work.

Besides, to get the information about track points, hover the mouse cursor over and see the information in a tooltip (time, speed, coordinates, altitude, sensor values). Note that messages are searched in the radius of 50 pixels to the cursor.



If you enable the **Trip routes** or **All messages on map** option in a report on units or unit groups, then such tables as **Engine hours**, **Rides**, **Speedings**, **Trips** have an additional first column with icons in the form of an eye. After clicking on the icon, the map is centered on the corresponding

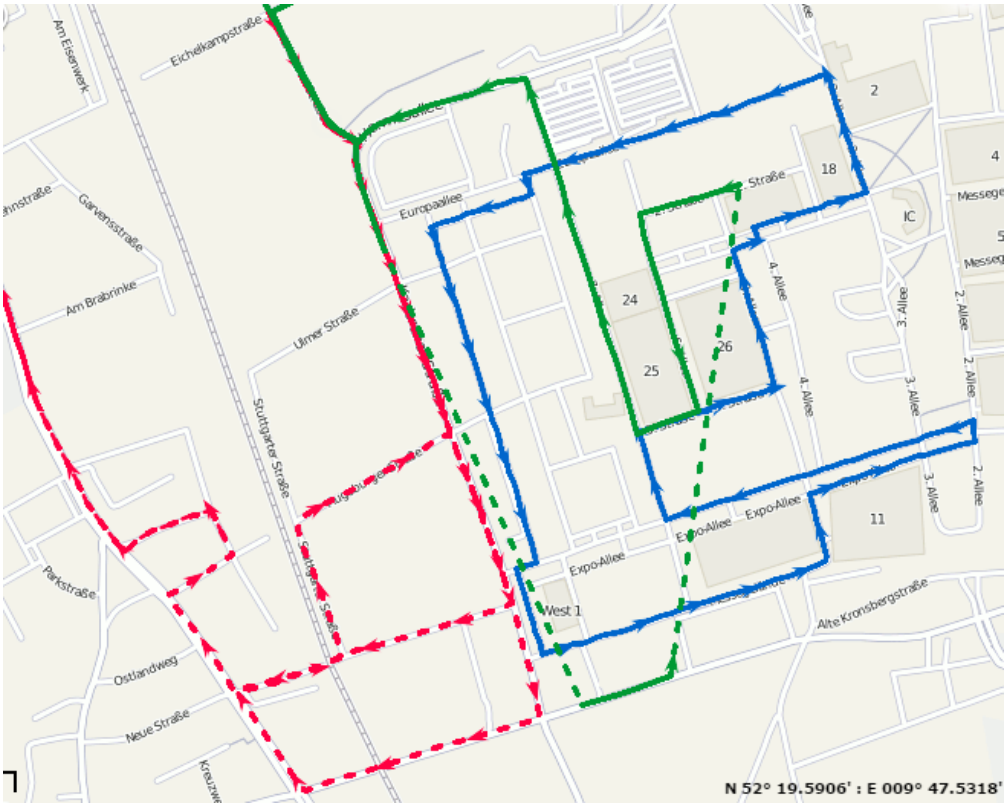
segment of the track which is highlighted with a red line. This function is also available for the **Trips** table in reports on drivers.



1 of 1 | Items from 1 to 5 of 5 | 50 | Clear

Beginning	End	Duration	Total time	Mileage	Avg speed	Max speed
2020-04-16 06:00:51	2020-04-16 06:20:18	0:19:27	0:19:27	6.58 km	20 km/h	45 km/h
2020-04-16 06:31:09	2020-04-16 06:39:09	0:08:00	0:08:00	2.44 km	18 km/h	59 km/h
2020-04-16 07:06:06	2020-04-16 07:36:00	0:29:54	0:29:54	21 km	43 km/h	124 km/h
2020-04-16 07:44:00	2020-04-16 07:53:57	0:09:57	0:09:57	0.59 km	4 km/h	18 km/h
2020-04-16 10:05:37	2020-04-16 10:14:35	0:08:58	0:08:58	1.99 km	13 km/h	27 km/h

Tracks can be rendered for units groups, too (see the Advanced Reports section). It is reasonable to assign different colors for units in a group to differentiate them on the map. However, note that the number of simultaneously drawn messages can be limited by your service provider.



Geofences in reports

Created geofences can be a part of a report. They are displayed on the map if you check the **Render geofences** box in the **Map** section of the report template.

Geofences are displayed with their captions and images or icons (if you have selected any). The color and the font size of the caption is taken from their properties. Apart from that, additional options can be applied to geofences.

Group icons.
The geofences that overlap each other can be replaced by one conditional item, and its tooltip contains detailed information. The same can be applied to markers.

Consider geofence visibility scale.
By default, all the geofences are rendered on the map. However, they can be seen or hidden according to their visibility parameter set in the properties.

⚠ Geofences are taken only from the same account as the report template itself.

Markers in reports

Most types of reports can have additional information visualized on the map with the help of special markers. To get these markers in a report, select the required markers in a report template.

The table below presents all possible markers and their icons.

	Parking marker	Marks a location where, according to the trip detector, a parking takes place. A tooltip shows the beginning of a parking time and parking duration.
	Stop marker	Marks a location where, according to the trip detector, a stop takes place. A tooltip shows the beginning of a stop time and stop duration.
	Filling marker	Marks a location where, according to sensors data, a fuel filling takes place. A tooltip shows filling time and the amount of fuel filled.
	Theft marker	Marks a location where, according to the sensors data, a fuel theft takes place. A tooltip shows theft time and the amount of fuel stolen.
	Event marker	Marks the locations where events were automatically registered by means of notifications. The events registered manually, including fuel fillings, are also shown by such markers if a location (and preferably a description) is indicated during event registration. A tooltip shows the event time and the text of the event.
	Violation marker	If you select event markers, then both event and violation markers are to be displayed because a violation is a special case of an event.
	Speeding marker	Marks a location where speed limits indicated in the unit properties were violated. A tooltip shows the initial time of the speeding interval (i.e. the time of receiving the first message with a speed value exceeding the allowed one), the allowed speed (indicated in the unit properties), the value of speeding and the total duration of a speeding interval.

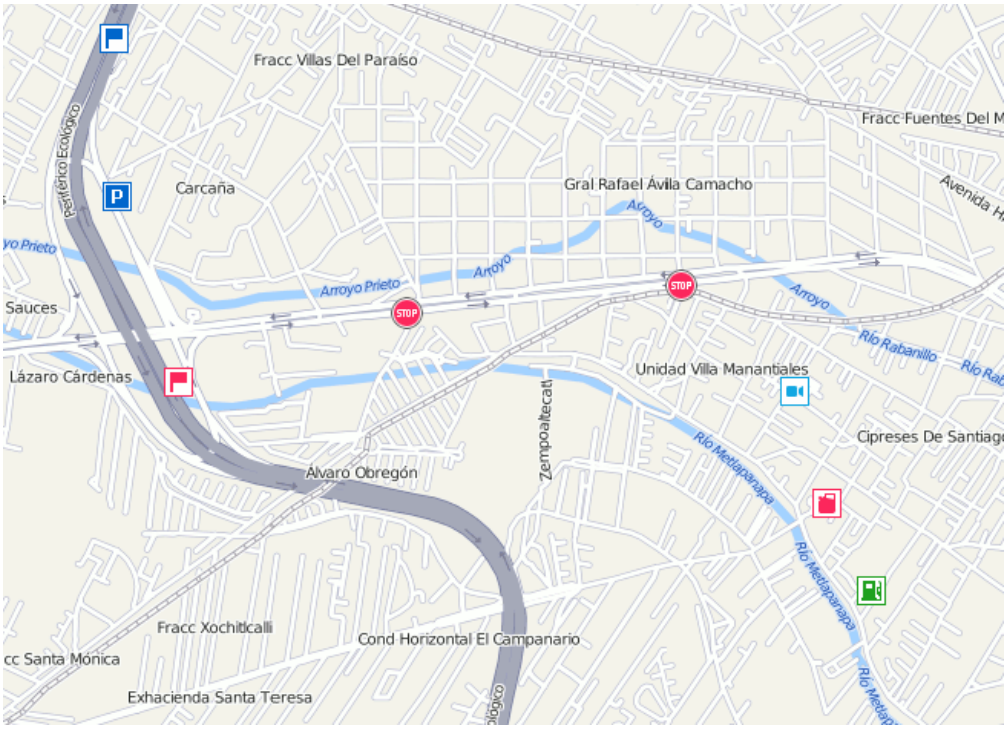
	Image marker	Marks a location where pictures from a unit were received.
	Video marker	Marks a location where videos from a unit were received.

The panoramic images of the territory can be displayed when clicking on the markers of parkings and stops. For this, maps with panoramas (for instance, Yandex Panorama or Google Street View) should be selected in user settings. If there are pictures of the territory with the coordinates of the marker, when pointed at it, the cursor changes from **arrow** to **hand**. Click on the marker to open a panorama snapshot in the window of the Address tool. Double-click on another such marker to update the information.

When enabling event markers, in addition to event markers you get violation markers because a violation is a special case of an event.

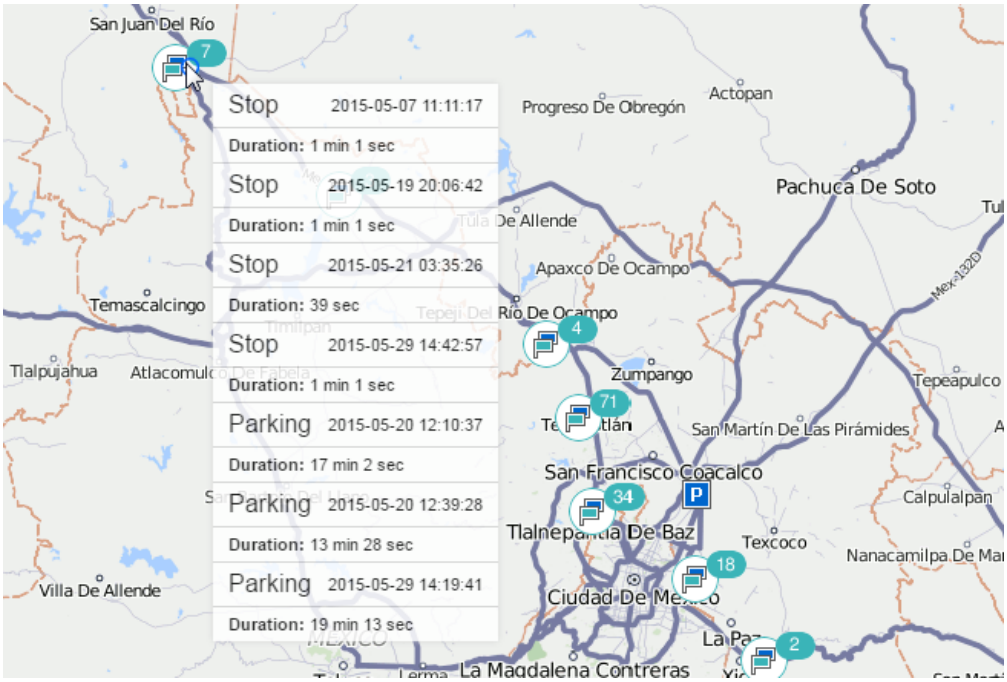
Markers appear on the map after a report is generated. If you see no markers, it means there are no events of the indicated type or the current map scale is not enough (try to zoom in).

When you hover the mouse cursor over a marker, you see additional information in a tooltip: for stops and parkings — starting time and duration, for events and violations — time and notification text, for fillings and thefts — time and fuel volume, for speedings — starting time, speed limitation as it is defined in unit properties, how much the speed is exceeded, and duration of this speeding.

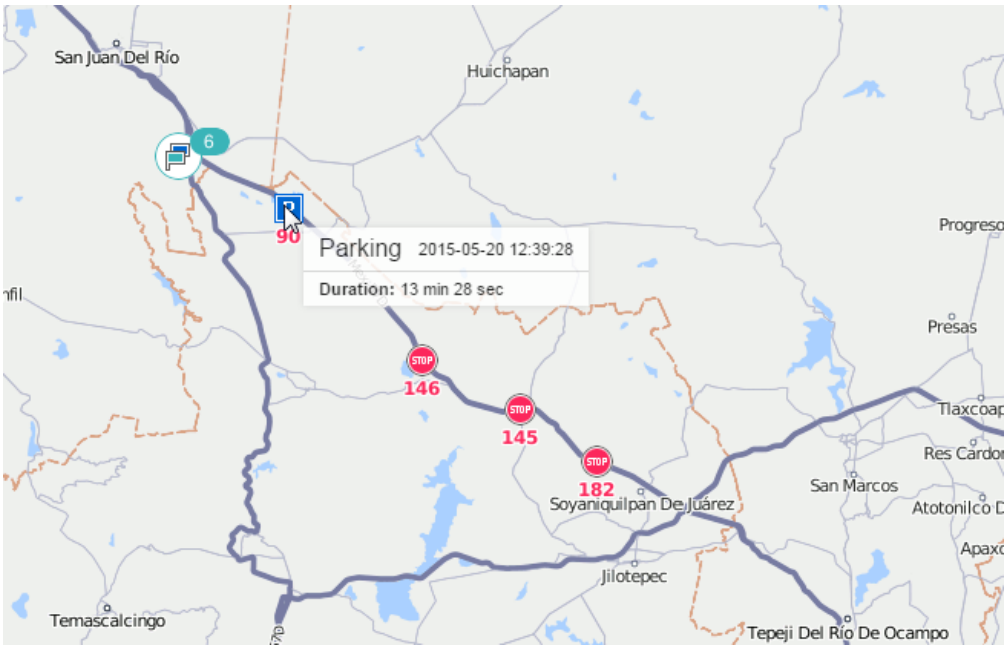


Markers, as well as geofences, can be grouped in case they overlap each other. To enable grouping, activate the **Group icons** option in the report template. If there are 1000 or more markers, their grouping is enabled automatically. The group icon shows the number of grouped elements. In the icon tooltip, you can see the detailed information about the events.

> If more than 100 markers are grouped, the tooltip contains only their names without the detailed information.



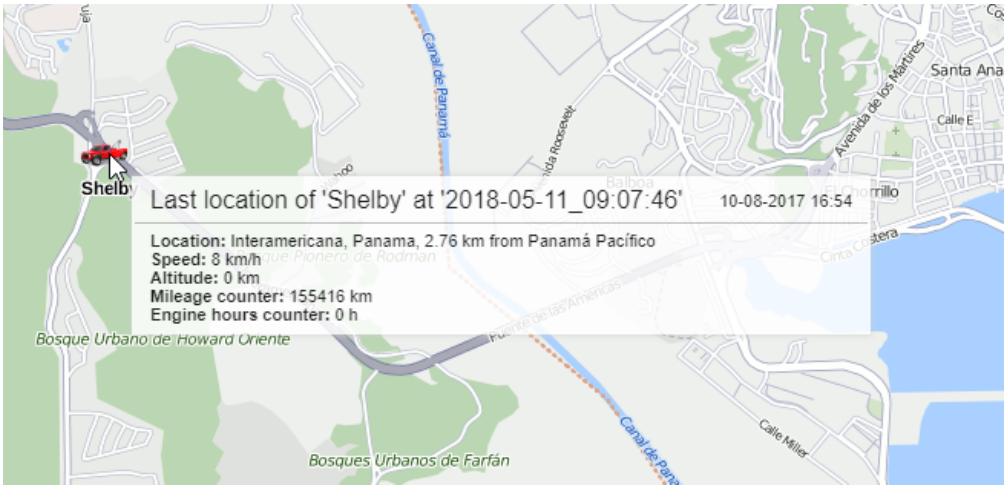
You can enable the **Marker numbering** option in a report template. In this case, each marker has its sequence number which is indicated below the marker in red color. Numbers are assigned chronologically, and each marker type has its own enumeration.



Unit last location

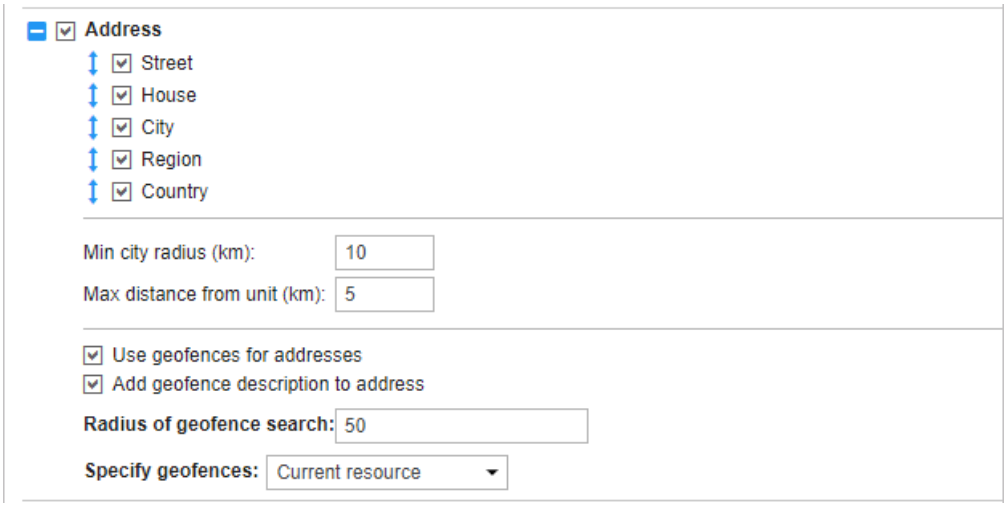
The last location of the unit can be displayed on the map. To enable this feature, select the **Unit last location** checkbox in map output settings of the report template. The last location does not depend on the reported interval, it is taken from the latest message received from the unit. Units are displayed on the map by their icons or by motion state signs (depending on the user settings)

as well as by their names considering the Unit label color option. In the pop-up tooltip you can find the time when the message was received, the speed at that point, altitude, and the values of mileage and engine hours counters.



Address

Many reports use the following address information: initial or final location of the unit during the trip, the place of a fuel filling or theft, the position during parking or stop, location where the connection was lost, message received, event registered, etc. Both the map selected as geodata source and the created geofences can be used as the source of the address information.



Addresses from map

Specify the format for displaying the address information. To do this, select which elements of the address should be displayed (country, region, city, street, and house are available), and arrange them in the preferred order, pulling up or down the double arrow ↕. If none of the five items is selected, the coordinates are displayed.

This format is especially relevant if the units are moving around the city. For addresses outside the city (near roads), the following two settings are important:

Min radius

If at a distance indicated as the maximum distance from the unit, no city is found, the address is bound to another city. The radius of the city, which can get into the address information, is indicated in this parameter. It may be required, for example, that only large cities appear in addresses.

Max distance from unit

If the unit is on the road and at a specified distance from it there is a city, the name of the road and the distance to this city get to its address.

If you find inaccurate address information in the reports, you can update the map of your region/ city. To do this, send a new map of your region in the proper format to the technical support.

Addresses from geofences

Sometimes maps may not contain the exact addresses in certain regions. In such cases, you can use geofences as addresses. Besides, you can specify your own names for certain addresses.

If the **Use geofences for addresses** option is activated, additional parameters become available. In particular, you can choose to display geofence's description alongside with its name (the **Add geofence description to address** option). To see the distance at which the unit is away from the geofence, specify the **radius of geofence search**. The maximum allowable value is 100 km or miles (depending on the selected system of measures).

The range of geofences used as addresses is adjustable. By default, all geofences that belong to the same resource as the report template are used. However, geofences from **all** available resources can be used if necessary. Alternatively, to narrow this range, you can specify a particular group of geofences to be used (it should be created in the same resource as the report template itself). Select the option in the **Specify geofences** drop-down list (groups of geofences are displayed in square brackets).

If the geofences are selected as addresses, but the location of the unit is not found, the address information is taken from the map and is formed according to the parameters specified above. When two geofences overlap each other, a smaller one is selected for the address.

ⓘ To work with these options, activate the Geofences service in the account properties.

Shifts

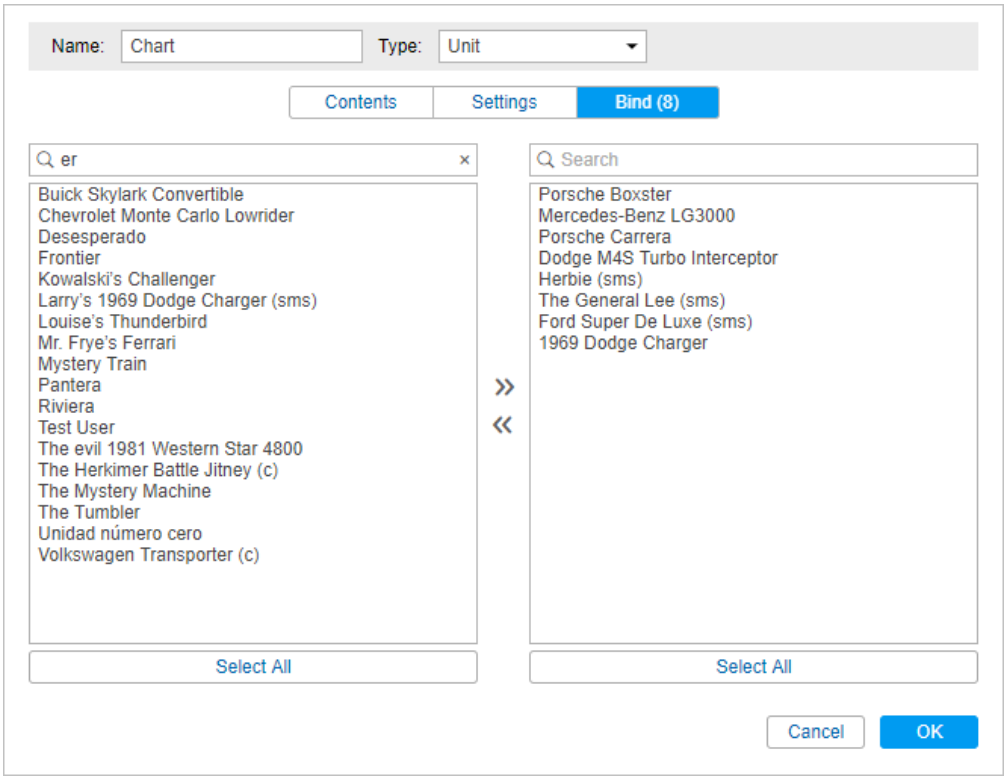
If the option is enabled, the information in the report is structured according to the shifts you specify. For example, a transport company has a vehicle and two drivers. According to calculations, the profit from vehicle usage comes only if it is used in two shifts: from 9 a.m. till 7 p.m., and from 9 p.m. till 7 a.m. Assume that we are interested in the report on trips during these shifts and information about what happened during the rest of the time is not important. So, it is necessary to adjust shifts correspondingly and mark the checkboxes in order for this setting to be used. Moreover, for this particular situation, it is necessary to apply grouping by shifts and use intervals retrieving.

If you need the events that occurred in a shift, that finishes in a new day, to be attributed by the system to the previous day (that is to the day of its beginning), enable the **Do not split overnight shifts** option.

Regardless of the shift settings, the report displays data only for the specified interval.

Binding Objects

Depending on its type, a report template can be bound to specific system objects and their groups (units, drivers, trailers, and passengers). Binding allows you to restrict the list of items for which the report is run.



To move the required items from the left list to the right one, double-click on them or click on the right arrow. For the convenience of search, you can use the dynamic filter above the list. The numeric indicator in parentheses next to the name of the tab indicates the number of bound objects.

Thus, when generating a query from the template, the drop-down list contains only those objects that have been bound. If a group is bound to the report template, all the objects belonging to the group are displayed in the drop-down list.

Advanced Reports

ⓘ To create advanced reports, activate the **Advanced reports** module.

Advanced reports include reports of the following types:

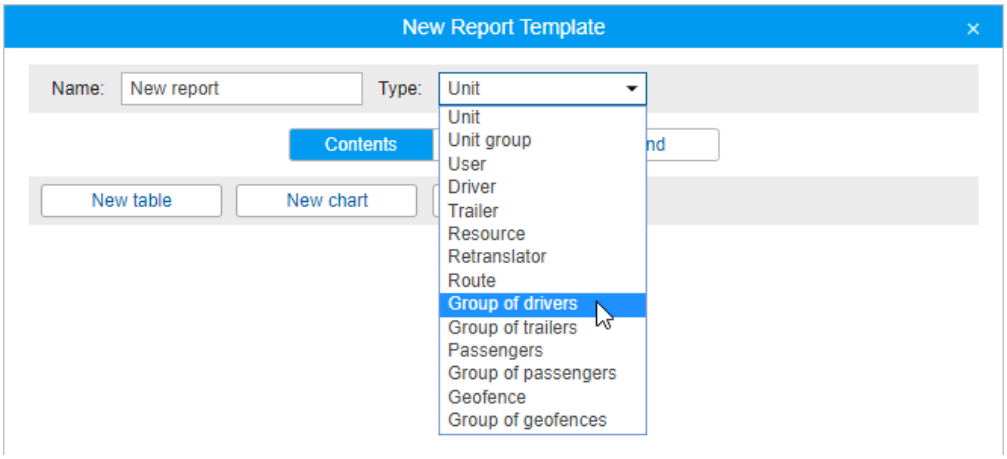
- Unit group;
- User;
- Driver;
- Group of drivers;
- Trailer;
- Group of trailers;
- Passengers;

- Group of passengers;
- Geofence;
- Group of geofences.

Besides, they include the **Logins** table from the report of the **Resource** type.

> ⚠ Advanced reports do not include the Log table from the reports of the **Unit groups** and **User** types.

You can select the type of advanced report in the **Type** drop-down list of its template.



Reports on Unit Groups

Data from several units can be gathered in one report if these units are from a unit group. To get a report on several units, select the **Unit group** type for the report template.

The functionality of these reports is very similar to reports on separate units but has a number of peculiarities and restrictions.

In the **Unit group** reports the following features are **available**:

- Any tables except **Messages tracing**;
- Graphical elements on the map: geofences, markers, unit last location icons, tracks and all messages on the map;
- Some graphs in the Statistics: **Report**, **Group**, **Interval beginning**, **Interval end**, **Report execution time**;
- Advanced options: U.S. measurement units, address format, etc.

All tables available for units are available for unit groups as well. Besides, the Unit latest data table is available for unit groups **only**. Moreover, the **Eco driving** report on unit groups contains a unique column Rating by violations.

In the **Unit group** reports the following features are **not available**:

- Charts;
- Most of the statistics excluding those mentioned above.

Note that if in the Total line of the unit group report you want to receive the correct data on the initial or final fuel levels, such parameter as **Unit** should occupy the main position (drag to the top) in the grouping list of the report template.

Tables for unit groups

There are some peculiarities in configuring tables for unit groups. The first column of the table shows the list of all units included into a selected group (in alphabetical order). This column is put in front of all the other ones indicated in a template. The **Count** column (if included in the report template) shows the number of events registered for the reporting period of a given unit.

Below is an example of a table on parkings for a group of 5 units. The table provides us with the following data: the beginning of the first parking, the end of the last parking, the summarized duration of all parkings for the reported period. Every line is dedicated to a single unit.

№	Grouping	Beginning	End	Duration	Count
1	Picasso	2012-08-27 18:17:00	2012-08-30 09:01:56	1 days 21:59:47	5
2	ShootingStar	2012-08-27 18:17:01	2012-08-30 09:01:57	1 days 21:52:35	4
3	SMS Sim004	2012-08-27 18:17:00	2012-08-31 13:49:22	2 days 23:39:11	6
4	SMS Sim007	2012-08-27 18:17:01	2012-08-30 09:01:56	1 days 21:52:34	4
5	Vliegende	2012-08-27 18:17:01	2012-08-30 09:01:57	1 days 21:52:35	4

If the option of detalization is applied, the nesting level appears. This means that you can expand the contents of a basic line ('+' at the beginning of a line, or the corresponding number in the heading of the column) and see the detailed list of events for a given unit. The number of hidden lines corresponds to the number in the **Count** column.

Unit > Detalization

	№	Grouping	Beginning	End	Duration	Count
⊞	1	Picasso	2012-08-27 18:17:00	2012-08-30 09:01:56	1 days 21:59:47	5
⊟	2	ShootingStar	2012-08-27 18:17:01	2012-08-30 09:01:57	1 days 21:52:35	4
.....	2.1	ShootingStar	2012-08-27 18:17:01	2012-08-28 09:03:05	14:46:04	1
.....	2.2	ShootingStar	2012-08-28 18:20:05	2012-08-29 09:13:58	14:53:53	1
.....	2.3	ShootingStar	2012-08-29 14:46:16	2012-08-29 15:01:16	0:15:00	1
.....	2.4	ShootingStar	2012-08-29 17:04:19	2012-08-30 09:01:57	15:57:38	1
⊞	3	SMS Sim004	2012-08-27 18:17:00	2012-08-31 13:49:22	2 days 23:39:11	6
⊞	4	SMS Sim007	2012-08-27 18:17:01	2012-08-30 09:01:56	1 days 21:52:34	4
⊞	5	Vliegende	2012-08-27 18:17:01	2012-08-30 09:01:57	1 days 21:52:35	4

In addition to detalization, you can apply the grouping by years/months/weeks/days/shifts. In this case, the table data is grouped by a selected time interval. If several grouping intervals are chosen, they are arranged in several levels of nesting. If grouping is set, detalization can be found on the final level of nesting, and it still shows a detailed list of events for a given unit.

Unit > Date > Detalization

	№	Grouping	Beginning	End	Duration	Count
⊞	1	Picasso	18:17:00	2012-08-30 09:01:56	1 days 21:59:47	5
⊞	2	ShootingStar	18:17:01	2012-08-30 09:01:57	1 days 21:52:35	4
⊟	3	SMS Sim004	18:17:00	2012-08-31 13:49:22	2 days 23:39:11	6
⊞	3.1	2012-08-27	18:17:00	2012-08-28 09:03:04	14:46:04	1
⊞	3.2	2012-08-28	18:20:05	2012-08-29 09:13:57	14:53:52	1
⊟	3.3	2012-08-29	11:20:00	09:01:57	16:20:54	3
	3.3.1	SMS Sim004	11:20:00	11:27:13	0:07:13	1
	3.3.2	SMS Sim004	14:46:15	15:02:17	0:16:02	1
	3.3.3	SMS Sim004	17:04:18	2012-08-30 09:01:57	15:57:39	1
⊞	3.4	2012-08-30	12:11:01	2012-08-31 13:49:22	1 days 1:38:21	1
⊟	4	SMS Sim007	18:17:01	2012-08-30 09:01:56	1 days 21:52:34	4
⊞	4.1	2012-08-27	18:17:01	2012-08-28 09:03:04	14:46:03	1
⊞	4.2	2012-08-28	18:20:06	2012-08-29 09:13:58	14:53:52	1
⊟	4.3	2012-08-29	14:46:16	09:01:56	16:12:39	2
	4.3.1	SMS Sim007	14:46:16	15:01:17	0:15:01	1
	4.3.2	SMS Sim007	17:04:18	2012-08-30 09:01:56	15:57:38	1
⊞	5	Vliegende	18:17:01	2012-08-30 09:01:57	1 days 21:52:35	4

To expand the enclosed information, click on the plus-shaped button at the beginning of each line. It is also possible to expand the nested levels by clicking the corresponding numbers-buttons in the heading of the nesting column. To hide all the expanded lines, click on the button '1'.

If there is no data for the given unit, all the cells (except for the name) contain only dashes. In some cases it is not convenient, so you can disable such uninformative lines. To do so, enable the **Skip empty rows** option in the report template.

Unit latest data

This kind of table is available only for unit groups. As for the separate units, this information is available in the statistics. The table presents the last location and the values of their counters.

The following columns can be selected to form the table.

Column	Description
Grouping	The column with the names of the units (appears automatically).
Last message	The time when the latest message from the unit was received.
Last coordinates	The time when the last message with valid coordinates was received (not always coincides with the previous column).
Location	The address or coordinates of the last location.
Speed	The speed according to the last message.
Mileage	The mileage counter value.
Engine hours	The value of the engine hours counter.
Traffic	The value of the GPRS traffic counter.
Driver	The name of the driver (if detected).
Trailer	The name of the trailer (if detected).
Notes	An empty column for your custom comments.

Grouping	Last message	Last coordinates	Location	Speed	Mileage	Traffic
Picasso	2016-03-09 17:59:51	2016-03-09 17:59:51	Narciso Mendoza, Sinaloa 81217	6 km/h	1641475 km	0 B
ShootingStar	2016-03-09 17:59:51	2016-03-09 17:59:51	Culiacán, Sinaloa	30 km/h	125943 km	759.55 MB
SMS Sim004	2016-03-09 17:59:51	2016-03-09 17:59:51	Aguaruto Centro, Sinaloa 80308	18 km/h	32489 km	0 B
SMS Sim007	2016-03-09 17:59:52	2016-03-09 17:59:52	Culiacán, Sinaloa	0 km/h	399187 km	2.48 MB
Vliegende	2016-03-09 17:51:26	2016-03-09 17:51:26	Hermosillo, Sonora	34 km/h	377776 km	0 B

By default, the latest information refers to the time of the report execution. However, the latest information at the end of the report interval can also be displayed. To do this, enable the **Consider report interval** checkbox in the template.

Apart from that, the filtration by geofences/units can be used for this report. This allows to quickly find the units which are situated in a certain place or close to other units.

The last location can be visualized on the map by unit icons — activate the Unit last location option in the report template.

Reports on Users

Several tables and charts can be generated for users.

In the Statistics the following fields are available: report template name, user name, reporting interval (beginning/end), report execution time, total time spent in the system, and logins count.

Log table

A set of columns for this table matches the one used in the same report on units.

Logins table

This kind of table shows what services the user logged in and how often. The table can contain the following columns.

Column	Description
Login time	The time when the user logged on to one of the services.
Logout time	The time when the user exited the service.
Duration	The time interval the user was online.
Host	The address of the computer from which the user logged in.
Site	The name of the service where the user logged in.
Count	The number of logins.
Notes	The empty column for custom notes.

Login time	Logout time	Duration	Host	Site
10 Aug 2015 15:04	10 Aug 2015 15:04	0:00:00	212.98.173.148	hosting.wialon.com
10 Aug 2015 15:04	10 Aug 2015 15:05	0:00:18	212.98.173.148	hosting.wialon.com
10 Aug 2015 15:05	10 Aug 2015 15:05	0:00:26	212.98.173.148	hosting.wialon.com
10 Aug 2015 15:05	10 Aug 2015 15:05	0:00:02	212.98.173.148	hosting.wialon.com
10 Aug 2015 15:06	10 Aug 2015 15:09	0:02:58	212.98.173.148	hosting.wialon.com
10 Aug 2015 15:07	10 Aug 2015 15:09	0:01:17	212.98.173.148	hosting.wialon.com
11 Aug 2015 15:09	11 Aug 2015 15:15	0:06:01	212.98.173.148	hosting.wialon.com
12 Aug 2015 14:09	12 Aug 2015 19:27	5:17:39	212.98.173.148	hosting.wialon.com
12 Aug 2015 14:10	12 Aug 2015 14:12	0:02:04	212.98.173.148	hosting.wialon.com
17 Aug 2015 15:36	17 Aug 2015 15:41	0:04:13	212.98.173.148	hosting.wialon.com
18 Aug 2015 16:04	18 Aug 2015 16:04	0:00:06	212.98.173.148	hosting.wialon.com

The same settings as for all the other tables can be applied to the user logins table: grouping, detalization, row numbering, total row, and time limitations. In the example below, you can see the user logins table with grouping by days, detalization, numbering, and total row.

Date › Detalization

	№	Grouping	Login time	Logout time	Duration	Host	Site	Count
⊞	1	10 Aug 2015	10 Aug 2015 09:40	10 Aug 2015 15:09	5:25:19	-----	-----	9
⊞	2	11 Aug 2015	11 Aug 2015 15:09	11 Aug 2015 15:15	0:06:01	-----	-----	1
⊞	3	12 Aug 2015	12 Aug 2015 14:09	12 Aug 2015 14:12	5:19:43	-----	-----	2
⊞	4	17 Aug 2015	17 Aug 2015 15:36	17 Aug 2015 15:41	0:04:13	-----	-----	1
⊟	5	18 Aug 2015	18 Aug 2015 16:04	18 Aug 2015 19:54	1:25:44	-----	-----	4
┆	5.1	18 Aug 2015 16:04	18 Aug 2015 16:04	18 Aug 2015 16:04	0:00:06	212.98.114.112	hosting.wialon.com	1
┆	5.2	18 Aug 2015 16:04	18 Aug 2015 16:04	18 Aug 2015 17:21	1:17:24	212.98.114.112	hosting.wialon.com	1
┆	5.3	18 Aug 2015 16:38	18 Aug 2015 16:38	18 Aug 2015 16:40	0:02:08	212.98.114.112	hosting.wialon.com	1
└	5.4	18 Aug 2015 19:48	18 Aug 2015 19:48	18 Aug 2015 19:54	0:06:06	212.98.114.112	hosting.wialon.com	1
⊞	6	20 Aug 2015	20 Aug 2015 13:58	20 Aug 2015 13:59	0:37:41	-----	-----	2
⊞	7	21 Aug 2015	21 Aug 2015 17:49	21 Aug 2015 18:08	0:18:51	-----	-----	1
	-----	**Total**	**10 Aug 2015 09:40**	**21 Aug 2015 18:08**	**13:17:32**	-----	-----	**20**

One report can display logins of more than one user. However, in this case, the report type should not be **User** but **Resource**. All the users that belong to an account for which such a report is executed, get into the report. See the example:

User › Detalization

	Grouping	Login time	Logout time	Duration	Count
⊞	Forbidden User	2013-09-25 11:24:30	2015-05-15 17:24:01	1:54:30	10
⊞	Hog's Head	2014-08-11 16:22:49	2014-08-11 18:00:21	1:37:32	1
⊞	adols	2015-05-12 12:40:04	2015-05-20 20:00:16	0:05:00	3
⊞	bidden	2014-07-02 11:13:53	2015-05-06 15:09:40	0:04:31	3
⊟	demo	2014-01-17 17:10:25	2015-05-20 19:13:52	0:11:42	4
┆	demo	2014-01-17 17:10:25	2014-01-17 17:11:24	0:00:59	1
┆	demo	2015-05-18 12:16:34	2015-05-18 12:27:04	0:10:30	1
┆	demo	2015-05-20 17:08:02	2015-05-20 17:08:08	0:00:06	1
└	demo	2015-05-20 19:13:45	2015-05-20 19:13:52	0:00:07	1
⊞	little	2014-05-07 10:26:47	2015-05-18 13:40:48	2:16:36	6

Custom fields table

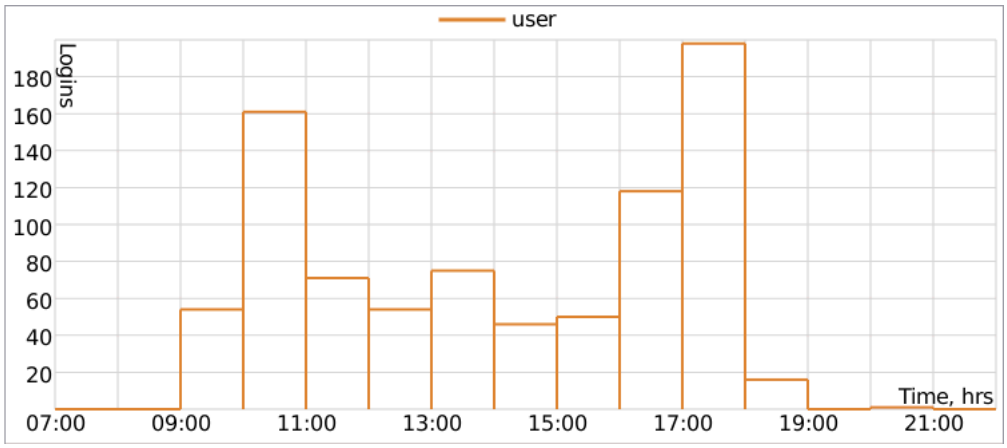
The **Custom fields** table represents the list of custom fields entered in the corresponding tab of the user properties dialog. This report has the same characteristics as the same report for units and groups.

Name	Value
dispatcher	yes
region	Furmankan, East 7 Road
shift	2
units under control	17
working schedule	13:00-17:00, 18:00-22:00

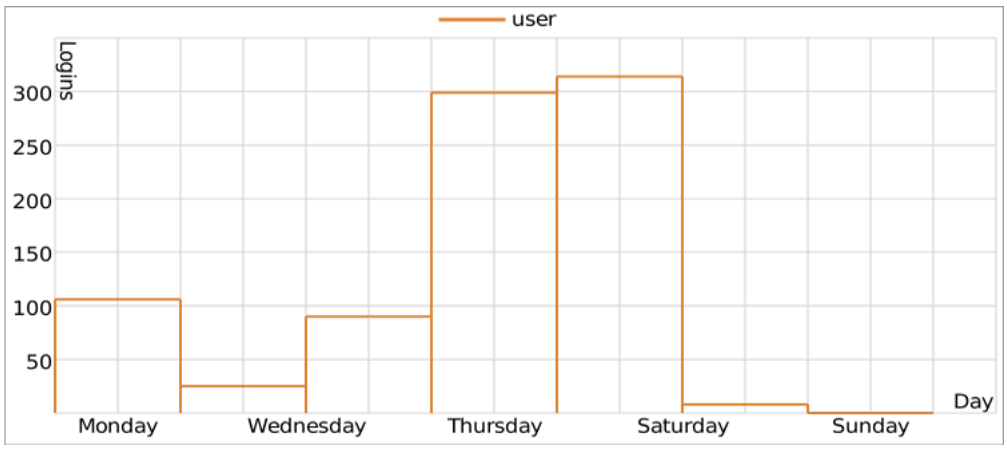
Charts applied to users

Two kinds of charts can be attached to the report on user logins: Logins/Hours and Logins/Days of the week. To get these charts, click the **Add chart** button and select the type in the dropdown list of the report template.

The **Logins/Hours** chart shows the frequency of the user's logons to the system at different times (hours):



The **Logins/Days of week** chart shows how often the user logged to the system on different days of the week:



Reports on Drivers

The following types of tables can be applied to drivers:

- Bindings;
- Custom fields;
- Driver activity;
- Eco driving;
- Infringements;
- Orders;
- SMS messages;
- Trips.

To generate reports on drivers or driver groups, the **Query reports or messages** access right to the resource which these drivers or groups belong to is required. Moreover, a driver and a report template should belong to the same resource.

Bindings

The **Bindings** table shows when and to which unit the driver was assigned, how long his work shifts lasted, how much fuel was spent, the distance traveled, etc.

The following columns can be included in this kind of report.

Column	Description
Unit	The name of the unit to which the driver was bound.
Beginning	The date and time when the driver was bound to the unit.

Column	Description
Initial location	The initial position, that is, the address at that moment (if available).
End	The date and time when the driver was unbound from the unit.
Final location	The final position, the address at that moment (if available).
Duration	The duration of a work shift.
Total time	The time from the beginning of the first shift to the end of the last shift.
Engine hours	The total amount of engine hours for a working interval of the driver.
Engine hours in movement	The number of engine hours for the interval of movement with the bound driver. ⓘ The movement is considered those intervals in which the speed value was greater or equal to the one from the Min moving speed field in the trip detector.
Engine hours in idle run	The number of engine hours for the interval of idling with the bound driver.
Mileage	The distance traveled within the period.

Column	Description
Mileage (adjusted)	The mileage taking into account the coefficient set in the unit properties on the **Advanced** tab.
Urban mileage	The distance traveled in the urban area.
Suburban mileage	The distance traveled in the suburban area. It is calculated in regards to speed. The urban/suburban speed line is indicated in Unit Properties –> Advanced (the **Urban speed limit** setting).
Avg speed	The average speed on a given interval.
Max speed	The maximum speed registered within this work shift.
Counter	The value of the counter sensor.
Status	The status of the unit registered during the interval (if there are several, the first one is displayed).
Violations	The number of violations.
Count	The number of bindings found on a given interval.
Consumed	The amount of fuel consumed in total for all fuel sensors.
Consumed by...	The volume of consumed fuel detected by any fuel sensor (such as impulse/absolute/instant fuel consumption sensor, fuel level sensor) or calculated by math or rates.

Column	Description
Avg consumption	The average fuel consumption, determined from the available fuel sensors.
Avg consumption by...	The average fuel consumption in the trip detected by one of the methods mentioned above.
Initial fuel level	The fuel level at the beginning of the work shift.
Final fuel level	The fuel level at the end of the work shift.
Penalties	The penalties calculated for the adjusted Eco driving criteria.
Rank	The penalty points, converted into a grade using a 6-point rating system.
Notes	An empty column for your custom comments.

In addition, in the report template to the right of the list of columns, you can specify the units to which the report is applied. If no units are selected in this section, the report will be applied to all available units.

The report is designed in such a way that the first column is the list of units to which the driver was bound. It is recommended to apply the detalization option to this table to get a possibility to expand any unit and see more detailed information about all work shift.

Unit | Detalization

	Grouping	Unit	Beginning	End	Duration	Violations	Count
⊟	SMS Sim004	-----	18.03.2016 11:00	18.03.2016 11:55	0:40:15	3	3
┆	18.03.2016 11:00	SMS Sim004	18.03.2016 11:00	18.03.2016 11:10	0:10:05	2	1
┆	18.03.2016 12:00	SMS Sim004	18.03.2016 11:20	18.03.2016 11:35	0:15:03	0	1
└	18.03.2016 13:00	SMS Sim004	18.03.2016 11:40	18.03.2016 11:55	0:15:07	1	1
⊟	Fish Boat	-----	18.03.2016 15:00	18.03.2016 15:55	0:35:14	4	3
┆	18.03.2016 15:00	Fish Boat	18.03.2016 15:00	18.03.2016 15:10	0:10:05	1	1
┆	18.03.2016 16:00	Fish Boat	18.03.2016 15:30	18.03.2016 15:45	0:15:05	2	1
└	18.03.2016 17:00	Fish Boat	18.03.2016 15:45	18.03.2016 15:55	0:10:04	1	1
⊟	Picasso	-----	18.03.2016 18:00	18.03.2016 18:55	0:45:19	2	3
┆	18.03.2016 18:00	Picasso	18.03.2016 18:00	18.03.2016 18:15	0:15:10	1	1
┆	18.03.2016 19:00	Picasso	18.03.2016 18:20	18.03.2016 18:25	0:05:04	0	1
└	18.03.2016 20:00	Picasso	18.03.2016 18:30	18.03.2016 18:55	0:25:05	1	1

To determine the intervals of binding, the messages from the unit are also taken into account. If there are such messages, they are considered to be of more priority than the messages about binding (the intervals are counted according to them).

Custom fields

The **Custom fields** represents the list of custom fields entered in the corresponding tab of the driver's properties. It can be generated for an individual driver, as well as for the whole group.

The following columns are available.

Column	Description
Name	Custom field name.
Value	Custom field value.
Notes	An empty column for your custom comments.

Name	Value
Age	30
Category	A, B, C
Driving experience	10
Phone number	+345458796541

Driver activity

The **Driver Activity** table shows such information as the type of driver's action, the crew of a vehicle, the state of the tachograph cards. It may include the following columns.

Column	Description
Beginning	The date and time when activity begins.
Card	The state of the digital tachograph (inserted/not inserted).
Activity	The type of driver's activity (rest, work, driving, available, not available).

Column	Description
Source	The source of data, which is used to generate information about driver activity. The following column values are available: **E** — the data about trips is used; **T** — the tachograph data is used; **U** — the data about driver unbinding is used; **None** — the data source is unknown.
Unit	The name of the unit to which the driver is bound.
Driving	The time of driving.
Work	The hours of active work (time spent by the driver on vehicle repair, fuel filling, etc.).
Availability	The hours of passive work (time spent by the second driver in the moving vehicle).
Rest	The time for rest of the driver (vehicle is stopped, the driver rests in a specially designated place).
Overall work	The total time spent by the driver on such actions as driving, work, reserve.
Slot	The slot for digital tachograph card (Driver or Co-driver).
Status	The vehicle crew size (single/crew).
Daily mileage	The distance covered by the bound driver during the day (24 hours).

Beginning	Card	Activity	Driving	Work	Availability	Rest	Slot	Status
01.04.2014 18:37	Inserted	Rest	0:00:00	0:00:00	0:00:00	8:23:00	Driver	Single
02.04.2014 03:00	Inserted	Rest	0:00:00	0:00:00	0:00:00	3:24:00	Driver	Single
02.04.2014 06:24	Inserted	Work	0:00:00	0:48:00	0:00:00	0:00:00	Driver	Single
02.04.2014 06:25	Inserted	Driving	2:47:00	0:00:00	0:00:00	0:00:00	Driver	Single
02.04.2014 09:12	Inserted	Rest	0:00:00	0:00:00	0:00:00	0:42:00	Driver	Single
02.04.2014 09:14	Inserted	Driving	1:22:00	0:00:00	0:00:00	0:00:00	Driver	Single
02.04.2014 10:36	Inserted	Rest	0:00:00	0:00:00	0:00:00	0:46:00	Driver	Single
02.04.2014 11:22	Inserted	Driving	1:49:00	0:00:00	0:00:00	0:00:00	Driver	Single
02.04.2014 13:11	Inserted	Rest	0:00:00	0:00:00	0:00:00	2:48:00	Driver	Single
02.04.2014 15:59	Inserted	Driving	6:06:00	0:00:00	0:00:00	0:00:00	Driver	Single

While creating this report template, you should select in the parameters of the table the way to determine driver activity: DDD files (are sent by the tachograph), online data (generated online on the basis of the events of bindings and trips) or bindings and trips (messages are used as the source). If the **Bindings and trips** option is selected, the result of the report changes when you change the settings of the trip detector, delete messages, bind and unbind, etc.

Eco driving

In addition to the information contained in the same-name report on unit, the table includes a column with the name of the unit to which a driver is bound.

Infringements

This report shows information on the violation of labor routine by the driver. It may include the following columns.

Column	Description
Time	Date and time of violation recording.
Infringement	Type of driver's activity the conditions of which have been violated.
Description	A short description of the infringement.
Seriousness	The extent of the infringement.

Column	Description
Unit	The name of the unit to which the driver is bound.
Quantity	The number of violations. If the grouping option is activated, this column shows the total number of violations for the selected interval.

№	Time	Infringement	Description	Seriousness
1	05.04.2014 22:58	Rest period	Insufficient daily rest period of less than 11 h	Serious
2	22.04.2014 20:23	Rest period	Insufficient reduced daily rest period of less than 9 h	Very serious
3	02.05.2014 12:13	Rest period	Insufficient weekly rest period of less than 45 h	Very serious
4	05.05.2014 02:33	Rest period	Insufficient split daily rest period of less than 3 h + 9 h	Very serious
5	23.06.2014 23:57	Driving time	Exceeded extended daily driving time of 10 h	Minor
6	30.11.2014 14:44	Rest period	Insufficient weekly rest period of less than 45 h	Minor
7	21.01.2015 18:18	Rest period	Insufficient reduced daily rest period of less than 9 h	Minor
8	22.01.2015 20:30	Rest period	Insufficient split daily rest period of less than 3 h + 9 h	Very serious
9	23.01.2015 05:58	Driving time	Exceeded extended daily driving time of 10 h	Very serious
10	23.01.2015 09:25	Break	Exceeded uninterrupted driving time of 4 h 30 min	Minor

While creating this report template you should choose in the parameters of the table a driver activity source: DDD files (are sent by the tachograph), online data (are formed online on the basis of the events of bindings and trips) or bindings and trips (messages are used as the source). If the **Bindings and trips** option is selected, the report's result changes in case of changes in the trip detector's settings, deleting messages, bindings, and unbindings, etc.

Orders

This report is similar to the report for a unit.

SMS messages

This report shows the correspondence of the dispatcher with the driver via SMS. The dispatcher (operator) can send messages to the driver from the Wialon interface through a special SMS window. The driver sends messages from his mobile phone. This mobile phone number must be indicated in the driver's properties.

The following columns can be included in the table.

Column	Description
Time	The date and time when the message arrived.
Type	The message type: **sent** (message sent by the dispatcher) or **received** (message received from the driver).
Text	The text of the message.
Phone	The phone number of the driver.
Modem phone	The phone number of the modem that sent/received an SMS.

Time	Type	Text	Phone	Modem phone
2011-11-04 11:40:13	Sent	5 orders in Central park area.	+375299000200	-----
2011-11-04 11:40:16	Recieved	OK	+375299000200	+375000000000
2011-11-04 11:40:44	Sent	Ready?	+375299000200	-----
2011-11-04 11:40:47	Recieved	5 min	+375299000200	+375000000000
2011-11-04 11:41:00	Recieved	Got jammed	+375299000200	+375000000000
2011-11-04 11:43:11	Sent	Richard Wagner st., 7a, entrance 3; Strombringer ave., 354; West 6th st., 1667;	+375299000200	-----
2011-11-04 11:43:40	Sent	Opera house, back entrance; Kings parkway, 47.	+375299000200	-----
2011-11-04 11:44:07	Recieved	Accepted	+375299000200	+375000000000
2011-11-04 14:44:14	Recieved	Route finished	+375299000200	+375000000000
2011-11-04 14:47:43	Recieved	SOS. Broke down. Between Kings Parkway and 47th East street.	+375299000200	+375000000000

Trips

The **Trips** table displays the location, duration, speed, and other parameters and may include the following columns.

Column	Description
Beginning	The date and time when the trip began.
Initial location	The address where the device was at the beginning of the trip.
Initial coordinates	The geographical coordinates of the location of the unit at the beginning of the trip (in decimal degrees).

Column	Description
End	The date and time when the trip ended.
Final location	The address where the device was at the end of the trip.
Final coordinates	The geographical coordinates of the location of the unit at the end of the trip (in decimal degrees).
Driver	The name of the driver bound to the unit (the column is shown only in the report on the group of drivers).
Unit	The name of the unit used in the trip.
Trailer	The name of the trailer (if bound).
Duration	The time interval of the trip.
Engine hours	The time of the operation of engine hours during the trip.
Mileage	The distance traveled during the whole trip.
Mileage (adjusted)	The mileage taking a coefficient set in unit properties (the **Advanced** tab) into account.
Urban mileage	The distance traveled in the urban area.
Suburban mileage	The distance traveled in the suburban area (i.e. at high speed). The urban/suburban speed line is indicated in the Unit Properties —> Advanced (the **Urban speed limit** setting).

Column	Description
Avg speed	The average speed within the trip.
Max speed	The maximum speed registered within the interval.
Trips count	The number of completed trips.
Consumed	The volume of consumed fuel detected by any sort of fuel sensor. If several such sensors are available, their values sum up.
Consumed by...	The volume of consumed fuel detected by a fuel sensor (such as impulse/absolute/instant fuel consumption sensor, fuel level sensor) or calculated by math or rates. More information about fuel in reports can be found here.
Rates deviation by...	The difference between consumed fuel detected by a sensor and consumption rates. If a number in this cell is negative, it means the detected consumption does not exceed the indicated rates.
Avg consumption	The average fuel consumption by any sort of fuel sensor. If several such sensors are available, their values sum up.
Avg consumption by...	The average fuel consumption during the trip detected by one of the methods mentioned above.
Avg consumption in idle run by...	The average fuel consumption during the idle run.

Column	Description
Avg mileage per unit of fuel by...	The average fuel consumption (per one liter/gallon) detected by one of the methods mentioned above.
Initial fuel level	The fuel level at the beginning of the trip.
Final fuel level	The fuel level at the end of the trip.
Max fuel level	The maximum fuel level during the trip.
Min fuel level	The minimum fuel level during the trip.
Penalties	The penalties calculated for the adjusted Eco driving criteria.
Rank	The received penalty points converted into a grade using a 6-point scoring system.
Notes	An empty column for your custom comments.

Additional possibilities

For the **Binding** and **SMS messages** tables, you can apply grouping by days/weeks/months, but you need to take into account that in these tables only one level of nesting is possible, i.e. at the first level - units, on the second — generalized information for the specified date/week/month (the second level is not disclosed).

In addition, you can query statistics for the reports, where the following fields are possible: report template name, driver name, report interval (beginning and end), and report generation time.

Tracks of the driver's movements can be displayed on the map.

Most tables can be generated for a group of drivers.

Unit > Trailer > Date > Detalization

	Grouping	Unit	Beginning	End	Duration	Count
⊟	Ducati	-----	2014-06-17 16:03:30	2016-03-18 23:59:59	13:04:36	3
⊞	Michael Schumacher	-----	2016-03-18 13:32:48	2016-03-18 23:59:59	10:27:11	1
⊞	Valentino Rossi	-----	2014-06-17 16:03:30	2016-03-14 18:40:17	2:36:47	1
⊞	Vin Diesel	-----	2016-03-18 13:31:48	2016-03-18 13:32:26	0:00:38	1
⊟	Honda	-----	2014-02-18 11:27:05	2016-03-18 13:32:30	15:00:35	3
⊞	Valentino Rossi	-----	2016-03-18 13:32:01	2016-03-18 13:32:30	0:00:29	1
⊟	Casey Stoner	-----	2014-02-18 11:27:05	2016-03-18 13:33:06	15:00:06	2
⊞	2010-02-18	-----	2010-02-18 11:27:05	2010-02-20 16:27:11	05:00:06	1
⊞	2011-03-18	-----	2011-03-18 13:33:06	2011-03-18 18:33:06	05:00:00	1
⊟	2012-03-18	-----	2012-05-10 13:33:06	2012-05-10 18:33:06	05:00:00	2
	2012-03-18 13:33:06	Honda	2016-03-18 13:33:06	2016-03-18 15:30:00	02:02:54	1
	2012-03-18 13:33:06	Honda	2016-03-18 15:30:00	2016-03-18 18:33:06	02:57:06	1

⚠ The **Total** row cannot be used in reports for driver and trailer groups.

Reports on Trailers

Two tables can be created for trailers:

- Bindings,
- Custom Fields.

ⓘ To generate reports on trailers or trailer groups, the **Query reports or messages** access to the resource to which these trailers or groups belong to is required. Moreover, the trailer and the report template should belong to the same resource.

Bindings

This table shows working intervals of the selected trailer if it was bound to a unit. It comes along with the information on fuel consumed, distance traveled, etc. The parameters of this table and possible columns are the same as in a similar table for drivers, but it doesn't contain the **Violations** column and columns with information about engine hours. The Bindings table can be also generated for trailer groups — it gives a possibility to build complicated four-level reports (trailers –> units –> dates/weeks/months –> single bindings). More information about bindings for driver groups can be found here.

Unit > Trailer > Date > Detalization

	Grouping	Unit	Beginning	End	Duration	Count
⊟	Ducati	-----	2014-06-17 16:03:30	2016-03-18 23:59:59	13:04:36	3
⊞	Comfortable house 1	-----	2016-03-18 13:32:48	2016-03-18 23:59:59	10:27:11	1
⊞	Comfortable house 2	-----	2014-06-17 16:03:30	2016-03-14 18:40:17	2:36:47	1
⊞	Comfortable house 3	-----	2016-03-18 13:31:48	2016-03-18 13:32:26	0:00:38	1
⊟	Honda	-----	2014-02-18 11:27:05	2016-03-18 13:32:30	15:00:35	3
⊞	Modern equipment	-----	2016-03-18 13:32:01	2016-03-18 13:32:30	0:00:29	1
⊟	Mixing machine	-----	2014-02-18 11:27:05	2016-03-18 13:33:06	15:00:06	2
⊞	2010-02-18	-----	2010-02-18 11:27:05	2010-02-20 16:27:11	05:00:06	1
⊞	2011-03-18	-----	2011-03-18 13:33:06	2011-03-18 18:33:06	05:00:00	1
⊟	2012-03-18	-----	2012-05-10 13:33:06	2012-05-10 18:33:06	05:00:00	2
	2012-03-18 13:33:06	Honda	2016-03-18 13:33:06	2016-03-18 15:30:00	02:02:54	1
	2012-03-18 13:33:06	Honda	2016-03-18 15:30:00	2016-03-18 18:33:06	02:57:06	1

Custom fields

This table presents the list of custom fields created in the trailer properties. It can be generated for an individual trailer, as well as for the whole group.

№	Name	Value
1	Mileage	55000
2	Model	Bambi
3	Year	2007

Reports on Passengers

The **Bindings** report can be generated on passengers.

> ⓘ To generate reports on passengers and groups of passengers, it is necessary to possess the **Query reports or messages** access right towards the resource to which these passengers belong. Moreover, a passenger (passengers) and a report template should belong to the same resource.

The **Bindings** table may include the time and location of the passengers boarding/leaving a vehicle, name of the unit used by passengers, duration of a trip, etc.

Column	Description
Beginning	The time a passenger was bound to a unit.
Initial location	The location of the passenger when binding to a unit.

Column	Description
End	The time the passenger was unbound from a unit. If the unbinding happened automatically and the **Show and mark as incomplete** parameter is selected in the table as the action for an incomplete interval, **Unknown** is shown in the field.
Final location	The location of the passenger when unbinding from a unit. If the unbinding happened automatically and the **Show and mark as incomplete parameter** is selected in the table as the action for an incomplete interval, a dash is shown in the field.
Mileage	The distance the passenger travelled by the time they were unbound from a unit.
Unit	The name of the unit to which the passenger was bound.
Driver	The name of the driver of the unit to which a passenger was bound.
Duration	The time the passenger spent on the trip (time between binding and subsequent unbinding). In case of an automatic unbinding, **0:00:00** is indicated in this field.

Beginning	Initial location	End	Final location	Mileage	Unit	Driver	Duration
2019-06-12 12:36:00	Mittelfeld 30519	2019-06-12 13:50:00	Mittelfeld 30519	39 km	Bus 123	Jack	1:14:00
2019-06-13 05:47:01	Laatzen 30880	2019-06-13 08:53:57	Mittelfeld 30521	102 km	Bus 417	Samuel	3:06:56
2019-06-13 16:44:00	Nordstadt 30167	2019-06-13 19:24:00	Burg 30419	143 km	Bus 25	Louis	2:40:00
2019-06-14 12:00:00	Dömitz 19303	2019-06-14 13:14:00	Uelzen 29525	60 km	Bus 3	Roger	1:14:00
2019-06-15 13:11:01	Obernholz 29386	2019-06-15 16:17:57	Wrestedt 29559	23 km	Bus 7	Thomas	3:06:56
2019-06-15 19:10:05	Burgwedel 30938	2019-06-15 21:50:05	Gifhorn 38518	46 km	Bus 103	Mark	2:40:00

Reports on Geofences

To execute reports on geofences and groups of geofences, the user should have the **Query messages or reports** and the **View geofences** access rights to the resource to which the geofences belong. Besides, the **View item and its basic properties** and the **Query messages or reports** rights to the unit or units are required.

A template of the report on geofences and groups of geofences can contain a table of one type only: the **Units** table.

The **Units** table shows the information about what units visited the geofence or group of geofences, at what time they did it, how long they stayed there, at what speed they moved, etc.

When creating a template, you must select a unit or units which supposedly visited the geofence or group of geofences in the table settings.

The **Units** table can include the following columns.

Column	Description
Unit	The name of the unit which visited the geofence.
Type	The type of the geofence (polygon, circle, or line).
Area	The area of the geofence.
Perimeter	The perimeter of the geofence. In the case of a line, its length is considered to be the perimeter, that is, its thickness is not taken into account.
Description	The description of the geofence (is taken from the geofence properties).
Time in	The time when the unit entered the geofence.
Time out	The time when the unit left the geofence.

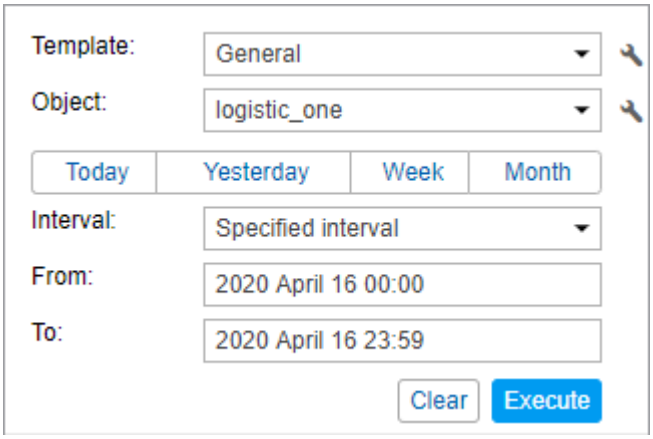
Column	Description
Duration in	The time the unit stayed in the geofence.
Total time	The time from the beginning of the first visit to the end of the last one.
Parkings duration	The total parking time in the geofence.
Off-time	The time during which the unit was outside the geofence from the first exit to the last entrance to the geofence.
Mileage	The mileage inside the geofence.
Mileage (adjusted)	The mileage adjusted to the coefficient specified on the **Advanced** tab of the unit properties.
Off-mileage	The mileage outside the geofence from the first exit to the last entrance to the geofence.
Off-mileage (adjusted)	The off-mileage adjusted to the mileage coefficient.
Avg speed	The average speed of the unit inside the geofence.
Max speed	The maximum speed of the unit inside the geofence.
Driver	The name of the driver if they were assigned to the unit.
Visits	The number of visits to the geofence for the specified period.

Unit	Type	Area	Perimeter	Time in	Time out	Duration in	Mileage
Honda Civic 6519	Polygon	116.97 ha	4.59 km	2019-12-05 09:05:17	2019-12-05 09:08:26	0:03:09	1.11 km
BMW 735i	Polygon	116.97 ha	4.59 km	2019-12-05 09:05:58	2019-12-05 09:06:38	0:00:40	0.00 km
Honda Civic 6519	Polygon	116.97 ha	4.59 km	2019-12-05 09:08:40	2019-12-05 09:22:12	0:13:32	2.22 km
BMW 735i	Polygon	116.97 ha	4.59 km	2019-12-05 09:21:58	2019-12-05 09:22:38	0:00:40	0.00 km
Buckaroo's rocket car	Polygon	116.97 ha	4.59 km	2019-12-05 09:24:28	2019-12-05 09:27:13	0:02:45	0.00 km
Honda Civic 6519	Polygon	116.97 ha	4.59 km	2019-12-05 09:30:36	2019-12-05 09:33:45	0:03:09	1.11 km
Honda Civic 6519	Polygon	116.97 ha	4.59 km	2019-12-05 09:33:59	2019-12-05 09:47:31	0:13:32	2.22 km

For the report on a **group of geofences**, activate the Detalization option in the table settings to see the detailed information about the visits of the unit or units to each geofence.

Executing and Viewing Reports

To generate a report, set its parameters (template, object, time interval) and click **Execute**. The report runs in the background. Once executed, the message at the bottom of the screen appears and the icon in the **Reports** tab starts to flash.



You cannot generate a report if no templates have been created in advance.

Template

Select the required report template from the drop-down list. By default, the one that was created and edited last within the current session is selected. To the right of the list is the icon for editing the properties of the selected template.

Object

Select the system object that you want to execute the report on (the current user should have the **Query messages or reports** access right). Depending on the report type specified in the template, you can select a unit, unit group, user, driver, trailer, route, resource, retranslator, group of drivers or trailers, passenger or group of passengers. For the Unit group report type, you can specify more than one object. Click on the **Add object** button (+) and in the drop-down list, select the required unit or unit group (shown in brackets). If specific objects are bound to the template, only they will

be available in the drop-down list. To view/edit the properties of the selected system object, click on the icon to the right of it.

> If the report type is **Unit**, only those objects that are currently in the **Monitoring** panel work list (and **not all** the objects to which you have the required access) are included in the drop-down list. In case the worklist is empty (when the dynamic work list is used or when units were deleted from the work list manually), the units to which you have the **Query messages or reports** access right will be displayed.

Interval

The report execution interval can be specified in two ways: manually or with the help of one of the available pre-set intervals.

Use buttons **Today**, **Yesterday**, **Week**, **Month** to select a pre-set interval. If you press one of those four quick buttons, the report launches immediately (there is no need to press **Execute**).

> If the **Week** interval is selected, the report is executed for the last **full week**, that is, for the previous week from Monday to Sunday. The **Month** interval works in the same way.

To select the interval manually, there are several options (the drop-down list to the right of the **Interval** field).

Specified interval
For such an interval you can specify the date and time of the beginning and end (to minutes).

Starts 'From' until today
Specify the exact start time. The current time will be automatically set as the end of the interval.

For previous
The number and the time interval (minutes/hours/days/weeks/months/years) for such an interval are indicated below. To select a numerical value for the interval, use the arrow keys or the mouse wheel. Valid values are from 1 to 99. Press and hold the arrows to rewind at an increased speed. When the **Include current** option is activated, the report is executed not for the last full period, but for the current one.

> The number of lines of the generated report is limited to 400,000 for optimal system performance. If the number of lines in the final report or the time of its execution exceeds the limit, the mark **cropped** is shown in parenthesis next to the name of the table.

There are alternative ways to receive reports in the monitoring system:

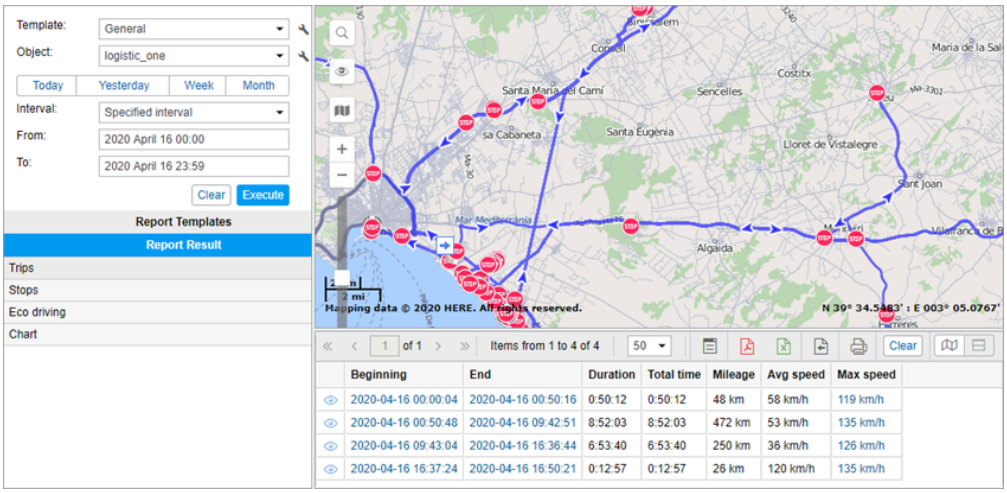
- receive reports by email at the specified time (adjusted through jobs);
- receive a report when an event happens (adjusted through notifications);
- quick report generation from the monitoring panel.

Viewing Reports Online

After executing a report, you can view the **Report result** section under the **Report templates** header. Tables or charts are shown in the lower right part of the window. Nothing is displayed if there is no required data for the specified interval.

The **Report result** section shows a list of the report contents: tables, charts, statistics. Click on the name of the required component to open it in the lower part of the window. The name of the open table, chart or statistics has a darker background.

Apart from tables, charts, and statistics, you can view the information on the map: for example, markers and tracks.



If the data in a table cell is highlighted in blue, you can move to the point that corresponds to it on the map. To do this, click on the cell.

A table can contain up to 100 000 lines, therefore it is divided into pages. To navigate through the pages, use the buttons at the top of the window (the blue arrows):

› : show the next page;
‹ : show the previous page;
« : go to the first page;
» : go to the last page.

To go to the required page, you can also type its number in the field of the toolbar above the table and press **Enter**.

To adjust the number of lines per page, select one of the available options (25, 50, 100, 200, 500) in the drop-down list of the toolbar.

The toolbar contains the following buttons:

: the button to go to messages;
: the button to export the report to PDF (default PDF settings: landscape orientation, A4 format, fixed page width);
: the button to export the report to Excel;
: the button to export the report to a file;
: the button to print the report.

The **Clear** button removes the report and the **Report result** section from the screen.

/ : the buttons to switch between the **Map-report view** and **Dual report view** modes.

Transfer from tabular report to messages

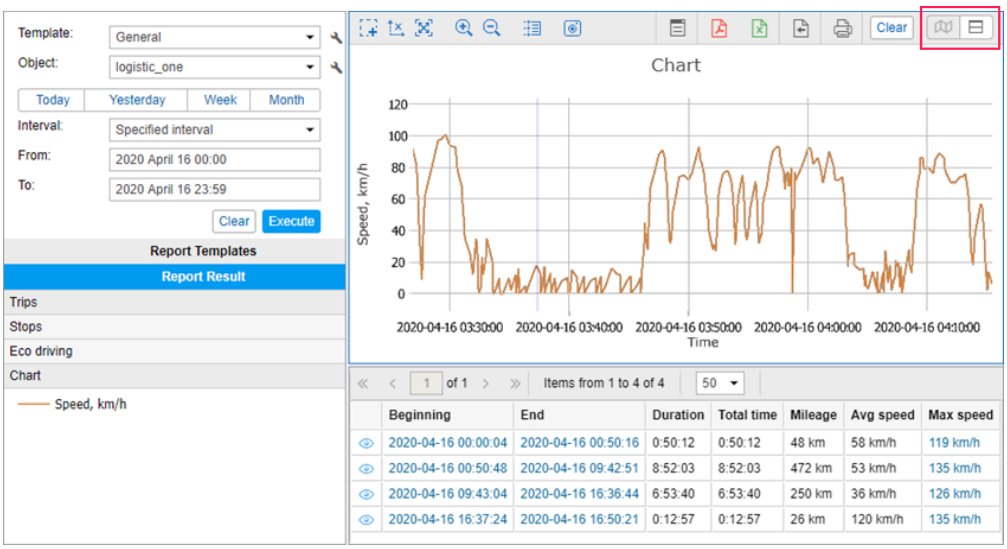
You can go from a report table to messages. This can be useful for analyzing the data received from a unit.

To go to the messages, click on the **Transfer to messages** button ( ). After that, the text in the cells that indicate time (such as **Time**, **Beginning**, **End**, etc.) becomes purple. These are links. Click on a link to go to the **Messages** tab where you can see all the messages for the report interval. The message of the selected link is highlighted in grey. On the map, the place from which it was sent is indicated with a marker. To return to the report, go to the **Reports** tab.

By default, the **Transfer to messages** button is inactive. If you click on this button, its active state is preserved when switching between tables, charts, and statistics.

Dual report view

If a report contains several charts or tables, you can view two of them at a time. To do this, click on the **Dual report view** button. After that, another chart or table opens and replaces the map. By default, this is the chart or table that follows the active one in the **Report result** section.

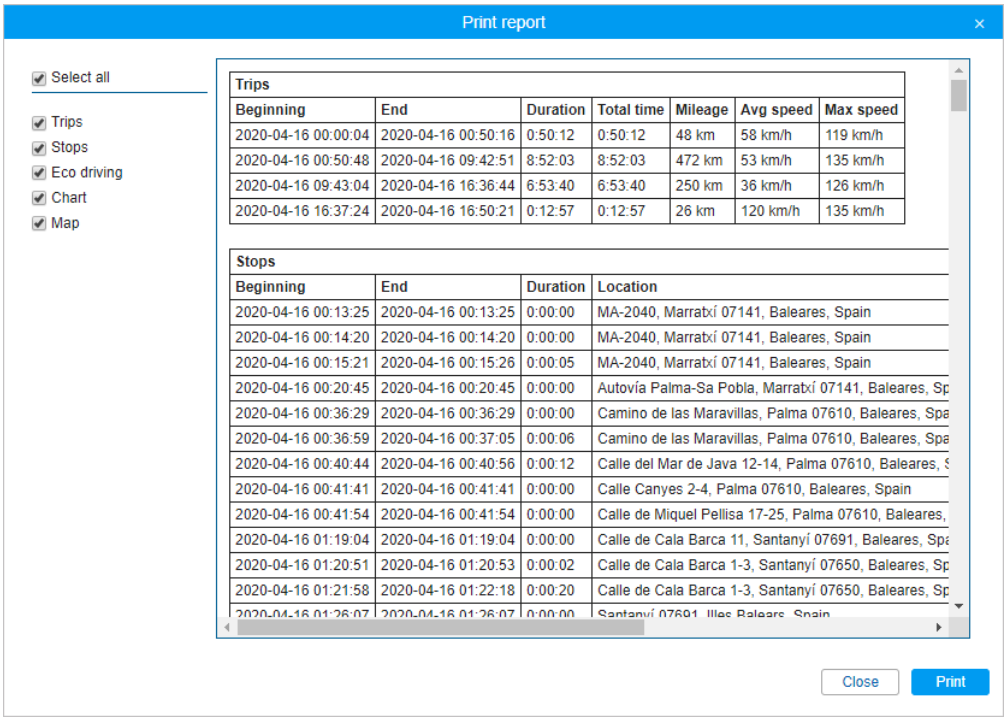


To switch between the report tables and charts, activate the one you want to replace (click on it so that its frame turns blue) and select the required one in the **Report result** section. The active table or chart is marked with the icon • in the list.

Printing Reports

After generating an online report, you can print it without first exporting it to a file. To do this, press the **Print** button, which is located above the active table or chart only when there is a generated report in the browser window.

In the left part of the **Print Report** dialog, you see the list of sections which are included in the report. Check those that you are going to print. On the right, you can preview these tables, charts, map, etc. To start printing, press **Print**. To exit, click **Close**.

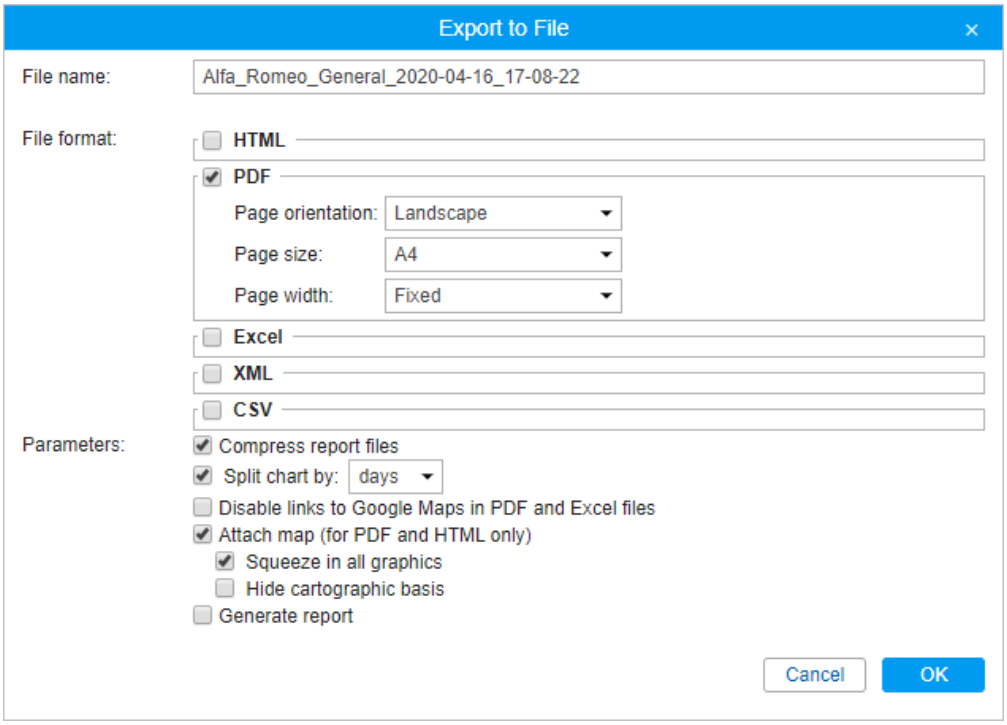


In Internet Explorer 10, maps and charts cannot be printed if the **Enhanced Protected Mode** option is on.

Exporting Reports to Files

To get a report as a file, press the **Export to file** button .

Specify the desirable file format or several formats at once. Supported formats are HTML, PDF, Excel, XML, CSV. For some formats, you may need to specify additional export options.



Reports in the form of files can also be received by email automatically using jobs and notifications.

Export parameters

The report file can be assigned any name by entering it manually in the **File name** field of the export dialog. If the name is not specified, the file is formed with the default name.

Specify if the file should be archived. Archiving is compulsory for the files of HTML format, as well as for the files with the total size of more than 20 MB regardless of the state of the **Compress report files** check box.

The **Split chart by** option allows receiving, depending on your selection, a separate chart for each day or week of the reporting period.

Indicate whether it is necessary to attach the map to the exported report. Graphical objects (such as map, chart) can be exported only into HTML or PDF files. Note that the map will be attached to the file only if tracks, markers or/and last unit position are selected in the template settings. By default, the map is scaled in order for the tracks/markers/last unit position to be seen on it. If these elements are not shown on the map, the map is not attached. If the **Squeeze in all graphics** checkbox is marked, the map is scaled in such a way that geofences are shown on the map along with the above-mentioned elements. Only Gurtam Maps can be attached to the report. Furthermore, the map layer can be hidden (using the **Hide cartographic basis** option) — in this case, tracks and markers are shown on the blank background.

The function of using a link to display the location (if the coordinates are available) is supported for the files exported in PDF or Excel. It works as follows: open the exported report (PDF/Excel), place the cursor on the corresponding field of a report, for example, the beginning/end time or address information from the unit (the cursor pointer changes to **hand**) and click on the link. Google Maps cartographic service will be opened in your browser, where the marker indicates the location. If there is no need to show the location, you can disable links to Google Maps in PDF and Excel files by marking the corresponding checkbox in the export parameters.

In order to disable the function described above, use the **Disable links to Google Maps in PDF and Excel files** option.

More parameters can be adjusted for some file formats. Those additional parameters are described below.

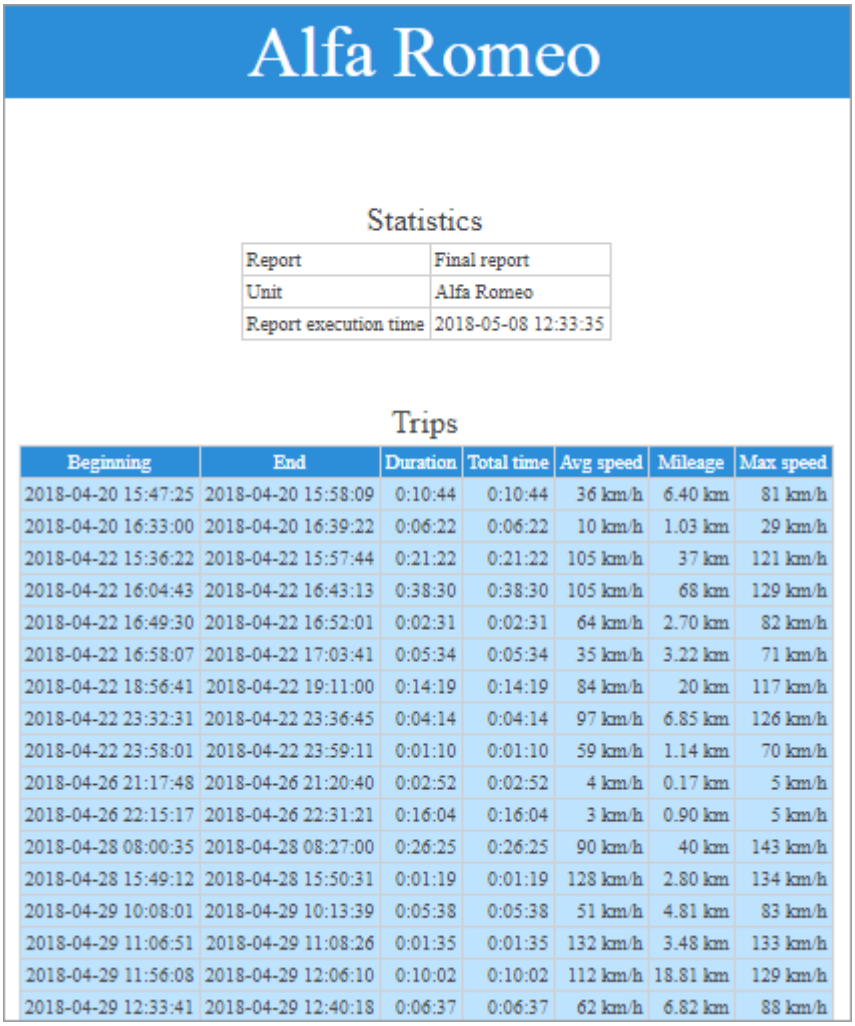
Usually, you export to a file a report that is already in the browser. However, you can also generate a new one according to the parameters set in the left panel. In this case, you should check the **Generate report** option.

Press **OK**. Depending on the browser settings, you will be offered to open a file or save it.

Report formats

HTML

Choose the HTML format to receive a report in the form of a web page, which can be opened in any Internet browser installed on the computer.



Alfa Romeo

Statistics

Report	Final report
Unit	Alfa Romeo
Report execution time	2018-05-08 12:33:35

Trips

Beginning	End	Duration	Total time	Avg speed	Mileage	Max speed
2018-04-20 15:47:25	2018-04-20 15:58:09	0:10:44	0:10:44	36 km/h	6.40 km	81 km/h
2018-04-20 16:33:00	2018-04-20 16:39:22	0:06:22	0:06:22	10 km/h	1.03 km	29 km/h
2018-04-22 15:36:22	2018-04-22 15:57:44	0:21:22	0:21:22	105 km/h	37 km	121 km/h
2018-04-22 16:04:43	2018-04-22 16:43:13	0:38:30	0:38:30	105 km/h	68 km	129 km/h
2018-04-22 16:49:30	2018-04-22 16:52:01	0:02:31	0:02:31	64 km/h	2.70 km	82 km/h
2018-04-22 16:58:07	2018-04-22 17:03:41	0:05:34	0:05:34	35 km/h	3.22 km	71 km/h
2018-04-22 18:56:41	2018-04-22 19:11:00	0:14:19	0:14:19	84 km/h	20 km	117 km/h
2018-04-22 23:32:31	2018-04-22 23:36:45	0:04:14	0:04:14	97 km/h	6.85 km	126 km/h
2018-04-22 23:58:01	2018-04-22 23:59:11	0:01:10	0:01:10	59 km/h	1.14 km	70 km/h
2018-04-26 21:17:48	2018-04-26 21:20:40	0:02:52	0:02:52	4 km/h	0.17 km	5 km/h
2018-04-26 22:15:17	2018-04-26 22:31:21	0:16:04	0:16:04	3 km/h	0.90 km	5 km/h
2018-04-28 08:00:35	2018-04-28 08:27:00	0:26:25	0:26:25	90 km/h	40 km	143 km/h
2018-04-28 15:49:12	2018-04-28 15:50:31	0:01:19	0:01:19	128 km/h	2.80 km	134 km/h
2018-04-29 10:08:01	2018-04-29 10:13:39	0:05:38	0:05:38	51 km/h	4.81 km	83 km/h
2018-04-29 11:06:51	2018-04-29 11:08:26	0:01:35	0:01:35	132 km/h	3.48 km	133 km/h
2018-04-29 11:56:08	2018-04-29 12:06:10	0:10:02	0:10:02	112 km/h	18.81 km	129 km/h
2018-04-29 12:33:41	2018-04-29 12:40:18	0:06:37	0:06:37	62 km/h	6.82 km	88 km/h

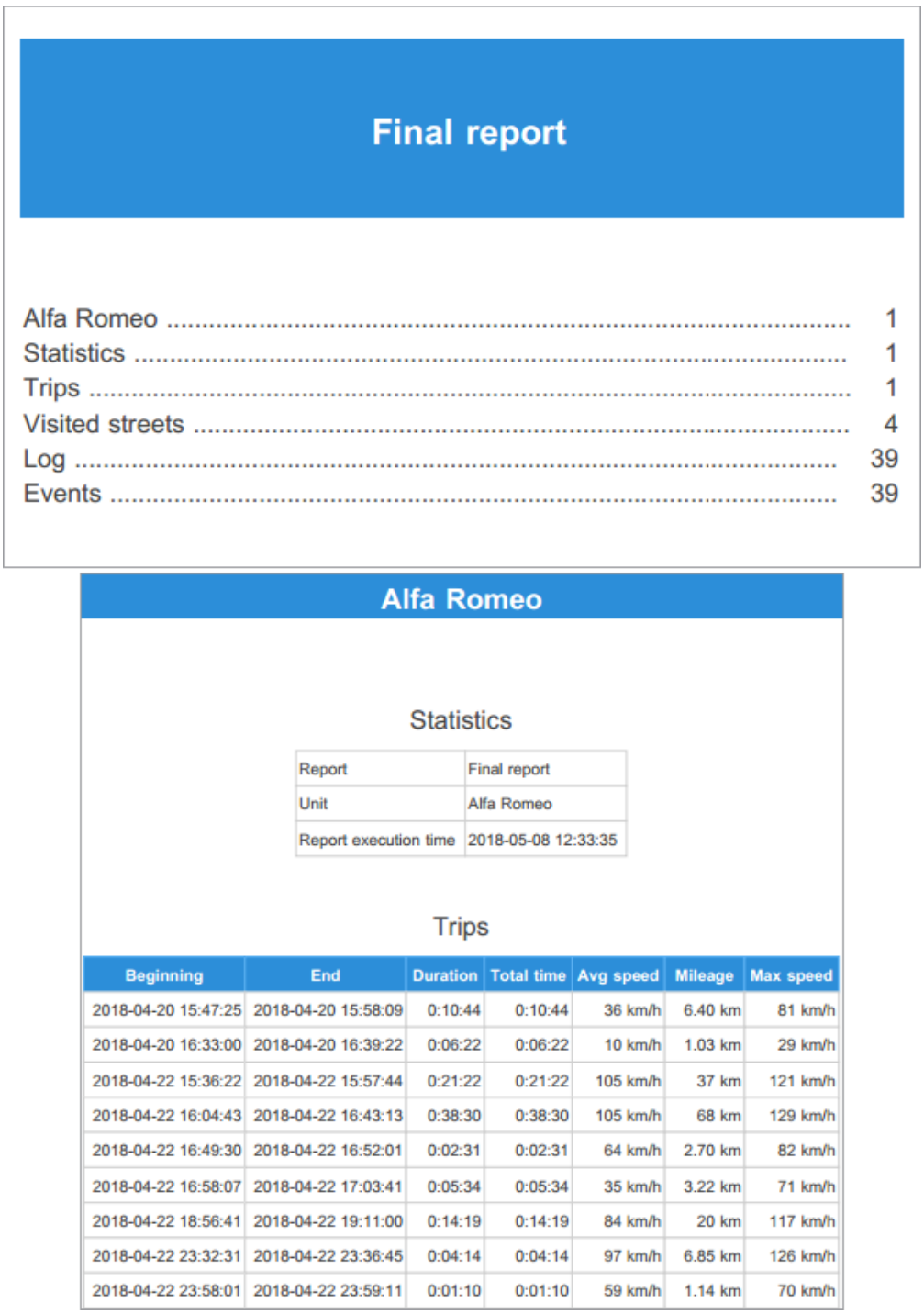
PDF

PDF is a widely known file format. To view these files Adobe Acrobat Reader is used (for Windows OS only). This type of file is well suited for printing.

You can additionally specify the page orientation (landscape or portrait) and format (A4 or A3) when exporting a PDF-file.

For reports with a large number of columns, the **Page width** option may also be appropriate. The standard page width is **fixed** which means it depends on the selected page format and orientation. However, if the table is too wide and does not fit the specified page width, this table will not be exported (only the heading will be displayed). In such cases, you can select **automatic** page width and the width of the page will correspond to the largest row in the table. If **Auto, compact** is selected, the cell width is equal to the length of the largest word in it. If **Auto, no wrap** is selected, the cell width is equal to the largest phrase in it (no line breaks are applied).

Note that if the automatic page width is selected, the page format and orientation become relative — they define only the height of the page, not the width.



Final report

Alfa Romeo

Statistics

Report	Final report
Unit	Alfa Romeo
Report execution time	2018-05-08 12:33:35

Trips

Beginning	End	Duration	Total time	Avg speed	Mileage	Max speed
2018-04-20 15:47:25	2018-04-20 15:58:09	0:10:44	0:10:44	36 km/h	6.40 km	81 km/h
2018-04-20 16:33:00	2018-04-20 16:39:22	0:06:22	0:06:22	10 km/h	1.03 km	29 km/h
2018-04-22 15:36:22	2018-04-22 15:57:44	0:21:22	0:21:22	105 km/h	37 km	121 km/h
2018-04-22 16:04:43	2018-04-22 16:43:13	0:38:30	0:38:30	105 km/h	68 km	129 km/h
2018-04-22 16:49:30	2018-04-22 16:52:01	0:02:31	0:02:31	64 km/h	2.70 km	82 km/h
2018-04-22 16:58:07	2018-04-22 17:03:41	0:05:34	0:05:34	35 km/h	3.22 km	71 km/h
2018-04-22 18:56:41	2018-04-22 19:11:00	0:14:19	0:14:19	84 km/h	20 km	117 km/h
2018-04-22 23:32:31	2018-04-22 23:36:45	0:04:14	0:04:14	97 km/h	6.85 km	126 km/h
2018-04-22 23:58:01	2018-04-22 23:59:11	0:01:10	0:01:10	59 km/h	1.14 km	70 km/h

Excel

Excel (.xlsx) is a popular product from the Microsoft Office suite. Here the data is presented in the form of spreadsheets. The report is divided into several tab pages. The data is automatically stored in tables and is suitable for subsequent processing by the tools of this program.

	A	B	C	D	E
1		End	Duration	Total time	Avg speed
2	2018-04-20 15:47:25	2018-04-20 15:58:09	0:10:44	0:10:44	36 km/h
3	2018-04-20 16:33:00	2018-04-20 16:39:22	0:06:22	0:06:22	10 km/h
4	2018-04-22 15:36:22	2018-04-22 15:57:44	0:21:22	0:21:22	105 km/h
5	2018-04-22 16:04:43	2018-04-22 16:43:13	0:38:30	0:38:30	105 km/h
6	2018-04-22 16:49:30	2018-04-22 16:52:01	0:02:31	0:02:31	64 km/h
7	2018-04-22 16:58:07	2018-04-22 17:03:41	0:05:34	0:05:34	35 km/h
8	2018-04-22 18:56:41	2018-04-22 19:11:00	0:14:19	0:14:19	84 km/h
9	2018-04-22 23:32:31	2018-04-22 23:36:45	0:04:14	0:04:14	97 km/h
10	2018-04-22 23:58:01	2018-04-22 23:59:11	0:01:10	0:01:10	59 km/h
11	2018-04-26 21:17:48	2018-04-26 21:20:40	0:02:52	0:02:52	4 km/h
12	2018-04-26 22:15:17	2018-04-26 22:31:21	0:16:04	0:16:04	3 km/h
13	2018-04-28 08:00:35	2018-04-28 08:27:00	0:26:25	0:26:25	91 km/h
14	2018-04-28 15:49:12	2018-04-28 15:50:31	0:01:19	0:01:19	128 km/h
15	2018-04-29 10:08:01	2018-04-29 10:13:39	0:05:38	0:05:38	51 km/h
16	2018-04-29 11:06:51	2018-04-29 11:08:26	0:01:35	0:01:35	132 km/h

Content | Statistics | Trips | Visited streets | Log | Events

When exporting a report to PDF, HTML, Excel the **alignment** is used. The columns with text (names of sensors, geofences, drivers, users, SMS and notification text, location addresses, etc.) are aligned to the left. The columns with numeric data (time, duration, speed, mileage, fuel, payments, count, etc.) are aligned to the right.

XML

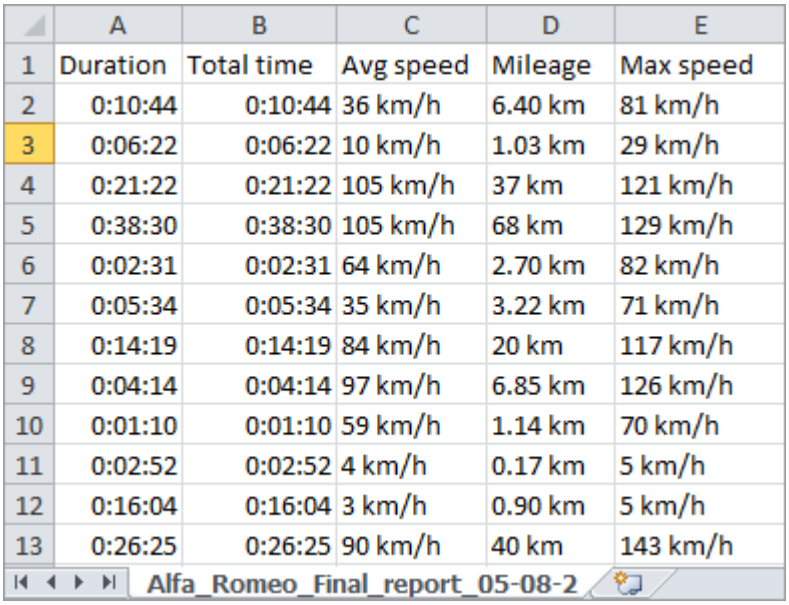
XML represents information in the form of a text file used for storing structured data (instead of existing database files), for exchanging information between programs, and for creating more specialized markup languages (such as XHTML) on its basis.

```
<?xml version="1.0"?>
- <report lang="en" tz="134228528" name="Final report">
  - <stats>
      <row name="Report" vt="0" val="0" txt="Final report"/>
      <row name="Unit" vt="0" val="0" txt="Alfa Romeo"/>
      <row name="Report execution time" vt="30" val="1525772015" txt="2018-05-08 12:33:35"/>
    </stats>
  - <tables>
    - <table name="Trips" rows="61" id="unit_trips" flags="16777344" cols="7">
      - <header>
          <col name="Beginning"/>
          <col name="End"/>
          <col name="Duration"/>
          <col name="Total time"/>
          <col name="Avg speed"/>
          <col name="Mileage"/>
          <col name="Max speed"/>
        </header>
      - <row>
          <col vt="30" val="1524228445" txt="2018-04-20 15:47:25"/>
          <col vt="30" val="1524229089" txt="2018-04-20 15:58:09"/>
          <col vt="40" val="644" txt="0:10:44"/>
          <col vt="40" val="644" txt="0:10:44"/>
          <col vt="20" val="35.791497" txt="36 km/h"/>
          <col vt="10" val="6402.701073" txt="6.40 km"/>
          <col vt="20" val="81" txt="81 km/h"/>
        </row>
```

CSV

CSV is a text file format used for the presentation of tabular data. Each line of this file corresponds to one line of the table, and the columns are separated from each other by a special delimiter character - a comma (,) or a semicolon (;). Each table is saved in a separate file.

To export to a CSV file, you should additionally choose the encoding (utf8, cp1251) and a delimiter (comma or semicolon). Depending on the state of the **Show column headers** checkbox, the file will start with the header line or immediately with the data.



	A	B	C	D	E
1	Duration	Total time	Avg speed	Mileage	Max speed
2	0:10:44	0:10:44	36 km/h	6.40 km	81 km/h
3	0:06:22	0:06:22	10 km/h	1.03 km	29 km/h
4	0:21:22	0:21:22	105 km/h	37 km	121 km/h
5	0:38:30	0:38:30	105 km/h	68 km	129 km/h
6	0:02:31	0:02:31	64 km/h	2.70 km	82 km/h
7	0:05:34	0:05:34	35 km/h	3.22 km	71 km/h
8	0:14:19	0:14:19	84 km/h	20 km	117 km/h
9	0:04:14	0:04:14	97 km/h	6.85 km	126 km/h
10	0:01:10	0:01:10	59 km/h	1.14 km	70 km/h
11	0:02:52	0:02:52	4 km/h	0.17 km	5 km/h
12	0:16:04	0:16:04	3 km/h	0.90 km	5 km/h
13	0:26:25	0:26:25	90 km/h	40 km	143 km/h

Alfa_Romeo_Final_report_05-08-2

Data in Reports

Time

The time of completion/start/end of any state is displayed in the reports in the format specified in the Settings → General section of a report template.

In the tables that include the duration of a state, the hours may not be combined into days (if the interval is longer than 24 hours). It means that instead of **5 days 12:34:56** it is displayed as **132:34:56**. To disable days and leave only hours, select the **hours:minutes:seconds** duration format in the table properties of the report template. This option does not only affect the formatting in the cells, but also the row **Total**. Moreover, the duration may be shown in the format of **hours** (with two decimal places). For instance, **3.45** instead of **3:27**. This is done by means of activating the **hours (with two decimal places)** option.

If grouping is used, a table receives additional column (**Grouping**) which displays the time in the following way:

- grouping by years shows corresponding years (for example, 2015);

- grouping by months shows the names of the months (for example, August);
- grouping by weeks shows the number of the week in a year (for example, week 10; note that the first week is considered to be the first **full** week in a year.)
- grouping by day of the week shows the corresponding day (for example, Friday);
- grouping by day of the month shows the corresponding day (from day 1 to day 31);
- grouping by dates shows the corresponding date in the format selected in the advanced settings of the report template;
- grouping by shifts shows the corresponding shift (for example, shift 1).

⚠ To receive reliable data for time/duration, it is important to correctly indicate the **Time zone** and **DST** options in the user settings.

Unit location

The information about the unit location is displayed in the following table columns: **Initial location**, **Final location**, **Initial coordinates**, **Final coordinates**, **Location**. If there is no data about the unit location at the moment of a certain event or at the beginning or end of a certain state, the report displays the last known location within the indicated interval.

For trips in private mode, if the Do not show unit location option is activated for the sensor, a dash is displayed in all the columns connected with the location.

Mileage

Mileage can appear in reports on trips, geofences, rides, speedings, digital sensors, etc., as well as in statistics and processed fuel level chart.

Mileage is calculated according to settings of mileage counter on the General tab of the unit properties. Besides, mileage can also depend on Trip Detector because the intervals of movement and parkings are detected by it.

Mileage can be ordinary or adjusted. The adjusted mileage may be useful to coordinate the mileage detected by the program and mileage detected by the vehicle itself. The correction coefficient is set in the unit properties on the **Advanced** tab.

In Statistics and in various tables, you can find many possibilities for mileage.

Mileage in all messages — the full mileage without any filtration by the trip detector. It is always the longest mileage because it also includes all adjustment of data.

Mileage in trips — the total mileage of all movement intervals found according to the trip detector.

Mileage (adjusted) — the mileage in trips multiplied by the correction coefficient.

Mileage in engine hours — the mileage in the intervals of engine hours.

Urban mileage — the distance traveled at the speed which is considered as the speed in populated areas.

Suburban mileage — the distance traveled at the speed which is considered as the speed outside populated areas. Urban speed limit is a setting in the unit properties which defines if unit is moving in the urban area or outside of it.

Initial mileage — the mileage sensor value at the beginning of the interval (trip, street visit, sensor operation, etc.).

Final mileage — the mileage sensor value at the end of the interval.

Mileage counter — the absolute mileage (the mileage counter value at the moment of the report generation).

In many tabular reports, mileage can be displayed. It can be calculated either by all messages or by messages in trips. Choice of the method of calculation is defined by the **Mileage from trips only** checkbox in the General section of the **Report template** dialog.

If less than 20 (miles or kilometers), the mileage is displayed with accuracy to hundredths (other decimal places are simply cut). Measurement units for speed and mileage (kilometers and kilometers per hour or miles and miles per hour) are selected in the additional settings of the **Report template** dialog. There you can also set the **Mileage/fuel/counters with accuracy to two decimal places** option to always see the mileage with the hundredths.

Speed

The average and maximum speed values can be included in the same reports as the mileage: trips, geofences, rides, speedings, digital sensors. Note that the **average speed** directly depends on the mileage because it is calculated by dividing mileage by duration (for example, distance traveled with a sensor on divided by the duration of an on the state. That is why a situation can happen when the average speed is zero and the maximum speed is a positive number. It can happen (1) if the duration of a state is zero (see explanation above); (2) if the mileage is zero (the unit was parked or the mileage counter is set incorrectly); (3) if the mileage is insignificant, for example, **0,01**, and the result of the division is smaller than 1. Note that mileage can be calculated either by all messages or by trips only (the option in the settings of a report), and this obviously affects the resulting values of the average speed.

The **Maximum speed** has nothing to do with the mileage and any counters. To calculate the maximum speed within an interval, all messages which get to this interval are analyzed and the largest speed value is selected and displayed in the corresponding cell.

The speed is given only in integer numbers.

When the intervals of **speeding** are displayed in the reports, it is necessary to take into account the peculiarities of determining them in the tables Speeding and Eco driving. Into the tabular report **Speeding** fall the intervals the speed on which was **higher** than the one received as a result of summing up the values of the speed limit and the tolerance on speed limit indicated on the Advanced tab of the unit properties. Into the table **Eco driving** fall the intervals the speed on which was **equal or higher** than the one indicated in the option **Min. value** for the **Speeding** criterion on the **Eco driving** tab of the unit properties.

Fuel

Many reports can provide information about the fuel: fuel level (initial/final), the volume of filled/stolen/registered/consumed fuel, average consumption, etc.

In most cases to receive the information about the fuel, you need the unit to have corresponding sensors installed. They should be configured on the Sensors of the **Unit properties** dialog and the corresponding calculation methods should be selected on the Fuel consumption tab.

The following abbreviations are used:

- FLS — fuel level sensor;
- ImpFCS — impulse fuel consumption sensor;
- AbsFCS — absolute fuel consumption sensor;
- InsFCS — instant fuel consumption sensor.

Without special fuel sensors, you can control the fuel in the following ways:

- register fillings manually in the **Monitoring** panel;
- use the calculation of the fuel consumption by rates;
- use the mathematical calculation of the fuel consumption that is based on the consumption rates from the ignition, relative or absolute engine hours sensors multiplied by the values of the engine efficiency sensors (if any). The latter can be used for taking into account the load, the movement in urban and suburban cycles and the work during different seasons.

The consumption by math does not require fuel sensors. The consumption rates and coefficients indicated in the properties of the ignition and engine efficiency sensors are multiplied by time.

In a report template, several methods of calculating fuel can be selected simultaneously. In this case, a separate column is generated for each method. Moreover, if there are several sensors of the same type, then a separate column is generated for each of them. If you want a certain sensor to be used for the fuel calculation, enter its name mask in the **Sensor masks** filter of the

parameters of the table. If in the report template you select columns that do not correspond to the unit's properties, zeros are displayed in the cells of the resulting report.

In the statistics, there is no possibility to show the information for each sensor separately. In such rows as **Avg consumption ...**, **Consumed by ...**, **Rates deviation ...**, etc. you can get only one value for each type of a fuel sensor (FLS/ImpFCS/AbsFCS/InsFCS). That is why the consumed fuel (**Consumed by ...**) in the statistics is the sum of the sensors of this type, and the average consumption (**Avg consumption ...**) is the arithmetic average of those sensors. However, the calculation of the deviation from rates (**Rates deviation ...**) depends on the adjustments of the sensors. If a unit has two sensors of the same type, the deviation from rates is calculated for each sensor separately, but for the statistics (as it can be only one row) the sum of those deviations is shown. Thus, the formula is:

Rates deviation = (Consumed by FLS1 — Consumed by rates) + (Consumed by FLS2 — Consumed by rates)

The fuel consumption detected by FLS, as well as the average consumption according to FLS, can be calculated including fuel thefts or excluding them. This is adjusted in the settings of a report template (check the **Exclude thefts from fuel consumption** box). Depending on this option, you can get the summarized information about the fuel consumption or the information about the fuel consumed by the vehicle.

By default, the fuel level is given in integer numbers. The volume of the consumed/registered/stolen fuel, as well as the average consumption is given to the nearest hundredth if their value is below 50 (if it is higher, then integer numbers are used). However, if required, you can see fuel values always with the accuracy to hundredths. Check the **Mileage/fuel/counters with accuracy to two decimal places** option in the report template (the rest of the numbers is rounded off).

If the U.S. measurement units are selected, the fuel is measured in gallons and the average consumption — in mpg (miles per gallon) unlike the European system where the average consumption is measured in l/100km (liters per 100 kilometers).

The fuel calculation algorithms process the messages taking into account the filtration that is configured on the Fuel consumption tab (the **Filter fuel level sensors values** option).

Consumption math

During the mathematical calculation, fuel consumption is computed separately for each pair of messages.

The following algorithm is used.

- The status of each engine sensor (engine ignition, absolute and relative engine hours sensors) in the current message is determined.

- For the operating sensors the values indicated in the **Consumed, l/h** field of their properties are summed.
- The values of the engine efficiency sensors are calculated.
- The received values are summed according to the formula **k1 + (k2 - 1) + (k3 - 1) + … + (kn – 1)**. In that way,the coefficient is formed. If the sum of the coefficients is less than 0 or invalid, the total coefficient is 1.
- To determine the current fuel consumption of the unit, the value from the point 2 is multiplied by the value of the point 4.
- The value from the previous message till the current one is multiplied by the value from the point 5.
- The consumption for each message pair for the indicated interval is summed and in that way, the fuel consumption is determined by the consumption math.

Fuel

The whole process of working with fuel sensors can be broken down into successive stages (in the subsections of stages you can find important options, terms, situations, etc.).

1. Data preparation
   Option: Ignore the messages after the start of motion
   Term difference: 'Mileage-based calculation' VS 'Time-based calculation'
2. Filtration
   Option: Filter fuel level sensors values
   Option: Filtration level
3. Detecting Fillings
   Option: Minimum fuel filling volume
   Option: Detect fuel filling only while stopped
   Option: Calculate fuel filling volume by raw data
   Special Case: How a filling is processed?
4. Thefts detection
   Option: Minimum fuel theft volume
   Option: Idling
   Option: Detect fuel theft in motion
   Option: Calculate theft volume by raw data
   Special Case: How a fuel theft is detected?
5. Consumption calculation
   Option: Replace invalid values with math consumption

Option: Exclude thefts from fuel consumption
Special Case: Filling/theft is sliced with one of interval frontiers

Preparing Data

> ⓘ Ellipsis (...) substitutes **Unit properties** → **Fuel consumption** when indicating the option paths.

Among the important options, the next list should be mentioned:

- Option: Ignore the messages after the start of motion;
- Special Case: Mileage-based calculation VS Time-based calculation.

Ignore the messages after the start of motion

```
... → 'Fuel fillings/thefts detection' block → 'Ignore the messages after the start of motion, sec'
```

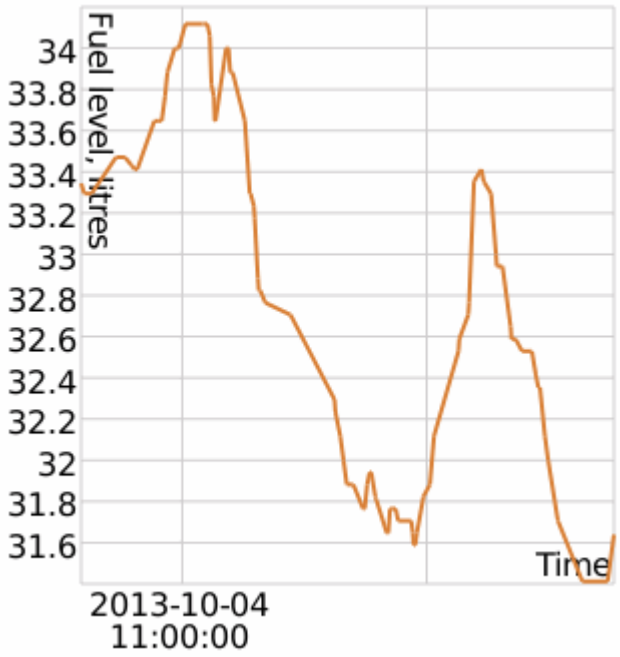
This option allows you to exclude messages after starting the movement within the designated time interval in seconds. Cross-border messages with an ignored interval are connected by a line.

Here is the whole algorithm.

1. A start motion message is taken and is used to define the number of messages being ignored;
2. This message is regarded as a left-frontier message;
3. Then we add seconds set in the option to this message timestamp to get the end moment of the ignored time period;
4. All FLS messages which got in this time period are ignored while processing;
5. The first message that comes after the ignored period (p.3), is called a right-frontier message;
6. Both left- and right-frontier messages are joined by the line being drawn (instead of taking the ignored messages into account while building the chart).

All the processed charts have the option for such correction (except for the Regular charts, where the data is raw).

This is the chart with no ignoring:



The chart with the ignore option turned on:

Mileage-based calculation VS time-based calculation

```
... → 'Fuel fillings/thefts detection' block → 'Time-based calculation of fillings'
... → 'Fuel fillings/thefts detection' block → 'Time-based calculation of thefts'
... → 'Fuel level sensors' block → 'Time-based calculation of fuel consumption'
```

The convergence of the data (i.e., when the sum of interval results equals the whole interval result) is guaranteed when all the mentioned options are activated/deactivated:

- time-based calculation of fillings;
- time-based calculation of thefts;
- time-based calculation of fuel consumption.

While **Time-based calculation** (all three options) is **switched on** the x-axis is time:

- fuel consumption/idling looks like a slowly descending curve on the graph;
- thefts/fillings — a quick falling in the fuel level for a short period of time (theft/filling processing time).

While **Time-based calculation** is **switched off** (the data is calculated as mileage-based) the x-axis is mileage:

- fuel consumption in motion looks like a slowly descending curve;
- idling is marked as a vertical falling of fuel level;
- thefts/fillings on stops are marked as a vertical rising of fuel level.

Filtration

> Ellipsis (**...**) substitutes **Unit properties** → **Fuel consumption** when indicating the option paths.

Two options are connected with filtering:

- Option: Filter fuel level sensors values;
- Option: Filtration level (0..255).

Filtration enabling and filtration level setting

```
... → 'Fuel level sensors' block → 'Filter fuel level sensors values';
... → 'Fuel level sensors' block → 'Filtration level (0..255)'.
```

When using the filtration make sure to:

- check the **Fuel level sensors** area (**Unit properties** → **Fuel consumption**);
- check **Filter fuel level sensors values**;
- set a non-zero value for the **Filtration level (0...255)**.

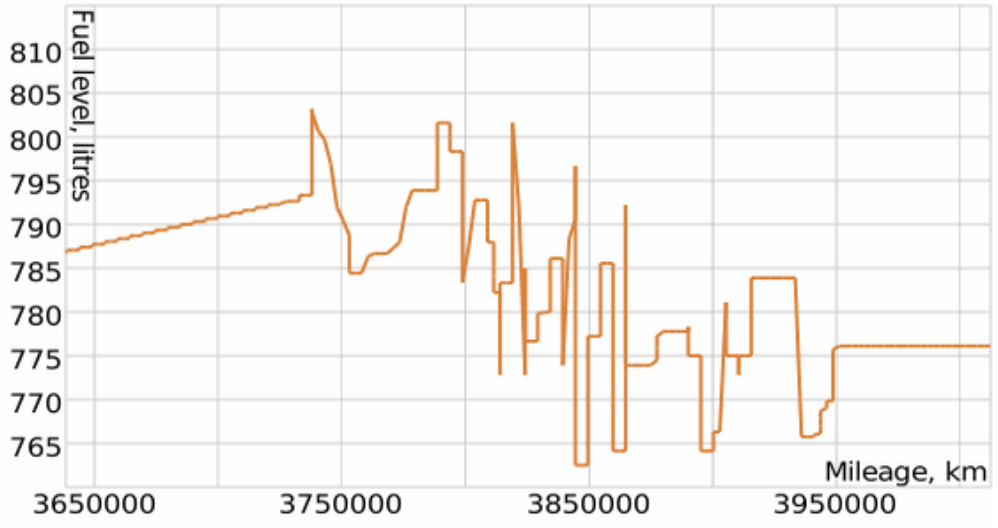
Filtering should be used when it is necessary to remove erroneous values, significantly larger/smaller than the remaining values. During filtering, median smoothing is used.

The value 0 in the **Filtration level** option is not the zero filtering, but the minimum possible filtering (for three messages — since this is the minimum amount of data required for median smoothing).

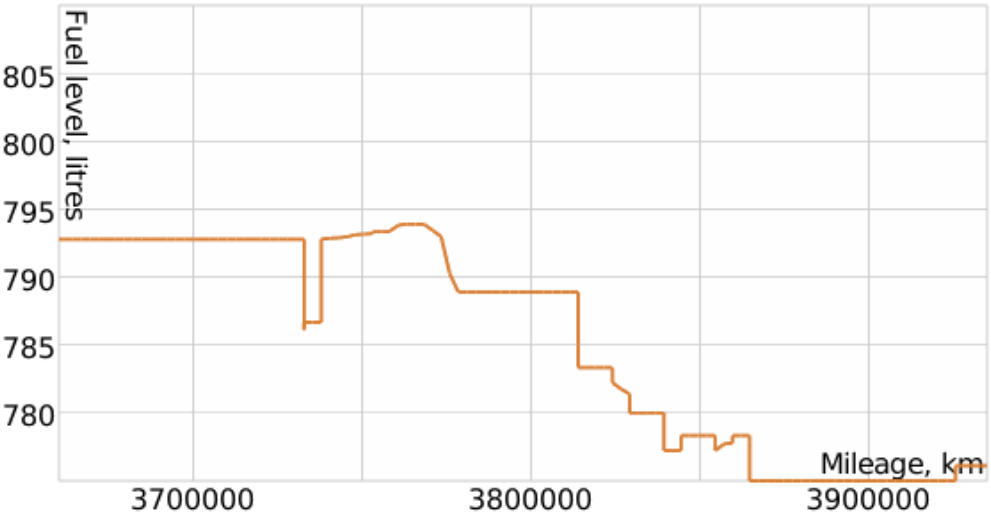
Any number from 1 to 255 set in **Filtration level** multiplied by 5. This number of messages is going to be filtered.

To disable the filtration completely, uncheck the **Filter fuel level sensors values** option.

The chart with the disabled filtration:



The chart with the enabled filtration:



Detecting Fillings

To detect fillings, the processed data is used (it is done on the Data preparation and Filtration steps).

ⓘ Ellipsis (**...**) substitutes **Unit properties** → **Fuel consumption** when indicating the option paths.

Three options are attached to this detection:

- Option: Minimum fuel filling volume, liters;
- Option: Detect fuel filling only while stopped;
- Option: Ignore filtration when calculating the filling volume;
- Special Case: How a filling is processed?

Minimum fuel filling volume

```
... → 'Fuel fillings/thefts detection' block → 'Minimum fuel filling volume, liters'
```

This option helps to exclude false fillings, because sensors may send false data rise in motion.

Detect fuel filling only while stopped

```
... → 'Fuel fillings/thefts detection' block → 'Detect fuel filling only while stopped'
```

In normal conditions transport vehicles are fueled during stops. This option narrows its search to stops/parkings only. In addition, if the maximum interval between messages is indicated on the Advanced tab and it has been exceeded, a filling can be detected at this interval.

Calculate fuel filling volume by raw data

```
... → 'Fuel Fillings/Thefts Detection' block → 'Calculate fuel filling volume by raw data'
```

When filtration is switched on, some fuel level deviations may occur at the beginning and end of a filling. To avoid it, the system uses unfiltered data when the filling volume is calculated. This option is applied only when the value before the filtration exceeds the value obtained as a result of filtration.

Special case: how is a filling processed?

Filling time frontiers and volume
The filling is performed.

Let the fuel volume in this message be **Vcurr**, the fuel volume in the previous message — **Vprev**. If the difference **d** (**=Vcurr - Vprev**) for the current message is positive, then the current message is marked as an **initial** filling message.
Time passes by. The filling is close to the finish. When **d-value** for some message becomes

negative (i.e. the fuel volume in the current message is less than in the previous one), then it is called the **final** filling message.

> If the fuel level does not change during the time indicated in the **Timeout to separate consecutive fillings** parameter on the Fuel consumption tab of the unit properties, the filling is considered finished as well.

The **volume** of the filling equals to **Vfinal - Vinit** (the difference in fuel volumes between the final and initial filling messages).

If the **Calculate fuel filling volume by raw data** option is activated, the values of the maximum **(Vmax)** and minimum **(Vmin)** fuel volume on the filling interval are used. The volume of the fuel filling will be **Vmax - Vmin**.

Filling timestamp calculation algorithm
Now it is time to find the filling timestamp.

Iteratively for every message within the filling interval (exclude the last one) the system seeks delta(**=Vnext - Vcurr**) for the next message which shows the fuel level growth between the current message and the next one.
The timestamp of the message whose delta is ultimately the biggest among others is regarded as the filling timestamp (in other words, the left message is selected from the message pair whose delta is the biggest one).

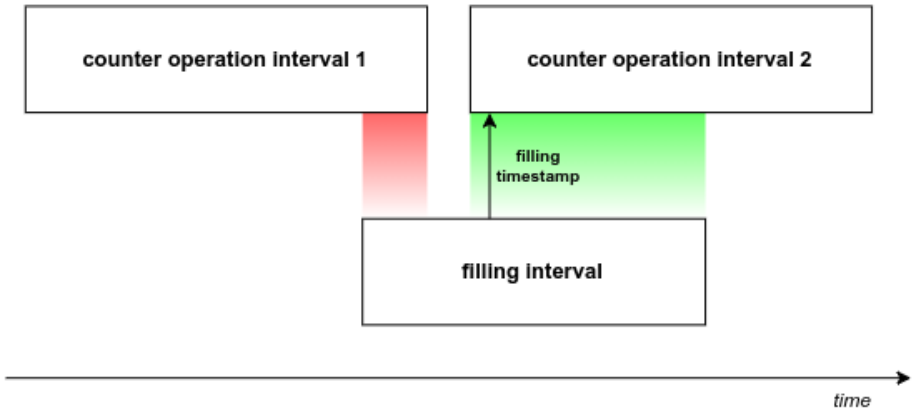
> A filling timestamp is calculated dynamically based on the available data from the sensors.

Determining fuel fillings in the Fuel traffic table

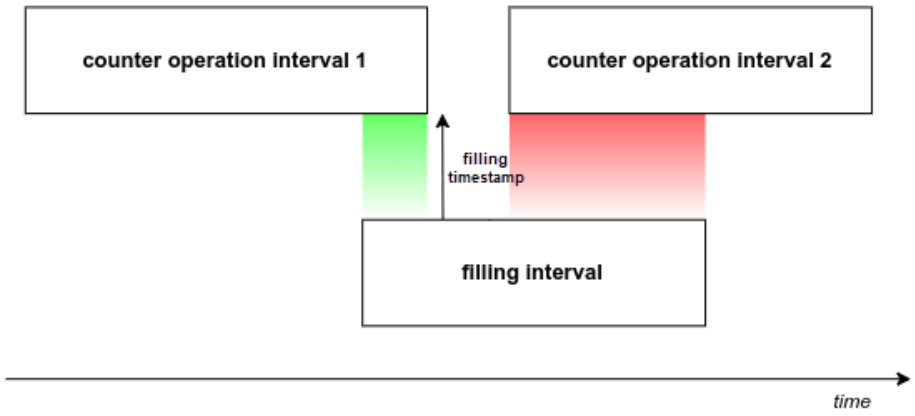
The Fuel Traffic table determines the fuel activity of the unit (fuel filling, theft, counter operation), according to which the report is being executed, as well as the units that were near it. The following algorithm explains what principle the system uses to determine to which of the nearby units the fuel was distributed.

The intervals for the distribution and reception of fuel are considered to be adjacent if the time of the fuel filling of the unit that receives fuel has fallen into the interval of operation of the counter of

the unit that distributed it (see the diagram).



If there was no such match, the algorithm searches for the intersection of the entire fuel filling interval of the unit that received the fuel with the intervals of the counter of the unit that distributed it and selects the nearest one (see the diagram).



Detecting Thefts

To detect thefts the processed data is used (it is done on the Data preparation and Filtration steps).

The next options are crucial while detecting thefts:

- Minimum fuel theft volume, liters;
- Idling;
- Detect fuel theft in motion;
- Ignore filtration when calculating theft volume.

Minimum fuel theft volume

```
'Unit properties' → 'Fuel consumption' → 'Fuel fillings/thefts detection' block →
'Minimum fuel theft volume, liters'
```

This option defines the required drop of the fuel level minus the fuel consumption for motion/idling, so that the theft is detected.

Idling

```
'Unit properties' → 'Fuel consumption' → 'Consumption math' block → 'Idling, liters
per hour'
```

The option allows detecting thefts on stops/parkings. The system finds the difference between the spent fuel volume according to the sensors and a mathematically calculated one. In case of a non-zero difference, which is equal to or more than the value set in the minimum fuel theft volume option, the fuel theft is detected.

Detect fuel theft in motion

```
'Unit properties' → 'Sensors' → Sensor type 'Engine ignition' → 'Consumption, liters
per hour'
'Unit properties' → 'Sensors' → Sensor type 'Absolute engine hours' → 'Consumption,
liters per hour'
'Unit properties' → 'Sensors' → Sensor type 'Relative engine hours' → 'Consumption,
liters per hour'
```

By default this option is unchecked. In case there is a necessity to control thefts in motion a user may use the option. But if sharp fuel level drop takes place then false theft may be detected.

Calculate theft volume by raw data

```
'Unit properties' → 'Fuel consumption' → 'Fuel Fillings/Thefts Detection' block
→ 'Calculate theft volume by raw data'
```

Similar to fillings, the filtration may deviate the start and the end fuel level values of thefts. To ignore such deviations, the system uses unfiltered data while calculating the volume of theft. This option is applied only when the value before the filtration exceeds the value obtained as a result of filtration.

Special case: how is a fuel theft detected?

Time frame of a theft and its volume
A theft is being performed.

Let us suppose that the fuel volume in the current message is **Vcurr**, the fuel volume in the previous message is **Vprev**. If the difference **d** for the current message (**d = Vcurr - Vprev**) is negative, the message is considered the **initial** message of the theft.
Time passes. When the value **d** is positive for some message (that is the fuel volume in the current message is higher than in the previous one), the message is considered as the **final** message of the theft.

> If the fuel level does not change during the time indicated in the **Timeout to separate consecutive thefts** parameter on the Fuel consumption tab of the unit properties, the theft is considered finished as well.

The theft **volume** equals to **Vfinal - Vinit** (the difference of fuel levels between the final and the initial messages).

Theft timestamp calculation algorithm
Now we are looking for the timestamp of the theft.

The system seeks a delta with the following message (**d = Vnext - Vcurr**) for every message within the theft interval. The delta shows the decrease in the fuel level between the current and future messages.

The message timestamp that has the highest delta is considered to be the theft timestamp (in other words, the left message with the biggest delta is selected from the pair of messages).

> The timestamp of a fuel theft is calculated dynamically depending on the values of the sensors in every particular situation.

Calculating Consumption

To calculate the consumption, the processed data is used (it is done on the Data preparation and Filtration steps).

> Ellipsis (**...**) substitutes **Unit properties** → **Fuel consumption** when indicating the option paths.

Two options and a special case are closely connected with this step:

- Replace invalid values with math consumption;
- Reports → Report Template Properties → Options → Exclude thefts from fuel consumption;
- Special Case: filling/theft is sliced with one of the interval frontiers.

Replace invalid values with math consumption

```
... → 'Fuel level sensors' block → 'Replace invalid values with math consumption'
```

In the case of values falseness, they are replaced with the values calculated mathematically. The mathematical calculation uses the data indicated in the properties of ignition, relative and absolute engine hours sensors (the **Consumption, l/h** option) and the value of the engine efficiency sensor.

Algorithm:

Let Vinit be the initial volume for the interval (what interval is taken is defined in the specified report template), Vfinal — the final volume. Then the difference is calculated between them with respect to fillings volume, i. e. Vinit – Vfinal + Vfill. In case the calculated value is equal to or greater than zero, the interval is marked as correct. But if the result value is negative, the consumption is treated as falsy and math consumption takes place.

Exclude thefts from fuel consumption

```
Reports → Report Template Properties → Options → 'Exclude thefts from fuel
consumption'
```

This option defines whether a theft is considered a consumption in calculations of various kinds of indicators. Keeping this option switched on is valuable when ignoring deviations because of the detected thefts.

Switch it off when a discharge is authorized, for instance, agriculture vehicles are filled with refueller and the user wishes to know the total turnover of spent fuel during the specified period of time.

Special case: a filling/theft is sliced with one of the interval frontiers. How is a filling/theft detected?

Let us consider the case on the example of filling. Assume we have sliced the filling with the initial frontier of the interval. As described in the How a filling is processed section, a filling timestamp is defined dynamically according to the unique case. Since we have sliced the filling with an interval, the second message of the interval becomes the initial filling message and it informs that the fuel level has grown compared to the previous value (the first message is the reference used to calculate the delta (**d=Vcurr - Vprev**) for the second message, it cannot be calculated for the first message because of the absence of the previous one).

The filling final message remains the same.

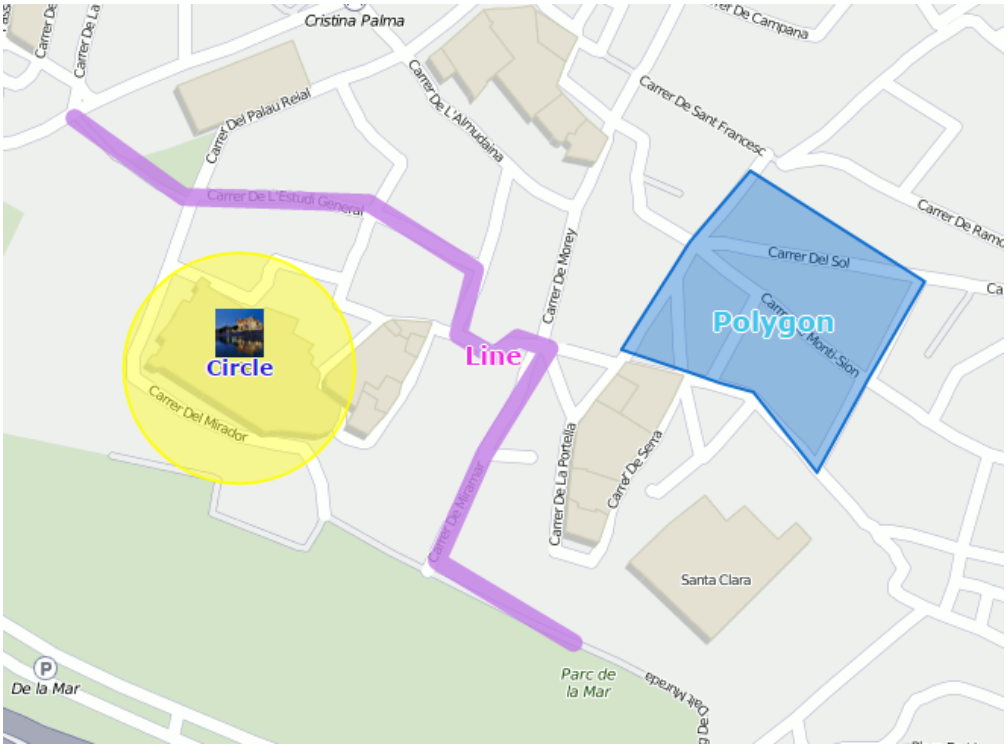
The filling volume declines compared to the unsliced filling reference (because of the initial message shifts to the right).

The filling timestamp might hold the position/shift to the right because it all depends on whether the message, whose timestamp is regarded as an unsliced filling timestamp, is taken into account when calculating the time of the filling. If it is taken, the filling time does not change.

Geofences

Geofence, or geographical zone, is an area on the map that is important for user's tracking purposes and requires special attention. Geofences can be used to control units' activity in these areas or, on the contrary, outside them. You can choose an image for a geofence or add a description.

A geofence can have a shape of a line (for example, an avenue or any road), polygon (a city or park or plant), or circle with any radius.



Geofences are widely used in Wialon. Along with the map's visual enrichment, they can be used in reports, notifications, and units' tooltips. Geofences can also be used as check points for route configuration. Geofence's tooltip may contain dynamically updated images and videos from external sources.

To open the Geofences panel, click the corresponding name in the top panel or choose the necessary item in the main menu customizer. Afterwards, choose a mode which allows you to work either with geofences or groups of geofences.

Geofence creation is available in the **Geofences** mode only, while the other options can be used in the **Groups** mode as well.

Creating a Geofence

Here are three steps to create a geofence.

1. Map geofence

Start working with geofences by choosing the corresponding mode.

Click on the **New** button. In the help window, you can see the instructions on how to create a geofence. Choose a geofence type on the left: **line**, **polygon** or **circle**.

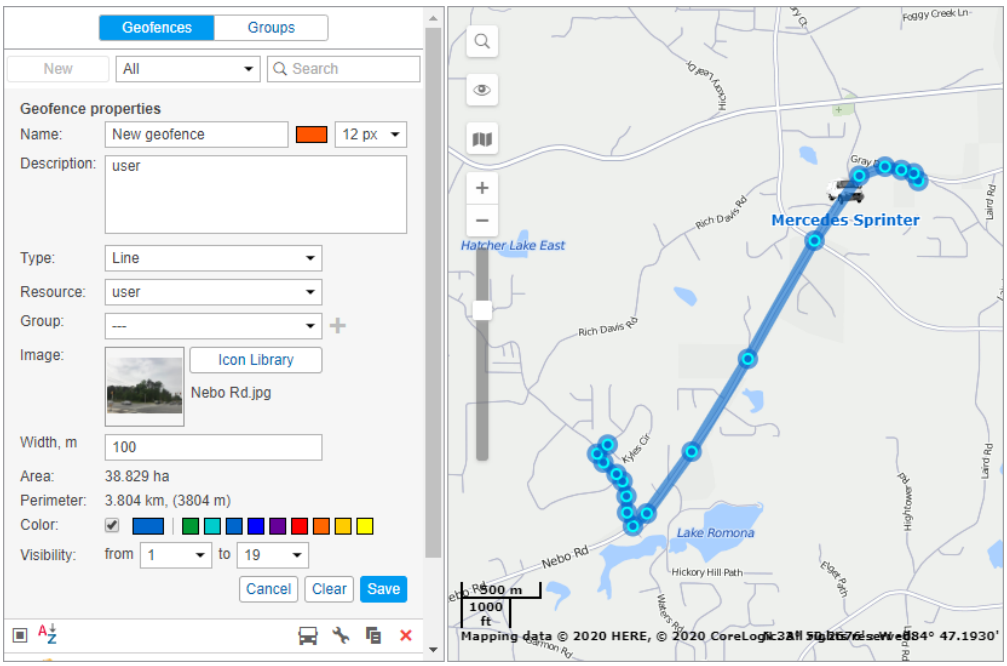
Then map a geofence. Here are the basic rules for mapping a geofence.

Double-click on any place of the map to put the first point. Then add more points using the same method. Put the points as close or as far from each other as you want.

To insert a point between two other points, double-click on a segment between them.

To move a point to another place, click on it and holding the left mouse button drag to another place on the map. Then release the mouse button.

To delete a point, just double-click on it. Note that points cannot be deleted if there are only two points — for lines, or three — for polygons.



A quick way to map a geofence is by using the Routing tool (create lines) or the Address tool (create circles).

2. Set geofence properties

Name

Geofence's name is used while tracking units as well as in reports and notifications. It is a required parameter. It can consist of one or more symbols. Besides, you can specify caption color and size. It has sense if the option **Display names of geofences on map** is enabled in the user settings.

Description

This field is optional. The description is displayed in the geofence tooltip. It can also be added to the geofence name if the geofence is used as the address source in reports. When you create a geofence, the description is filled in automatically with the address information taken from the first point you map. However, you can edit or simply delete it. The text should not contain more than 10,000 characters. You can use **html** (including **iframe**) tags in descriptions in order to format text or get images from other sites. For example, you can embed videos from web cameras, get photos of crossroads, load information about the weather or exchange rates, and so on.

Type

Geofence can be of the shape of the line, polygon, or circle. For line, you also can indicate its thickness, for circle — radius (in meters or feet, depending on resource settings).

Resource

This option is shown if the current user has access to more than one resource. The resource chosen while creating a geofence defines the measurement system used to calculate its area, length, radius, thickness, etc. (metric, U.S. or imperial system).

Group

While creating a geofence you can include it in one or several existing geofence groups. To do this, choose the necessary geofence in the dropdown list. Use the button + to add lines; × — to delete a geofence from a group.

Image

You can attach any image to a geofence. An image can be chosen from the standard icons (the **Icon Library** button) or loaded from your computer by pressing the corresponding area and choosing the file you need. Supported formats are PNG, JPG, GIF, and SVG. Moreover, you can use the Icon Library application (for top accounts only) which enables uploading individual icons for

geofences. The icons uploaded to the system using this application will be available for you in the standard **Icon Library**. To facilitate the work with the library, the uploaded icons are placed in the same list, but separately from the standard ones (at the top). All loaded images are automatically resized by 64×64 pixels to display the geofences on the map and on the list. However, in the tooltip for a geofence, you can see an enlarged image (up to 256x256 px). In the geofence's editing dialog you can delete the image used. To do so, point to it and click on the delete button. Click OK to save changes, or Cancel to dismiss them.

Area & Perimeter

These fields are not editable, they are calculated automatically.

> Area and perimeter values also depend on resource settings, and can be given in hectares and kilometers or square miles, square feet and miles (feet), respectively.

Color

This color will be used to render a geofence on the map and to display it in a unit's tooltip and in extended unit information as well as some other places where next to the geofence's name where a unit is located, is shown a square of the same color. The color is chosen using the palette or manually (by entering its RGB code). You can also choose if geofence's shape should be shown on the map. For this purpose, the corresponding flag to the left of the color palette is used.

Visibility

Here you specify map zooms at which geofences will be displayed or not. For example, if a geofence is a city, it has sense to see it on remote scales, whereas if it is a building it is more logical to see it on more detailed scales. Different map types can have different graduation of map scales. However, all possible values fall into the range from 1 to 19, where 1 is the most detailed scale (small streets and houses are displayed) and 19 is an overview (the whole world).

3. Save geofence

When finished, press **Save**. In case of a mistake, press **Clear** and try again. To close the create mode without saving results, press **Cancel**.

Geofences can be saved to a file and easily transferred from one resource to another.

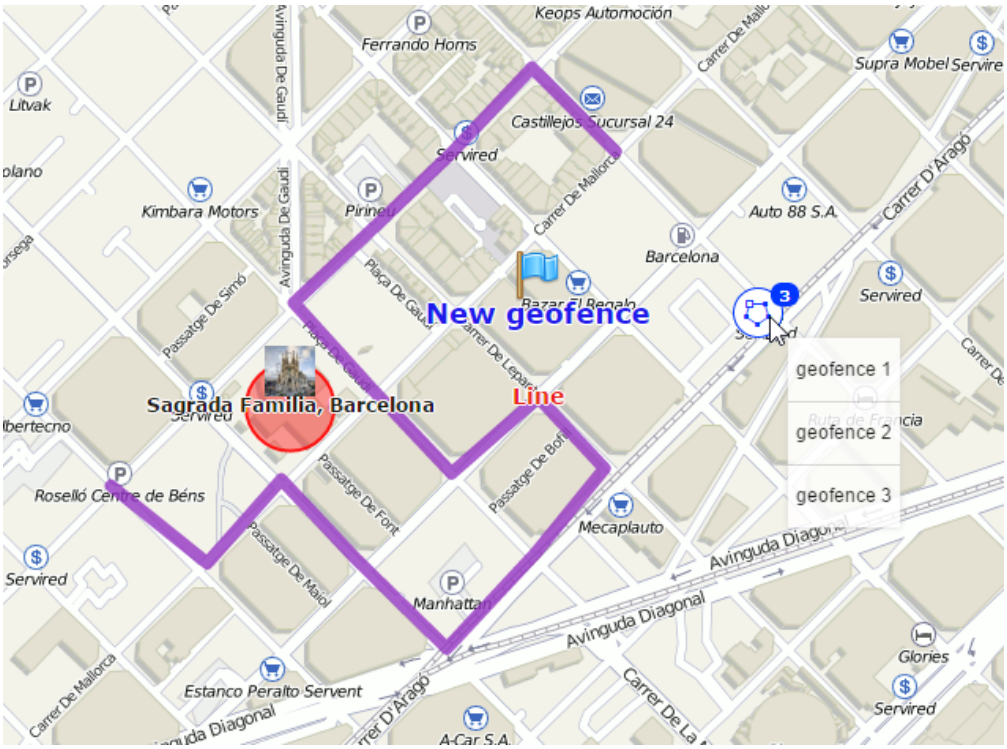
Managing Geofences

In the work area, there is a list of all available geofences. To move to the necessary geofence on the map, click on its name in the list.

Put check marks in the left column of the table to choose the geofences you want to be displayed on the map. Deselect these boxes to remove geofences from the map. A check mark at the header of the list selects/deselects all the geofences if their visibility corresponds to the current map scale and the appropriate layer is enabled.

If you have ticked too many geofences or they are very big, it can slow down browser performance. In this case, the setting of rendering geofences on server may help.

A geofence can be presented on the map by its name (if the flag **Display names of geofences on map** is enabled in the user settings), by the image or shape assigned (if that option is activated in geofence properties), as well as any combination of these three elements. The geofences that overlap each other can be replaced by one conditional item.

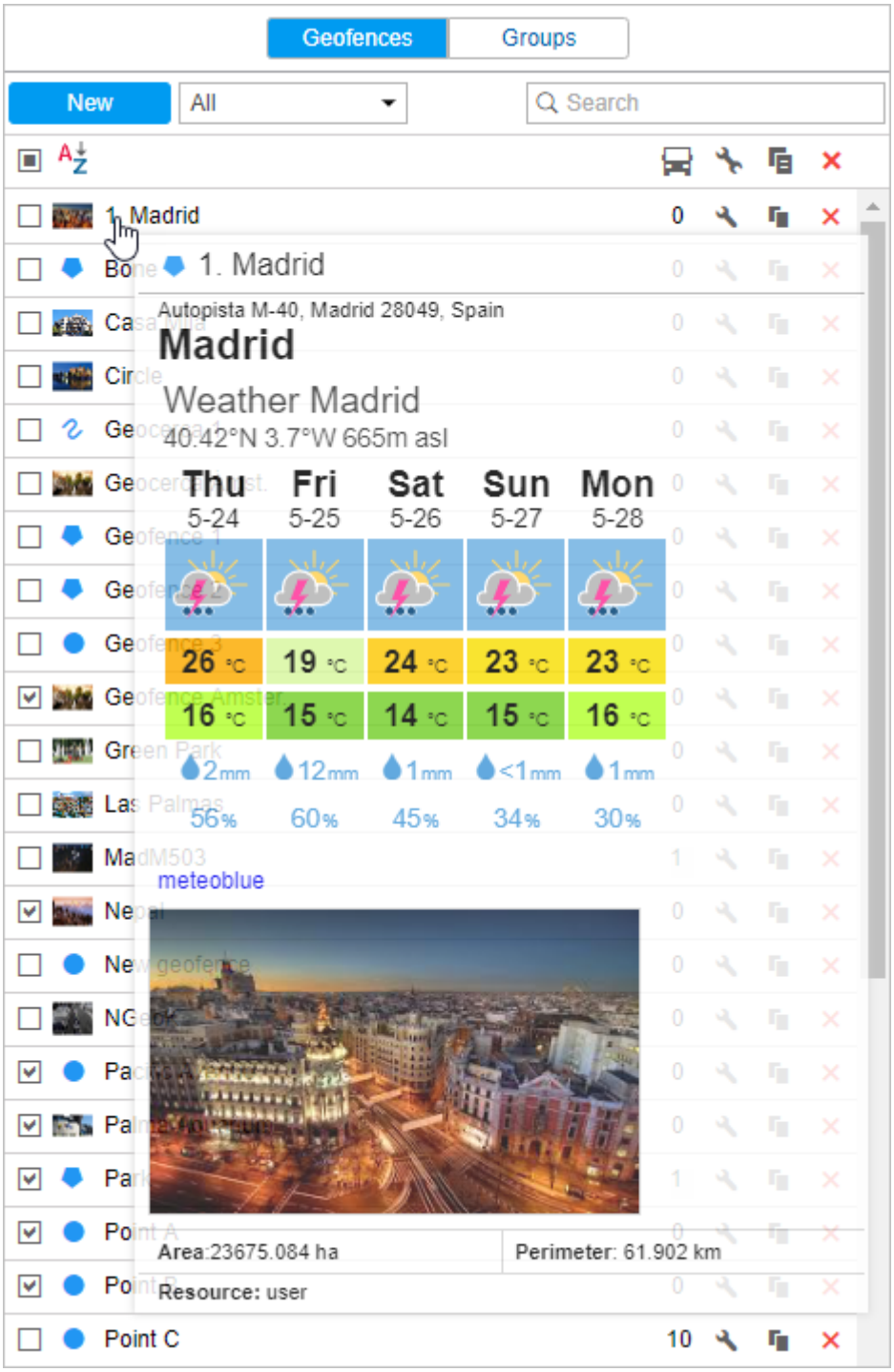


To see a tooltip with the information about a geofence, hover the mouse cursor over its name in the list in the left part of the window or over the geofence icon on the map. You can also hover the cursor over the geofence itself while holding the **Ctrl** key. The tooltip contains the following information:

- name;
- type (displayed visually);
- description (if it was set);
- the image in an enlarged view;
- the name of the resource to which the geofence belongs (if the current user has access to several resources);

- a list of units within the geofence at the moment.

Depending on the geofence type, there will be also area, perimeter, length, and/or radius. The measuring units for these parameters depend on the measurement system chosen for a resource to which the geofence belongs. If a description contains links to other images, they will be shown as well. For instance, a tooltip of a geofence can look like this:



The following code has been used to add weather forecast to the tooltip:

```
  <iframe src="https://www.meteoblue.com/en/weather/widget/daily/
madrid_espa%c3%b1a_3117735?
geoloc=fixed&days=5&tempunit=CELSIUS&windunit=KILOMETER_PER_HOUR&coloured=coloured&pi
ctoicon=1&maxtemperature=1&mintemperature=1&layout=light"  frameborder="0" scrolling="
NO" allowtransparency="true" sandbox="allow-same-origin allow-scripts allow-popups"
 style="width: 270px;height: 223px"></iframe><div><!-- DO NOT REMOVE THIS LINK --><a
href="https://www.meteoblue.com/es/tiempo/pronostico/semana/
madrid_espa%c3%b1a_3117735?
utm_source=weather_widget&utm_medium=linkus&utm_content=daily&utm_campaign=Weather%2B
Widget" target="_blank">meteoblue</a></div>
```

Hold the **Ctrl** key and click on the geofence (on the map) to open its properties dialog.

To find or sort geofences, use the filter and the quick search. The filter is a dropdown list with several predefined criteria:

By property:

- Polygons;
- Lines;
- Circles.

By resource:

- Here you can find a list of the resources available for the current user (if they are more than one). Click on any of them to display geofences belonging only to this particular resource.

To find a needed geofence quickly, you can use the dynamic filter above the list. Type the name of the geofence or some part of the name and observe the search results.

The following icons and buttons are used in the panel **Geofences**:

	Shows how many units are there inside the geofence at the moment. These units are listed in the tooltip (the data refreshes once in two minutes). If there are question signs (?) in this column, it means the option **Presence in geofences** is disabled. If needed, activate it in user settings.
	The button to view or edit (depends on the access rights) geofence properties: size, shape, name, color, position, etc.
	The button to copy a geofence. You can edit a geofence and save it under another name.

× ×	The button to delete a geofence(s). To delete several geofences at once, check them in the first column of the table and press the delete button at the top of the list. If the button is dimmed, it means you don't have enough access rights to the resource which the geofence belongs to.

⚠ It is prohibited to edit the geofences that have more than 5000 points.

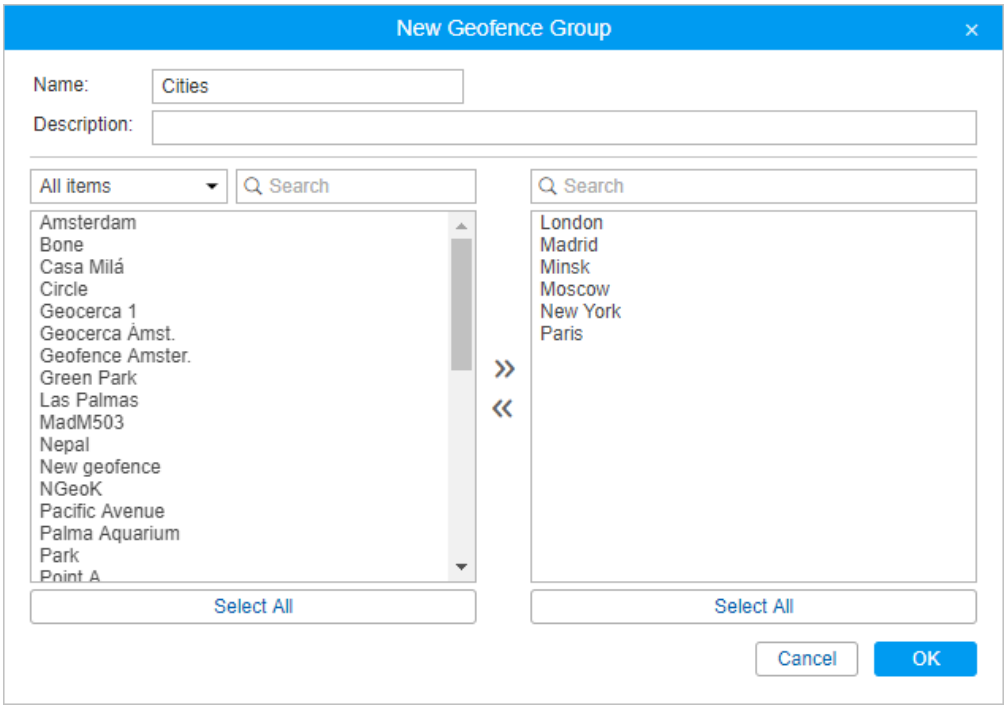
Groups of Geofences

Created geofences can be formed into groups. Groups are used to unite geofences on the basis of any criteria and serve as parameters of intervals filtration in several report templates. Moreover, groups of geofences are used in the notifications of the corresponding type.

⚠ A group may contain only geofences belonging to the same resource as the group itself.

To work with groups, choose the corresponding mode in the **Geofences** panel.

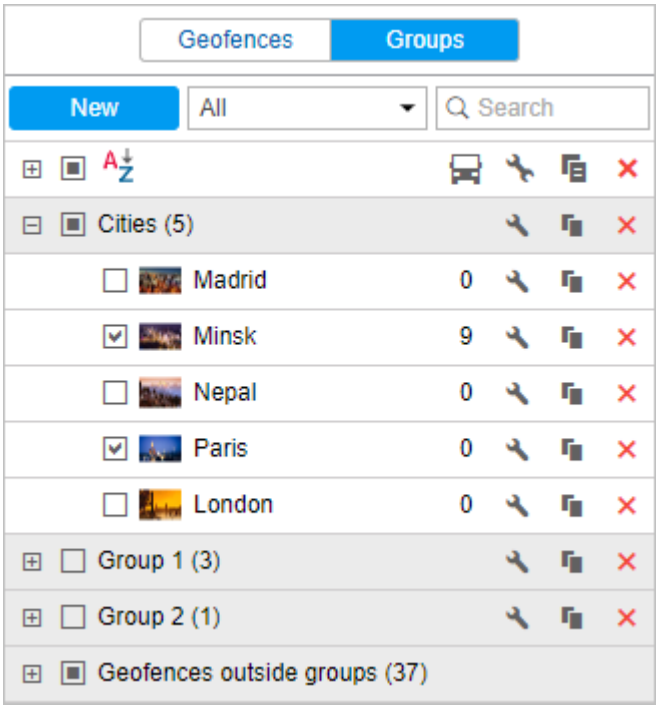
To create a new group of geofences, click the **New** button. Enter a name and description, and choose geofences to be included in a group. Click **OK**.



A list of created groups of geofences is displayed in the work area. Groups are arranged alphabetically. The same as for geofences, a filter or a dynamic search can be used for groups. Moreover, groups can be edited, copied, or deleted. Note that upon deleting a group you can not delete its contents.

Geofences not included in any group can be found in the **Geofences outside groups**.

Series of standard actions are available for geofences in a group (unfold a group in order the corresponding buttons to appear).



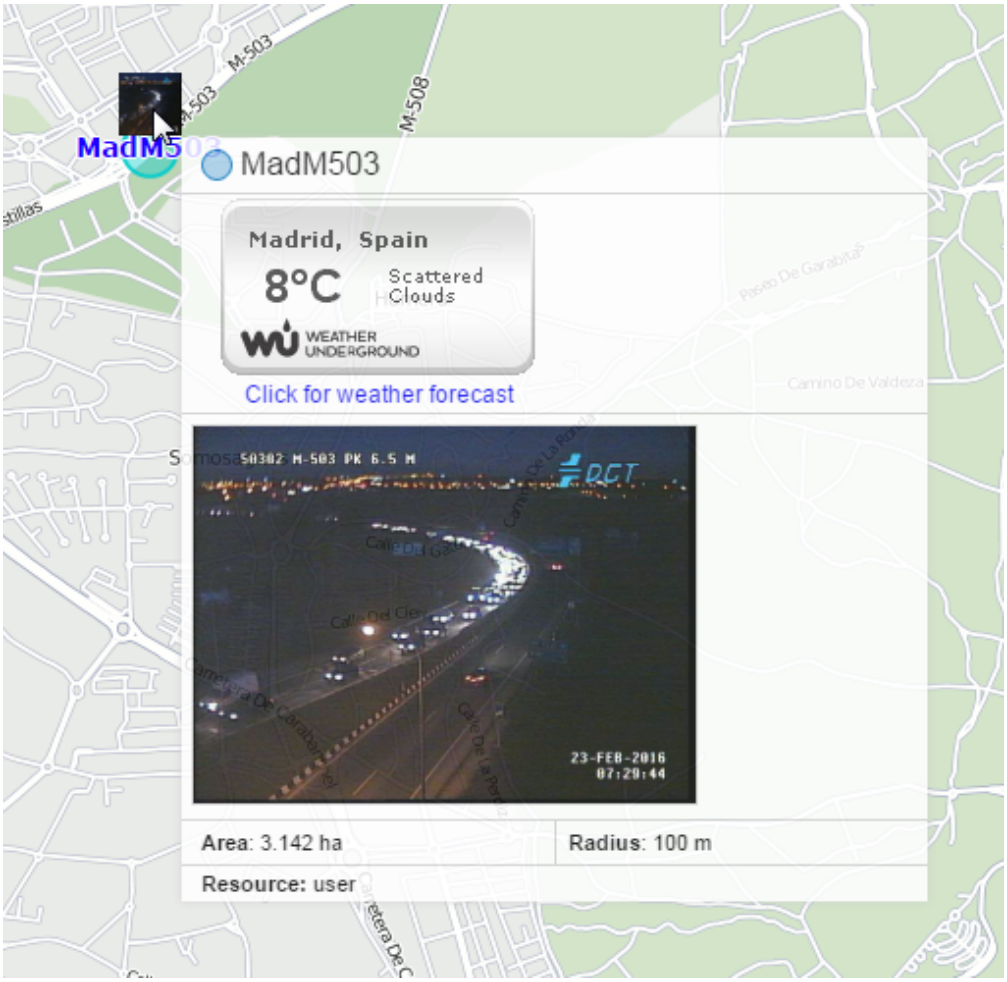
Using Geofences

While tracking online

Geofences can be displayed on the map (the ones that have flags in the panel **Geofences** are shown). That simplifies the visual perception of the map and enriches it. Different regions can be selected by different colors and you can estimate the units' presence in definite areas. If a geofence is displayed on the map, you can press **Ctrl** and put the mouse cursor over it to see its tooltip (name, type, list of units inside, etc.). In case of the geofences that have images assigned, the tooltips appear as you just point them with the cursor. If there are 1000 or more geofences, they are automatically grouped on the map. The grouped geofences are displayed by means of a common icon which indicates their number.

In a unit's tooltip and in its additional information you can see its presence in geofences if the option **Presence in geofences** is enabled in the user settings.

Besides, it is possible to get images from external sources in geofences' tooltips (webcam videos, photos, rates of exchange, etc.).



Besides, a column with geofences where units are located can be displayed in the Monitoring panel instead of ordinary addresses.

> ⓘ For the **Geofences** to be displayed on the map you should check if the corresponding layer is active.

In notifications

You can be notified by email, SMS, online or by other means when your unit leaves or enters a geofence. It is also possible to set speed limitations and sensor range for a unit during its presence in a geofence. Besides, entering a geofence or leaving it can be automatically accompanied by action: send a message to the driver, block the engine, change users' access to this unit, and many others. See Notifications.

In reports

Geofences can be used in reports as addresses (in the **Location** column) if the **Use geofences for addresses** flag is enabled in the **Advanced settings** block of the reports' template.

Many tables are generated on the basis of geofences. Among them there are the following:

- geofences: visits to geofences (all entries and exits to/from the selected geofence(s) are given together with visit duration, distance travelled within the geofence, average and maximum speed, etc.);
- non-visited Geofences: geofences which were ignored (non-visited) during a period of time or on certain days;
- rides and Unfinished Rides: rides from one geofence to another (convenient to control how cargo is transported in several trips).

Geofences can be also used to filter intervals in reports.

When a report is generated, geofences can be rendered on the map.

In routes

Geofences can be used as check points while configuring routes.

Routes

Wialon provides an opportunity to track a unit that moves along a route and is supposed to visit definite check points in a predefined or arbitrary order, at a definite time or without any strict schedule.

To use the **Routes** module, it is important to understand the meaning of the terms **route**, **schedule**, **round** and the difference between them.

A route is a set of check points each of which has a certain position on the map. The number of check points in a route is unlimited. See Creating a route for more information.

A schedule is a table which contains information about the time of passing through check points. One route can have many schedules attached to it. See the Schedule section for more information.

A round is a combination of a route, its schedule and a unit assigned to them. See the Rounds section for more information.

To configure a route, perform the following steps.

1. Create the route itself, that is, mark check points on the map.
2. Create one or more schedules for this route.

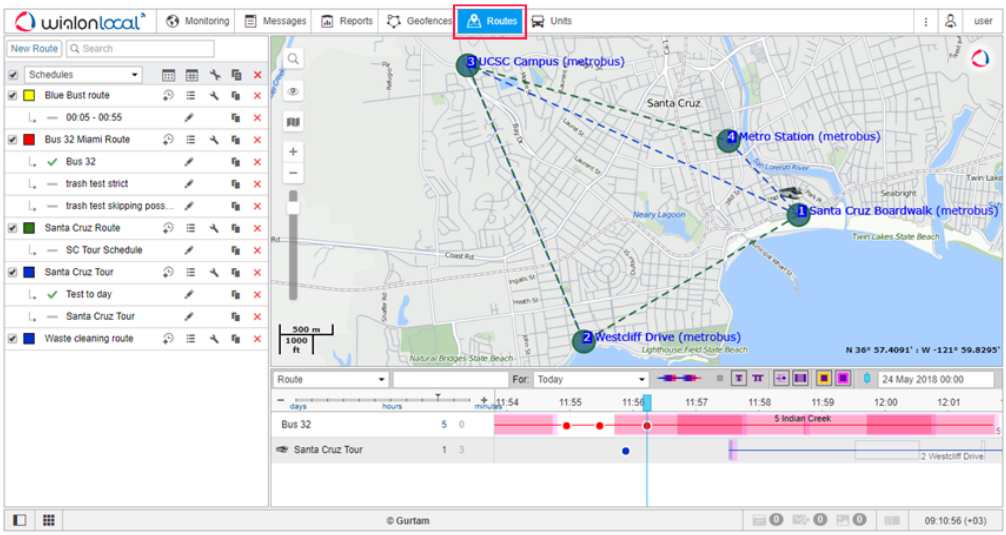
3. Assign units to the schedules manually or enable automatic creation of rounds.

> To see routes on the map, make sure that the **Routes** panel is active in the main menu, and the **Routes** layer is active in the visible layers menu.

When everything is configured properly, you can monitor the unit performance on the route in different ways:

- following it on a special online timeline;
- getting notifications about the events related to the route;
- executing reports on the results of passing through the route.

To manage routes, click on the **Routes** heading in the top panel or select the corresponding item in the main menu customizer. Here you can configure routes and observe the progress of active rounds.

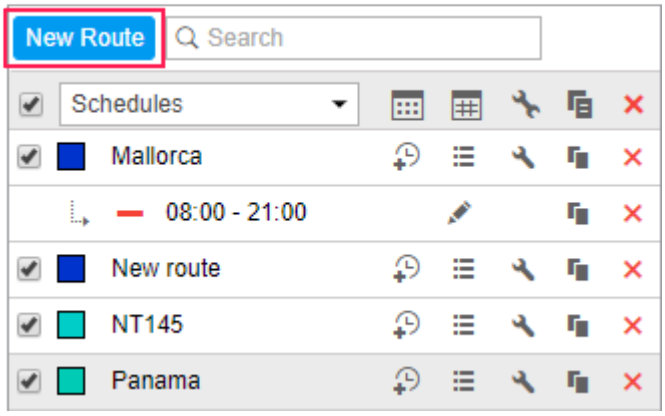


The measurement system is specified in the user settings.

You can resize the window sectors. To do so, click on the border between them with the left mouse button and, while holding it, move the border to the right/left or up/down. However, if less than 10% of the map is left while expanding the lower sector, the map automatically collapses. To expand it, click on the line under the top panel.

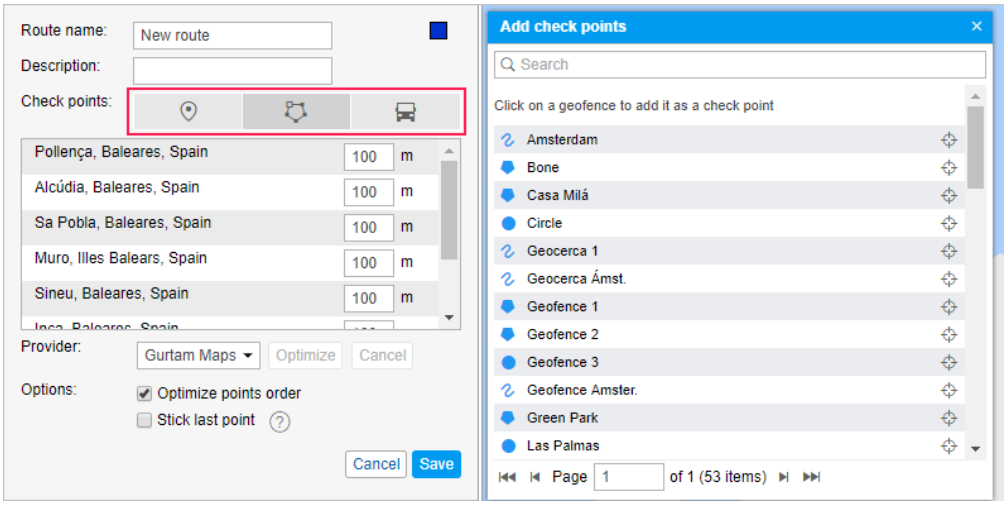
Creating a Route

To create a new route, click on the **New Route** button.



Type the route name (at least four characters), which will be displayed in the list, in notifications, in reports, in tooltips, etc. Optionally, you can add a description, and select a color which will be used to display the route on the map and on the timeline.

A route consists of check points. Check points can be added by various means: from the map, from geofences and even from moving units.



Adding check points

Click on the corresponding icon to add check points in one of the following ways.

From map/address

Either type the address in the search field or simply double-click on the map to indicate check points. See the Address section for more information about the **Address** tool. Having found the point, edit its name if necessary (the **Adress** field) because it is impossible to do it later. Then add it to the route by clicking **Add as check point**.

From geofences

Clicking on this button opens the list of available geofences. The type of the geofence (circle, line,

polygon) is shown graphically to the left of its name. Click on geofences to add them as check points.

From units

A check point can have no fixed coordinates. It can be a moving unit. In this case, visiting this point means approaching it within the specified radius. To add a unit as a check point, click on it in the list.

Geofences and units are added to the list of check points by clicking on them. To find the necessary object quickly, use the dynamic filter on the top. To the right of the geofence and unit names there is a button to center the map on these objects. However, the geofences and units are visible only if they are marked to be displayed on the map in the corresponding panels. If you have more than 100 items, they are divided into pages, and to view them all, use the navigation buttons at the bottom of the list.

When the points are added, you can edit their radius. However, in case of geofences, the radius is not specified because their shape and size are taken as they are. In a route, the copies of geofences are created and, when saved, they lose connection with their originals. You can edit or delete those original geofences later, and it will not affect the route in any way. However, in case of units, the connection with the original is always preserved unless the unit is deleted.

You can edit and delete check points or add more if necessary. To change their sequence, just drag the points up and down holding them by the blue arrow-shaped icons. Note that check points cannot be renamed.

When finished, press **Save**. The route will appear on the list. To see it on the map, click on its name. It is strongly recommended to check all the points on the map before proceeding because when the route has schedules, it is impossible to edit it.

> ⚠ When a route has schedules, it is impossible to change the sequence of check points, add or delete them. To edit such a route, make its copy and alter the necessary parameters before saving. Then delete the original route. However, you will have to configure schedules and rounds again.

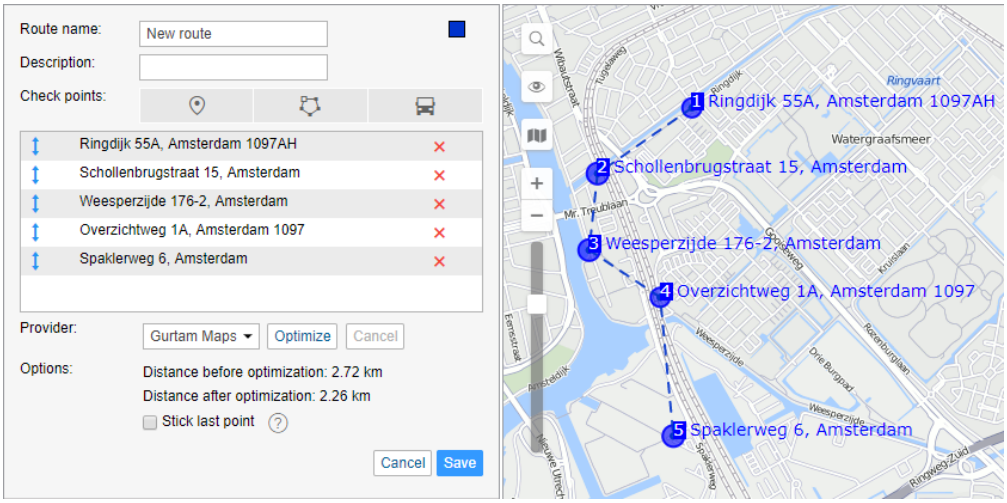
Optimization

Optimization is available if the route has more than two points.

Before saving a route, you can apply the function of optimization. In this case, the program automatically determines the shortest way to visit all the points. It is especially useful for courier services. The default cartographical service used for optimization is Gurtam Maps. However, you can select another source from the dropdown list (Google, Yandex, Visicom, HERE). The shortest

route can be built considering existing roads and highways, or avoiding traffic jams, and so on. These additional parameters depend on the map provider selected and are the same as in the Routing tool.

To apply optimization, click on the **Optimize** button. See the route distance before and after optimization below. To restore the initial route, click **Cancel** next to the optimization button.



To build a route, you can also use the Routing tool.

Managing Routes

Routes are listed in the alphabetic order. To quickly find a certain route, use the dynamic filter above the work list. Type the route name or part of the name into this field.

Below the dynamic filter there is a dropdown list where you can select the way to display routes in the work list.

Routes. Only routes are displayed (without any sublevels).

Schedules. The routes are displayed with their schedules.

Check points. The routes are displayed with their check points.

Active units. The routes are displayed with the units that are currently performing them.

The following icons are used in the **Routes** panel:

: edit the selected route (change its name, description, color, and the radius of the check points);

: add a new schedule for this route;

: show the list of rounds for this route (finished, in progress, pending, estimated, aborted);

: create a manual round for this schedule;

: copy the selected route or schedule (create a new route or a schedule on the basis of the

selected one);

: delete the selected route or schedule;

: the automatic creation of rounds for this schedule is enabled (click to disable);

: the automatic creation of rounds for this schedule is disabled (click to enable);

: the automatic creation of rounds for this schedule is impossible because the schedule type is not **Relative to day**.

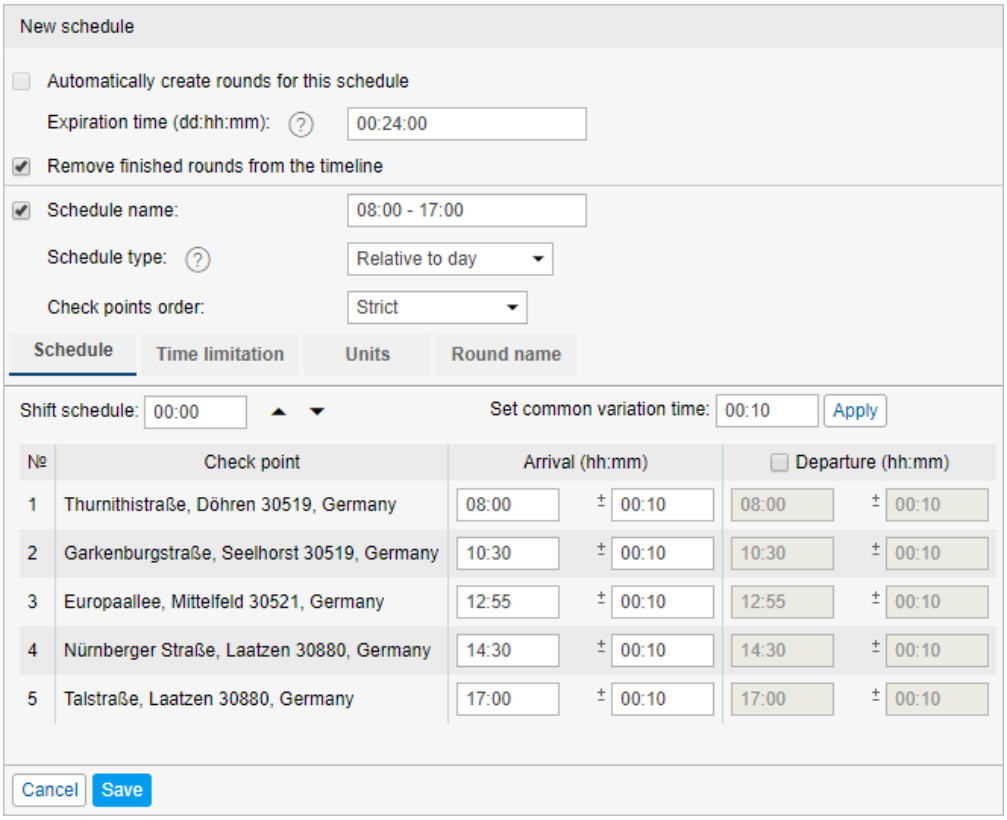
To display a route on the map, check the box next to its name and make sure the **Routes** layer is activated. To center the map on the route, click on its name.

The names of the check points are displayed on the map by default. To hide them, deactivate the **Display names of routes' check points on map** option in the user settings.

Schedule

A schedule is a list of check points with the estimated time of their visit. One route can have an unlimited number of schedules. Different schedules can be applied to odd and even days, to weekends and weekdays, to different months, etc.

To create a schedule for a route, click on the **Add schedule** button ( ) next to the route name and adjust the required parameters.



General parameters

Automatically create rounds for this schedule

Rounds can be created automatically without any assistance of a dispatcher. When it is time for a unit to visit the first point, the round is activated (taking the variation time into account) and the system starts to track it.

> ⚠ This option can only be applied to the **Relative to day** schedule type. Besides, to activate this option, select one or more units that should be assigned to the route in the **Units** tab of the same dialog.

Expiration time

This is the time (days:hours:minutes) after which the round is finished forcibly and obtains the **Aborted** status. This time is counted from the moment the round begins to be tracked.

Schedule name

You can use the automatically generated name for the schedule. It includes the time of the first and the last point or it can be **Copy of ...**, if the new schedule is created as a copy of the existing one. However, you can give the schedule a different name manually, if you check the box before its name.

Remove finished rounds from the timeline

It is advisable to leave this option checked. Otherwise, finished rounds remain on the timeline and it is difficult to navigate through them. However, you can delete rounds from the timeline in the list of rounds.

Schedule type

Relative to activation

The scheduled time of the check point visit is counted from the moment of round activation. The time of activation is specified when creating a round manually.

Relative to day

The scheduled time of the check point visit refers to the time of the day. So, this schedule can be used on different days (once a day). The automatic creation of rounds can be applied only to this type of schedule.

Absolute

The scheduled time of the check point visit is absolute, i.e. the date is also specified. This type of schedule requires to create rounds manually.

Check points order

This parameter is extremely important for route control.

Strict

All check points are supposed to be visited in the order established in the route. No skipping is allowed. It means that if a unit has to arrive at Point #3, any visits to other points are ignored. The round is considered finished when the unit enters the last check point after visiting all points in the established order. There are two possible results of such a round: all the points have been visited or all of them have been skipped (if the round has been aborted due to timeout).

Skipping possible

Check points are supposed to be visited in the indicated order, however, it is possible to skip some of them. If a unit visits Point #4 immediately after Point #2, Point #3 is considered to be skipped (even if visited later). The round is considered finished when the unit enters the last check point, and it does not matter how many points have been visited.

Arbitrary

Check points can be visited in any order. The round is considered finished when **all** the points have been visited.

Schedule grid

Here you can see the list of all the check points of the route and their visiting time. You can indicate the time of arrival or the time of arrival and departure for every check point. Besides, you can set the variation time which will not be regarded as a violation of the schedule (for example, +/- 5 minutes).

Time of arrival to a check point. The time format is **hh:mm**.

Arrival variation (hh:mm) corresponds to a time interval within which a unit is allowed to arrive at a check point. For example, if the variation time is 5 minutes and the arrival time is 16:30, the unit should come to the check point between 16:25 and 16:35.

Time of departure from a check point.

Departure variation corresponds to a time interval within which a unit is allowed to leave a check point.

The same variation time of arrival and departure can be set for all check points simultaneously. To do so, fill in the **Set common variation time** field and click **Apply**.

If a check point has the arrival time only, it is considered visited on arrival. If both the arrival and the departure times are indicated, the check point is considered visited only when the unit leaves it.

It is important to set the arrival variation of the first check point, because in this case, a round is created (appears on the timeline and begins to be tracked) in advance. If the arrival variation of the first check point equals zero or has a small value, it may happen that a unit visits the point before

the round is created. In this case, the visit will not be detected. Therefore, it is recommended to set a larger arrival variation for the first check point.

Time limitation

Yo can apply time limitations to the schedule to restrict its operation to certain time intervals, days of the week, days of the month or months. For example, you can select only even or odd days, or the working hours of the weekdays, and so on. Note that this option does not work with the **Absolute** schedule type.

Units

Here you can assign units to the schedule. It is obligatory if rounds are created automatically. If you create a round manually, you can assign a unit immediately at the moment of round creation. If several units are indicated, the first to begin the round will be assigned to it.

> ⓘ The **Use unit in retranslators, jobs, and notifications** access right is required for unit assignment.

Switch to the **Units** tab. Here you can see two lists. The units to be assigned are displayed in the left one and those already selected go to the right one. The left list does not contain all the units available to you, but only those included in the monitoring panel work list. In case the work list is empty (when the dynamic work list is used or when the units have been deleted from the work list manually), the units available to you according to the access rights will be displayed.

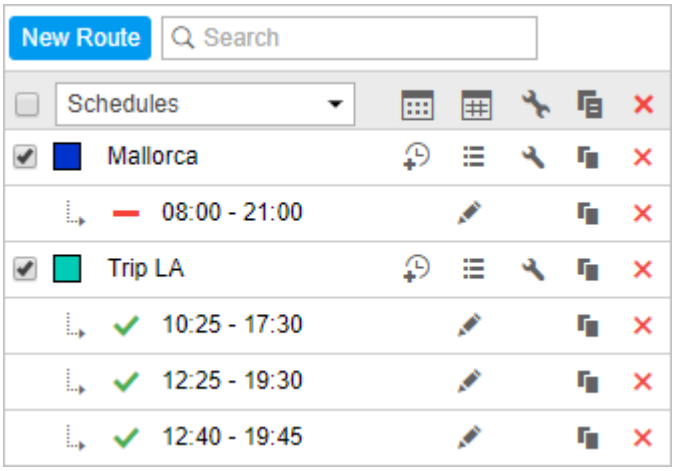
Round name

Here you can set a name mask that will be applied to rounds created on the basis of this schedule to differentiate them from those related to other schedules. This is useful when you enable the automatic creation of rounds. You can use special tags to set the name mask.

%ROUTE%	The route name.
%SCHEDULE%	The schedule name.
%FIRSTPOINT%	The first check point name.
%LASTPOINT%	The last check point name.

%DATE%	The date of round creation.
%TIME%	The time of round creation.

When all the parameters are set, press **Save**. You can see the result in the **Routes** panel if you select the **Schedules** filter. To edit the schedule, click on its name. Here you can also delete and copy schedules, as well as create rounds manually. To the left of the schedule name, there is a button to enable or disable the automatic creation of rounds.



Having configured the first schedule, you can easily create more by copying and shifting. Click on the **Copy schedule** button ( ) next to the schedule and alter the necessary parameters. Enter the shifting time (hh:mm) and click **Apply**. All arrivals and departures will be shifted by the indicated interval. If needed, change the schedule name.

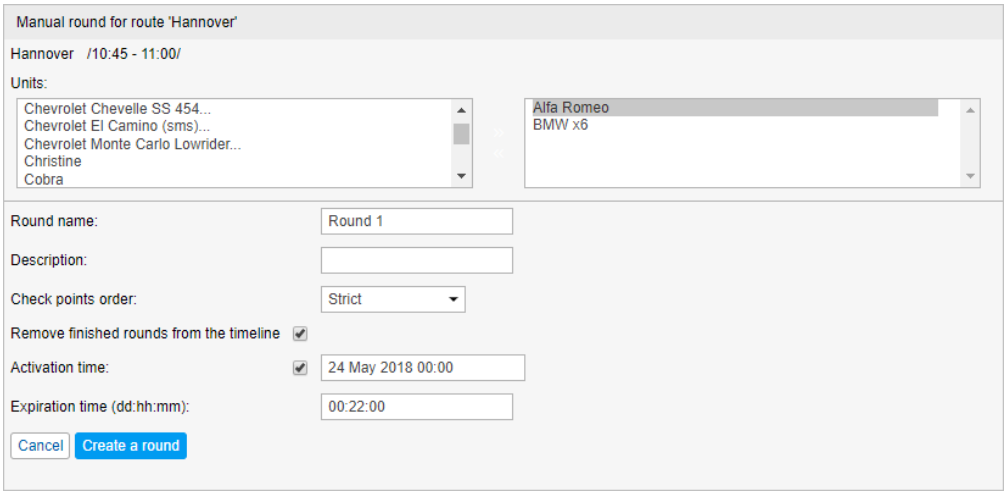
Rounds

A round is a combination of a route, its schedule and a unit assigned to them. A unit performs a route (that is, visits the check points of the route) in accordance with the assigned schedule.

Rounds can be created manually or automatically.

Manual round creation

To create a round manually, click on the **Create manual round** button next to the required schedule.



At the top, you can see the names of the selected route and schedule. Below, you can see two lists. The units to be assigned are displayed in the left one and those already selected go to the right one. The left list does not contain all the units available to you, but only those included in the monitoring panel work list. In case the work list is empty (when the dynamic work list is used or when the units have been deleted from the work list manually), the units available to you in accordance with the access rights will be displayed.

Then indicate the name of the round, add a description (optional), select the check points order, set the activation and the expiration time, and other parameters (see the Schedule section for more information).

The activation time is the date and time when the system starts to track the round. This parameter is especially important for schedules of the **Relative to activation** type. If you leave this field empty, the round begins when the unit enters the first check point (if the check points order is strict) or any check point (in other cases).

Next, click **Create a round**.

Automatic creation of rounds

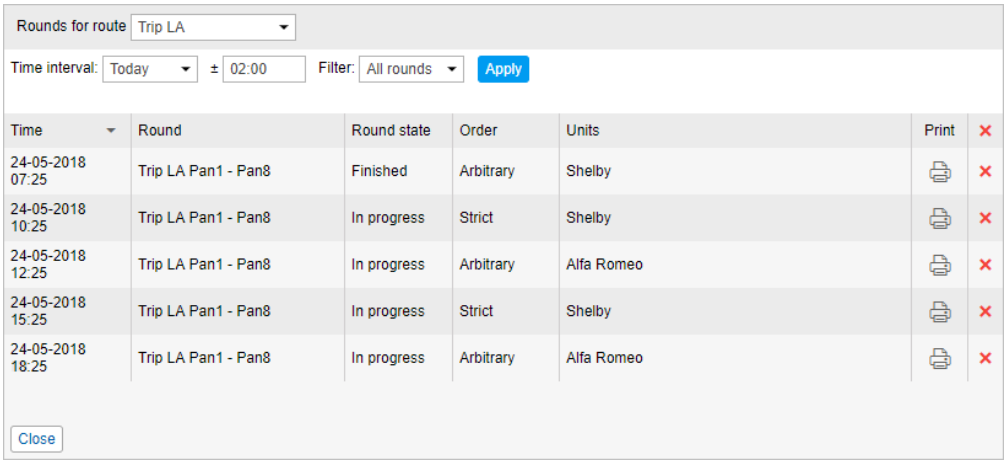
You can enable automatic creation of rounds in two ways.

The first method is available for the schedules of the **Relative to day** type after the assignment of at least one unit. Activate the **Automatically create rounds for this schedule** option and click **Save**, or switch on the corresponding button before the name of the schedule in the work list.

The second method implies creating a notification and selecting the Create a round notification action.

Round list

To see the list of rounds created or planned for a certain schedule of a certain route, click on the button .



Select the time period (**Hour**, **Today**, **Yesterday**, **Week**) or set a custom interval. For the first four options, you can extend the time period for several hours (+hh:mm). It is convenient if the working shift ends after midnight.

Use a filter to specify the rounds you need. You can display either all rounds or those of a certain status: in progress, pending, finished, estimated, or aborted. Having set all the parameters, click on the **Apply** button to display the required rounds. Besides, in the dropdown list in the upper left corner, you can choose whether to display the list of rounds for one route or for all the routes simultaneously.

The table shows the following information: the start time of the round, its name, state (finished, aborted, estimated, in progress, history), check points order (arbitrary, strict, skipping possible), and the assigned units.

You can print out the information about any round. To do it, click on the printer button in the **Print** column next to the required round. The printing report consists of two tables. The first one provides the information about the round (its name, description, state, units, activation time, route name and schedule), the second — about its check points (their sequence number, address, the arrival time, and if activated in the schedule, the departure time). Click on the **Print** button to print it out.

At the end of the line there is the delete button . It removes the rounds and, as a result, they disappear from the timeline and receive the **History** status. However, all the information about them is stored in the database and is available in reports.

Controlling Routes

There are several methods of tracking units on routes and you can choose what suits you better.

Online control

In the lower right part of the screen, there is a timeline on which the rounds are displayed. Here you can see all rounds created manually as well as those that are in progress at the moment.

> The rounds activated 10 or more days ago are removed from the timeline automatically.

If there are many rounds, you can filter them by the following parameters: route, schedule, round, and unit. You can select the necessary option in the dropdown list and type the name mask of the route/schedule/round/unit in the text field on the right. You can also specify the time interval for which the rounds should be displayed. To apply the filtration, press **Enter**.

Additionally, you can apply grouping to the list of rounds  . In this case, there will be a separate line for every route/schedule/round/unit. The number of items the line contains is indicated in brackets next to its name.

The timeline scale is adjustable. It can display a period of time equal to a fortnight or just a minute. On a small scale, the names of the check points can overlap. That is why sometimes it is advisable to hide them. You can select one of the following options:

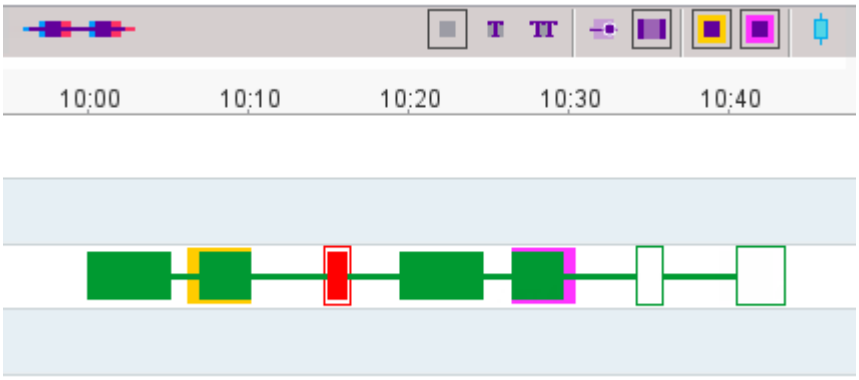
 hide captions;

 show the names of the current points only. A current point is the one where the unit is located at the moment or the one that is supposed to be visited soon;

 show all captions.

You can move the timeline to the right and left by clicking on it with the left mouse button and dragging it. Besides, the timeline can move by itself in such a way that the current moment is always displayed in the center. To adjust this setting, click **Lock current time**  . You cannot move the timeline manually while this option is activated.

On the timeline, a route is represented by a horizontal line of the color attributed to it. The check points are displayed as vertical sections on this line and are placed in accordance with the scheduled time of arrival. If both the arrival and departure times are indicated, the check point is displayed as a rectangle. Besides, the check points that only have the arrival time can be expanded to rectangles due to the deviation time (if specified). To activate this option, click **Mark deviation time**  .



Until the check point is visited, it is displayed as an empty rectangle. After the visit, the rectangle is filled with the color attributed to the route. Additionally, you can activate contours which highlight schedule violations:

- yellow is used to mark delays;
- pink is used to mark outrunning.

If the check point has been visited in accordance with the schedule, no contour is applied. If the point has been skipped, it is filled and contoured with red filling regardless of the route color.

To see the real time of the check point visit on the timeline, activate the **In fact** option . The real time is displayed in circles above the scheduled time.

Notifications about routes

While a unit is performing a round, you can receive notifications about the events related to it, the changes of the state, and so on. For this purpose, create a notification of the **Route control** type and adjust it properly in accordance with your needs. You can be notified when the round starts and finishes, when the unit enters, leaves, or skips a check point, and in some other cases. The notifications can be sent by email or SMS, displayed online in a pop-up window, stored in the unit history as events or violations, and so on. See Notifications for more information.

Reports on routes

All events connected with the unit performance on routes are stored in the system automatically. Later, you can analyse them in reports.

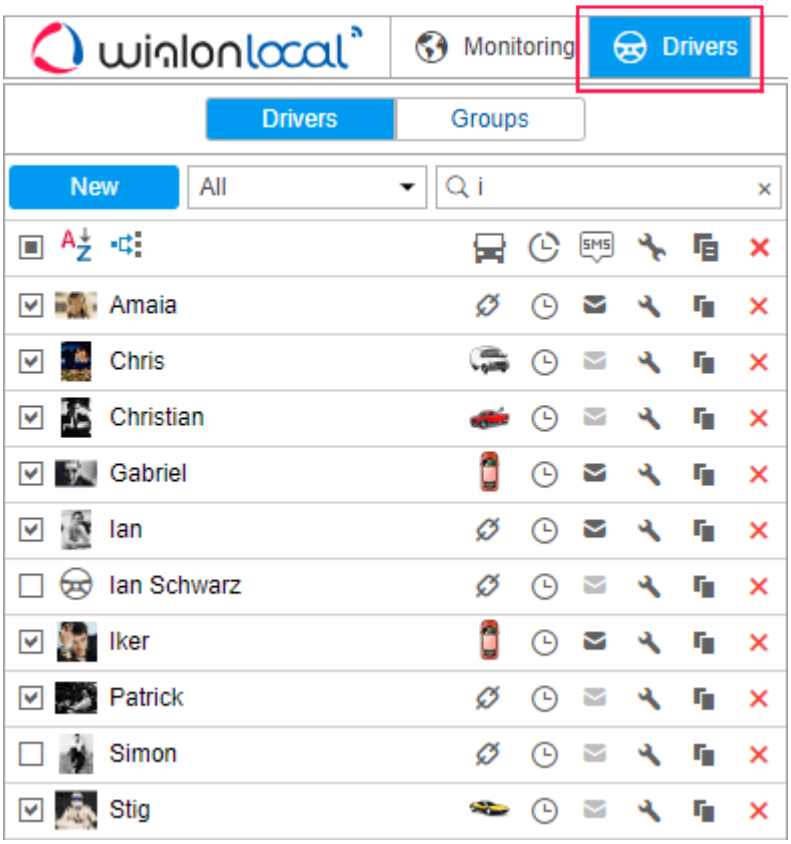
When executing a report, you can add the following tables based on the information about routes:

- Rounds (for unit),
- Check points,
- Rounds (for route).

Drivers

Wialon system provides a possibility to create and manage the list of drivers working for you. One click of a mouse can assign a driver to a unit, i.e., attach to a vehicle. Then in the reports on this unit, a driver will be indicated. It is particularly useful when several drivers work with the same unit. There is also a possibility to detect drivers automatically with the help of the iButton system. Moreover, created drivers can be formed into groups.

To start working with drivers, choose the **Drivers** item in the top panel, or click the necessary item in the main menu customizer. Afterwards, select the mode you want to work with (drivers or groups).



Creating a Driver

In the monitoring panel, select the **Drivers** mode, click on the **New** button, and indicate the required parameters.

Name

Give driver a name that will be visible during the tracking process and in reports.

Code

Specify a unique identification code of the driver. If you use the code for the automatic binding of drivers, make sure that the code (including the case) corresponds to the parameter value of the sensor created for the automatic binding. Otherwise, the binding of the driver is not registered.

For example, the **avl_driver** parameter is used for the created sensor of the **Driver binding** type. In the message received from the unit, the parameter value is **avl_driver=00000a777e10**. In this case, you should specify **00000a777e10** in the **Code** field.

Description

Type any comments (optional). It is shown in driver's tooltip.

Phone number

Enter driver's phone number. It will be shown in driver's tooltip and can be used to send SMS messages to the driver and make calls. If you attempt to create a driver with a phone number that is already reserved to another driver or unit, a special alert will be displayed, and this phone number will not be saved.

⚠ Units or drivers with the same phone numbers cannot exist in the system.

Mobile key

Password for mobile authorization.

Exclusive

If this flag is enabled, this driver can be the only one assigned to a unit. In case you bind this driver to a unit (in real time) which already has one or more assigned drivers, those drivers are reset automatically. This flag works only for drivers within a common resource.

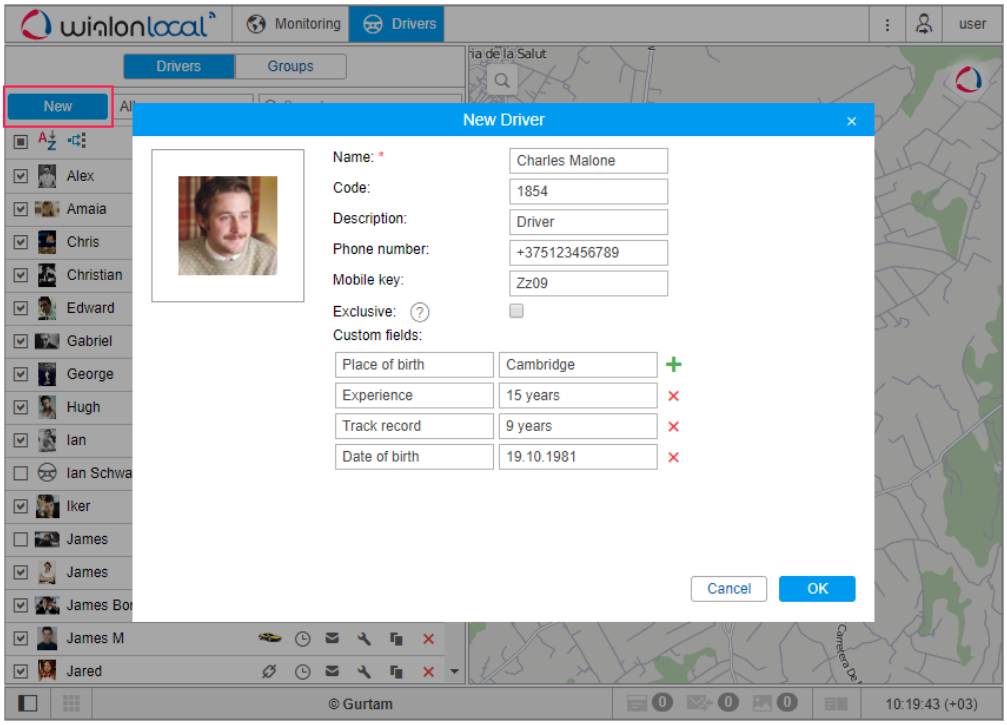
Photo

To quickly identify a driver, you can attach their photo or any other image. To do this, press the **Browse** button and find and load an image from the disk. Supported formats are PNG, JPG, GIF, and SVG. In the driver's editing dialog, you can delete an image used. To do so, point a cursor on it, and click the appeared delete button. Click OK to save changes, or Cancel to dismiss them.

Custom fields

Create driver's card adding any information as custom fields (information may include external links). They are shown in driver's tooltip and can be summoned in reports. Note that custom fields with the same name cannot coexist within one particular driver.

At the end click **OK**. The new driver appears in the list.



Like other resource objects, you can copy drivers from one resource to another using the import and export tool. Read about the particularities of their transfer here.

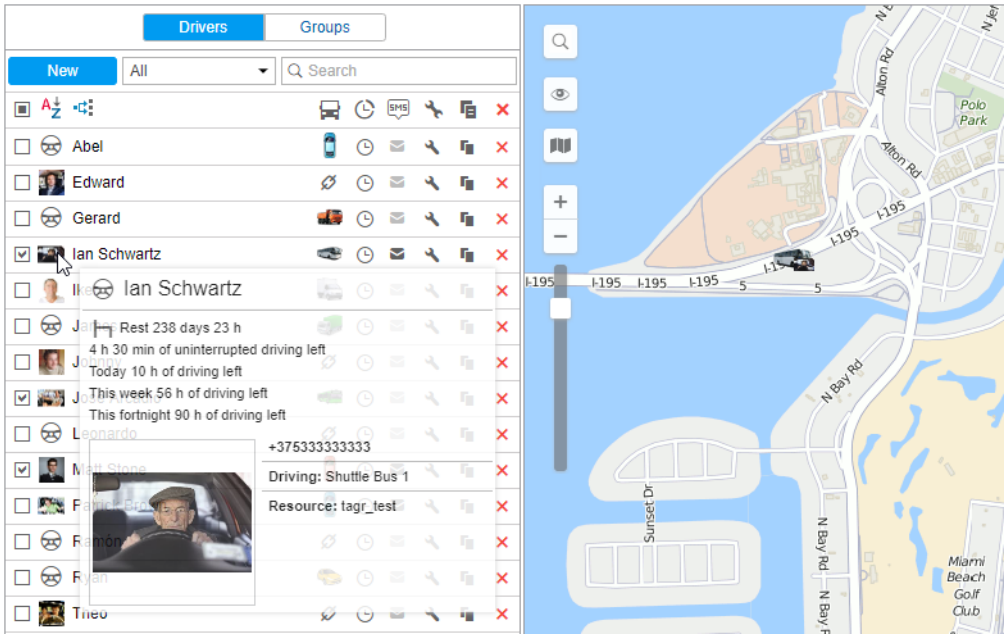
> You cannot import or export driver groups.

Managing Driver List

Drivers are listed in the alphabetic order. To quickly find a certain driver, use the dynamic filter above the list. There are also filters to display drivers that belong to a certain resource or group or display drivers according to their status (loose/bound). Those filters are presented in the form of drop-down menus above the list.

> For drivers to be displayed on the map, you should check if the corresponding layer is active.

To display a driver on the map, tick the check box on their left. As drivers do not have their own coordinates, they borrow their location from the units to which they are assigned. Click on the driver's name in the list to center the map on their position. An assigned driver's icon is shown at the bottom right corner of the unit's icon. If a driver is not assigned to any unit at the moment, their last known position is shown (with a bigger icon). If there is no data about the driver's location (for example, if they have never been bound to any unit), such a driver is not shown on the map.



DDD files received from tachograph contain driver's activity information. Such files can be uploaded automatically (due to the corresponding settings of equipment), or manually (using the Tacho Manager application). Received information on the driver's activity helps to control whether a driver follows the AETR standards or not. Driver's activity is displayed in the tooltip of each driver, and contains the following data:

- current state (driving, work, availability, rest) and its duration;
- the date and time when the daily driving (shift) started;
- driving information for the current shift (time left for driving/exceeded driving time/missed rest beginning and the required duration of rest);
- week's driving info (time left for driving/exceeded driving time/missed rest beginning and the required duration of rest);
- two-weeks driving info (time left for driving/exceeded driving time/missed rest beginning and the required duration of rest).

If there is less than one hour left for the current shift or less than three hours left for driving in a week or two weeks, the tooltip contains a warning and the color of the driver icon changes to red, or an exclamation mark appears on the right (if there is a photo of the driver).

The tooltip also shows the driver's name, phone number, enlarged photo, resource (if there are several), description, and custom fields (if any were set). Moreover, a unit name can be shown in a tooltip if a driver is bound to it.

In the list, an icon image of the unit to which the driver is bound is displayed in the next column after the driver's name. If you place the cursor over this icon, the unit's tooltip is displayed (the same as in the **Monitoring** panel).

You can also perform a number of actions:

or : bind/unbind driver to/from a unit as well as delete incorrect bindings (disabled if there is no enough access rights);

: register working shift or delete bindings;

: send SMS to the driver (the button is not displayed if the current user does not have enough rights; if the button is dimmed, it means there is no phone number in the driver's properties);

or : edit or view driver's properties;

: create a new driver using this one as a basis;

: delete driver (the button is dimmed if you have not enough access rights).

Assigning Drivers

Several drivers can be assigned to a single unit.

There are two ways to bind a driver to a unit: manual and automatic.

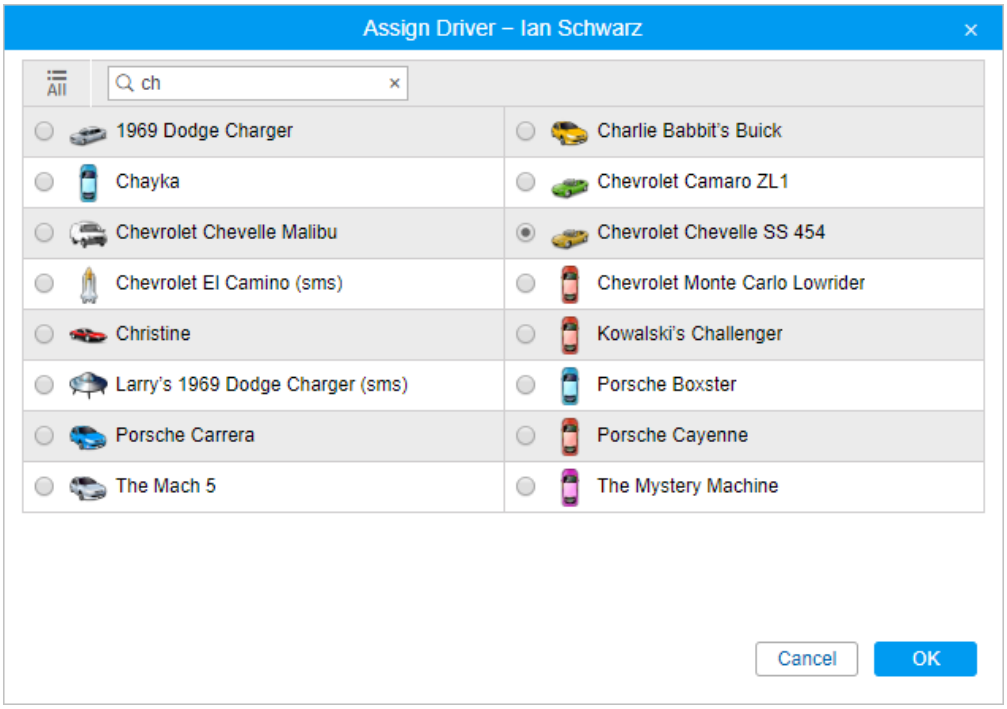
> To assign drivers to units, you should have the **Create, edit and delete drivers** access right towards the resource where those drivers belong.

Manual binding

The manual assignment can be performed in both modes (**Drivers**, **Groups**) of the **Drivers** panel. Use the **Bind/Unbind** button (/) to attach or detach drivers to/from units. The button is disabled ( ) if your access is not sufficient.

Click on the **Bind to unit** button ( ), choose a unit for the driver to be bound to, and click **OK**.

Availability of units in this list depends on the work list in the **Monitoring** panel. If there are no units in the list, click on the **Add all available** button ( ). If the list is still empty, then you have no access rights to these units.



To unbind a driver from a unit, click on the icon of the unit next to the driver's name and click on the button . Besides, you can unbind a driver by registering a working shift or deleting bindings from history.

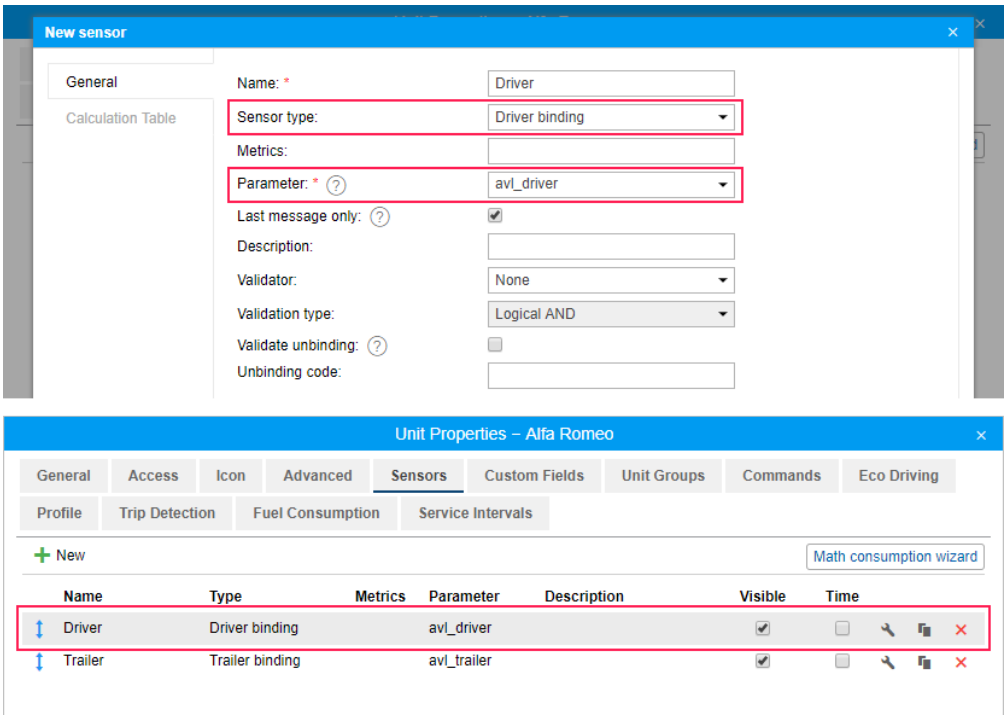
Automatic binding

To detect a driver automatically the corresponding equipment should be installed. For instance, contact memory devices, namely digital electronic keys (e.g. RFID chips) are widely used in personnel access control systems. When getting into the vehicle, the driver applies the electronic key to the reader connected to the tracker. If the parameter received from the tracker contains the key code, the driver gets bound. However, if the value of the parameter is empty, the driver gets unbound.

To use the automatic method of binding, some adjustments should be done in the system beforehand.

1. A special sensor of **Driver binding** type should be created in the properties of each unit intended for auto-binding. A parameter for this sensor can be avl_driver or some other depending on your equipment and its configuration. One or more driver sensors can be created on the basis of different parameters. If more than one driver binding sensor exists within a unit, the option **Validate unbinding** can be useful. If the option is activated, a driver bound to a unit automatically can be unbound from this unit only if the empty value comes from the same parameter that was used to bind the driver. Otherwise, the driver reset coming from any parameter will lead to the reset of all drivers bound to this unit.

A driver can be unbound from the unit upon receiving the parameter with the unbinding code configured in the properties of the **Driver binding** sensor, and also upon the activation of the corresponding notification (for example, upon switching off the engine). When a driver with enabled Exclusive checkbox is assigned to a unit, all others are automatically unassigned. This function is relevant for drivers created within the same resource.

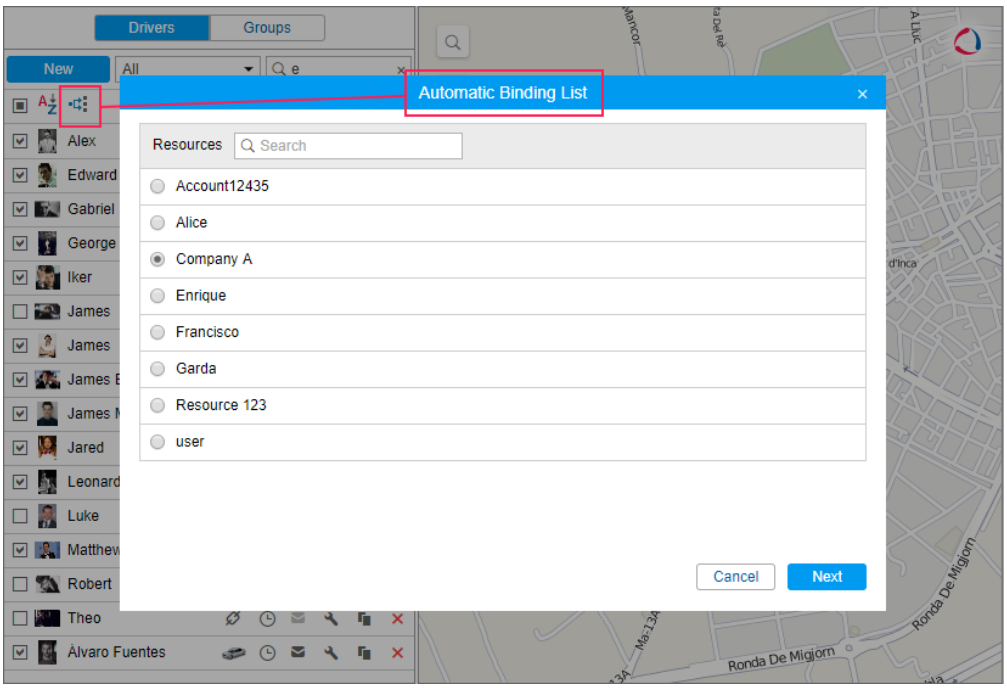


2. Create a list of units for any resource the drivers of which are intended to be bound automatically. In order to do so, click 'Auto-binding' icon ( ), and follow the steps listed below.

Upon clicking the **Automatic binding** icon a list of available resources is opened.

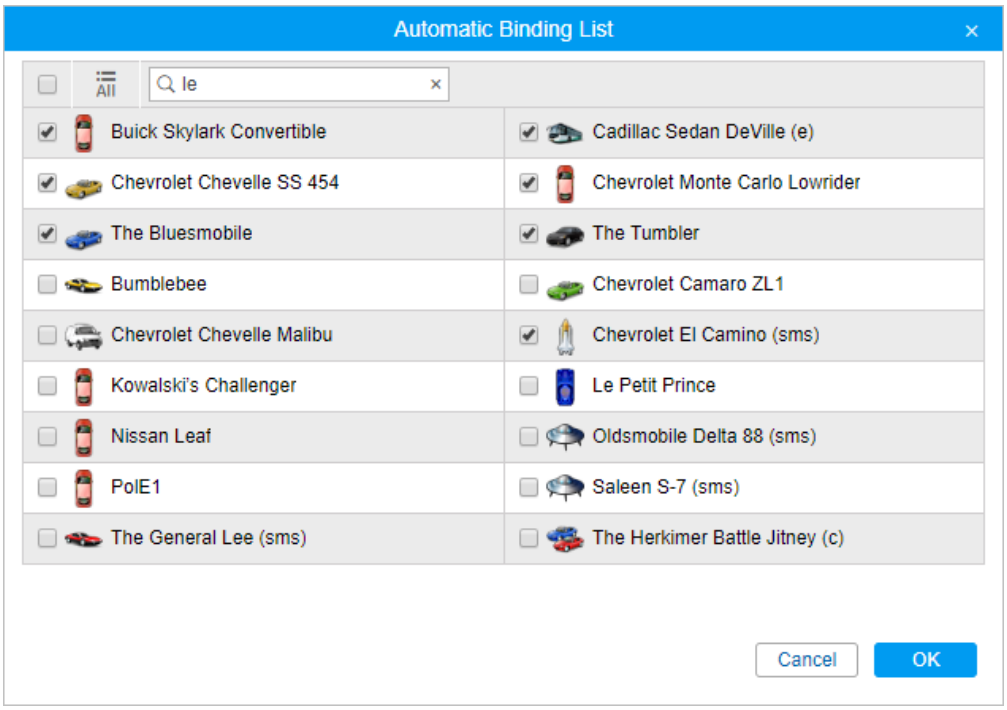
Here you choose a resource the drivers of which will be used in automatic binding (with the units chosen in the next dialog). In order to understand which drivers belong to a particular resource, go back to the **Drivers** panel, and apply a filter by resource (drop-down menu to the right of the **Create** button).

After choosing a resource, click **Next**. If only one resource is available, then it will be chosen automatically.



The next dialog contains a list of units to which the drivers from a chosen resource can be bound automatically. Depending on the access rights possessed, the list can be viewed or edited.

ⓘ The **Automatic binding** list contains only those units, to which the user has the **Use unit in jobs, notifications, routes, retranslators** right.

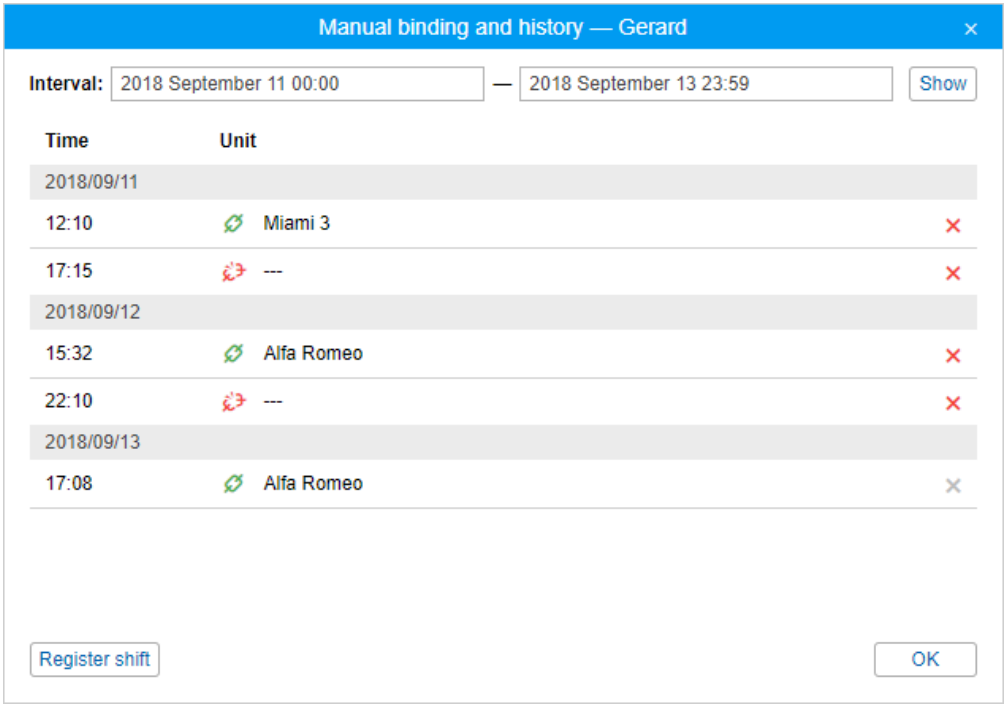


Thus, a driver will be automatically bound to a unit with the help of iButton in case (1) this unit has a special sensor in its properties and (2) this unit is indicated in the list of auto-attachable units applied to the resource where the driver belongs.

Automatic binding of drivers is removed in the same way: in the **Automatic binding** dialog, choose a resource and cancel the selection of units for which the automatic binding will not be used.

Registration of the working interval

This option allows to view the history of bindings, remove them if necessary, and register the driver's shift manually. To perform these actions, click on the **Register work interval** icon ( ) to the right of the driver's name.

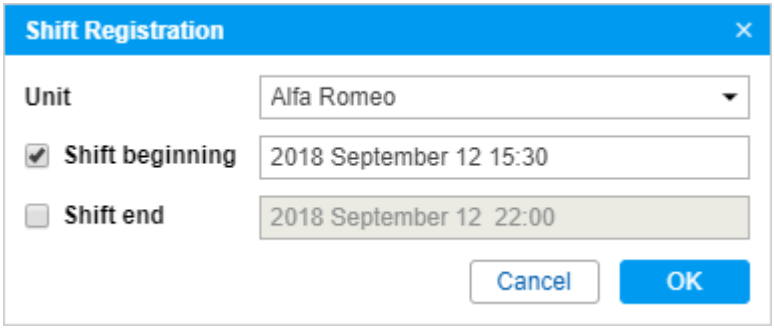


To view the history of bindings, specify the required interval and click **Show**. In the list of bindings, you can see the unit name, the date and time of each binding and unbinding.

You can remove an incorrect binding or unbinding from the list by clicking on the icon at the end of the line.

> You cannot remove the last binding or unbinding registered in the system.

To register a shift manually, click on the **Register shift** button in the lower left corner of the dialog box. Next, select the unit and specify the beginning and/or end of the shift. To activate the field of the shift end, select the check box next to it.



When registering a shift manually, the date and time indicated as its beginning and end should be in the past or present. If you specify the beginning and end in the future, the shift is registered with the current date and time.

To finish the shift registration, click **OK**.

Simultaneous bindings

A driver can be bound simultaneously only to one unit. If somehow (for example, through registration of shifts) you are trying to bind a driver to another unit, later assignment cuts off the previous one.

However, several drivers can be assigned to one unit at once. It is reasonable with long-distance truck drivers and truckers.

If you want to avoid the situation when a unit may have several drivers assigned to it, use the flag **Exclusive** in driver properties. If a driver with such a flag is bound to a unit, other previously assigned drivers are reset automatically.

Note the following restrictions.

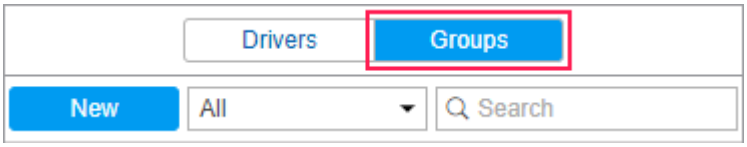
- For correct operation, all drivers must belong to one resource.
- It works only in real time, i.e. there are no such rules when registering work shifts of drivers.
- It does not work in a reverse way, i.e. if a driver with the activated **Exclusive** checkbox is assigned to a unit at the moment and another driver without that checked is being assigned, both of those drivers will be bound.

Driver Groups

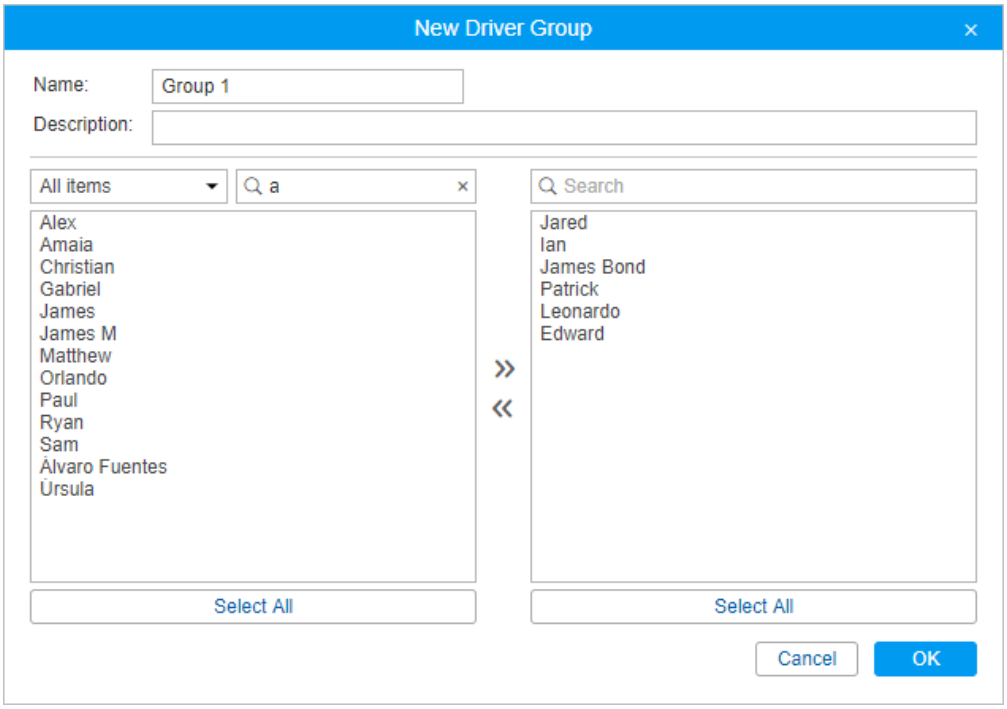
Created drivers can be formed into groups. Groups can unite drivers by any criteria. Driver groups are used in group reports.

⚠ Only drivers who belong to the same resource as the group itself can compose the group.

To start working with groups, choose the corresponding mode in the **Drivers** panel.



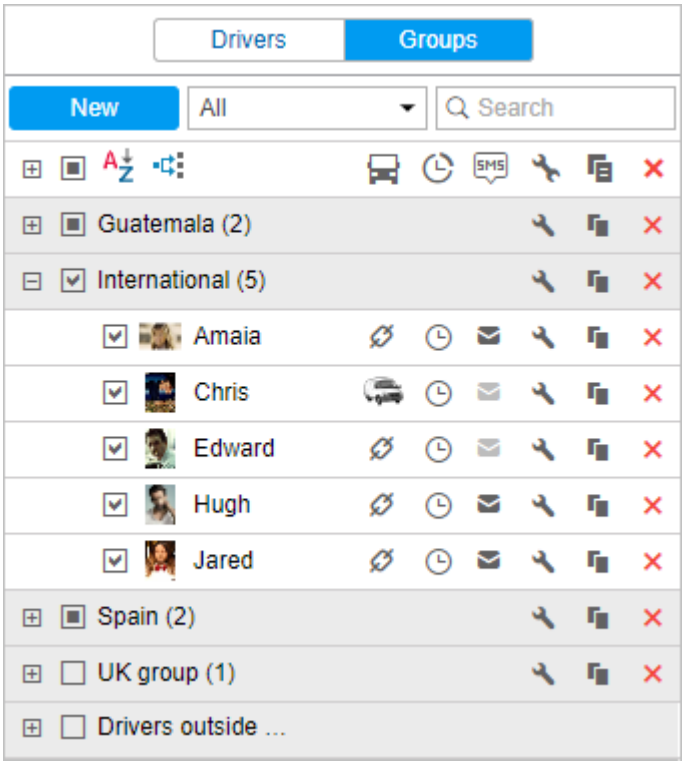
To create a new group of drivers, press the **New** button. Enter its name and description. The drivers to form the group are chosen in the list at the left. The contents of the list can change according to the option chosen in the filter above. It can display all the drivers, a group of drivers (the names of the groups are shown in brackets) or the drivers outside groups. Move necessary drivers to the right list using double clicks or the **Add** button. Press **OK**.



A list of created driver groups is displayed in the work area. Groups are arranged alphabetically. The same as for drivers, a filter or a dynamic search can be used for groups. Moreover, groups can be edited, copied, or deleted. Note that upon deleting a group you can not delete its contents.

Drivers not included in any group can be found in the **Drivers outside groups**.

Series of standard actions are available for drivers in a group (unfold a group in order the corresponding buttons to appear).



Using Drivers

In addition to working with drives on the main tab, you can perform the following actions:

- display information about drivers on the **Monitoring** tab and on the map;
- configure the notifications about separating and assigning drivers or notifications which allow separating drivers from units automatically;
- use information about drivers to execute different reports.

The "Monitoring" tab and the map

The table below describes how to configure the displaying of information about drivers on the **Monitoring** tab and on the map. You can see the name, photo, driver's phone number, the unit to which the driver is assigned, and the resource to which the driver belongs.

Place	How to configure
Unit tooltip	Select the **Drivers** item in the user settings.
Extended unit information	Select the **Drivers** item in the user settings.

Place	How to configure
Work list on the **Monitoring** tab (icon)	Enable the **Drivers** option in the monitoring panel customizer.
Map (icon and name)	Check the driver in the list of the **Drivers** tab and select the **Drivers** layer on the map. You can also select a layer with the names of drivers on the map.

ⓘ After assigning a new driver, the information about the driver in tooltips is updated within a minute.

Notifications

You can configure notifications about assigning and separating the driver from the unit. You can also create a notification after which the driver should be separated from the unit automatically (for example, after entering the garage). To do this, select the Reset driver action in the settings.

Reports

You can add a column with the name of the driver to the tables of most reports (Trips, Engine hours, Fuel fillings, Fuel thefts, Speedings, etc.). The name is displayed if the driver was assigned to the unit during the selected report interval.

Beginning	End	Duration	Mileage	Driver
2013-03-13 10:58:10	2013-09-04 06:41:21	174 days 19:43:11	0.00 km	John
2013-09-04 06:41:21	2013-09-04 08:17:38	1:36:17	14.38 km	John
2013-09-04 10:47:20	2013-09-04 11:11:54	0:24:34	0.54 km	John
2013-09-04 11:11:54	2013-09-04 11:29:27	0:17:33	0.47 km	John
2013-09-04 22:28:37	2013-09-04 22:37:00	0:08:23	0.45 km	John
2013-09-04 22:37:00	2013-09-04 22:56:05	0:19:05	7.39 km	John
2013-09-04 22:56:05	2013-09-04 23:20:30	0:24:25	27 km	John

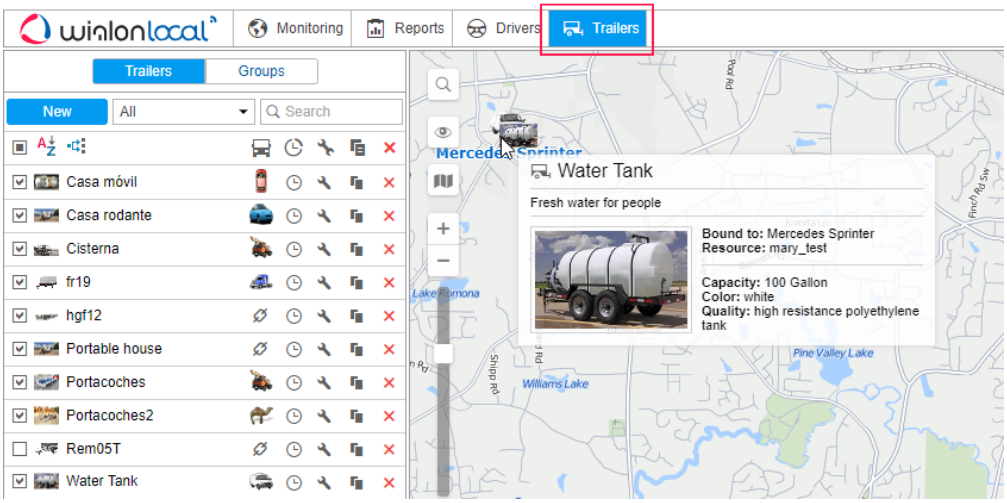
You can also apply filtration by driver. This allows you to select what intervals should be included in the report: for example, include only those intervals of trips, parkings, fuel fillings, etc., during which a specific driver (or no driver at all) was assigned to the unit.

In addition, the system provides advanced reports on driver assignments, activity, eco driving, infringements of working hours, etc. You can execute them for a driver or a group of drivers.

Trailers

Trailers in the Wialon monitoring system are any mechanisms attached to or driven by the main vehicle (unit) and not having their own trackers or controllers. In functionality, trailer monitoring is similar to driver monitoring.

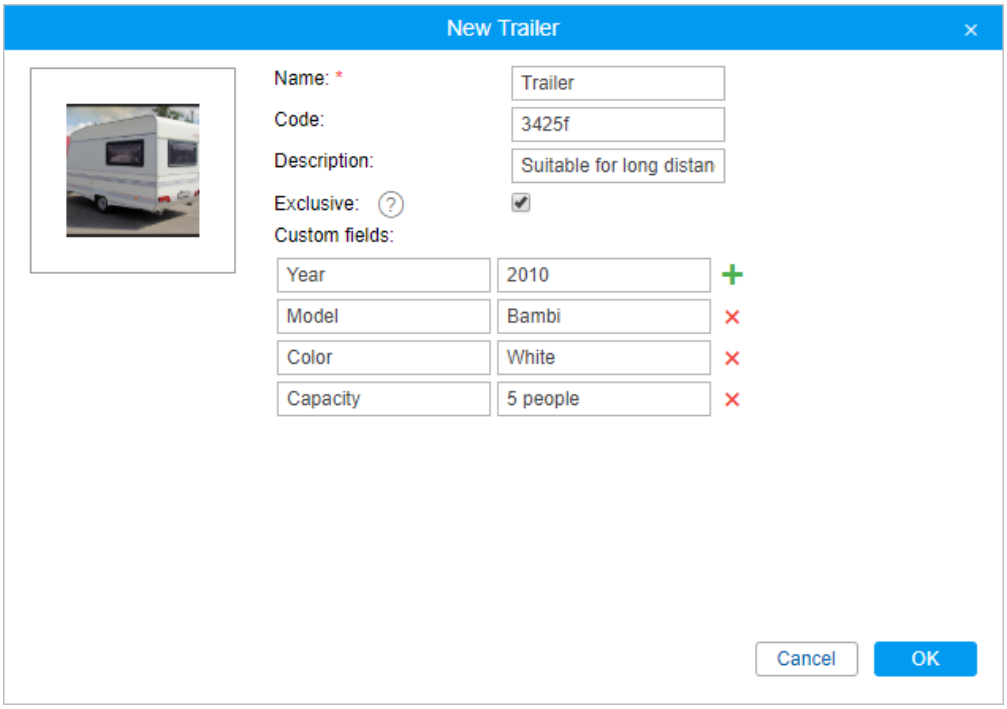
To work with trailers, click **Trailers** in the top panel or select the corresponding item in the main menu customizer.



Then select a mode that allows you to work with trailers or groups of trailers.

Creating a Trailer

Go to the **Trailers** panel and press the **New** button. In the dialog that opens, fill in the name, identification code (for automatic binding), description, and custom fields. This information is shown in the trailer's tooltip and used in reports. You can upload an image for the trailer which will be used to show the trailer in the list and on the map. It is recommended to upload square images so that their proportions are not distorted. The properties that can be assigned to trailers are the same as for drivers.

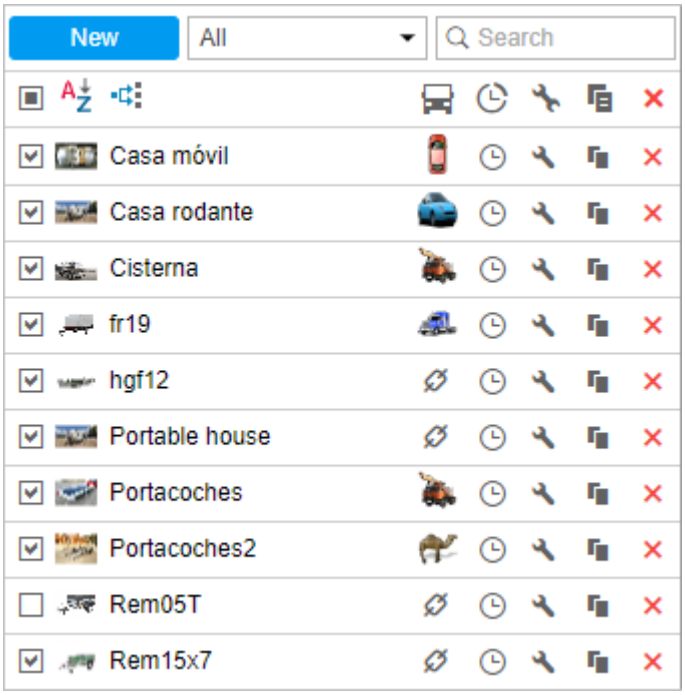


Trailers, like any other resource content, can be copied from one resource to another using the import and export tool.

> You cannot copy trailer groups.

Managing Trailer List

Trailers are listed in the alphabetical order. To quickly find the required trailer, apply the filter to the list (in the drop-down list, select filtration by property or by resource) or use the dynamic search.



To display a trailer on the map, tick the checkbox on its left (make sure that the trailers layer is activated). As trailers do not have their own coordinates, they borrow location data from units to which they are bound. Click on the trailer's name in the list to center the map on its position. If the trailer is bound, its smaller icon is displayed in the lower right corner of the unit's icon. If the trailer is not bound to any unit at the moment, its last known position is shown (with a bigger icon). If there is no location data (for example, the trailer has never been bound to any unit), the trailer is not displayed on the map.

In the tooltip for each trailer, you can see its name, its enlarged picture, description, and custom fields (if all this information has been added), as well as the name of the unit to which the trailer is currently bound.

Next to the name of the trailer is the icon of the unit to which it is bound. If you pause on this icon, a pop-up window appears with information about the unit.

The following actions are used to work with trailers:

- or : bind or unbind the trailer (if there are no access rights, the icon is disabled);
- : register the work interval or delete bindings;
- or : edit or view trailer's properties;
- : create a new trailer using the selected one as a sample;
- : delete trailer (the button is disabled if there are no access rights).

Binding and Unbinding Trailers

Trailers, the same as drivers, can be bound to units either manually or automatically.

Simultaneous bindings of trailers to units is the same as for drivers.

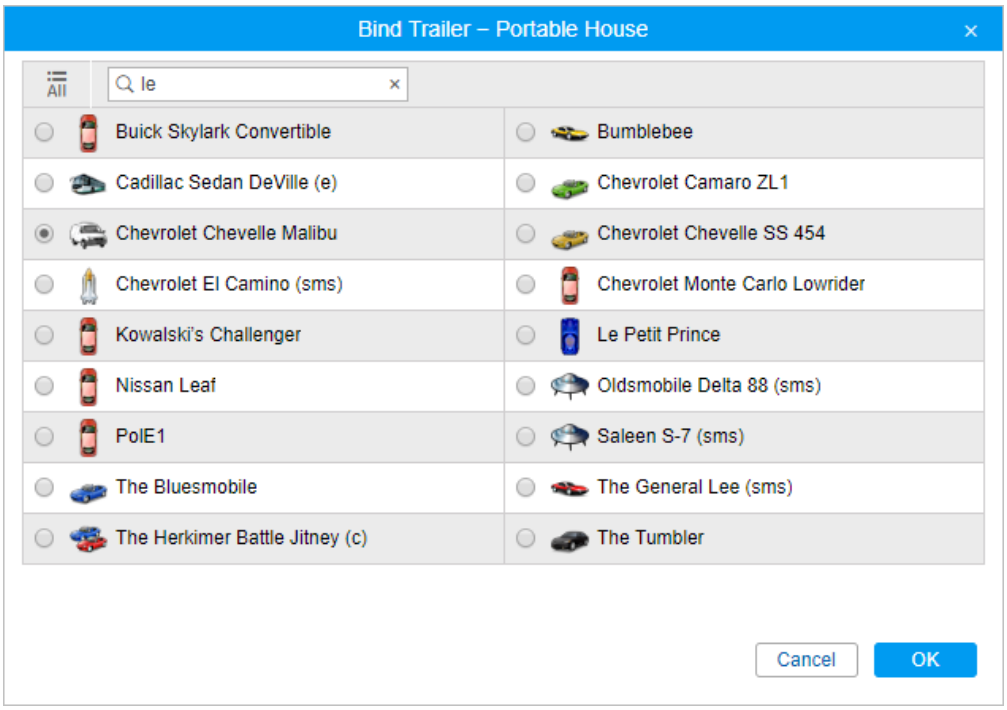
> To bind or unbind trailers to units, the **Create, edit, and delete trailers** access right to the resource is required.

Manual binding

Manual binding and unbinding can be done in the **Trailers** panel. To the right of each trailer, there is the icon or which binds or unbinds the trailer. If you do not have enough access rights, the icon is disabled .

Click on the **Bind to unit** icon ( ), select the required unit, and click **OK**.

The contents of the list correspond to the work list of the **Monitoring** panel. If there are no units in the list, click on the **Add all available** icon ( ). If the list is still empty, it means you have no access rights to the units.



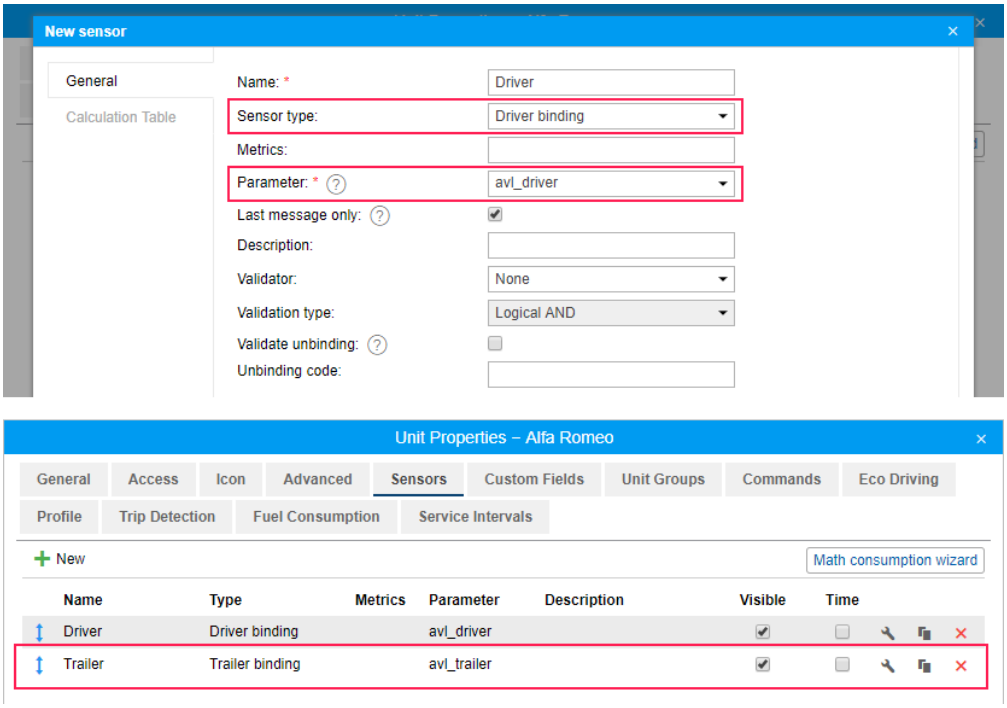
To unbind a trailer from a unit, click on the unit icon to the right of its name, and then use the icon . Besides, you can unbind the trailer by registering a new working shift or by deleting bindings from history.

Automatic binding

Automatic method of binding trailers to units requires special equipment, such as, for instance, iButton digital electronic keys.

Also, make sure to make the required adjustments in the system: both for trailers and for units. Follow the steps described below.

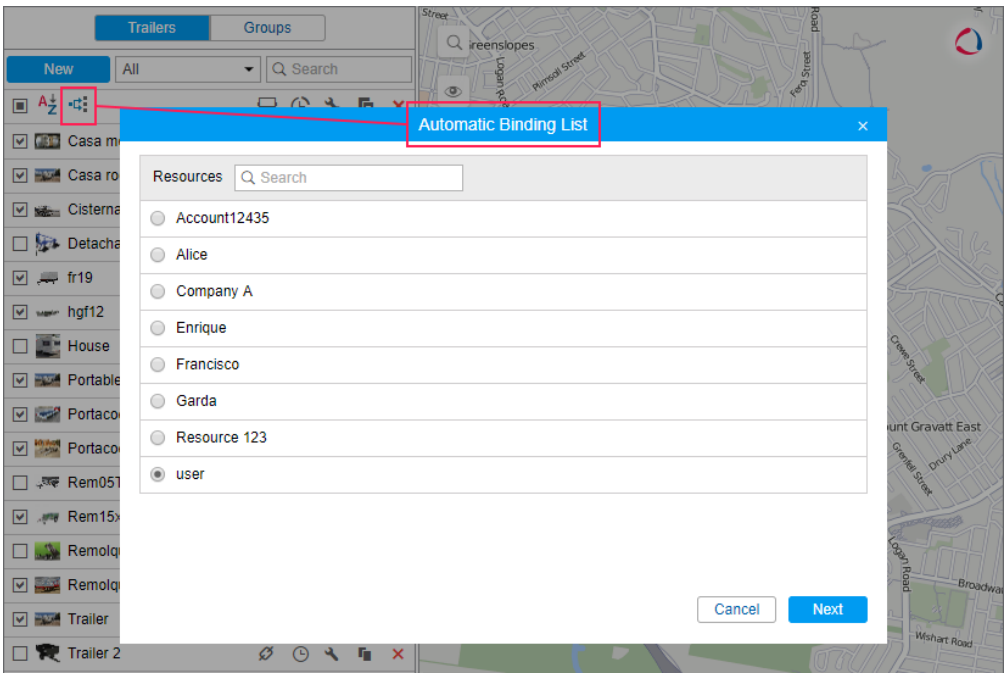
1. Create a special sensor of the **Trailer binding** type in the properties of each unit to which the trailer is supposed to be bound automatically. You can use the **avl_driver** parameter for this sensor or any other parameter depending on your equipment and its configuration.



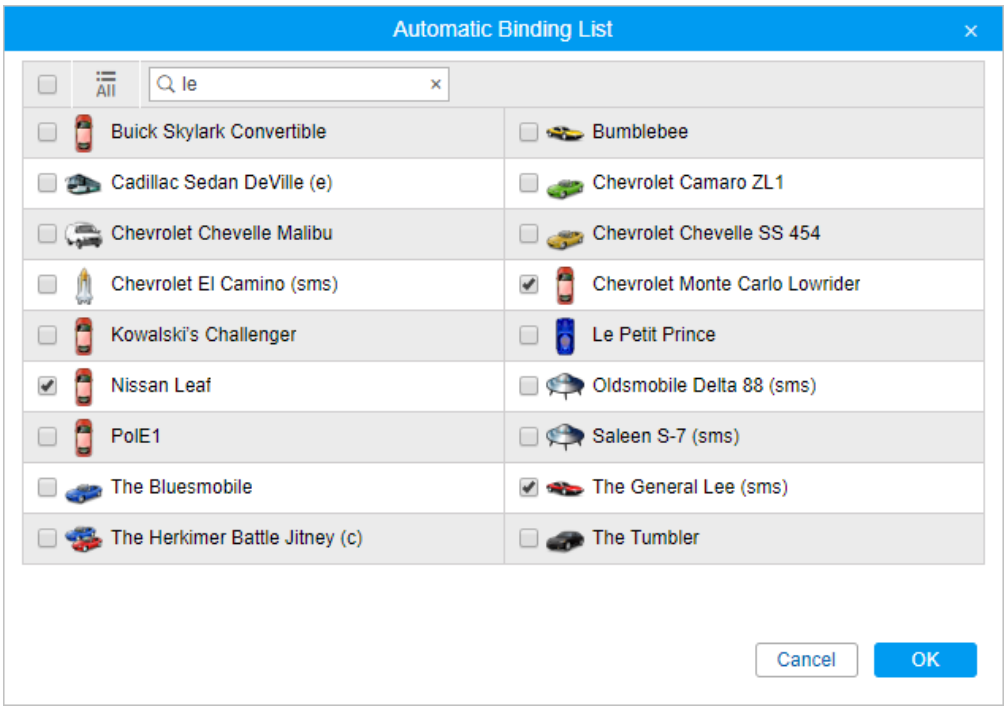
2. Click on the icon of automatic binding ( ) to create a list of units to which the trailers from this resource can be bound automatically. A box with the list of all available resources opens. Verify that you have access rights to the user that is the creator of the resource, otherwise, a warning will be displayed.

Select the resource whose trailers will be used in automatic binding. To learn which trailers belong to a particular resource, go to the **Trailers** panel and apply the filter by resource (drop-down list to the right of the **New** button).

After choosing a resource, click **Next**. If only one resource is available, it will be selected automatically.



The next dialog box contains a list of units to which the trailers can be bound automatically. Select the required units.

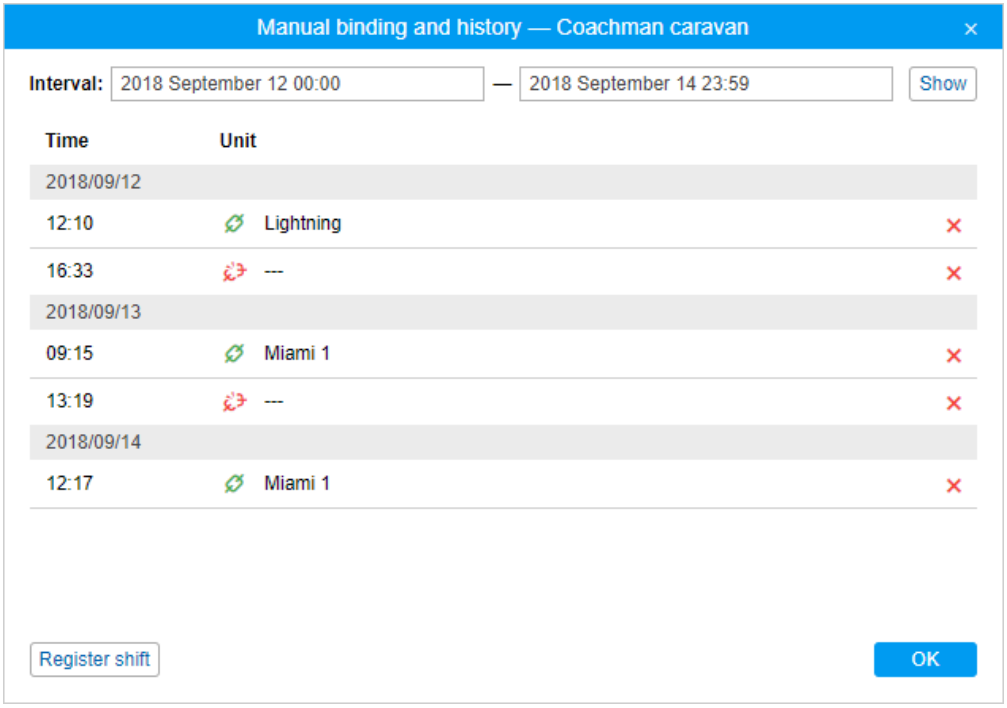


The trailer will be automatically bound to a unit with the help of iButton if two conditions are met: this unit has a special sensor configured in its properties and it is indicated in the list of units bound automatically.

Automatic binding of trailers is removed in the same way: in the **Automatic binding** dialog box, select a resource and clear the boxes of units for which the automatic binding will not be used.

Registration of the working interval

This option allows to view the history of bindings, remove them if necessary, and register the shift of the trailer manually. To perform these actions, click on the **Register work interval** icon ( ) to the right of the trailer name.

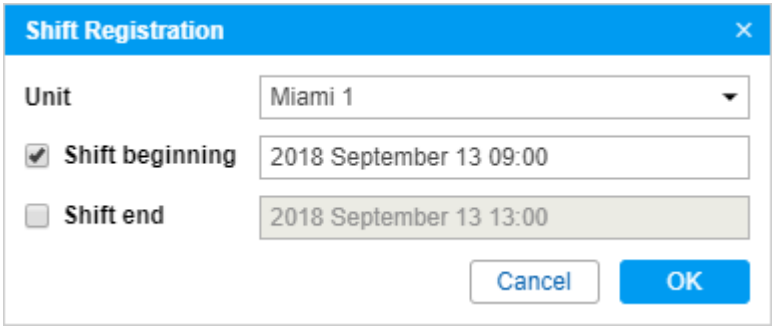


To view the history of bindings, specify the required interval and click **Show**. In the list of bindings, you can see the unit name, the date and time of each binding and unbinding.

You can remove an incorrect binding or unbinding from the list by clicking on the icon at the end of the line.

> You cannot remove the last binding or unbinding registered in the system.

To register a shift manually, click on the **Register shift** button in the lower left corner of the dialog box. Next, select the unit and specify the beginning and/or end of the shift. To activate the field of the shift end, select the check box next to it.



When registering a shift manually, the date and time indicated as its beginning and end should be in the past or present. If you specify the beginning and end in the future, the shift is registered with the current date and time.

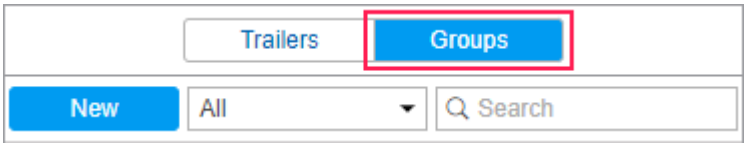
To finish the shift registration, click **OK**.

Trailer Groups

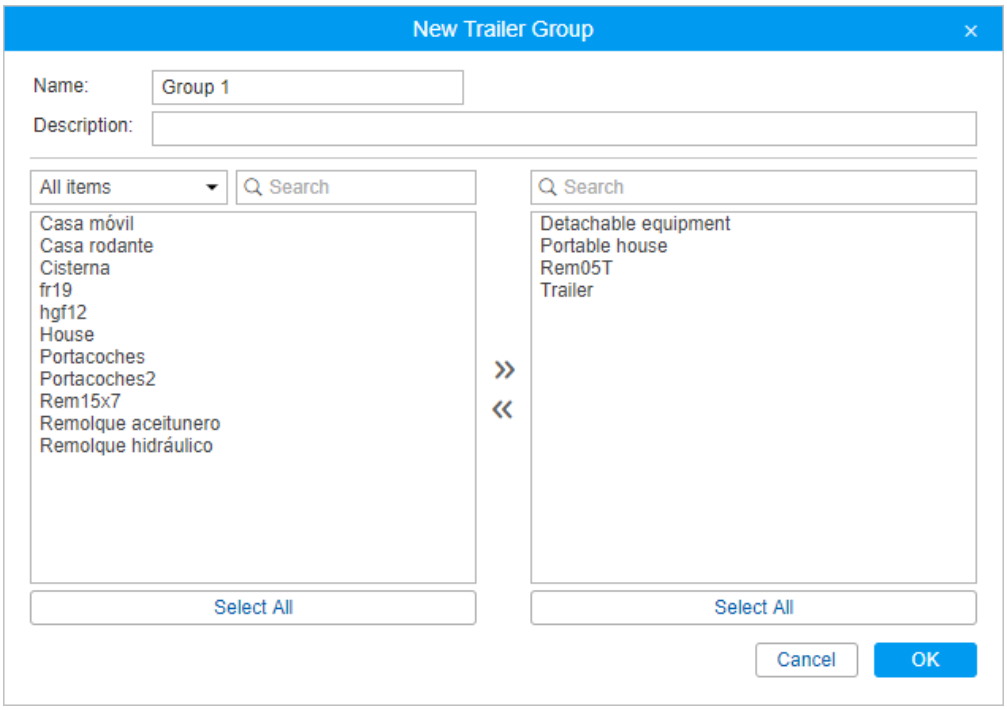
You can group trailers on the basis of certain criteria and then use the groups in reports.

> ⚠ Only a trailer that belongs to the same resource as the group itself can be added to the group.

To start working with groups, switch to the **Groups** mode in the **Trailers** panel.



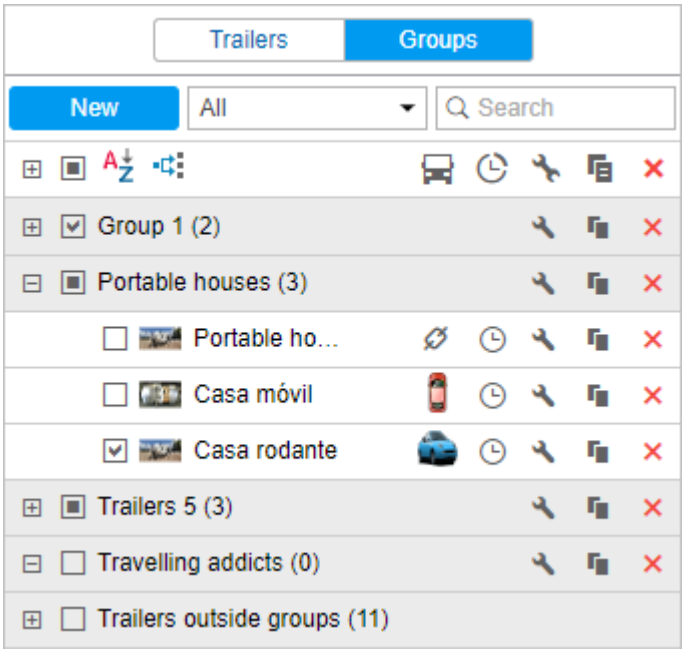
To create a new group of trailers, press the **New** button. Enter its name and description. The selection of trailers that should be included in the group is carried out in the list on the left. The contents of the list can change according to the option chosen in the filter above. It can display all the trailers, a group of trailers (the names of the groups are shown in parentheses), or the trailers outside groups. Move the required trailers to the right list by double-clicking or clicking the **Add** button (arrow pointing right). Press **OK**.



A list of created trailer groups is displayed in the work area. Groups are listed alphabetically. The same as for trailers, you can use a filter or a dynamic search to quickly find the required group. Moreover, you can edit, copy, or delete groups. Note that when deleting a group, you do not delete the trailers themselves.

Trailers not included in any group can be found in the **Trailers outside groups** group.

Standard actions are available for trailers in a group (open the group to display the action icons).



Using Trailers

Online tracking:

- Trailers can be displayed in the Monitoring panel.
- Trailers can be displayed in additional information of the unit if this option is activated in the **General settings** tab of the **User settings** dialog box.
- Trailers can be displayed on the map. Even though they do not have their own coordinates, the location of the trailer can be defined with the help of the unit to which the trailer is bound. To see the trailer on the map, check the box with its name in the left column in the trailer panel. If the trailer is bound to the unit, it is displayed in the lower right corner of the unit's icon. If the trailer is not bound to the unit, the last known position is displayed.

In notifications:

- You can configure a notification to be informed when a trailer is bound to a unit or unbound from it.

- Using notifications, you can also unbind trailer automatically, for example, when entering the destination point.

In reports:

- Many tables (such as **Trips**, **Geofences**, **Parkings** etc.) can have a column, which shows whether the trailer was bound to a unit at a certain interval or not.
- As a part of the Advanced reports module, you can generate tables for individual trailers and trailer groups. The **Bindings** and **Custom fields** tables are currently available.

Passengers

The Wialon system provides the means to control passengers who travel regularly using special transport (for example, school buses or corporate vehicles). When entering and exiting the vehicle, the passenger applies an RFID tag to a special reader. The received data is sent to Wialon where it can be further used for monitoring purposes.

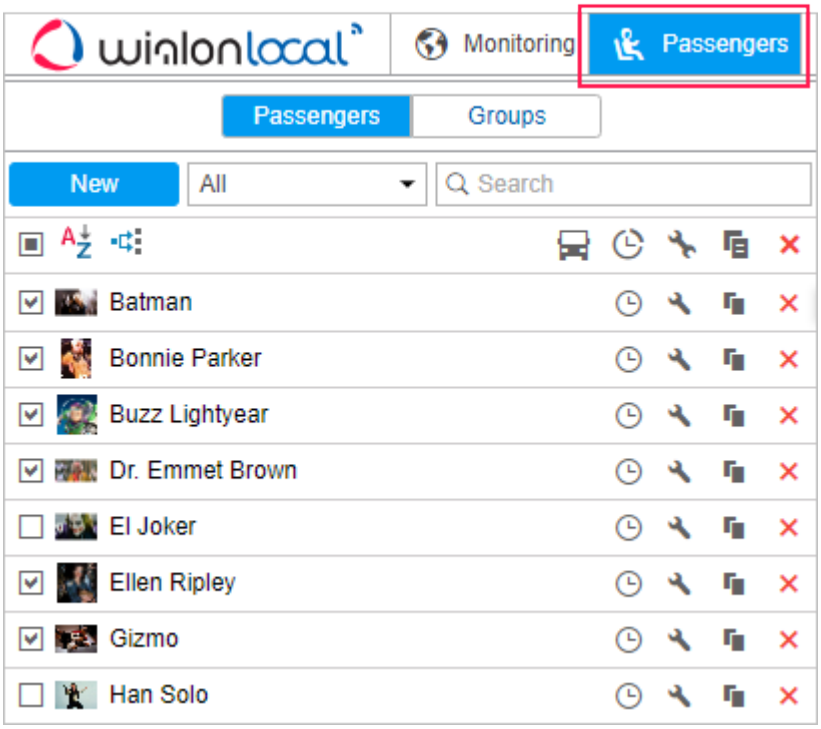
Algorithm of controlling a passenger

When a person enters or exits the vehicle, the RFID tag sends identical information. Therefore, you should distinguish between these actions. The first response of an RFID tag in 24 hours means a passenger got into a vehicle. The second operation of the same tag in the same vehicle means the passenger got out. If the second operation of the tag occurs in the same vehicle within 1 minute after getting on or off, then it is considered to be false. The system ignores such an operation.

If a passenger gets into a bus using an RFID tag, and afterwards the same tag triggers on another bus, the system recognizes it as getting off the first bus and getting on the other one.

If a passenger enters the bus and the period indicated in the **Automatic unbinding** field of the passenger properties passes, the passenger is unbound automatically.

To control passengers in the monitoring system, you should create passengers in the interface of the monitoring system and form automatic binding lists. Data received from an RFID tag provides a possibility to carry out online monitoring, generate reports on passengers, and send corresponding notifications.

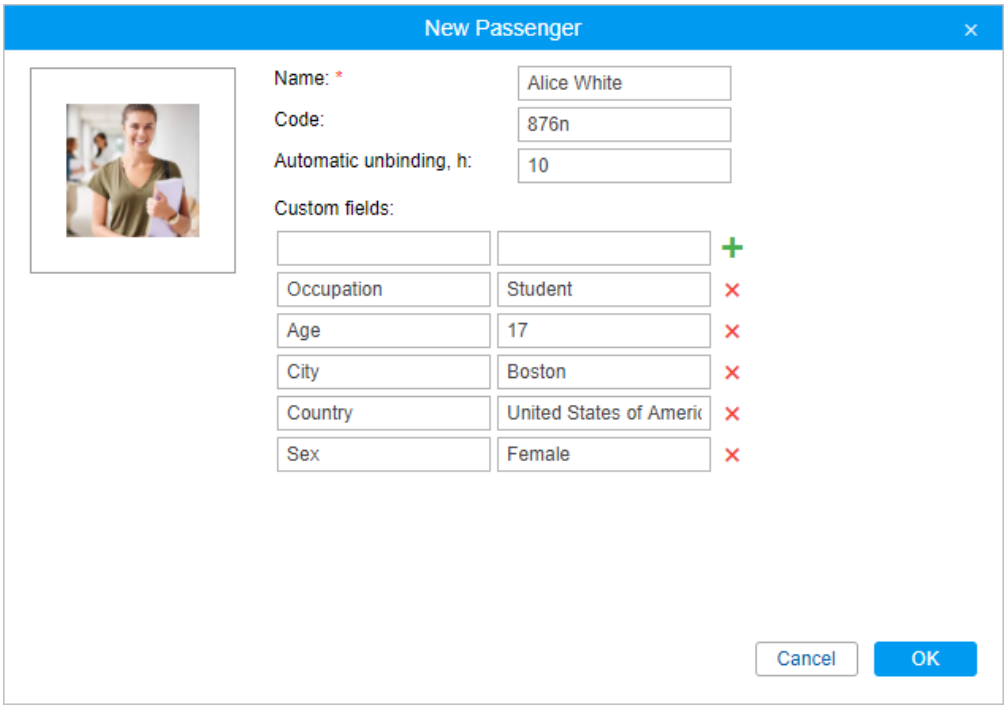


Creating a Passenger

To create a passenger, go to the **Passengers** panel and click **New**. Here enter a passenger name, an identification code for his automatic binding, and the time after which the automatic unbinding should be executed (a value from 0 to 99 is acceptable).

> ⓘ To create passengers, it is necessary to possess the **Create, edit, and delete passengers** right towards a resource.

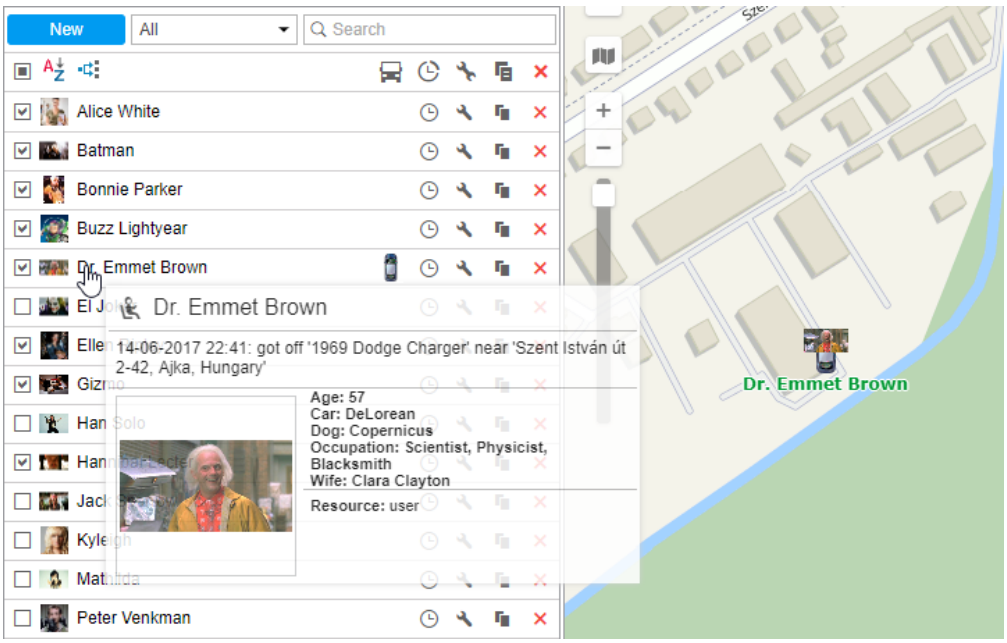
Additionally, you can fill in custom fields. This information is shown in the passenger's tooltip and, partially, in reports. You can upload the passenger's photo PNG, JPG, GIF, and SVG formats. An image is used to identify a passenger in the list and on the map. It is recommended to upload square images so that their proportions are not altered. A detailed description of parameters used upon passenger creation is provided in the driver creation section.



Managing Passenger List

Passengers are listed in the alphabetical order. To quickly find a certain passenger, use the filter (choose filtration by property or by resource from the drop-down list to the right of the **New** button) or the dynamic search.

To view a passenger list, the **View passengers** access right to a resource is required.



To display a passenger on the map, check the box with their name (the corresponding visible layer should be activated). Passengers do not possess their own coordinates, therefore they borrow their location from the units they are bound to. Click on the passenger's name in the list to center the map on their position. If the passenger is bound to the unit, a small icon in the bottom right corner of the unit icon is displayed. If a passenger is not bound to any unit at the moment, their last known position is shown (with a bigger icon). If there is no data about the passenger's location (for example, if they have never been bound to any unit), such a passenger is not shown on the map.

In the passenger's tooltip, you can find the name, enlarged image, and custom fields (if any were set), as well as a name of a unit to which a passenger is currently bound.

Next to the passenger's name, you can find an icon of the unit to which the passenger is currently bound. When you pause on this icon, a pop-up window appears with the information about the unit.

The following actions are used to work with passengers:

: view or edit passenger's history (: getting on, : getting off, : automatic unbinding);
or : edit or view passenger's properties;
: copy a passenger (create a new passenger using this one as a basis);
: delete a passenger (the button is inactive if you do not have the required access rights).

Binding and Unbinding Passengers

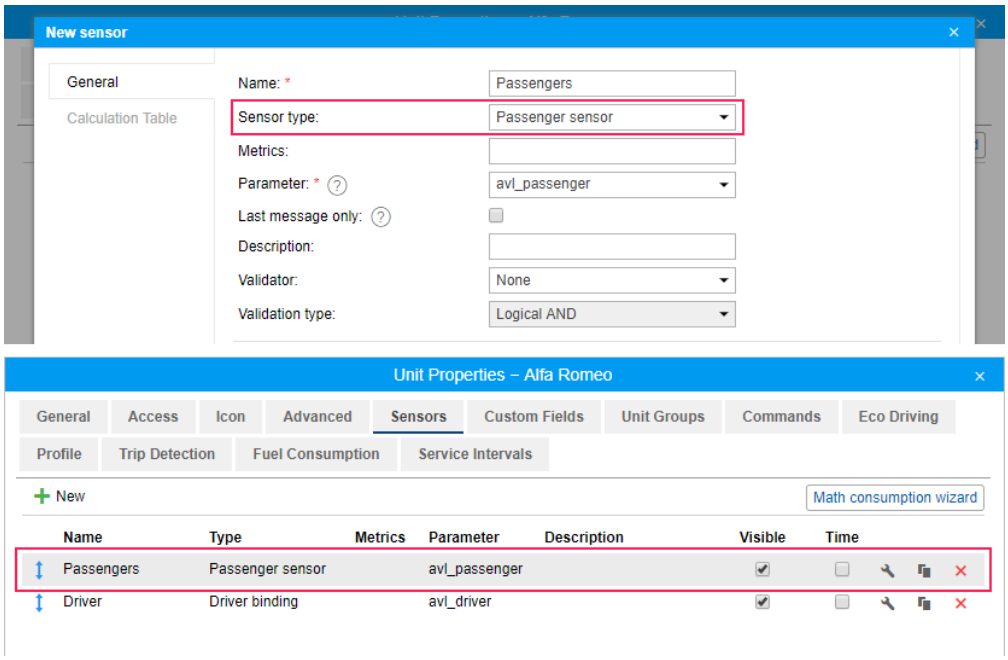
Passengers can be bound to the unit only automatically. The automatic identification method requires appropriate equipment. To work with passenger traffic, RFID tags are widely used. When getting on or getting off the vehicle, the passenger applies an RFID tag to a special reader.

> To bind or unbind a passenger, the **Create, edit, and delete passengers** access right to the resource is required.

For automatic binding and unbinding of passengers, special adjustments in the system are required:

1. Create the sensor of the **Passenger sensor** type in the properties of each unit to which the passenger is supposed to be assigned automatically. The parameter for this sensor depends

on your equipment and its configuration.

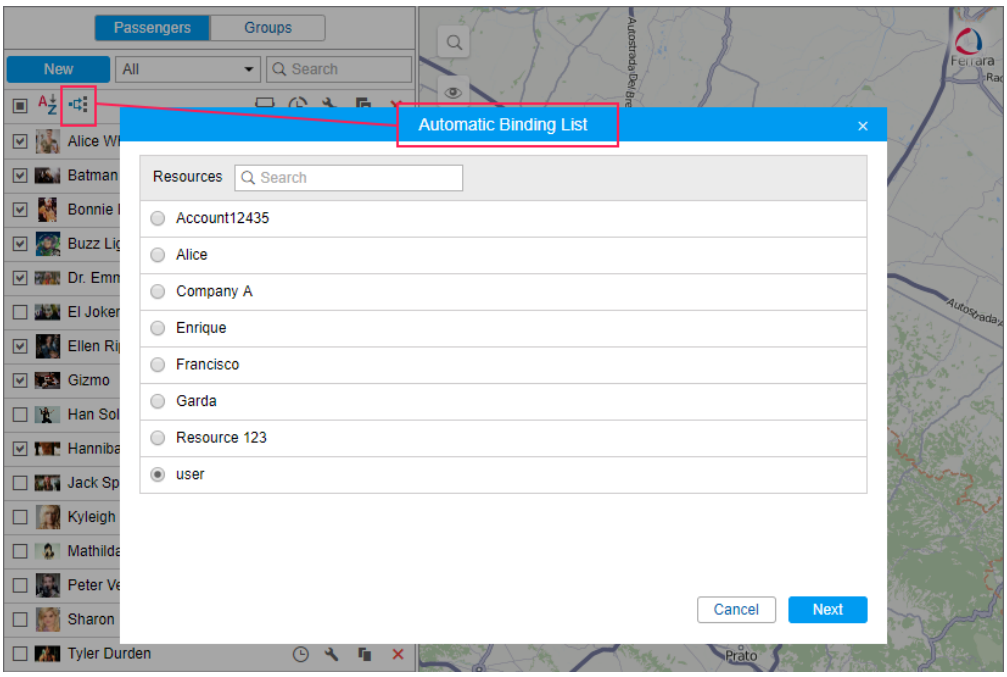


2. Create an automatic binding list. To do so, click the **Auto-binding** icon ( ) and follow the steps described below.

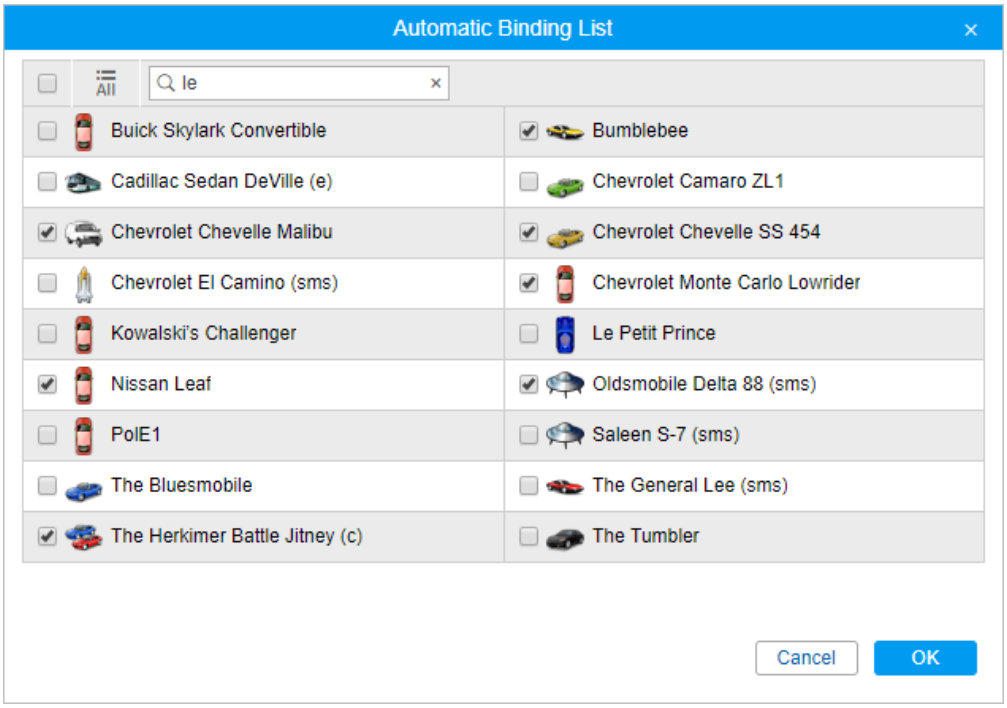
After clicking on the **Automatic binding** icon, a list of available resources opens. Verify that you have access rights to the user that is the creator of the resource, otherwise, a warning will be displayed.

Here you choose a resource whose passengers will be used in automatic binding (with the units selected in the next dialog box). In order to understand what passengers belong to a particular resource, go back to the **Passengers** panel and apply a filter by resource (a drop-down list to the right of the **Create** button).

After choosing a resource, click **Next**. If only one resource is available, then it will be selected automatically.



The next dialog box contains a list of units to which passengers can be bound automatically. Select the required units.



Thus, a passenger will be automatically bound to a unit with the help of an RFID tag in case this unit has a special sensor configured in its properties and this unit is indicated in the automatic binding list of the resource to which this passenger belongs.

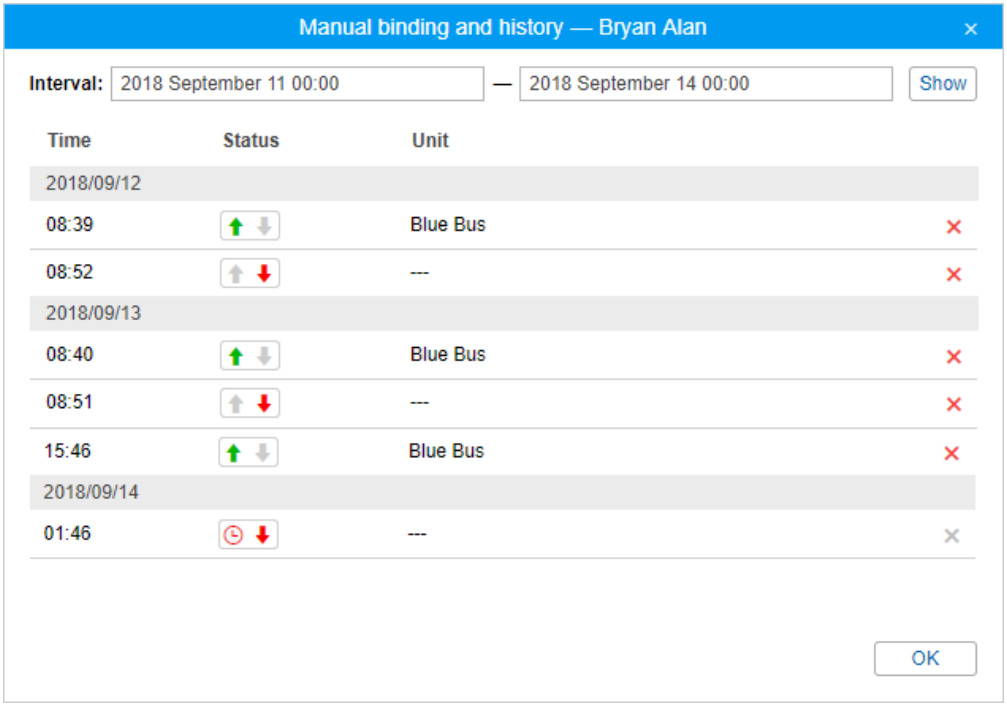
Automatic binding of passengers is removed in the same way: open the **Automatic binding** dialog, select a resource, and clear the check boxes of units for which the automatic binding will not be used.

History

To view the history of bindings and unbindings of the passenger, press the button to the right of its name. In the window that opens, specify the interval for which you want to see the history and click **Show**.

The following icons are used in the dialog box:

- : **In** (entry);
- : **Out** (unloading);
- : **Auto checkout** (automatic unbinding in accordance with the value indicated in the passenger's properties).



The status of the passenger (except for the **Auto checkout** status) can be changed manually by clicking on the required icon. To remove the binding or unbinding from the history, press the icon at the end of the required line.

Similar to the messages from the unit, the last registered binding or unbinding cannot be removed.

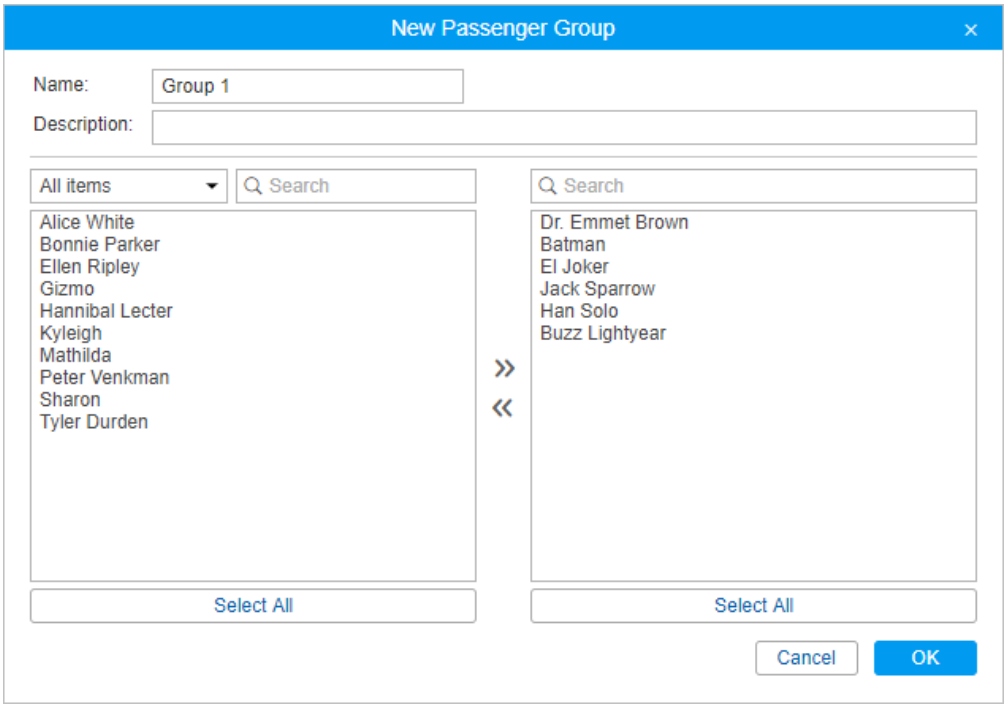
Passenger Groups

You can group passengers on the basis of certain criteria and then use the groups in reports.

> ⚠ Only the passengers who belong to the same resource as the group itself can be included in the group.

To start working with groups, choose the **Groups** mode in the **Passengers** panel.

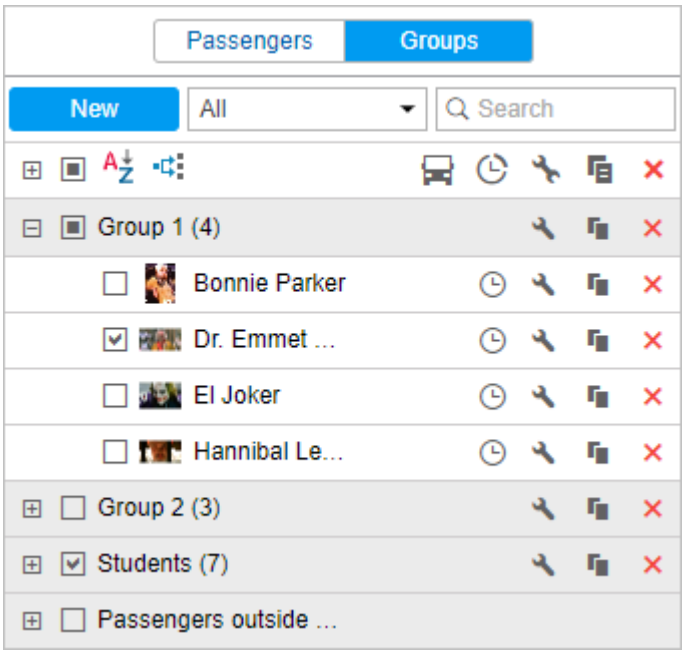
To create a new group, click on the **New** button. Enter the name and description. Passengers are selected in the list on the left. The contents of the list can change according to the option selected in the filter above. It can display all the passengers, a group of passengers (the names of the groups are shown in parentheses), or the passengers outside groups. Move the required passengers to the right list by double-clicking or pressing the **Add** button (an arrow pointing right). Press **OK**.



A list of created groups of passengers is displayed in the work area. The groups are arranged alphabetically. In the tooltip, you can see the list of the passengers that form it. The same as for drivers, a filter or a dynamic search can be used for groups. Moreover, groups can be edited, copied, or deleted. Note that deleting a group does not delete the passengers themselves.

The passengers that do not belong to any group can be found in the **Passengers outside groups** group.

Some standard actions are available for passengers in a group (open the group to display the action icons).



Using Passengers

Online tracking:

- You can view passengers on the map. Despite not having their own coordinates, a passenger's location can be determined on the basis of the unit they are bound to or have been bound to. To display a passenger on the map, check the box with their name in the left column of the **Passengers** panel. If the passenger is bound to a unit, their icon is displayed in the lower right corner of the unit icon. If there is no binding, the last known position of the passenger is shown.

In notifications:

- You can configure the Passenger activity notification to get informed when the passenger gets into or out of a vehicle.
- You can configure the Passenger alarm notification to get informed if the passenger does not leave a vehicle within an indicated time interval.

In reports:

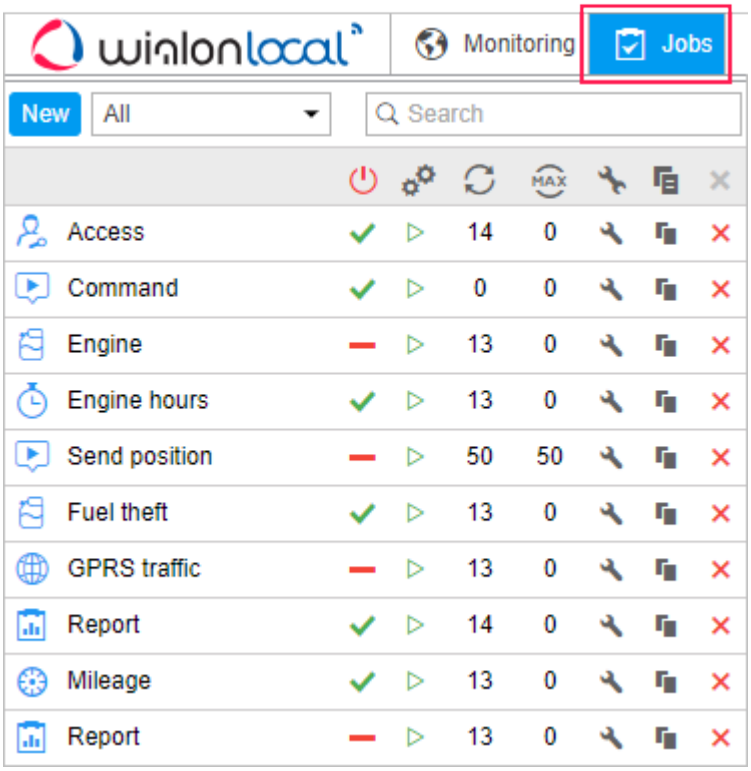
- Such report as Trips may include a column displaying a number of passengers transported by a unit as part of this trip.

- Using the Advanced reports module, you can generate the Bindings table which shows the time and location of passengers' getting into and out of a vehicle, name of the unit used by passengers, duration of the trip, and so on.

Jobs

A job is a set of actions executed according to the given schedule. Jobs can be of different types, such as executing a command, changing access to units, sending a report by email, and so on.

To configure jobs, open the **Jobs** panel by selecting a corresponding name in the top panel or clicking on the **Jobs** item in the main menu customizer. Here you can see the list of all created jobs and information on their state.



In the list, the jobs are sorted by name. For the convenience of search, use the dynamic filter. Input job name or its part into the search box and observe the results. You can also filter jobs by the resource they belong to. To do so, use the drop-down list above the list.

The tooltip that appears when you pause the mouse cursor on the job name displays the complete information about the job: job type, parameters, schedule, time of the last attempt of job's execution, resource (if there is access to several), and other parameters depending on job configuration. In columns on the right, you can see the job's state (on/off), the number of executions already made, and the number of maximum executions allowed.

The system supports running a test execution of a job. Test execution is a single execution of a created job regardless of its activation time and the number of executions indicated. Test execution is performed within one minute after clicking on the corresponding icon in the work list. The result of the test execution is recorded in the log. Moreover, you can view the information about the job's test execution in the corresponding report on a user. Note that during the test execution of the job, the icon becomes inactive until it finishes.

In the panel, the following icons and buttons are used:

Job type	Different kinds of jobs are marked with special icons in the first column: : command execution; : sending report by email; : sending information about fuel by email or SMS; : access management; : job on mileage counters; : job on engine hours counters; : job on GPRS traffic counting.
/	Click on the job state sign in the header of the table to enable or disable all jobs at once (if you have access rights to them). Icons and enable and disable the job.
	Job's test execution column. Test execution can be run for a particular job only. To run it, click .
	The first (left) column shows how many successful executions took place; the second (right) column shows the maximum number of executions allowed.
	Buttons to view and/or alter job properties (depending on your access rights).
	Create a new job on the basis of the selected one.
	Delete the selected job.

If the job belongs to some resource to which you do not have the **Create, edit, and delete jobs** access right, enabling and disabling, editing, or deleting of the job will be unavailable.

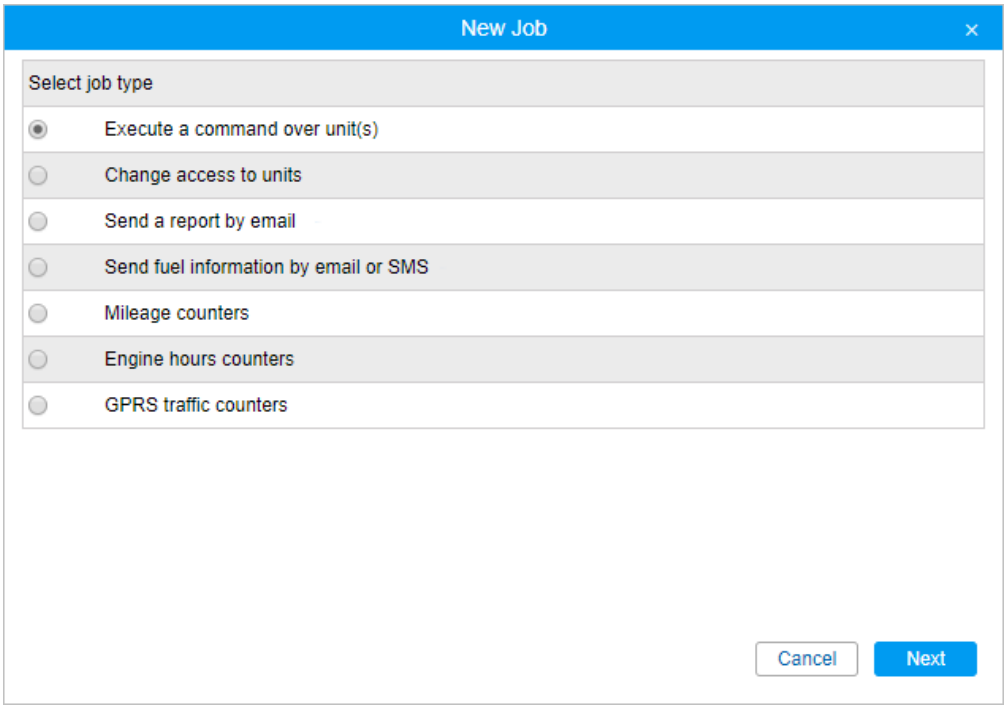
Configuring Jobs

To work with jobs, the **Create, edit, and delete jobs** access right is required.

To create a new job, press the **New** button. In the dialog box that opens select the job type:

- Execute a command over unit(s),
- Change access to units,
- Send a report by email,
- Send fuel information by email or SMS,
- Mileage counters,
- Engine hours counters,
- GPRS traffic counters.

Then select units to apply this job to and set the basic parameters (activation time, schedule, and so on). In addition, for each type of job, adjust individual parameters described below.



Selecting units for jobs and notifications

> The creator of the resource to which the job belongs must have the **Use unit in jobs, notifications, routes, retranslators** access right to the units.

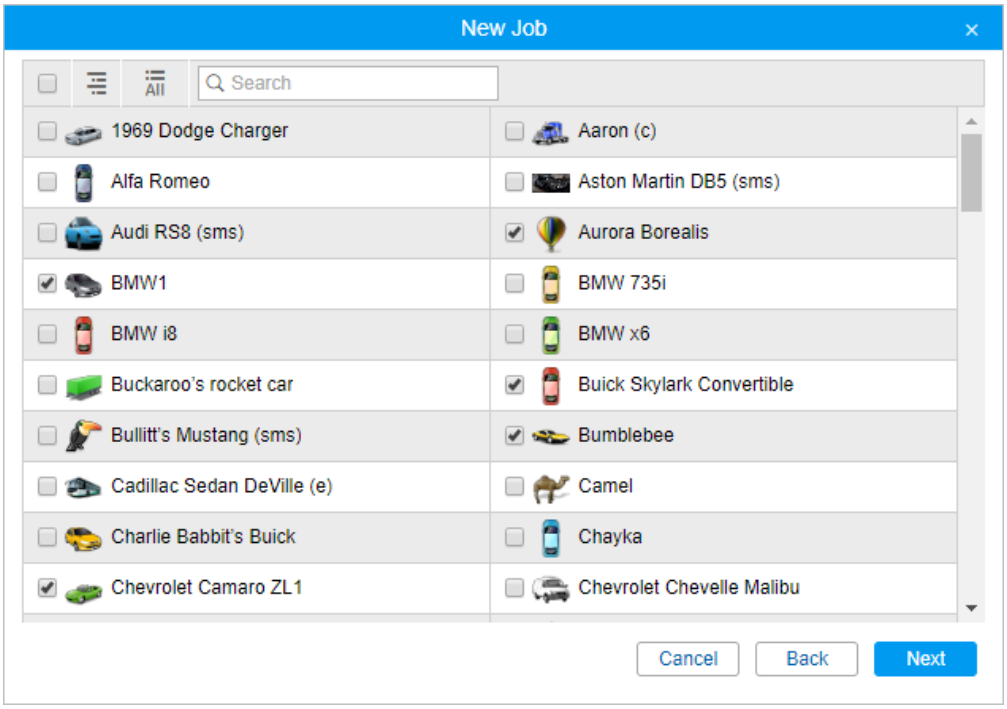
Only those units that are currently in the work list of the Monitoring panel are displayed on the page for selecting units for a job or notification.

If no units are displayed, click on the **Display all** button All. If the units do not appear, check if you have access right to units.

You can switch between the units and groups modes by clicking the switch-button / . If a unit group is selected, the job or notification will be applied to all the units that are included in the group at the time the job is executed or the notification is sent. The list of units that are currently in the group can be found in the group's tooltip.

Check the boxes of units or groups you want to apply the job or notification to. To select all items, check the box in the header of the table.

Please note that if there are more than 100 units on this page, their icons are not displayed.

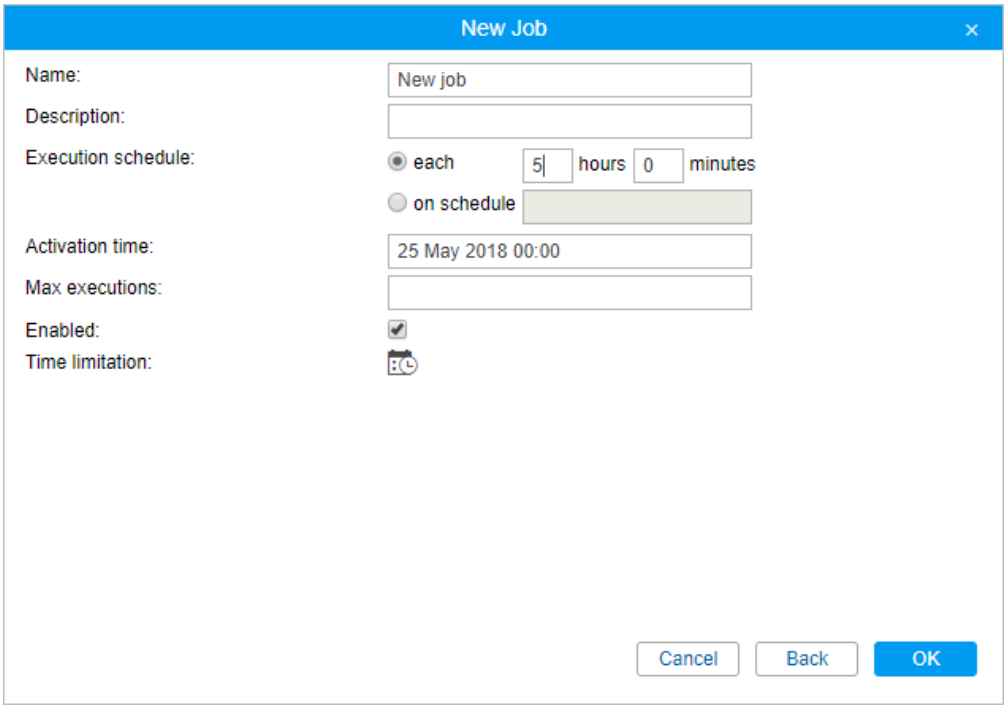


When editing a job or a notification or viewing the properties, the unit selection dialog box contains units selected for a job or a notification and units currently displayed in the work list. If necessary, you can add or remove units. To be able to do so, make sure you have the **Use unit in jobs...** access right to these units. If a job or notification that you are editing contains units to which you

do not have enough access rights, you will be warned about it. In case you save such job or notification, the units will be lost.

Parameters for jobs

Parameters for jobs are set in the last dialog box.



Name

The name of the job that will be used in the list of jobs or the subject of the letter if the job is to send some information by email.

Description

The job description is optional. If available, it is used in the tooltip to the job. The text should not contain more than 10,000 characters.

Execution schedule

Use one of two ways to set the job's schedule:

1. You can specify the frequency (interval) of execution — every nth number of hours and minutes.
2. You can create a schedule of execution within a day. The time is set in the 24-hour format **hours:minutes** or just **hours**. As separators, use spaces.

Example:

```
8:00 22:00
```

In this case, the job will be executed at 8 a.m. and 10 p.m. daily (if other conditions concerning execution days are not set on the **Time Limitation** tab).

Activation time

Date and time when the job will be activated.

Maximum executions

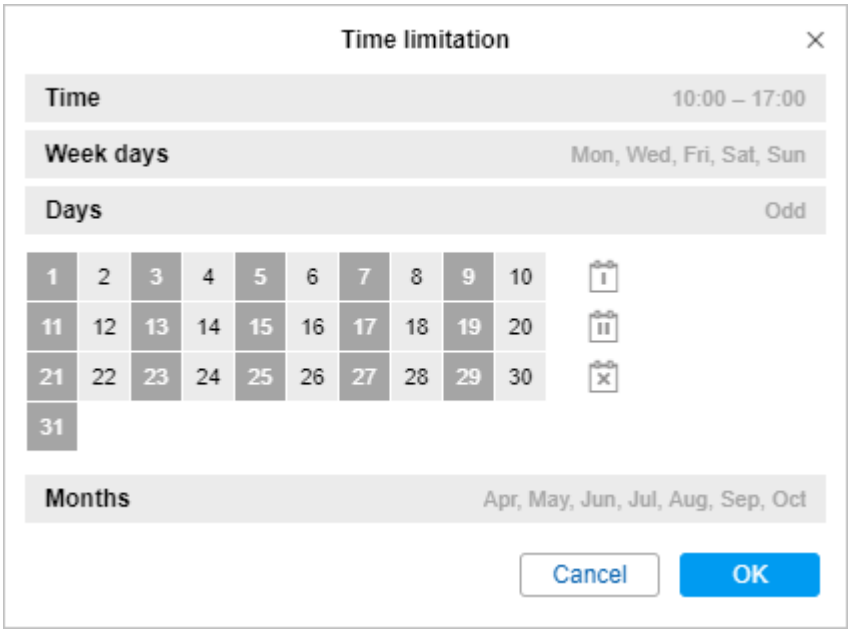
The number of job executions after which the job will be disabled. If you leave this field empty, the job will continue running until you delete or disable it manually.

Enabled

This check box indicates whether the job is enabled or not. When creating a job, enable this check box to activate the job immediately after its creation. If this check box is not marked, the job will still appear in the list, and you can activate it later.

Time limitation

You can set time limitation for a job. This means that it will be carried out at certain hours of the day, or on certain days of the week, or only on working days from 9 a.m. to 6 p.m. For instance, if you want to reset the traffic counter, it is convenient to make a time limit on the first days of the month. In such a case, after the first day of each new month, the counter will automatically reset to zero.



To get the daily report, select the **For previous 1 days** interval of the report and enter some night time, for example, 3 am, in the execution schedule. Then, when you come to work, all the necessary reports for the previous day will already be in your email box.
If the workday ends after midnight, as some cars may arrive late, the daily report can be configured in the following way. Select the **For previous 24 hours** interval of the report, and enter 4 a.m. as the activation time for the job. Then the report will automatically be executed once a day, at 4 a.m., and will contain the analysis of the data for the past day. In this case, the trips that end after midnight will not be split into two parts.

To receive a weekly report, select the **For previous 1 weeks** report interval, enter some night time in the execution schedule, and in the time control limit, select Monday. Thus, by Monday you will have reports for the past week.

To receive a monthly report, select the **For previous 1 months** report interval, specify the time in the execution schedule, and in the time control limit, check the box of the first day of the month. Thus, the corresponding report will arrive on the first day of each month for the previous month.

Job Types

When creating a job, you can select an action or set of actions which should be performed automatically at the specified time. The jobs are divided into 7 types depending on these actions. The icon denoting the job type is displayed to the left of the job name in the list.

See the detailed description of the job types, settings, peculiarities of usage and the required access rights on the respective pages.

Icon	Type
	Send a command to units.
	Change access to units.
	Send a report by email.
	Send fuel information by email or SMS.
	Send and/or change the value of the mileage counter.

Icon	Type
	Send and/or change the value of the engine hours counter.
	Send and/or reset the value of the GPRS traffic counter.

Execute a Command over a Unit

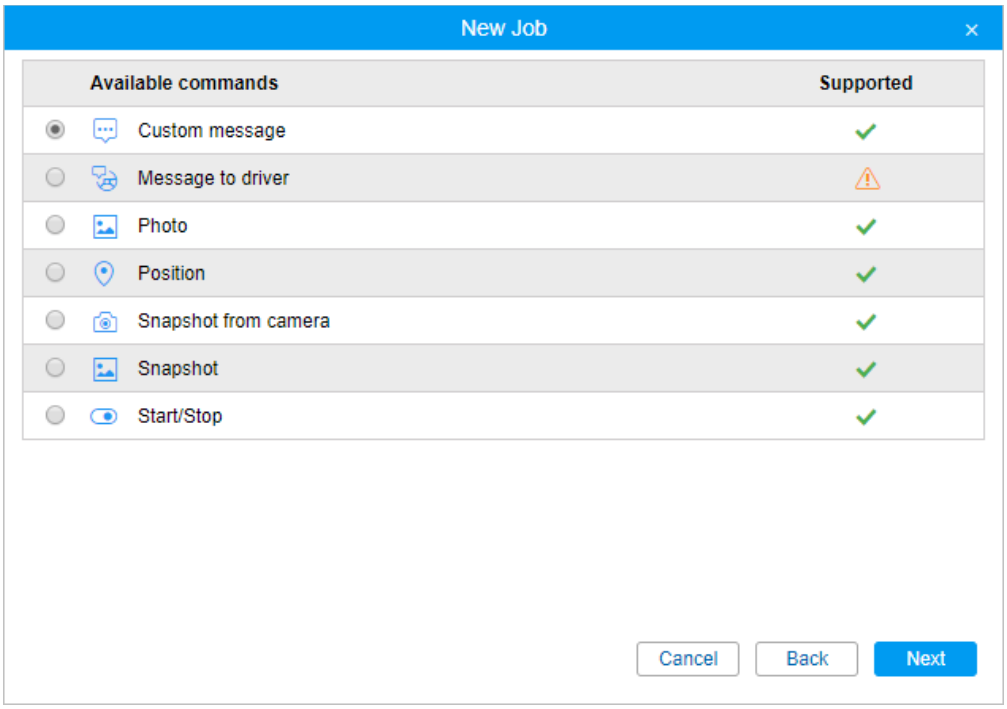
For the **Execute a command over a unit** job, select a command that should be executed.

> The list consists of all commands configured in the properties of the selected units (verify that you have the **Execute commands** access right to these units)

Some of the units might not support the selected command. Restrictions can be placed due to the absence of access rights or the device type in use.

Pay attention to the icon in the **Supported** column:

- ✓ means that all the selected units support the command;
- ⚠ means that not all the selected units can execute the command (for more information about the restriction, see details in the tooltip).



For some commands, you should set additional parameters, such as the input/output number, online report interval, and so on. More information about executing commands you can find here.

When the time comes to execute a command according to the job's schedule, the user's access rights are checked. The user who is the creator of the resource to which the job belongs should have the **Execute commands** access right as well as the set of rights indicated in the properties of the command itself.

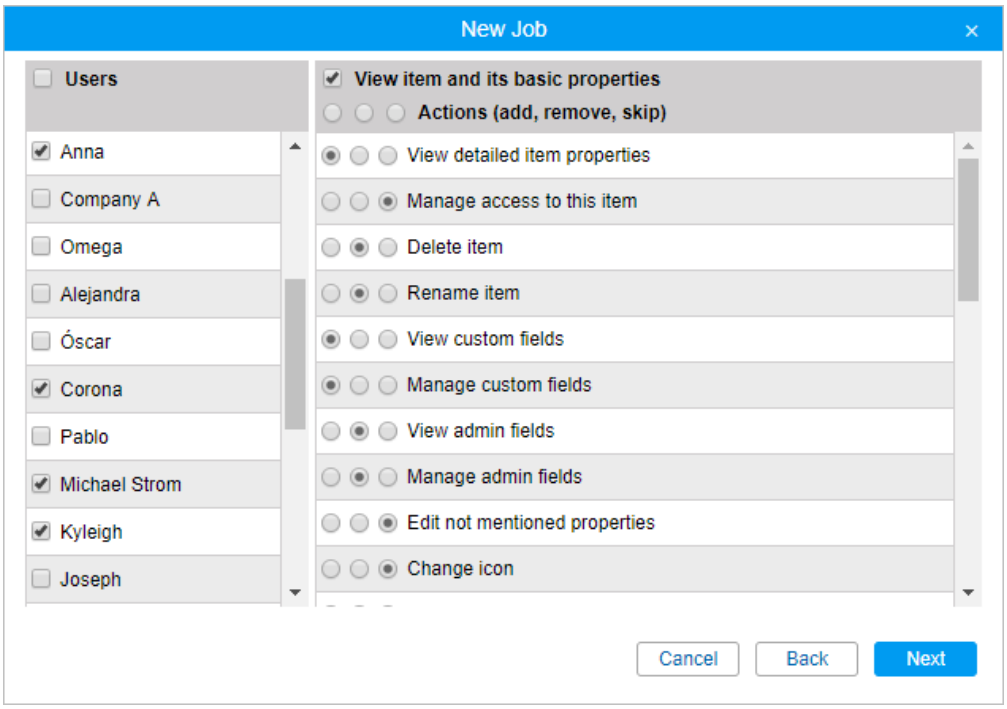
Change Access to Units

This job is used when users' access rights must be changed at the specified time. It can be useful when, for example, you want to give someone demo access or limit access to working hours, and so on.

To configure this job, select users and assign them new access rights.

> The list displays only users to whom you have the **Manage user's access rights** access right.

Check the users whose rights you want to change. In the drop-down list, select the level of rights that you want to set: each right can be added, removed, or skipped. More information about access rights can be found here.



The user who is the creator of the resource to which the job belongs must have the **Manage access to this item** access right to the unit.

Send a Report by Email

This job is used to automatically generate and send reports about units' activity to your email(s).

To receive a report by email, in the properties of the billing plan, specify the email address from which system messages should be sent.

To configure sending the report by email, specify the following:

Resource

In the drop-down list, select the resource to which the required report template belongs. To view the templates of all resources available to the user, select **All available**.

Report template

In the drop-down list, select the required report template. The list shows only the templates that belong to the selected resource.

File format

Check the format (formats) in which the report should be sent. The following formats are available: HTML, PDF, Excel, XML and CSV. More information about file formats and their parameters can be found on the Export report to file page.

Parameters

Specify additional report parameters:

- compress report files (HTML, CSV, XML files, and files larger than 20 MB are always archived),
- split chart by days/weeks,
- disable links to Google Maps in PDF and Excel files,
- attach map (for PDF and HTML formats only).

If the map is attached, the **Squeeze in all graphics** and **Hide cartographic basis** options become available.

Interval

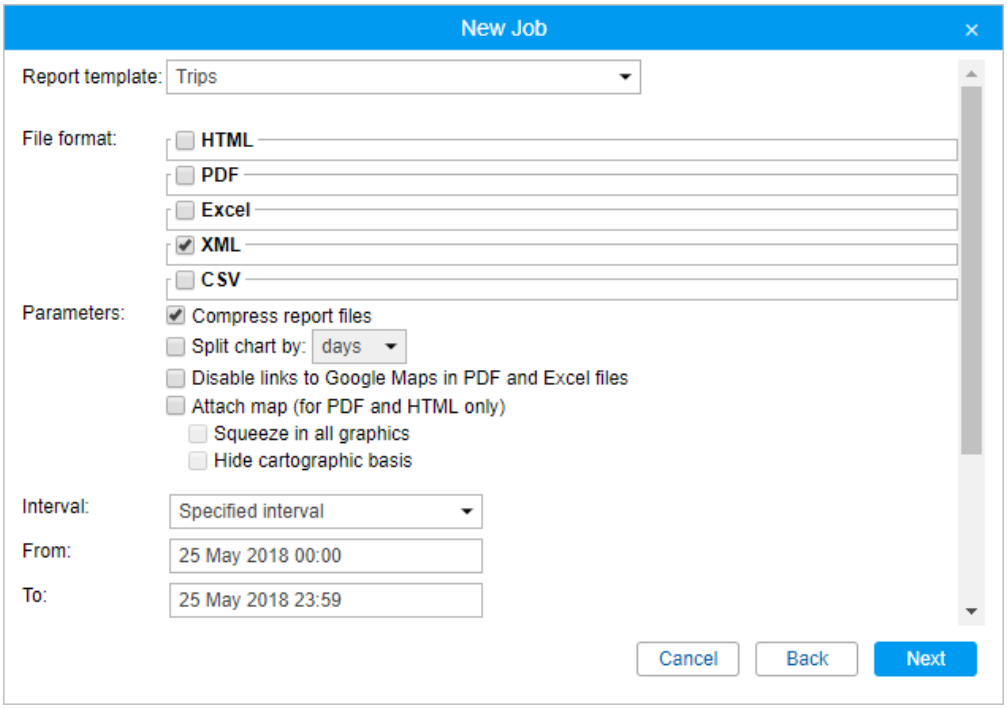
Specify the reporting period. For the **For previous...** interval, it is possible to activate the **Including current** option so that the report is executed not for the latest full period, but for the **current** one.

Content

Choose whether you want to receive file/archives or a link to an FTP-server where the files/archives are stored.

Recipients

Specify the email addresses to which the report should be sent.



Depending on the type of the report template, the list of objects for which the report is executed differs. The list displays only those objects that belong to the same resource as the report template, and for which the user has the **Query messages or reports** access right. If the access right to the object (or the object itself) was removed, the created task is not executed.

> ⚠ When selecting a unit, the list displays only those that are currently in the work list of the monitoring panel.

The information about the geodata in such a report is shown in accordance with the settings of the user-creator of the resource in which the job was created.

Below are a few practical examples of jobs usage with an interval of the **For previous ...** type.

To get the **daily report**, select the **For previous 1 days** interval of the report and enter some night time, for example, 3 a.m. Then, when you come to work, all the necessary reports for the previous day will already be in your email box.
If the workday ends after midnight, as some cars may arrive late, the daily report can be configured in the following way. Select the **For the previous 24 hours** interval of the report and enter 4 a.m. as the activation time for the job. In this case, the report is automatically executed once a day at 4

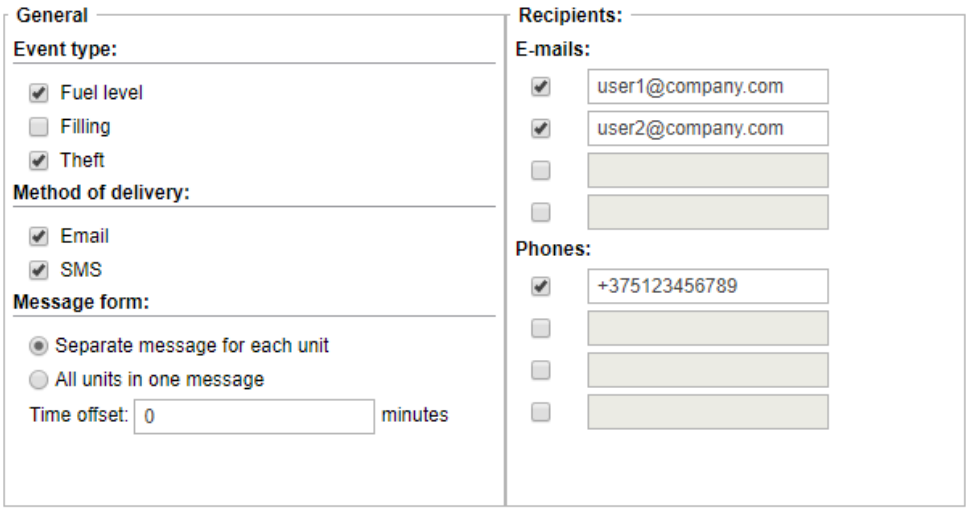
a.m. and contains the analysis of the data for the past day. At the same time, the trips that end after midnight are not split into two parts.

To receive a **weekly report**, select the **For previous 1 weeks** report interval, enter some night time in the execution schedule and select Monday in the time control limit. Thus, by Monday you will have reports for the past week.

To receive a **monthly report**, select the **For previous 1 months** report interval, specify the time in the execution schedule and check the box of the first day of the month in the time control limit. Thus, the corresponding report will arrive on the first day of each month for the previous month.

Send Fuel Information

You can get information about fuel fillings, thefts as well as current fuel level by email or SMS. To detect fuel fillings and thefts, the appropriate unit settings are used (for more information see Fuel consumption).



Set additional report parameters:

- Event type: fuel level, filling, theft (you can select all three).
- Method of delivery: by email and/or SMS. On the right, enter your email(s) and phone number(s) in the international format.

  > ⚠ To be able to send text messages, the **Can send SMS** option must be activated in user properties.

- Message form: one unit in one message or all units in one message.

- Time offset (in minutes): this option allows you to analyze messages from the black box. The time of the last job execution minus the offset will be considered the beginning of the interval, and the current time will be viewed as the end of the interval.

If the filling or theft falls on the joint of the intervals, it is possible they will not be determined. For instance, the minimum amount of theft is 15 liters, the schedule of task execution is once an hour (9:00, 10:00, 11:00, 12:00, an so on). In this case, if within the last 5 minutes of an hour 10 litres were drained, and 10 more were drained within the first 5 minutes of the following hour, they will fall into different intervals. As a result, the job will not be executed, as each of these thefts does not reach the minimum value. That is why, to exclude a large number of joints, it is recommended not to create a job with a very frequent execution interval. In any case, you can execute a report on fillings and thefts for a day, week, month, and so on, which will include all the events.

When sending fuel information, the system uses the following data collection algorithm.

The first job execution — information for the interval from the indicated activation time (minus time offset) to the job execution time;

Further job executions — data for the interval from the previous job execution (minus time offset) to the current job execution.

Information on fuel fillings and thefts is sent only if such events have been detected. Information on fuel level is sent always. If there is no such data, an email with the **Fuel level unknown** text is sent.

SMS format

Text messages have the following format:

```
Unit Name
x a/b/c
```

where

Unit Name is the name of the unit as it is set in unit properties (to save traffic, it is recommended to use letters of the Latin alphabet);

x is the sensor number;

a is the fuel level;

b is fuel filling;

c is fuel theft.

For example, the SMS message

```
Iveco_1501
1 66/-/-
2 100/-/10
```

means that, according to the first sensor, the unit Iveco_1501 has 66 lt of fuel, and no fillings and thefts were detected; according to the second sensor (fuel in the second tank, for example) fuel level is 100 lt, no fillings were found, and a 10 lt theft was detected.

Dashes may mean one of the following.

- The corresponding option is not selected in job parameters. For example, sending fuel level is not activated.
- There are no valid data (relevant for fuel level).
- Required events were not detected (relevant for fillings and thefts).

Depending on the settings of the resource, the fuel volume can be displayed in litres (if the resource uses the metric system) and gallons (if the resource uses the American or Imperial measurement system).

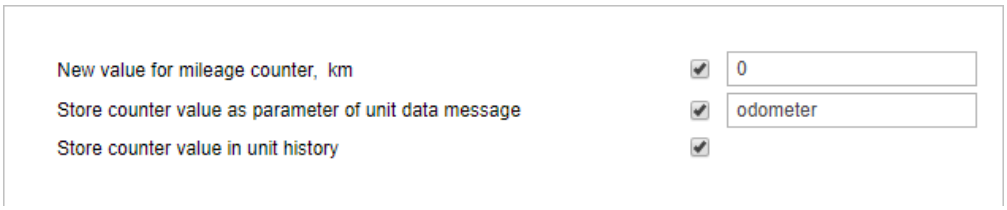
Jobs on Counters

Three types of counters are used in Wialon: counters of GPRS traffic, mileage, and engine hours. They can be set up in the properties of the unit on the **General** tab.

Jobs on counters allow you to automate the saving of the counter values and also adjust the accounting of mileage, engine hours, and GPRS traffic.

Mileage counters

With the help of this job, you can save the current value of the mileage counter, reset it to zero or any other value, and save it as a parameter in the message.



To set a new value or reset the counter, select the **Set new value for mileage counter** option and enter the desired value below. The counter will obtain this value each time the job is executed. Depending on the resource settings, different measurement systems can be used.

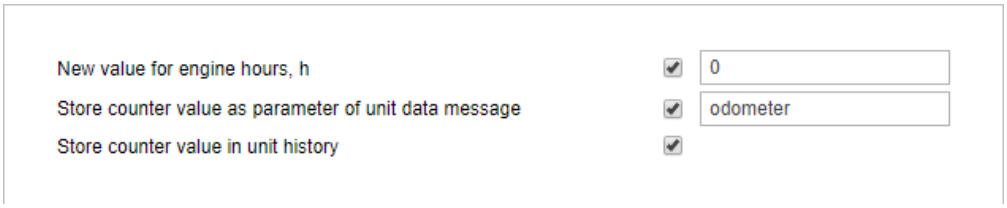
Mark the **Store counter value as parameter of unit data message** check box to save the counter value as a parameter in the data message (a sensor with this parameter should be created for the unit). It allows displaying the initial and final mileage in the report on trips. The parameter name should be indicated by the letters of the Latin alphabet, and words should be separated by

underscores instead of spaces. It is recommended to store the counter values while the unit is parked, for example, once a day at night.

The **Store counter value in unit event history** can be used to store the current mileage counter value. It is especially recommended if the counter is subject to reset to zero according to the job.

Engine hours counters

This type of job is similar to the previous one, but it is applied to the engine hours sensors.



Check the **Store counter value as parameter of unit data message** box to save the current value of the engine hours counter as a parameter in the message, which allows to subsequently create an engine hours sensor on its basis. When entering the parameter name, it is advisable to use underscores instead of spaces. For more accurate calculations it is recommended to store the counter values during the parking of the vehicle, for example, once a day at night.

The **Store counter value in unit history** checkbox is responsible for storing the value, and in its field, a new value (in hours) that will be applied to the counter after the job is completed is entered.

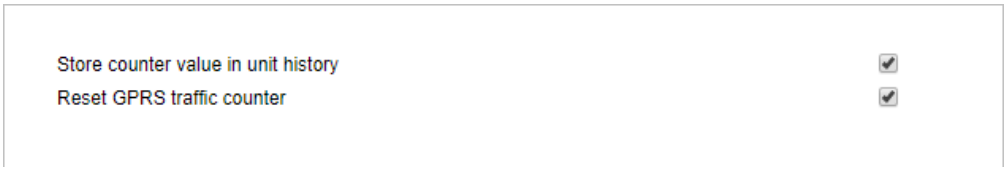
> This type of job can be performed successfully only if at the moment of its execution the user who is the creator of the resource to which the job belongs has the **Edit counters** right to a unit.

If you save the values of traffic, mileage, engine hours or counters in the unit history, they are recorded in the system as registered events, which allows you to display them in the Events or Chronology reports later. Saving the value of the counter as a parameter in the message occurs in the unit database in such messages as Data Message, while the hourly rate is displayed in seconds, and the mileage value, depending on the unit settings, is in meters or feet.

GPRS traffic counters

This job is used to:

- regularly reset the traffic counter automatically;
- store the GPRS traffic counter value in the unit history, which allows you to receive reports on consumed traffic.



Indicate the status of the **Store counter value in unit history** option. If the option is activated, each traffic reset is registered in the system, and then you can generate a report on events or a report on traffic to see traffic consumption. If the option is not activated, resets are not registered as an event.

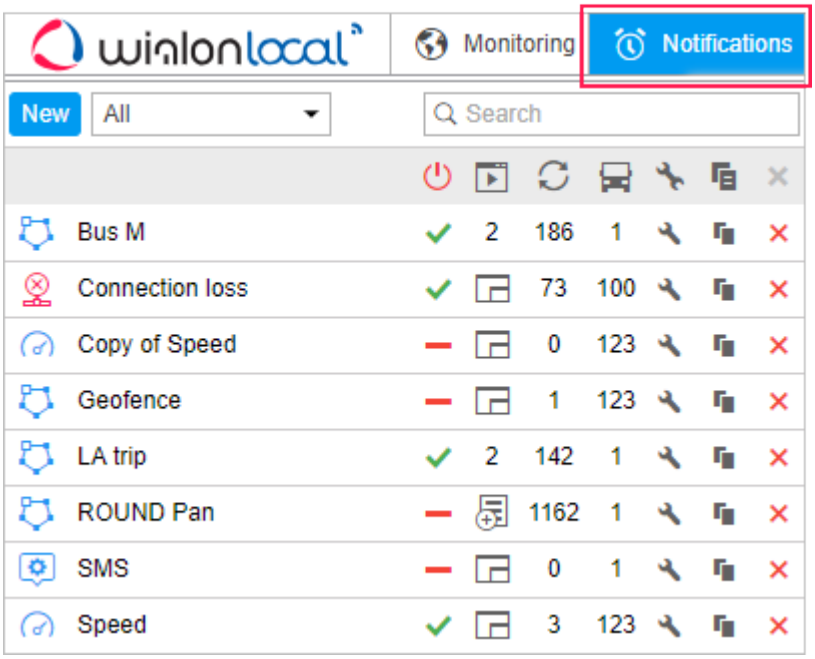
The **Reset GPRS traffic counter** option is used to reset the counter to 0 when the job is performed.

Each of the two options can be used both individually and together with each other. When we check both boxes, we get a job that will reset the counter on the specified schedule, and the reset value will be stored in history.

Notifications

In Wialon, you can be notified about any unit activity or change in its state. It can be speeding, change of location, sensor values, and others. A notification can be delivered by email or SMS, shown online in a popup window, and so on.

To create, edit, and view notifications, open the **Notifications** panel by choosing a corresponding name in the top panel or clicking on the necessary item in the main menu customizer.



How to create a notification

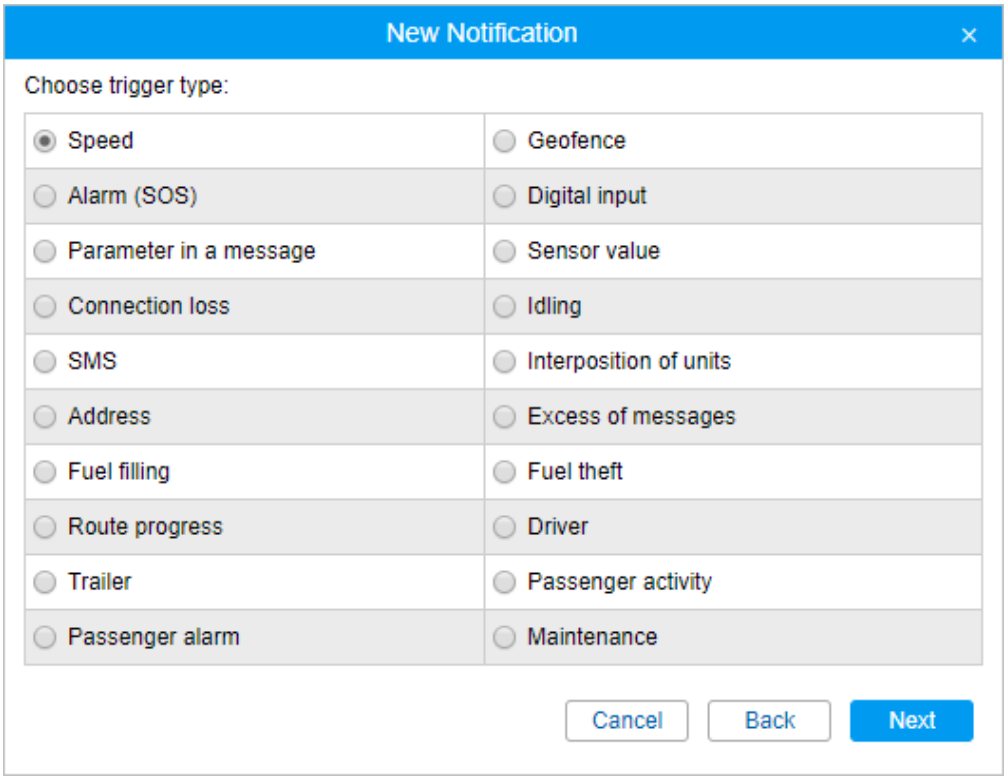
Below is a detailed description of the process of creating notifications.

1. Click the **New** button.
2. Choose unit(s) for which you want to create a notification and click **Next**. Units are selected in the same way as in jobs. Here you can learn more about job creation and editing.
3. Select the trigger type: geofence, speed, alarms, sensor values, message parameter, and so on. Click **Next**. Here you can learn more about notification types.
4. Adjust control parameters required for the notification type selected in the previous step: select geofences, indicate speed limits, and so on. Click **Next**. Here you can learn more about notification parameters.
5. Enter the text for the notification using special tags listed in the table below. They will be substituted with real values when notification triggers. Here you can learn more about notification text.
6. Indicate how the notification should be delivered: sent by email or SMS, pop up online, registered in the unit history, and so on. Here you can learn more about the notification actions.
7. Name the notification and set a schedule for its execution.
8. Click **OK**. The created notification appears in the list in the left part of the window.

ⓘ To create a notification, the **Use unit in jobs, notifications, routes, retranslators** access right is required. In addition, in order for the notification to work, you need to have access rights to those actions that are affected by the notification (for example, to send a command, register events, change access rights, and so on).

Notification Types

There are different conditions for triggering notifications.

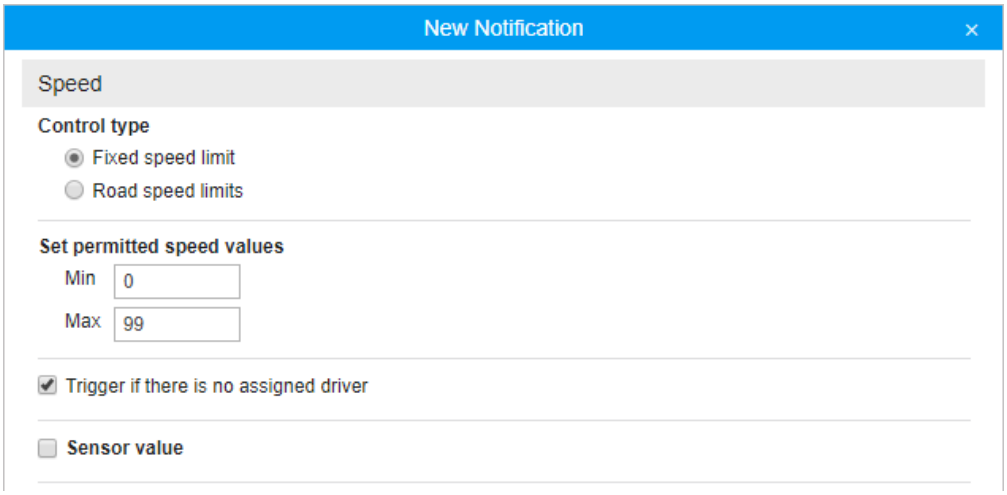


Speed

To configure a notification about speed violations, select the **control type**: fixed speed limit or road speed limits. For the **Fixed speed limit** type, specify the range of the allowed speed. For the **Road speed limits** type, specify the allowed speeding.

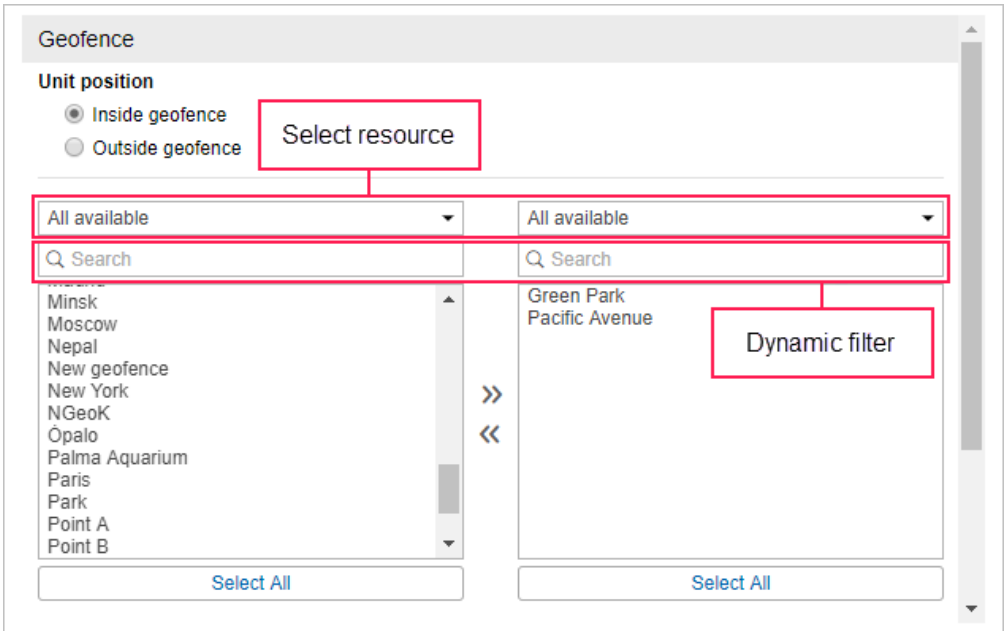
If the **Trigger if there is no assigned driver** option is enabled, the notification triggers when the conditions indicated for the control type are met and no driver is assigned to the unit.

A sensor value can be another condition of notification triggering. Configuring this option is similar to the notification of the same name.



Geofence

When choosing this type of notification, in the next window specify the control type: inside or outside the geofence. Select the resource whose geofences should be shown in the list (select **All available** to view the geofences of all available resources). Also, choose the geofences or groups of geofences (shown in the square brackets), for which this notification should work. For the search convenience, you can use the dynamic filters above the lists.



Select the logical operator – the value on the basis of which the notification is activated.

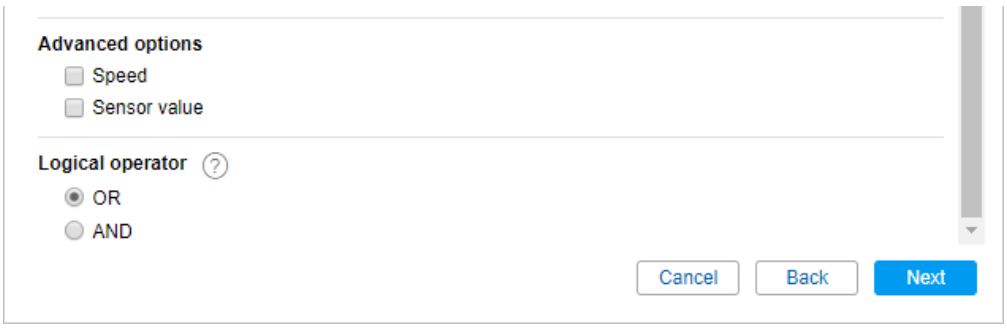
For the unit inside the geofence:

- **OR** — the notification is activated when the unit enters any of the selected geofences;
- **AND** — the notification triggers when the unit enters all the marked geofences simultaneously.

For the unit outside the geofence:

- **OR** — the notification is activated when the unit leaves any geofence, when before it was in all the selected geofences;
- **AND** — the notification triggers when the unit leaves all the marked geofences simultaneously.

In addition, you can adjust speed limitations and/or sensor value range — then the notification triggers only if all the specified conditions are met.



Alarm (SOS)

For this type of notification, no specific settings are required. However, the equipment you use must either support the corresponding functionality, or the compliant sensor should be set in the unit properties.

Digital input

Specify the number of digital input and the control type: trigger in case of its activation or deactivation. If the message does not have the **I/O** parameter, the **io_n** parameter is analysed.

Parameter in a message

This type of notification helps to trace the parameters in the messages. The controlled parameter must be real, that is, sent by the equipment. Virtual parameters, such as speed, alt, sats, etc. cannot be controlled by this type of notification.

Four control types are provided: value range, text mask, parameter availability, and parameter lack. Only real parameters, i.e. sent by the device itself can be considered whereas virtual parameters such as speed, altitude, sats (satellites) etc. cannot be controlled by this type of notification.

To control **Value range**, specify the parameter name, define the minimum and maximum values for it, and select whether to trigger in the specified range or out of it. If you need to get notifications for all parameters except 0, select a value range from 0 to 0 and select the trigger type **Out of specified range**.

To control **text**, enter the parameter name and **Text mask** using wildcard symbols (? and *).

For such types of control as the **Parameter availability** and **Parameter lack**, it is sufficient to indicate the parameter name. For the notification to work for the parameter appearance and

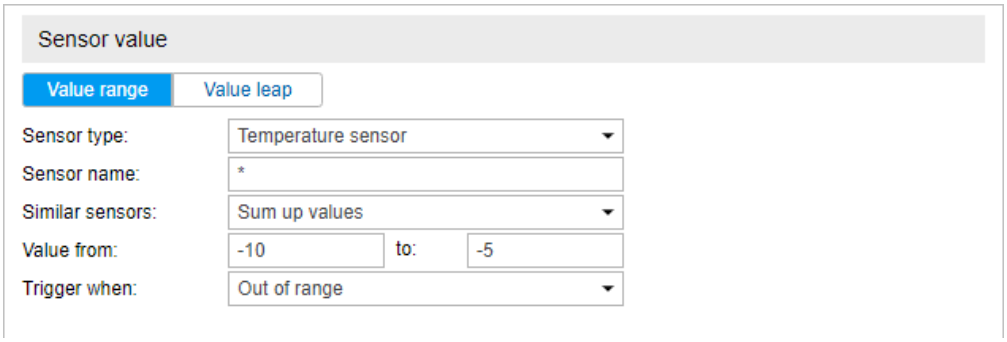
disappearance, on the last page of the dialog select the **Generate notification only when state changed** option.

> For the **in** and **out** parameters it is possible only to control the parameter availability/lack.

Sensor value

With this type of notification, you can control either the sensor getting some undesirable value (**Value range**) or an abrupt significant change in the sensor value (**Value leap**). To specify the sensors which should be controlled by the notification, select the sensor type in the dropdown list or set the name mask using wildcard symbols (* and ?). Both methods can be used simultaneously. If several sensors that meet these conditions (same type or name mask, or both) are found, their values can be summed or calculated individually — select the corresponding option. Then enter the minimum and maximum values and select the control type: trigger in the specified range or out of it.

If you control the value leap, enter a delta. The notification triggers when the delta is exceeded. Note that the indicated delta is compared to the module of the delta of values.



Connection loss

The notification can trigger when the connection is lost or restored. Select the required option in the **Notification** section. You can select both options at once.

Then choose the control type.

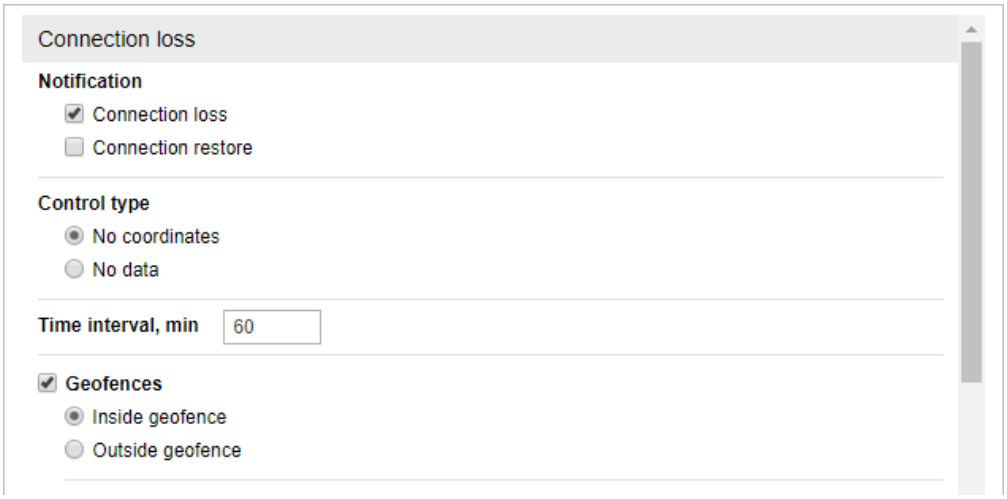
No data. It can be a simple connection loss when no messages are received from the unit during a period of time.

No coordinates. There are also cases when all sensors are active and their values are known, but it is impossible to locate the unit (for example, someone has covered the GPS aerial).

Set the loss time of data/coordinates (in minutes), after which the notification should trigger.

Using the **Geofences** option, you can monitor connection loss in regards to specific geofences or groups of geofences. Specify the control type: trigger inside or outside a geofence. Select the resource whose geofences should be shown in the list (select **All available** to view the geofences of all available resources). Select the geofences or groups of geofences (shown in the square brackets), for which this notification should work.

Note that the geofences should be created in advance. For the search convenience, you can use the dynamic filters above the lists.



Idling

Here you need to specify the speed and time to determine what situation should be considered as idling (vehicle parking in supposedly working hours). It is recommended to specify a speed greater than 0 in order to exclude possible equipment errors. Indicate the time allowed for parking. If this time is exceeded, a notification will trigger.

ⓘ The maximum allowed time of idling is 47 hours and 59 minutes (2 days).

In addition, you can activate the **Sensor value** control — in this case, the notification will trigger only if both conditions are met. It is convenient, for example, to control idles with the engine or implements turned on.

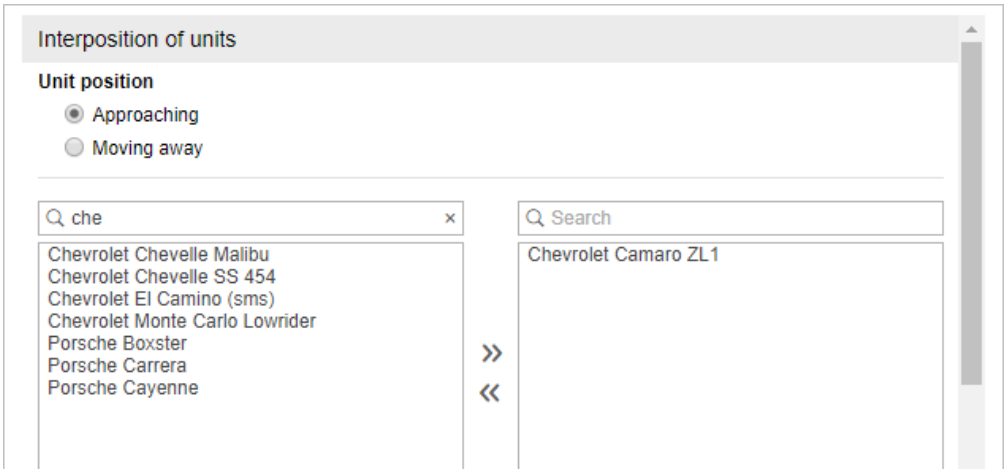
Using the **Geofences** option, you can monitor idling in regards to specific geofences or groups of geofences (must be created in advance). Specify the control type: inside or outside the geofence. Select the resource whose geofences should be shown in the list (select **All available** to view the geofences of all available resources). Also, choose the geofences or groups of geofences (shown in the square brackets), for which this notification should work. For the search convenience, you can use the dynamic filters above the lists.

SMS

You can receive a notification when a SMS message arrives. To specify which SMS messages you are interested in, enter a mask for the message text. This feature can be useful, for example, when a device sends SMS of certain content in case of malfunction.

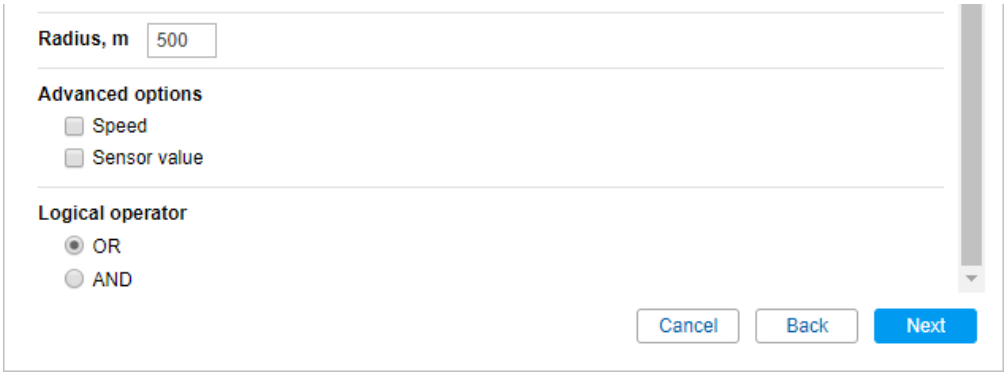
Interposition of units

This notification allows you to control the interposition of units: their approaching and moving away from each other. Select the criterion (approaching or moving away) and transfer from the left list to the right one the units whose approaching or moving away should trigger the notification. For the search convenience, you can use the dynamic filter above the list.



Next, specify

- radius, m — the distance between the units with decreasing or increasing of which the notification should be triggered;
- advanced options — filters for speed and sensor value;
- the logical operator — the value, on the basis of which the notification is activated. If **OR** is selected, the notification is activated when the unit approaches or moves away from any of the selected units. If the logical operator **AND** is selected, the notification goes off when the unit approaches or moves away simultaneously from the marked units.



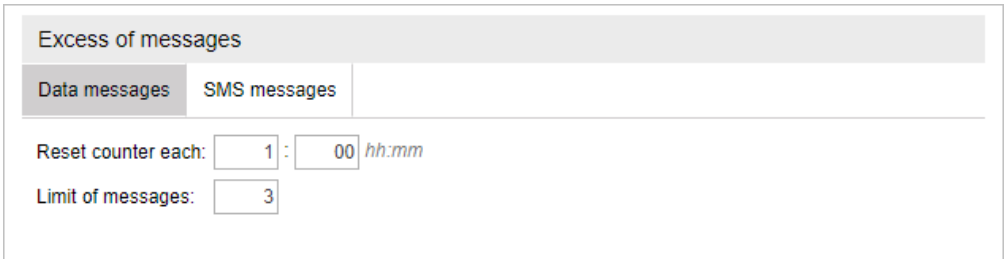
The interposition of units is checked by the system using the latest messages only.

Address

This type of notification is similar to geofence control. It allows you to control the entrance/exit or being **in** or **out of** a particular place. Enter some address parameters (e.g. city, street, and house) and then select the most appropriate option from the found addresses. Also, specify the radius of the point. In addition, filters for the sensor and speed can be applied.

Excess of messages

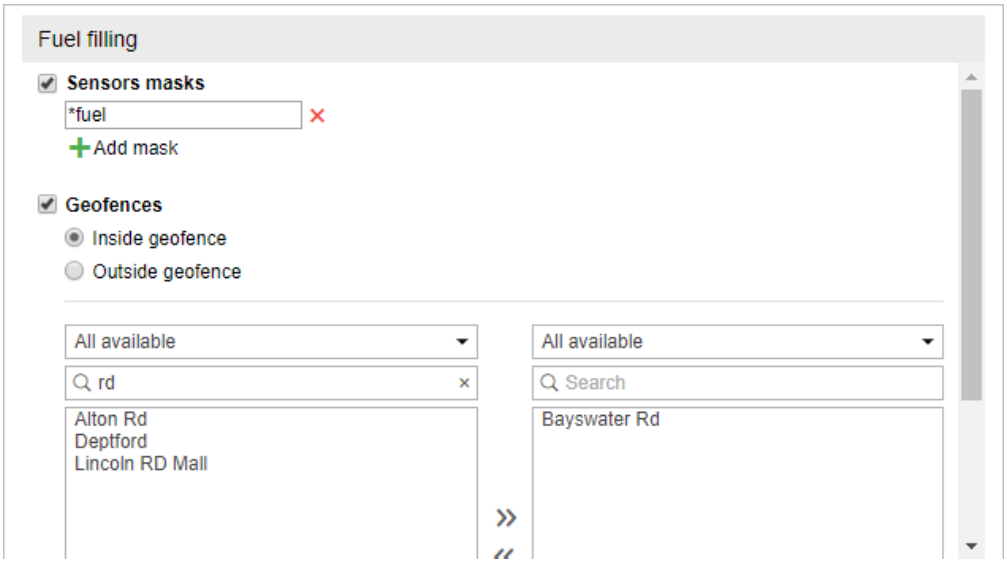
With this type of notification, you can be warned if a unit exceeds the limit of messages you have set. This can be either ordinary data messages or only SMS messages. Indicate the limit of messages and set the reset interval. For example, if you configure a notification, as shown in the example below, the notification will trigger if the unit sends 3 or more SMS messages within 1 hour.



Fuel filling

This notification type allows you to control fuel fillings. When creating the notification, you can specify the sensor masks that should be used to estimate fuel fillings and their volume. Also, using the **Inside geofence** and **Outside geofence** options, you can monitor fuel fillings in regards to specific geofences (must be created in advance). Select the resource whose geofences should be shown in the list (select **All available** to view the geofences of all available resources). Also, choose the geofences or groups of geofences (shown in the square brackets), for which this notification should work. For the search convenience, you can use the dynamic filters above the lists.

The notification is triggered when the minimum amount of fuel filling indicated on the **Fuel consumption** tab of the unit properties is reached, and also after the system receives enough data to estimate the full amount of fuel filling (the entire volume of data, messages from the black box, imported messages, etc. received). In order for the notification to arrive only once (after reaching the minimum volume of fuel filling), it is necessary to activate the **Ignore recalculated data** option.

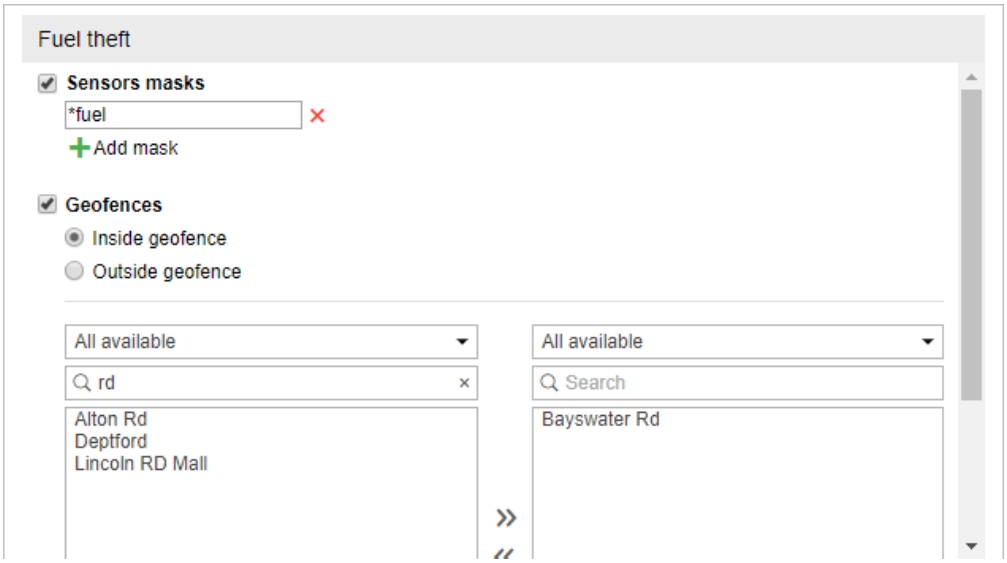


Notification is triggered for each fuel level sensor individually.

Fuel theft

Notification of this type allows you to monitor fuel thefts. When creating a notification, you can specify the sensor masks that should be used to estimate fuel thefts and their volume. Also, using the **Inside geofence** and **Outside geofence** options, you can monitor fuel thefts for certain geofences (must be created in advance). Select the resource whose geofences should be shown in the list (select **All available** to view the geofences of all available resources). Also, choose the geofences or groups of geofences (shown in the square brackets), for which this notification should work. For the search convenience, you can use the dynamic filters above the lists.

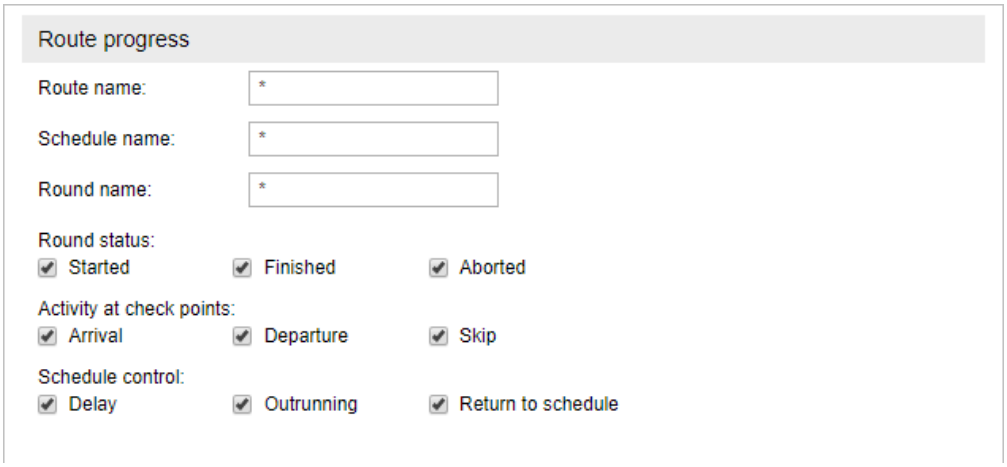
The notification is triggered after a fuel theft is detected. In order for the notification to come only once (after reaching the minimum amount of fuel theft), it is necessary to activate the **Ignore recalculated data** option.



Notification is triggered for each fuel level sensor individually.

Route progress

For this type of notification, select the statuses to control: round start, round finish, arrival to check point, check point skip, departure from check point, etc. Additionally, you can specify a name mask for a route, schedule and/or round.



Driver

Choose whether you want to control the assignment of the driver or its removal. To control both, create two notifications. To specify a particular driver, enter the code (or code mask) in the **Driver code** field. You can add multiple masks separated by commas without spaces. If you leave an asterisk (*) in this field, all drivers will be monitored without exception.

Trailer

Choose control type: trailer assignment or reset. Settings to adjust are the same as for the previous type.

Passenger activity

To receive notifications of passenger's activity, choose the control type (check in/check out) and enter the passenger's code or code mask. You can add several codes o code masks separated by commas without spaces. If you leave the asterisk sign (*) in the field, all the passengers will be controlled.

Passenger alarm

Indicate a timeout upon the expiry of which you'll receive an alarm message if any passenger of a chosen resource stays in a vehicle. Timeout is started to count upon passenger binding.

Maintenance

First, you choose trigger type: notify when service term approaches or notify when service term is expired. Then indicate the interval before or after the term for the notification to trigger. This interval can be in days, kilometers, engine hours, or together. You can control either all intervals existing on the Service Intervals tab in unit properties or just several intervals. To specify target

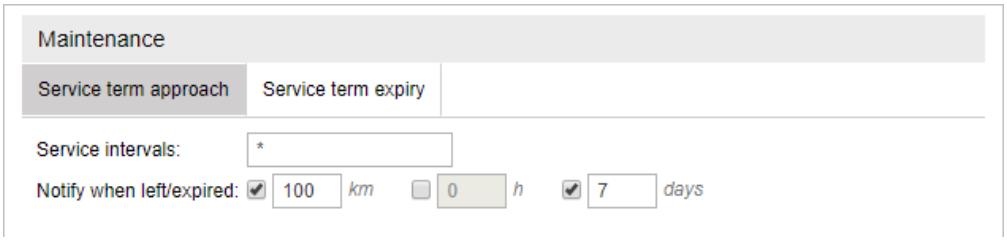
intervals, enter a name mask using wildcard symbols like asterisk (*) and question sign (?). Then indicate how much mileage, or time, or how many engine hours should be left or expired to make the notification trigger.

> ⓘ Notification about maintenance triggers only once — when a critical point is met (mileage, engine hours or time) about any maintenance interval. Then information about service work done should be delivered through event registrar or through unit properties dialog. Only after that, the notification starts working again.

Notifications' triggering peculiarities

If upon creation of notification a unit with an already exceeded maintenance interval is chosen, then the notification for such a unit will not trigger.

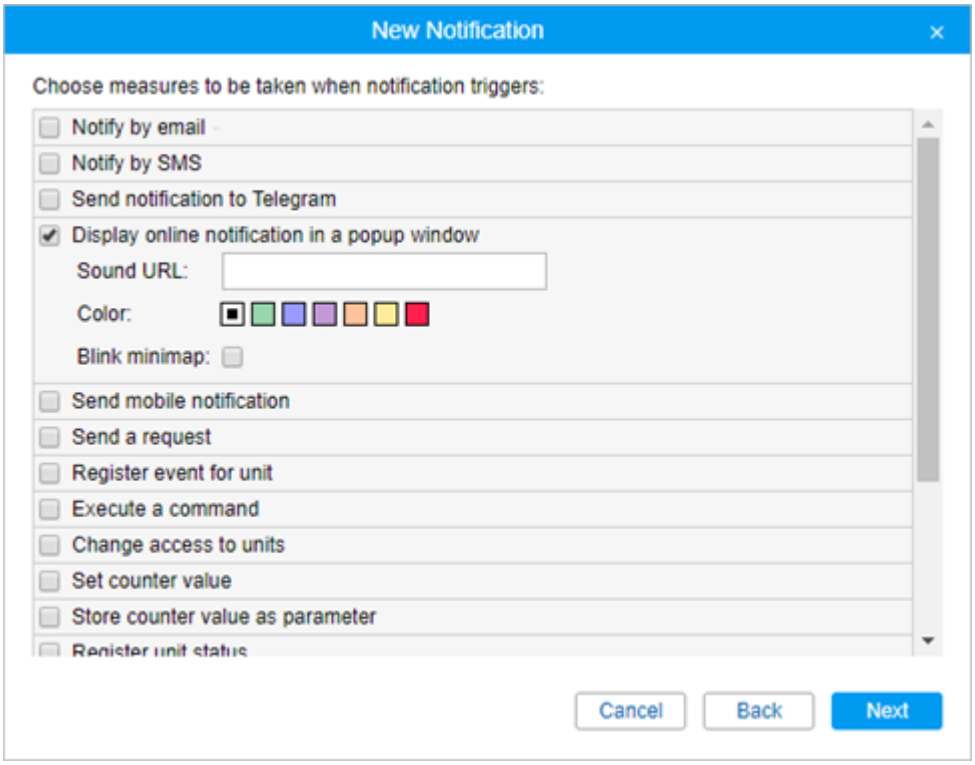
If no position messages have been sent to a unit, then the notification for such a unit will not trigger.



As each notification belongs to some resource, it takes its measurement units from this resource. If the American or imperial measurement system is set for the resource, then speed is shown in miles per hour (mph), radius in feet (ft), and mileage in miles (mi). Otherwise (in case of metric system), it will be kilometers per hour, meters and kilometers, correspondingly.

Notification Actions

Notification action is the action the system will perform when a notification triggers.



Notify by email

This action is used to set up email notifications. You can indicate one or more email addresses to send a notification to. When all fields for entering addresses are filled in, additional slots appear automatically. The header of the message will contain the name of the notification and the name of the unit in the parentheses. The body of the letter will contain the text of the notification, where the tags will be replaced with specific values.

In addition, if the device allows, an image sent by the unit in the message may be attached to the notification. To do this, check the **Attach image from triggered message** option.

To receive a notification by email, in the general properties of the billing plan, specify the email address from which system messages will be sent.

Notify by SMS

This action is used to set up SMS notifications. Type in one or more telephone numbers in the international format, for example, +375293293294. When all fields for entering phone numbers are filled in, additional slots appear automatically.

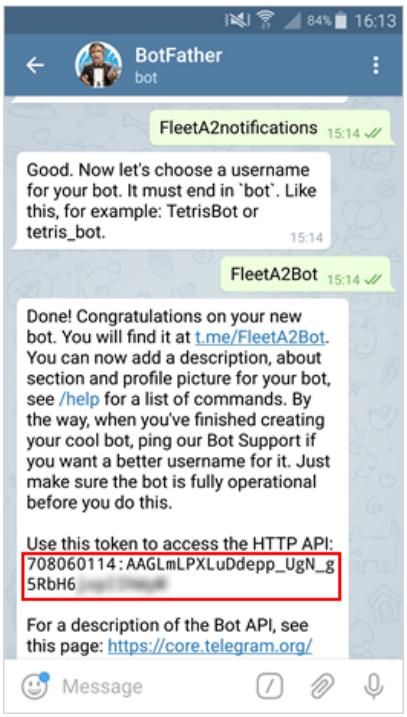
> ⚠ If the **Can send SMS** check box is not activated in user properties, the corresponding notification delivery method becomes unavailable.

Send notification to Telegram

This action allows sending alerts about triggered notifications to the Telegram messenger.

Configuring notification sending for one user

1. Create a bot.
   - Tap the **Search** icon.
   - Find the bot named **BotFather**.
   - Tap **Start** and follow the instructions.
   - Specify the received token in the **Bot token** field.



2. Tap **Start** to subscribe to the created bot.

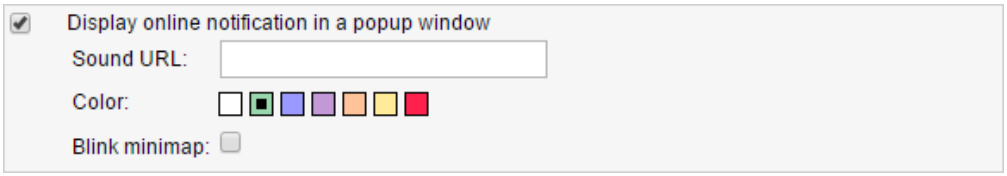
3. Indicate the user ID.
    - Find the bot named **userinfobot**.
    - Tap **Start**. If you have found the correct bot, you should receive a message with the user ID. In order to find out the ID of another user, forward any of their messages to the bot.
    - Indicate the received ID in the **Channel ID** field.

Configuring notification sending for a public channel

1. Follow steps 1 and 2 from the instruction above.
2. Create a public channel in Telegram.
3. Add the created bot to the channel as an administrator with a right to post messages.
4. In the **Channel ID** field in Wialon, indicate the link to the channel in the **@link** format (without **t.me/**). The link is specified in the **Info** section of the channel.
5. In the channel settings, add subscribers, that is, the users who should receive notifications, or send them the invite link.

Display online notification in a pop-up window

This action is used to set up online notifications that will be displayed in a pop-up window. Such a notification can be silent or accompanied by a specific sound. If no URL is given for the sound, the standard tune will be used. To use a custom tune, enter the URL of the sound. The recommended file size is up to 0.5 MB.



It is possible to receive notifications in the minimap once a notification triggers. To enable this option, check the **Blink minimap** box in this section.

Different browsers can have restrictions regarding formats of audio files:

	MP3	WAV	Ogg	AAC
Internet Explorer 9+	+			+
Google Chrome 11+	+	+	+	

Mozilla Firefox 12+		+	+	
Safari 5+	+	+		+
Opera 10+		+	+	

To highlight a notification, you can set an individual colour to it. This colour will be applied to the background of the triggered notification so that you could easily notice it.

Send mobile notification

This action is used to set up mobile notifications from the selected application. Choose the required application in the **Applications** field. Next, the system checks to what users the current user and the creator of the resource have the **View detailed item properties** and **Act as given user** access rights and creates the list of users. Specify the users who should receive mobile notifications (hold the **Ctrl** key and check any box to select all users). For the convenience of search, use the dynamic filter above the list.

Note that the availability of mobile notifications service depends on the chosen service package.

To receive mobile notifications, the user of the application for iOS and Android should authorize in the application and enable the **Notifications** option in the settings.

Send a request

This action allows sending alerts about the triggered notifications to third-party systems. When choosing this action, indicate the server address as well as the method of the HTTP request (**POST** or **GET**).

Register event for unit

This action allows registering a notification as an event in the unit history. As a result, you can generate a report on these events.

> To work with this action, make sure that the **Manage events** access right has been provided.

Register as violation

This action works together with the **Register event for unit** action and allows to register a notification not only as an event, but also as a violation. As a result, the Violations report becomes available.

Execute a command

When you select this action, a command is sent to the unit (units) when a notification is triggered. Select a command from the list of the available ones. The list contains all commands configured in the properties of selected units if a user has the Execute commands access rights towards them. Next to the header of the command can be special icons that signify the following:

- all selected units support this command;
- not all of the selected units support this command (see details in the tooltip).

If necessary, set the parameters.

If you send commands that require the input of text or a message (for example, **Send custom message** or **Send message to driver**), you can use tags (the same as for the notification text). When the command is executed, the entered tags are converted to the values that correspond to them.

> Tags are converted to values only if a command is selected as a notification action (not if a command is sent manually from the **Monitoring** panel).

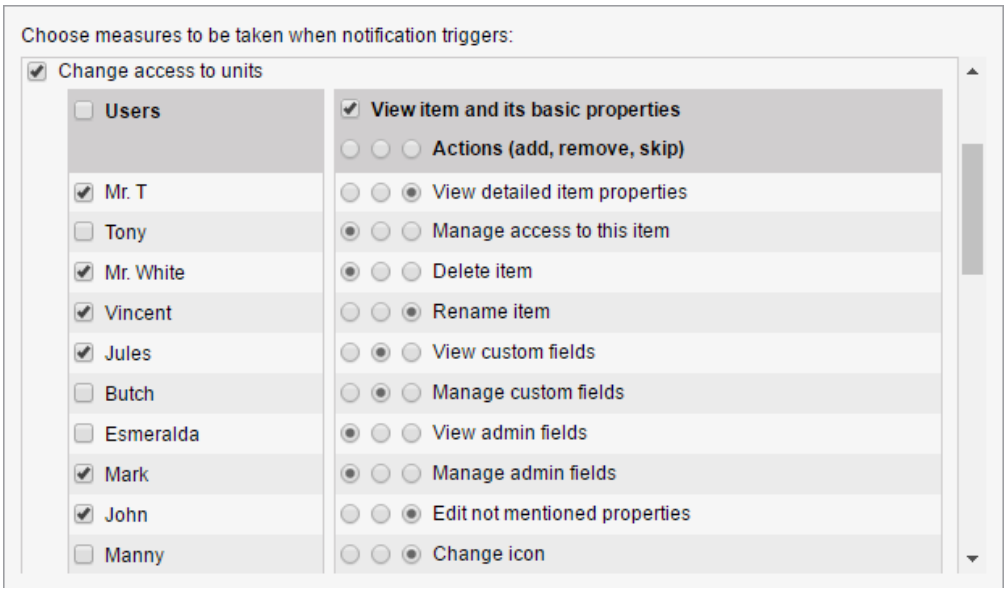
You can read more about commands here.

Change access to units

This action allows changing access rights to units once the notification is triggered. Select users whose access rights should be modified when trigger conditions occur. Specify the access rights that should be applied to these users after the notification triggers. You can use this feature, for instance, in the following situation: suppose you have created a user who monitors the

transportation of their cargo, that is, they have access rights to certain units. After the cargo is delivered to the agreed place (that is, after the unit entered a geofence), these units automatically become unavailable to the user.

ⓘ To work with this action, the **Manage access to this item** access right is required.



Set counter value

This action is used to change (or reset) counter values when notification triggers. Select one or more counters (mileage counter, engine hours counter, traffic counter) and set new values for them.

ⓘ To work with this action, the **Edit counters** access right is required.

Store counter value as parameter

This action is used to store the current values of mileage or engine hours counters as parameters in unit data messages (**odometer** or **engine_hours**, correspondingly). These parameters can be used to create sensors on their basis (for example, engine hours sensor) and to get initial/ or final mileage in reports. For more precise calculations, it is recommended to store counters while the unit is parked, for example, once a day at night time.

To work with this action, the **Edit counters** access right is required.

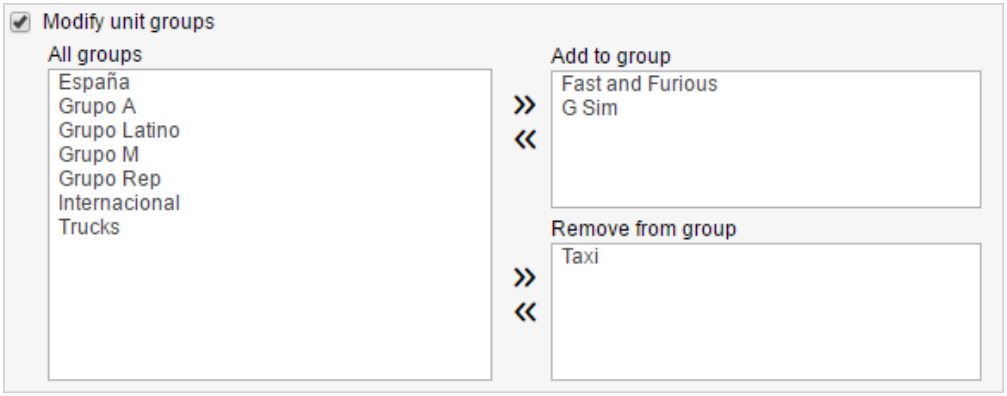
Register unit status

This action is used to set a new status for a unit when a notification triggers. For instance, when unit enters a geofence, the **private** state can automatically switch to **business**.

To work with this action, the **Manage events** access right is required.

Modify unit groups

This action is used to change the contents of unit groups when a notification triggers (units can be added or removed from the group). On the left, there is a list of all available unit groups. Move the required groups to the **Add to group** or **Remove from group** sections. As a result, after the notification triggers, the unit will be added or removed from the group.



Send a report by email

This action is used to send a report to the specified email address(es) once the notification is triggered. Indicate the resource to which the required report template belongs (select **All available** to view the templates of all available resources), report template, object (only the objects that belong to the same resource as the template are displayed), file format(s), time interval and report parameters. Note that when choosing an object, sometimes it is convenient to use the **Triggered unit** option. In this case, a report is generated for the same unit that the notification triggers for.

Afterwards, for the **Content** item, specify whether you would like to receive files/archives or the link to the FTP server where the corresponding files/archives are stored. Indicate the report interval:

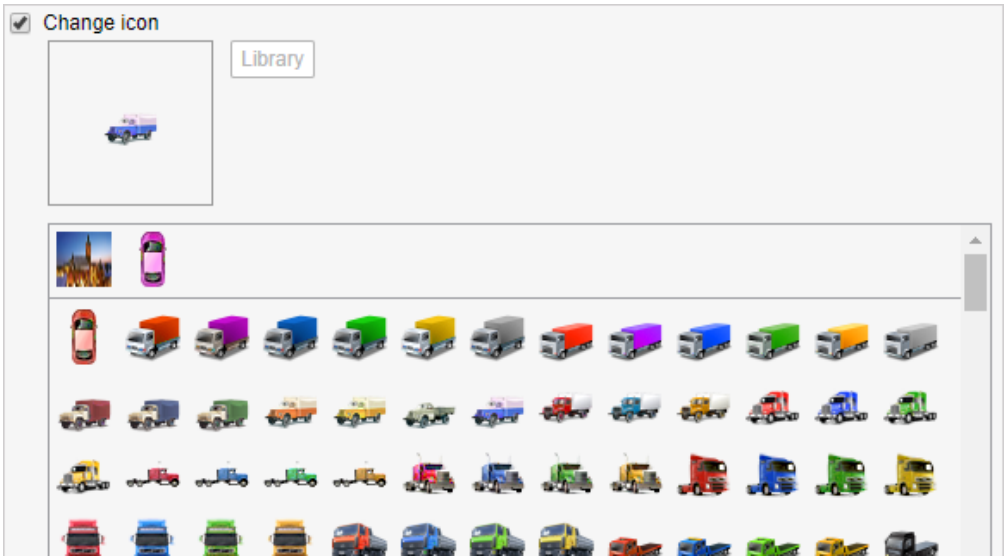
choose particular dates or specify any time interval for the previous X minutes/days/weeks/months/years. Enter an email address(es) to which the report should be sent upon notification triggering. To generate a report, the **View messages and reports** access right is required. To find out more about file formats or parameters description, see the Export Report to Files section.

The information about the geodata in such a report is shown in accordance with the settings of the user-creator of the resource in which this notification was created.

> ⚠ If the access right to the object (or the object itself) was removed, the created notification is not executed.

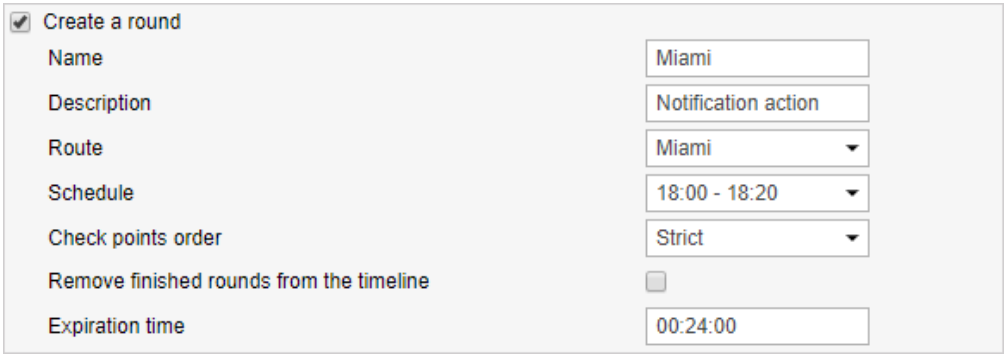
Change icon

This action is used to replace the icon of the current unit by the specified one when the notification triggers. Click on the **Library** button to open the window with the available icons.



Create a round

After the notification triggers, a new round can be created for a unit. For example, when one round is finished, a new round can be assigned, or when a unit leaves the geofence (for example, a garage), a new round is automatically created for it. More about the parameters that can be configured for rounds are described in the Routes section.



Reset driver

This action is used to reset driver automatically when the notification triggers. This action can be useful when, for example, you want to unbind the driver from the unit once the unit returns to the depot.

> The **Create, edit, delete drivers** access right is required for this action. Driver resetting can take place only within the resource to which the notification belongs.

Reset trailer

This action is used to reset trailers when the notification triggers.

> To work with this action, the **Create, edit, delete trailers** access right is required. The same as for driver resetting, trailers should belong to the same resource in order for the action to be executed correctly.

Online Notifications

Receiving online notifications is one of the ways of informing the user about the activity of the unit.

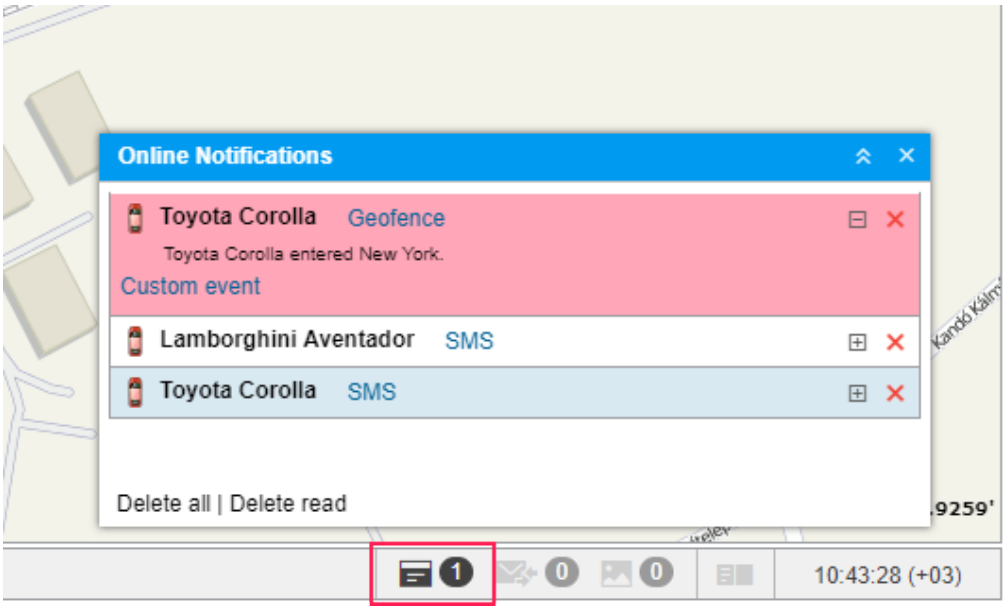
Only the users who are authorized in the system at the moment the notification is activated can receive an online notification. Online notifications are not stored in the system once the session has ended.

> To receive online notifications about a unit, the user should have the minimal rights to the resource in which these notifications have been created, and the **View item and its basic properties** right to the unit.

By default, online notifications are displayed in the pop-up window as they trigger. Make sure that the **Automatically display pop-up events** checkbox is enabled in user settings. To switch to

manual mode, disable this option. In this case, to open the window, click on the icon in the bottom panel. This icon is also an indicator of unread messages and shows their number. In addition, you can see the number of unread messages on the browser tab.

After clicking on the name or text of the notification, the map is centered on the place where the event took place. After clicking on the name of the unit, the map is centered on its last position. Additionally, the unit is added to the work list on the **Monitoring** tab and to the map.



The online notification window provides quick access to the custom event registration based on the received data about the unit's activity. When registering an event with the help of the online notification, the notification text is used as a comment. Afterwards, the registered event and the commentary on it can be viewed in the **Events** report.

For the top-level users and users with dealer rights, a filter by notification type is available in the online notifications window.

Online notifications can be viewed in minimaps.

The system supports receiving browser push notifications. Their advantage is that you can view a notification from any tab of your browser, or when the browser is minimized. You can enable browser push notifications in the dialog box which appears after you receive the first online notification.

Notification Text

The text is used for such notification actions as **Notify by SMS or email**, **Register event for unit**, **Display online notification in pop-up window**.

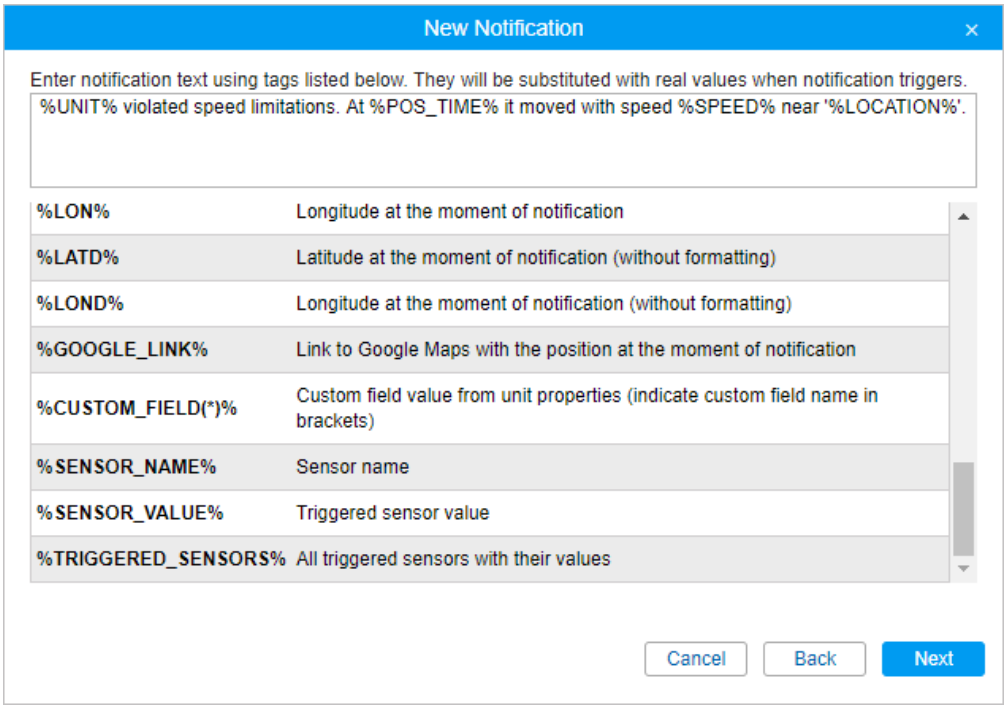
The text of a notification can be written in any language, contain any characters, words, and phrases, and be of any size. In addition, you can use tags, that is, parameters encrypted with special characters. In a message, such characters will be replaced with real values. If you want to receive a notification by SMS, do not write long messages.

Example:

The text «'%UNIT%' violated speed limitations. At '%POS_TIME%' it moved %SPEED% near '%LOCATION%'» can be transformed to «'Rover-119' violated speed limitations. At '2000-01-01 12:01:37' it moved 136 km/h near 'KU 8, Thurnau, DE'».

The units of measurement (kilometers or miles) used to decrypt the tags depend on the resource settings to which the notification belongs. The date and time format is taken from the settings of the creator of this resource.

In the text of the notification with the Send a request action type, enter the parameters of the request. When composing the text of the notification yourself, use URL encoding. Note that when using this type of notification action together with others (such as **Notify by email**, **Notify by SMS**, and so on), the same text is created for all notifications.



Below is the list of tags applicable to most types of notifications:

%UNIT%	Unit name.

%UNIT_ID%	Internal unit ID in the system.
%CURR_TIME%	Current date and time.
%LOCATION%	Unit location when notification was triggered.
%LAST_LOCATION%	Last known unit location. This information may be useful if there is no location information in the triggered message.
%LOCATOR_LINK(60,T)%	Create a locator link for the triggered unit (in parentheses indicate its lifespan in minutes, T and G parameters to show tracks and geofences).
%ZONE_MIN%	The smallest of the geofences where the unit was located when the notification was triggered.
%ZONES_ALL%	All the geofences in which the unit was located when the notification was triggered.
%SPEED%	Speed registered when notification was triggered (is not applicable to fuel fillings or thefts).
%POS_TIME%	Date and time of the triggered message, or the last message with the position (in case the triggered message has no information about the position).
%MSG_TIME%	Date and time of the message that triggered.
%DRIVER%	The name of the driver assigned to the unit when the notification was triggered. It is displayed only if the driver belongs to the same resource as the notification.

%TRAILER%	The name of the trailer assigned to the unit when the notification was triggered. It is displayed only if the trailer belongs to the same resource as the notification.
%SENSOR(*)%	Unit sensors and their values (indicate a sensor mask in parentheses).
%ENGINE_HOURS%	Engine hours when the notification was triggered.
%MILEAGE%	Mileage when the notification was triggered.
%LAT%	Latitude when the notification was triggered (for example, N 55° 45.7530').
%LON%	Longitude when the notification was triggered (for example, E 37° 35.2068').
%LATD%	Latitude without formatting.
%LOND%	Longitude without formatting.
%GOOGLE_LINK%	Link to Google Maps with the position when the notification was triggered (for example, http://maps.google.com/?q=55.762550N,37.586780E).
%CUSTOM_FIELD(*)%	Custom fields of the unit. If you leave the asterisk sign in parentheses, all available custom fields (including administrative ones) will be shown with their values (in the **'key: value'** format). However, you can get the value of a certain field if you specify its name in parentheses. In this case, the resulting notification text will contain the value of the specified field (only the value but not its name).

The time tags use the time zone of the user who created the notification. If another user opens the notification properties and clicks **OK**, the time zone of the latter user is applied.

There are also tags that are applied only to specific types of notifications:

%ZONE%	The name of the geofence for which the notification was triggered (for the notifications of the **Geofence** type). In the text of the Outside geofence notification, the %ZONE% tag is replaced with the names of the geofences (separated by a comma) which the unit entered at the time of the previous message and already left. If there is no previous positional message or there are no geofences that satisfy the condition described above, the text of the notification shows only the name of there tag (that is, %ZONE%).
%ZONE_DESC%	The description of the geofence (for the **Geofence** notification) taken from its properties.
%SENSOR_NAME%	Name of the triggered sensor (used in notifications of various types).
%SENSOR_VALUE%	Value of triggered sensor.
%SERVICE_NAME%	Name of service interval (used in maintenance notifications).
%SERVICE_TERM%	State of service interval — left/expired value (used in maintenance notifications).
%TRIGGERED_SENSORS%	All triggered sensors and their values (used in maintenance notifications).
%LOSE_RESTORE%	Connection loss/Connection restored (used in connection loss notifications).
%PARAM_NAME%	Parameter name (used in parameter control notifications).
%PARAM_VALUE%	Parameter value (used in parameter control notifications).

%SMS_TEXT%	Text from SMS message (used in SMS control notifications).
%VOLUME%	The volume of the fuel filling or theft (for the fuel filling or fuel theft notifications).
%INITIAL_LEVEL%	The fuel level when the filling or theft began.
%FINAL_LEVEL%	The fuel level when the filling or theft finished.
%TIME_FROM%	The time when the fuel filling or theft began.
%TIME_TO%	The time when the fuel filling or theft finished.
%DURATION%	The duration of the fuel filling or theft (in minutes).
%DRIVER_ID%	Driver's code (used in notifications about drivers).
%DRIVER_NAME%	Driver's name (used in notifications about drivers).
%TRAILER_ID%	Trailer's code (used in notifications about trailers).
%TRAILER_NAME%	Trailer's name (used in notifications about trailers).
%OTHER_UNIT%	Name of another unit (used in notifications about interposition of units).

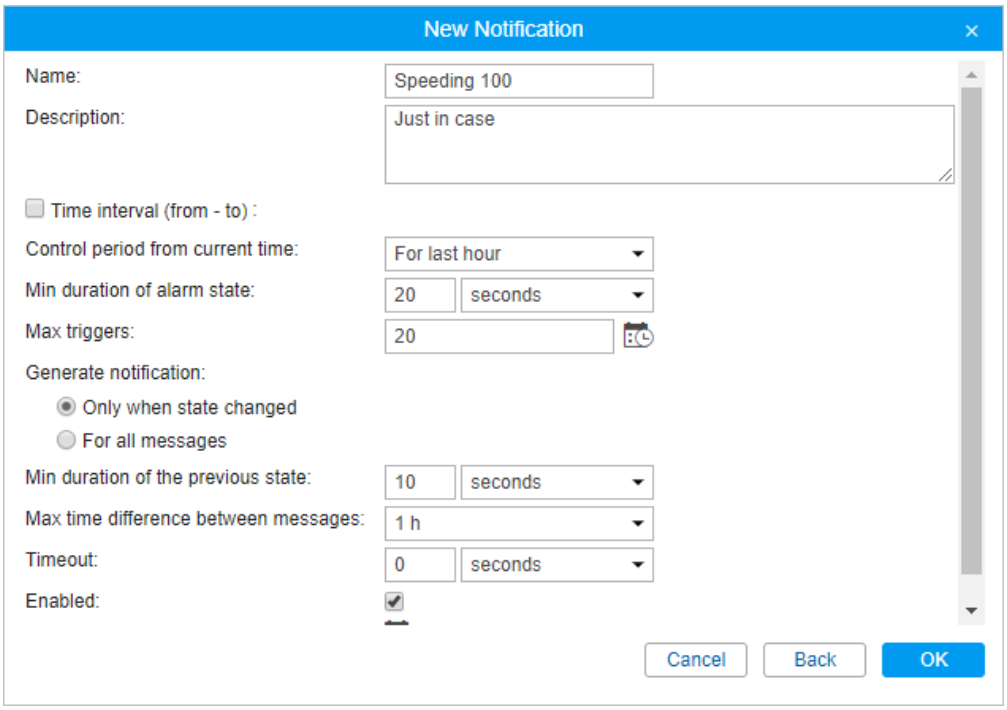
%ROUTE_NAME%	Route name (used route control notifications).
%ROUTE_STATUS%	Round execution status (used in route control notifications).
%ROUTE_POINT%	Name of the check point (used in route control notifications).
%ROUTE_SCHEDULE%	Schedule name (used in route control notifications).
%ROUND_NAME%	Round name (used in route control notifications).
%COUNTRY%	Country.
%REGION%	Region (state, etc.).
%CITY%	City (town, etc.).
%STREET%	Street.
%HOUSE%	House.

If the data is unknown, the tags are displayed as they are (not substituted with any values). The exceptions are the following tags which do not appear in the notification text when there is no data: %UNIT%, %USER%, %CURR_TIME%, %LOCATION%, %LAST_LOCATION%, %SPEED%, %POS_TIME%, %MSG_TIME%, %UNIT_GROUP%, %ENGINE_HOURS%, %MILEAGE%, %LAT%, %LON%, %LATD%, %LOND%, %GOOGLE_LINK%, %INSURANCE_CASE%, %ZONES_ALL%, %ZONE_MIN%, %UNIT_ID%, %MSG_TIME_INT%, %NOTIFICATION%, %TAG_NAME%, %TAG_ID%, %LOSE_RESTORE%, %LOCATOR_LINK%.

A tag must be marked with a percent sign on both sides. Otherwise, it is considered as plain text and is not substituted with real values.

Notification Parameters

The last page of the dialog box contains the parameters for triggering notifications. Their set may vary depending on the selected notification type.



Name

The name of the notification.

Description

The description is optional. If added, it is used in the notification tooltip. The text should not contain more than 10,000 characters.

Time interval (from – to)

The validity period of notification. By default, it is not set (the **Time interval** box is not checked). However, if necessary, you can set any validity period accurate to minutes (check the box and indicate the required interval). Upon the expiration of the indicated time period, the notification will be automatically switched off (or permanently removed if the units mentioned in this notification do not exist anymore).

Control period from current time

This is the period between the time the message was generated and the current time of the server.

If this interval is exceeded, the message is not taken into account and the notification does not trigger. It is recommended to indicate a control period of at least an hour because a shorter period may not be enough for data analysis.

Min duration of alarm state

This parameter is used to exclude accidental triggering of a notification (for example, due to tracker errors, it may seem that the unit left the specified geofence and returned 10 seconds later). Specify the interval in seconds, minutes, or days (select the interval type from the drop-down list). The maximum allowable value is 24 hours (1440 minutes, 86,400 seconds).

> The minimum duration value applies directly to the main condition for triggering (which corresponds to the notification type) and does not influence the additional ones (speed, sensor value, and so on).

Max triggers

After reaching the maximum number of triggers specified in the field, the notification turns off automatically.

It is possible to set time limitation for this parameter. To do this, press the icon and specify the restrictions. As a result, the maximum number of notification triggers will be applied only to the indicated intervals. If there are several intervals, after reaching the maximum number of triggers in one of them, the notification triggers an unlimited number of times before the next tracking period starts.

Generate notification: (1) when the state changes, (2) for all messages

In the first case, it is required for the unit not to be in an alarm state in the moment of notification activation. For the notification to trigger, the state should change to alarm. In the second case, the notification will trigger as soon as the alarm state is detected regardless of the previous state. If the second option is selected, the following parameters are irrelevant.

Min duration of the previous state

This parameter is used to exclude excessive triggers. For example, a unit can return to the normal state for a very short period and then return to an alarm state. This parameter is necessary for the notification not to trigger twice. Set the interval in seconds, minutes, or days (select the interval type from the drop-down list). The maximum allowable value is 24 hours (1440 minutes, 86,400 seconds).

Max time difference between messages

When the system receives a message which is identified as an alarm (that is, contains the parameters that are intended for notifications), the previous message is analyzed. If the time

difference between the current message and the alarm exceeds the **Max time difference between messages** parameter, the notification does not trigger.

Timeout
The time interval after receiving the message, after which it will be analyzed. It is recommended to set a bigger time value if the device has a 'black box' which might require some time to unload all the messages stored during the period of communication loss (for instance, while the device was abroad). Set the interval in seconds or minutes (select the interval type from the drop-down list). The maximum allowable value is 30 minutes (1800 seconds).

Enabled
This parameter determines whether the notification is active after its creation or editing or not.

Process LBS messages
If this parameter is checked, the system takes into account the location received with the help of the LBS detector.

Time limitation
It is possible to set limitations depending on time, day, or month. For example, the control can be carried out only on weekdays and within working hours. Click here to learn more about the parameters for jobs.

Managing Notifications

You can get the following information from the notification list:

Notification state ( ): : notification is enabled, : notification is disabled.	
: the number of activations.	
: the number of units to which the notification is applied.	
Control type	**Action(s)**
: speed; : geofences; : alarm (SOS); : digital input activation/deactivation;	: email; : SMS; : online pop-up window; : mobile notifications sending;

: sensor value;
: parameter in a message;
: connection loss;
: idling;
: SMS;
: interposition of units;
: address visit;
: excess of messages;
: fuel filling;
: fuel theft;
: route progress;
: driver control;
: trailer control;
: maintenance (service intervals);
: POST/GET request sending;
: event registration;
: violation registration;
: command execution;
: modify users access level;
: manipulate counters;
: register unit status;
: modify unit groups;
: send a report by email;
: icon change;
: create new round;
: reset driver;
: reset trailer;
2, 3, and so on: if several notification actions are chosen, a digital indicator shows the quantity of such actions.

Pause the mouse cursor on a notification to see detailed information in the tooltip: control type, parameters, actions, lifetime, max triggers, text, and resource (if available).

You can perform the following actions with notifications:

/ : enable/disable a notification,
: enable/disable all notifications at once,
: edit notification settings,
: create a new notification, using the current one as a basis,
: delete a notification.

If you only have a viewing access right to the resource where the notification is located, you cannot edit or delete it, and some icons look inactive:

/ : you cannot change notification state,
: you can only view notification properties, editing not available,
: you cannot delete the notification.

The notifications are listed in alphabetical order. Use the dynamic filter to find the required notification.

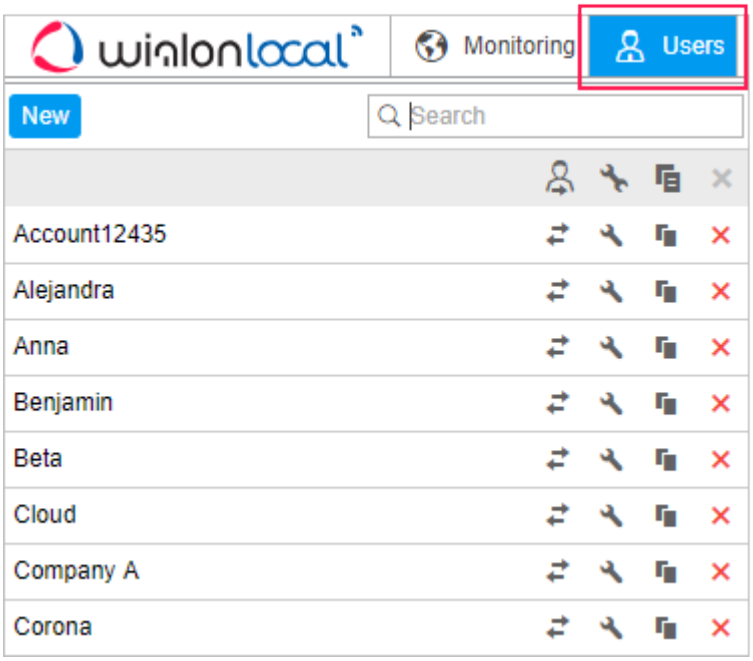
If you have access to several resources, you can filter notifications based on the resource to which they belong. To view the notifications of a particular resource, select it in the drop-down list above the table.

Users

A user is a system object that has a unique name (login) and password. Users can login to Wialon where they can control their units with the help of different tools and features. Different users can have different access rights and, accordingly, see a different set of monitoring units and other system objects, create their own geofences, report templates, and so on.

Working with users

To work with users, open the **Users** panel by choosing a corresponding name in the top panel or clicking on the **Users** item in the main menu customizer.



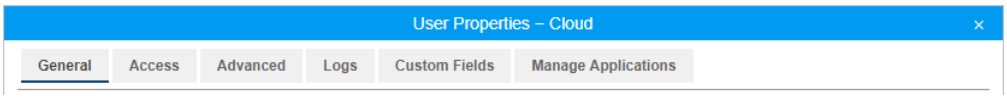
The panel contains the list of users available to the current user. For the convenience of search, use the dynamic filter.

Below is the list of actions you can perform right from the panel.

: log in as this user. The icon is disabled if you do not have enough access rights. More information about logging in as a different user can be found here.

or : edit or view user properties (the type of displayed icon depends on your access rights). User properties dialog box can contain up to six tabs which were described previously:

- General,
- Access,
- Advanced,
- Logs,
- Custom fields,
- Manage applications.



: create a new user based on the selected user.

: delete the selected user from the system. The button is disabled if there are not enough access rights.

Application of users

If you have access rights to several users, you can create objects under a selected user or within their account. As a rule, the information that a certain object (driver, geofence, unit, and so on) belongs to a certain resource or account is displayed in the object's tooltip or properties dialog box. Besides, in all panels that contain filters, there is an additional filter by user or account in the form of a drop-down list.

User actions in the system are logged. For instance, you can view user's (operator's) chat with the driver, learn which commands were sent to units by this user, what alterations this user made to some object properties, what objects they created, and so on. This functionality is available mainly through reports.

In the advanced reports on users, you can see more detailed data on users' logins and logouts, as well as build activity charts by the hour and day.

User access to monitoring units can be controlled automatically:

- with the help of the job (for instance, you can allow access only during a working shift);
- with the help of the notification (for instance, deny access upon route completion).

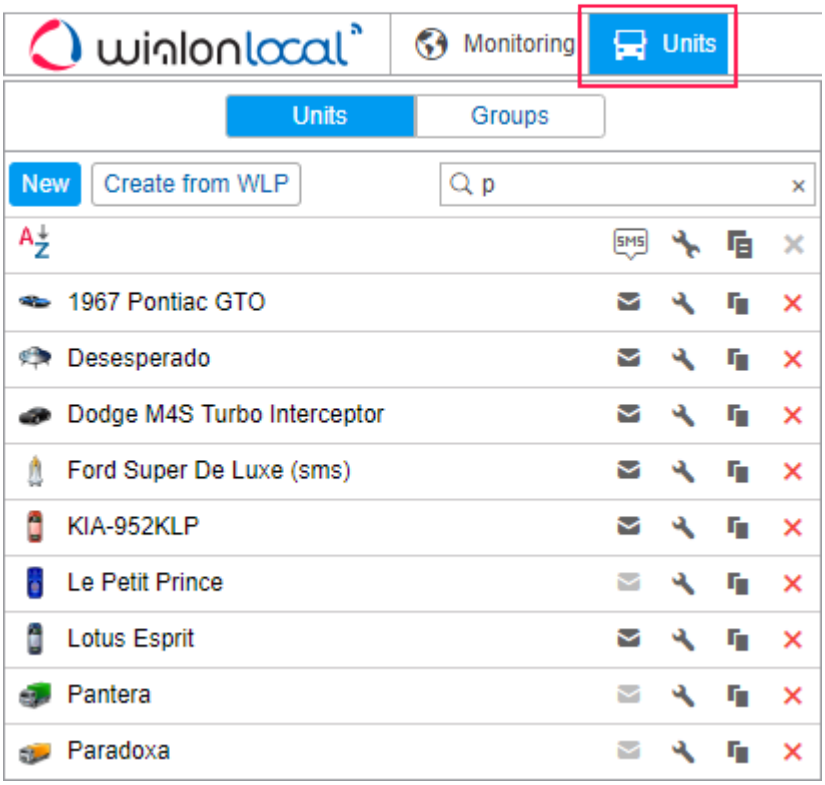
Individual settings can be imported to other users. More information about the transfer of user settings can be found here.

Units

A unit is a vehicle, equipment, person, pet, or any other moving or stationary object that can be monitored using satellite monitoring.

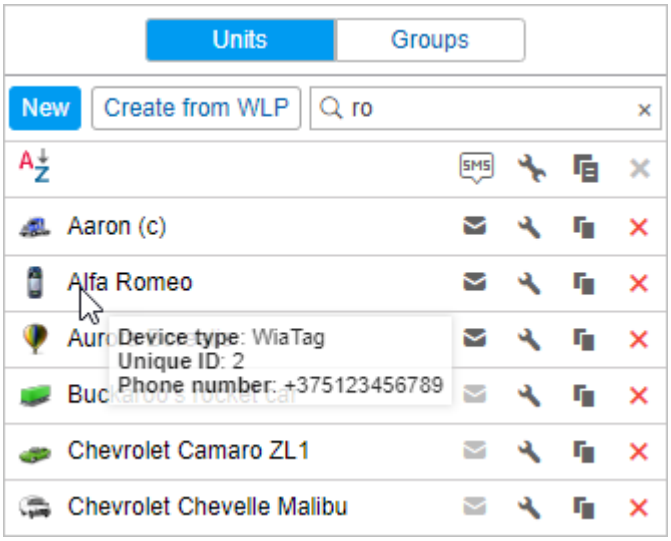
The **Units** tab is used to create new units manually and with the help of WLP files (unit properties import), view, edit, copy, delete units, export their properties, and send SMS messages to them.

To work with units, open the **Units** tab by clicking the corresponding name in the top panel or selecting the item in the main menu customizer. Two modes are available on the **Units** tab: **Units** and **Groups**. Note that by clicking the **New** button in the **Units** mode you create a new unit while in the **Groups** mode you create a new group of units.



Managing Units

To create a unit, click **New**, fill in the fields of general properties, and press **OK**. The created unit appears in the worklist. In addition, a unit created in the monitoring system or CMS Manager automatically appears in the worklist of the **Monitoring** tab (in the simple list mode) of the account it has been created in.



Units are listed in alphabetical order. Each unit has an icon. To quickly find the required unit, use the dynamic filter. Such information as the unit type, unique ID, and phone number(s) can be found in the unit's tooltip.

> To view the unit's tooltip, the **Edit connectivity settings** access right to the unit is required.

Below is the list of actions you can perform right from the tab.

: send an SMS to the unit. It can be a command or another message. The SMS icon is not displayed if this feature is not activated for the current user. If the icon is inactive, it means that there is no phone number indicated in unit properties or the current user has not enough access rights to the unit. If two phone numbers are indicated in unit properties, select one of them when the SMS sending dialog box opens. More information about sending SMS messages can be found here.

: view or edit unit properties. To get the most efficient results both in reports and in online monitoring, the unit should be configured correctly, in accordance with the device type in use, available sensors, and tracking tasks. Depending on your access level and activated services, the dialog box can contain up to 13 tabs:

- General,
- Access,
- Icon,
- Advanced,
- Sensors,
- Custom Fields,
- Unit Groups,
- Commands,

- Eco Driving,
- Profile,
- Trip Detection,
- Fuel Consumption,
- Service Intervals.

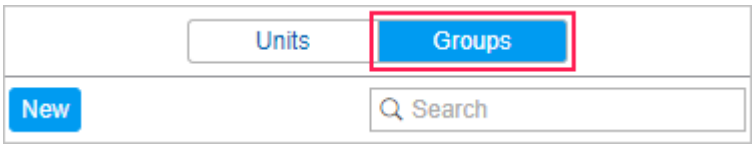
: create a new unit based on the selected unit.

: delete the unit from the system. The button is disabled if there are not enough access rights.

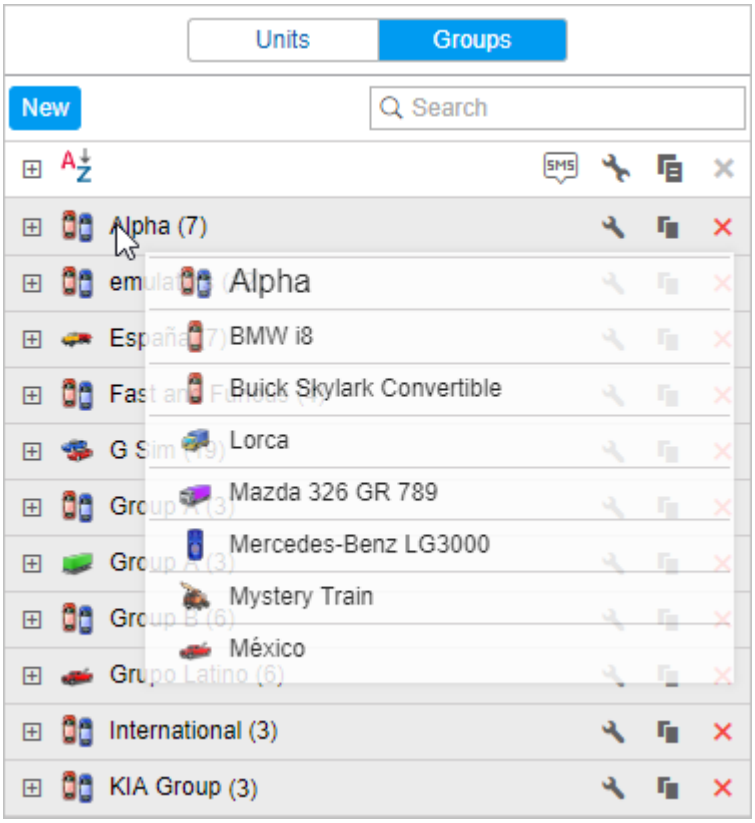
Unit Groups

Created units can be formed into groups. Groups are used to unite units on the basis of some criteria.

To work with unit groups, choose the **Groups** mode in the **Units** panel.



To create a group, click **New**, fill in the fields of general properties, select units, and click **OK**. The group will appear automatically in the worklist of the **Monitoring** panel (in the group view mode) of the account it has been created in.



The list of created unit groups is displayed in the work area. Groups are listed in alphabetical order. To the right of each group name, you can see how many units are included in it. The names of units included in the group are listed in the group's tooltip. To quickly find the required unit group, use the dynamic search above the list.

Below is the list of actions you can perform right from the panel.

- or : edit or view unit group properties;
- : create a new group on the basis of the selected one;
- : delete the group from the system. Deleting a group only deletes the group, but not the units included in it. If the icon is inactive, it means you do not possess enough access rights to perform such an action.

Depending on your access rights, the dialogue box of unit group properties can contain up to four tabs. See their description on the **Unit group properties** page.

Working with unit groups, take into account some specific features of access rights described below.

- A group can be used to give the user access to several units at once.
- With groups, access to a unit can be expanded but not narrowed.
- The creator of the group must have access rights to units in this group. Only in this case, it will be possible to transfer access to these units to other units through the group.

To add or remove units to/from the group, you are required to have the **Edit ACL propagated items** access rights to this group.

The use of unit groups in monitoring

Unit groups are widely used in the Wialon system.

1. Online monitoring of unit groups:

   - display/remove from the map a group of units with one mouse click;
   - send commands to a group of units at once;
   - view a certain parameter (sensor value, movement state, and so on) for a group of units in one window.
     More information about worklist management can be found here.

2. Advanced reports:

   - generate all tabular reports for a unit group;
   - draw tracks of all grouped units on the map.
     More information about the unit groups can be found here

3. Configuring jobs, notifications, and routes:

   - apply the jobs, notifications, or routes to a unit group during the configuration, instead of applying them to each unit individually.
     More information about creating and editing jobs can be found here.

You can also work with unit groups in the management system. To learn more, visit the Unit groups in management section.

Working with unit groups is easy. Deleting a unit group does not delete the units themselves. That is why you can create, edit, and remove unit groups, that is, configure the groups according to your needs. You can also configure automatic editing of groups with the help of the notification of the Modify unit groups type. When the set conditions are met, the unit can automatically be added to or removed from the group.

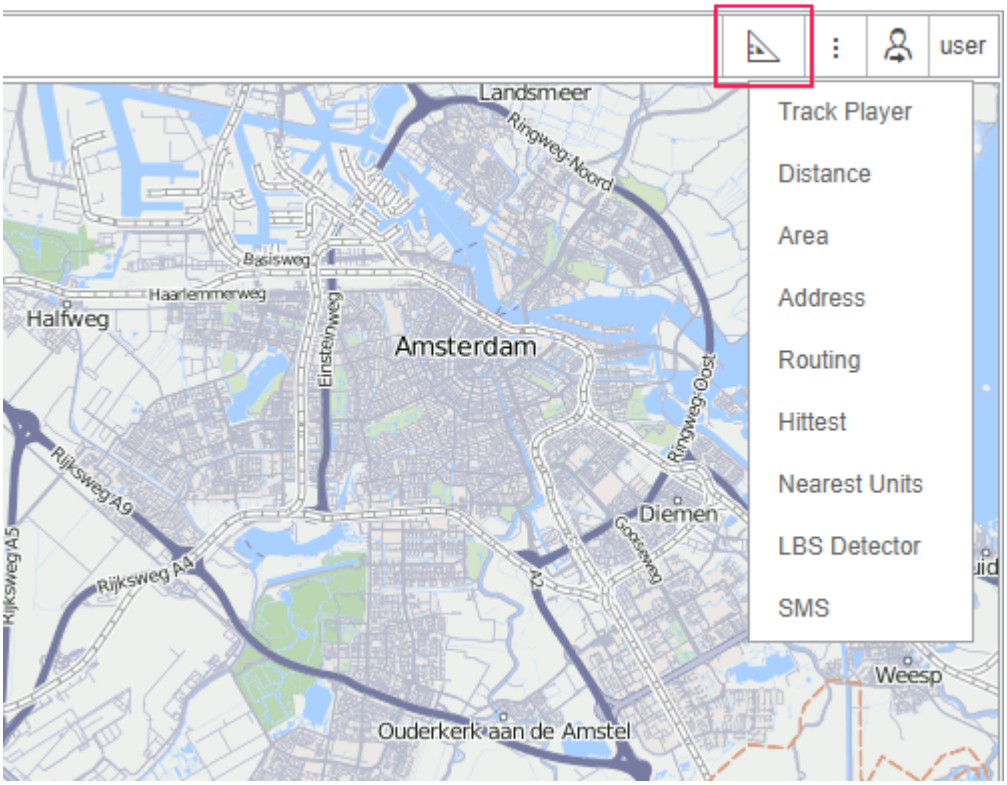
Tools

In Wialon, tools are used for various kinds of calculations. To view the list of available tools, click on the **Tools** button in the top right corner of the top panel or choose the required item in the main menu customizer.

The **Tools** menu contains eight items:

- Track player,
- Distance,
- Area,
- Address,
- Routing,
- Hittest,
- Nearest units,
- LBS detector.

As the ninth item, the SMS tool may be presented.



To get more accurate measurements, follow the rules:

- To add a point, double-click on any place on the map;
- To insert a point, double-click on the segment between two points;
- To delete a point, double-click on it;
- To move a point, click on it and, while holding it, drag it to the required location.

To quickly access tools, use shortcuts. To minimize or close the window of the tool you are working with, use the icons in the upper right corner. You can also drag the window around the screen. In addition, by pulling the right or bottom edge of the window, you can resize it (not applicable to the **Area** and **Distance** tools). The position and size of each tool are memorized and the next time you open it, the tool opens in the same form and position in which it was closed.

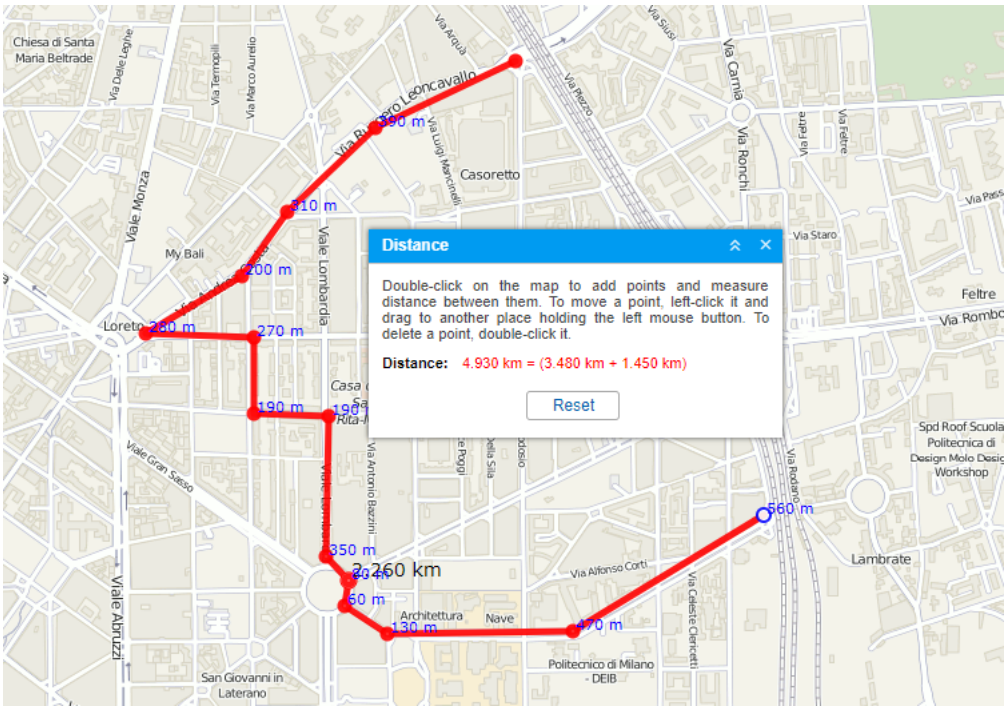
The units of measurement for tools related to online calculations (such as **Distance**, **Area**, **Address**, **Routing**, **Nearest units**) are taken from the settings of the current user. The units of measurement for tools related to working with tracks (such as **Track player**, **Hittest**) use units from the unit settings.

Distance

To measure the distance from one point to another, select the **Distance** tool. To indicate the initial point, double-click on any place of the map. Then, sequentially add new points. You can move the map or zoom it using any of the ways described in the Maps section.

Next to each point, the distance from the previous point is indicated. The total sum of all segments can be calculated in the window of the **Distance** tool. To know the sum, place the mouse cursor over the last point (a white dot with the blue border). If the cursor is moved to another place, the total sum of segments will also include the distance to the current position of the cursor. In brackets, you will see the sum of all segments already mapped onto the map + the distance to the cursor. If the cursor is placed over the last added point, the added distance is 0m.

Move the cursor along the already added line to get the distance from the starting point to the current cursor position. The cursor position is marked with a white dot. When you pause the mouse cursor on it, the cursor takes the form of a plus sign (+). The caption with a black font shows the distance from the first point to the selected position.



To clear the map and start measurements again, use the **Reset** button.

Routing

This tool helps to quickly lay the shortest routes from one point to another with a visit to any number of intermediate points. You can specify the order of points yourself or use the order proposed by the **Routing** tool. You can indicate key points by double-clicking on the map or entering the required addresses. The resulting route can be saved as a geofence with or without control points or as a route and can be used for route or geofence control later on.

Selecting provider

Gurtam Maps is a default cartographical service used to build a route. In addition, depending on the available maps, other map providers, such as Google, Yandex, HERE, and others, can also be used. However, if you use these maps, you should choose the order of points manually (or pre-determine it by Gurtam Maps). Some providers offer additional options. For example, if Google is selected, the route can be mapped taking into account different conditions: whether you travel by car (default option) or on foot, whether you want to avoid highways or not, and so on. Using Yandex, you can build routes considering traffic jams. Namaa maps allow you to select the traffic scheme (plan) that should be taken into account when planning a route.

Placing points

There are two basic ways to set key points for a route.

Using the mouse

Just make several double-clicks on the map to indicate the key points. If the **Use detected addresses as names for points** option is enabled in the **Points** section of the window, the addresses are automatically registered as point names. If the address information is missing, the point is added anyway, but without a name.

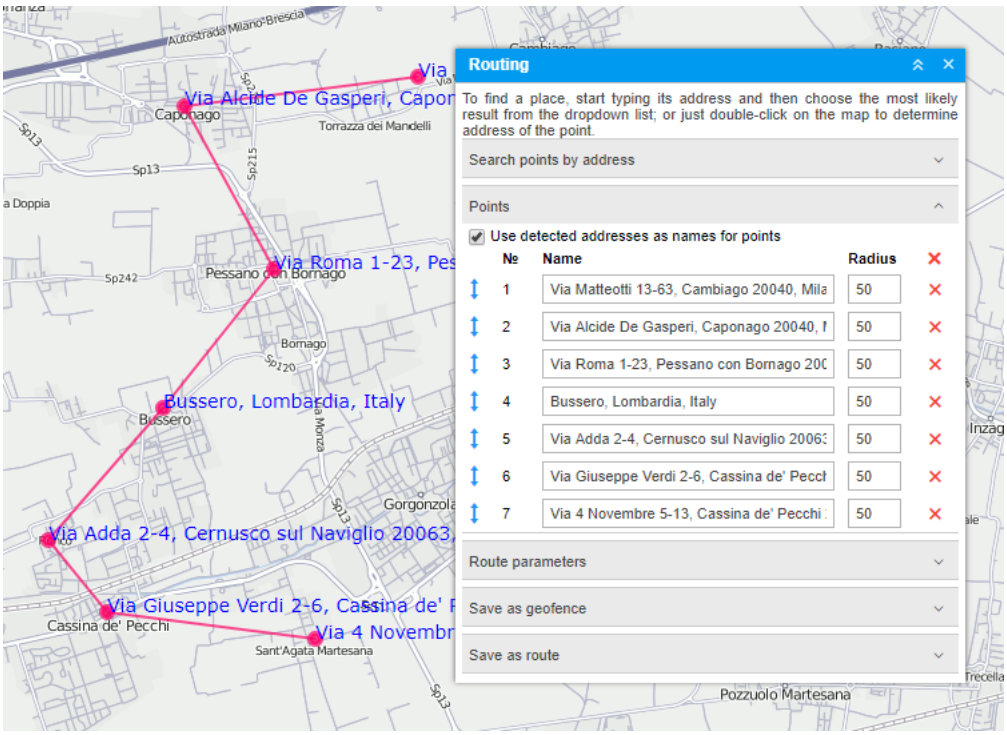
Using the address tool

In the **Address** section of the window, indicate the addresses of the points you want to visit. The usage of the Address tool was described in detail in the previous section. The indicated points can be added to the route automatically if the **Auto save of points** check box is enabled, or manually (by clicking on the **Add point** button) if the check box is disabled.

> ⓘ If you are going to use this route for route control, it is recommended to choose the starting point of the unit to which this route will be assigned as the first point.

When at least two points are set, it is possible to draw the route. To do this, click on the **Calculate** button. Note that you might want to pre-edit key points, especially if you are going to save this route as a geofence or as a route.

The list of points is displayed in the **Points** section of the window. Here you can change the order of points, edit their names and radius, and delete them.



Route calculation

When building a route with Gurtam Maps, you can use a different sequence of route points:

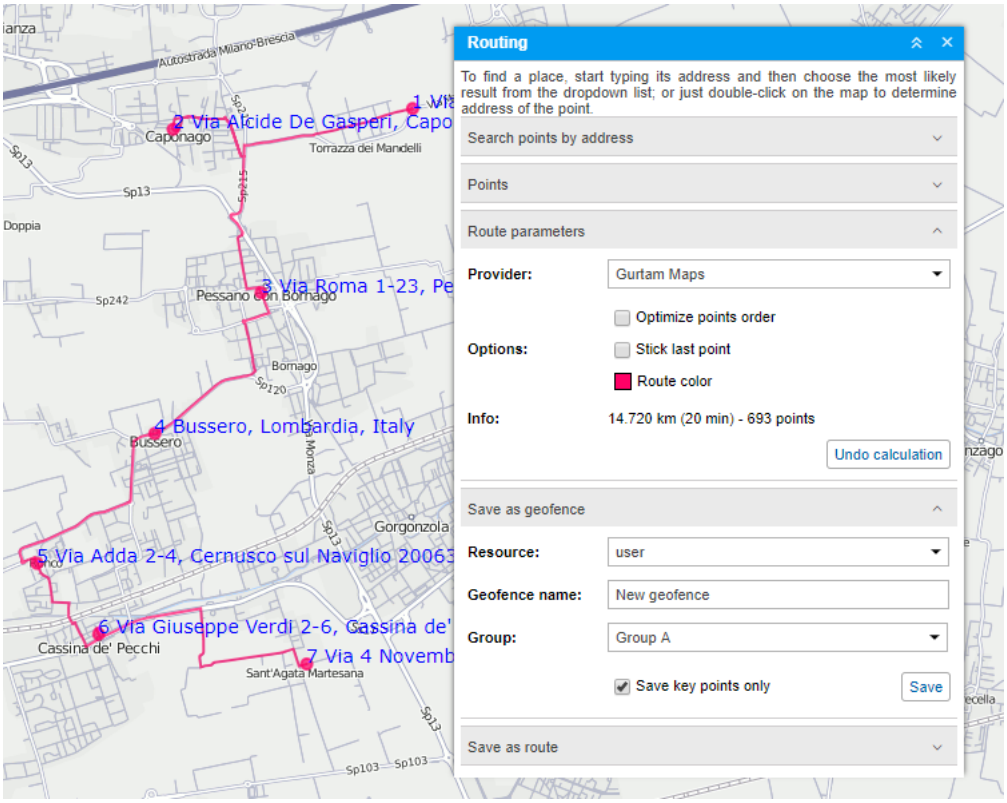
- points follow each other in the order in which they were placed on the map. If you want to use this option, there is no need for any configurations;
- points rearrange to build the shortest route. If you want to use this option, enable the **Optimize points order** check box. In this case, the first route point is fixed, and a route is laid without being tied to roads. The last point can also be fixed. To use this feature, activate the **Stick last point** check box. As a result, regardless of the order of the points, the last indicated point is the last route point as well.

In addition, you can select the colour of the route line.

Having configured the required parameters, click on the **Calculate** button. After that, you can see a list of the available routes based on the indicated points in the **Route parameters** section. The length and approximate duration are specified for each of them. Click on the route in the list to view it on the map. Now you can select the most appropriate route and save it.

If you want to change some parameters (for example, add more points), click **Undo calculation**. If you want to build a new route, first remove all points in the **Points** section of the window.

If the calculation is made using routing, the route is built taking into account the existing roads. Gurtam Maps is supported as a default routing provider for this tool.



Saving as a geofence or route

After the route is created, the result can be saved as a line-shaped geofence or as a route. The **Save as geofence** section automatically opens by default after the calculation. Here you should enter the geofence name, select the resource and the geofence group (if you want to include the created geofence in an existing group) and click on the **Save** button.

There are two options for saving the route:

- if the **Save key points only** check box is enabled, the geofence will correspond to the line passing along the shortest path through the points of the route;
- if the check box is not activated, the geofence will correspond to the entire line of the route.

The newly created geofence will appear on the Geofences tab where it can be further edited.

The result can also be saved as a route. To do this, it is necessary to expand the corresponding section, indicate the name for the route, and click **Save**. The created route appears on the Routes tab where it can be further edited.

To build a route, you can also make use of a specially designed app Delivery Service.

Nearest Units

This tool is designed to help you to find units which are the nearest to a certain place according to their last message.

On the **Tools** tab, select **Nearest Units**. In a special window, set the parameters of your request and observe search results.

Request

There are two ways to indicate a place.

- Double-click on the map in this place.
- Enter an address in the **Search** field and then choose the most likely variant below.

In the selected place, a red marker appears, and at the bottom, the list of nearest units is displayed.

If in the user settings the **City** parameter is set, then the city/town is already specified when you open the tool.

> ⚠ Only Gurtam Maps can be used for address detection.

Additional parameters

Several additional parameters can be applied to the search:

Number of units to show

5, 10 or 20 units can be shown (choose the number from the dropdown list).

Consider routing

When choosing this option, the distance from the indicated place to a unit is calculated not directly but taking into account existing roads. Moreover, enabling this option you can not only receive the distance between the indicated point and a unit, but also time which is necessary for covering this distance.

> ⚠ If this option is activated, but the distance to the nearest unit is more than 1000 km and Gurtam Maps are selected as the routing provider, the routing is not taken into account.

Routing provider

By default, it is Gurtam Maps. However, it can be Google, Yandex, Visicom, and HERE as well.

Geofence

Any geofence can be selected as district limitation. The filter by geofence is applied to found results only. This feature is designed to exclude from search results the units which are far away from the indicated place.

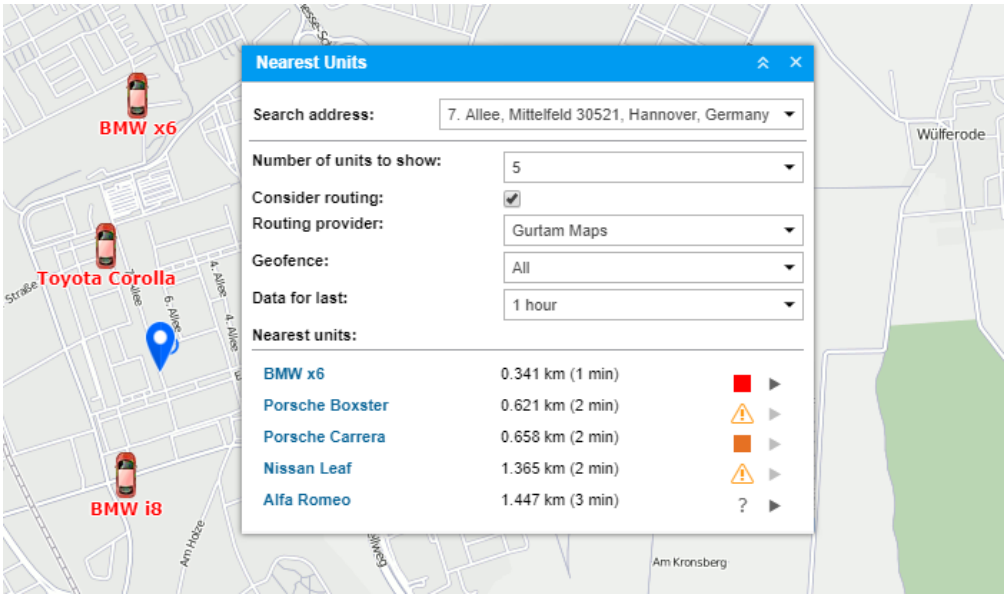
Data for last

Units which have not been sending messages for a long time can make difficulties for locating nearest units. Then it is handy to narrow the search interval: for last 5 or 30 minutes, 1, 6, 12 or 24 hours, or set **Anytime** (no limitations). If unit last message does not get into the specified interval, this unit will not be considered.

Search results

Search results are presented at the bottom of the window as a list of units. There you can see the following information:

- unit name (click to focus the map on unit),
- driver's phone number (if any driver with indicated phone number is bound to unit),
- distance to the indicated place (if routing is applied, the first number stands for a distance considering routing and the number in brackets stands for the time necessary to cover this distance, if available),
- sensor state indicator (adjusted on the Advanced tab of unit properties),
- buttons to send commands to unit (including messages to driver).



If you are not satisfied with search results, please, check your work list because the search of nearest units is performed on the basis of units displayed on that list.

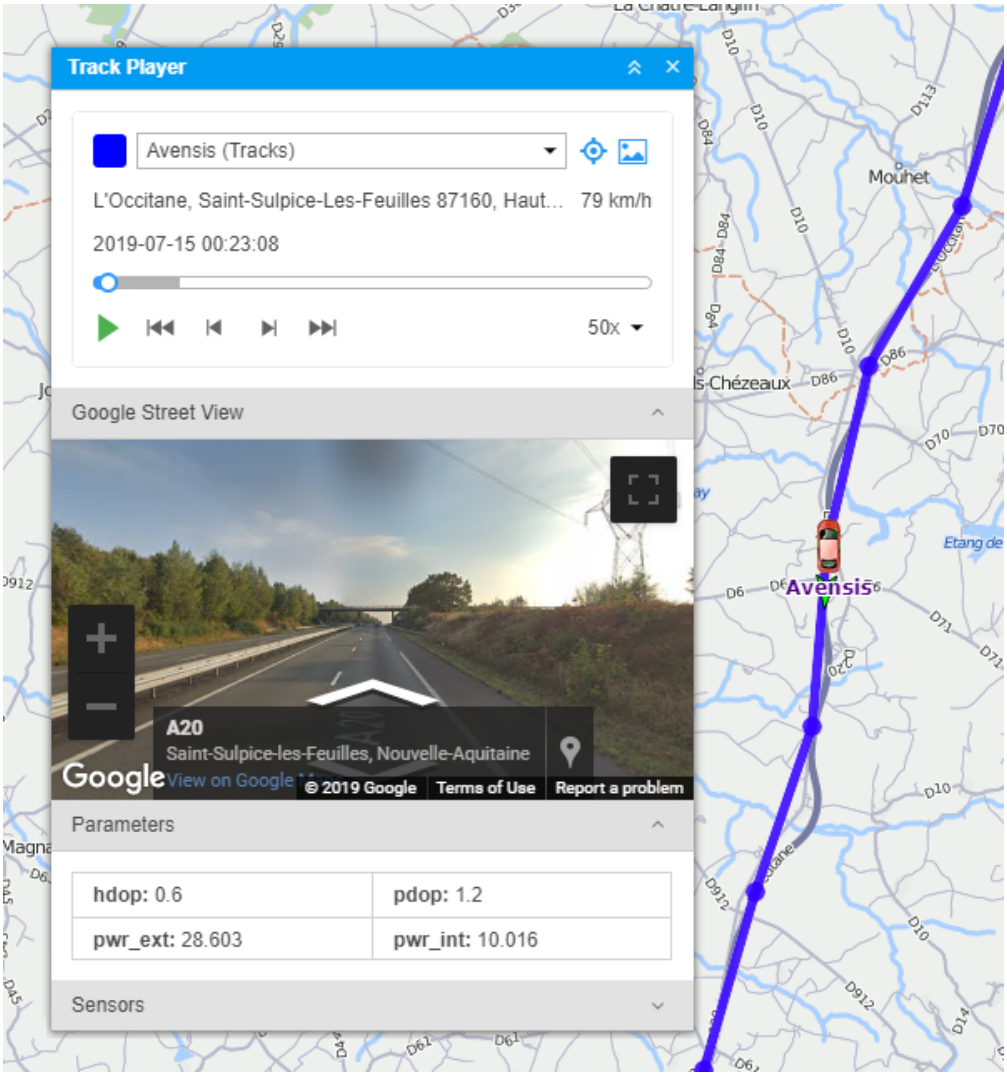
Track Player

This tool allows playing tracks of moving units.

There are four ways to build a track:

- build tracks on the Tracks tab;
- request messages on the Messages tab. The track is mapped automatically;
- generate a report with the activated **Trip routes** or **All messages on map** option in the report template;
- use the **Quick track** icon ( ) on the Monitoring tab.

The most recently built track (on any tab) is selected in the Track Player automatically. However, you can switch tracks manually by choosing them in the drop-down list. The track is named after the unit it was built for, and the tab on which it was built is indicated in parentheses.



Player settings

The **map** can be moved manually or automatically. This setting is adjusted with the icon . If this option is disabled, you can only move the map manually. If it is active, the map moves automatically in the following cases:

- along with the unit during playback;
- when using the buttons of initial and final positions;
- when using the buttons for point-by-point movement on the track;
- when navigating the track by clicking on different places of the timeline;
- when choosing a new track in the drop-down list (the map moves to the first point of the track).

If messages from the unit contain pictures, you can show or hide them during playback using the icon .

Select appropriate **playback speed** from the drop-down list. It can vary from real-time speed (1x) to accelerated 1000 times (1000x, that is about 16 minutes of messages played in one second). Regardless of the selected value, messages with zero speed and no movement are played as fast as possible. If you change the playback speed while playing the track, a new value will be applied after you press **Pause** and then **Play** again.

> Playback speed is rather conditional. Playback performance depends on the type of browser in use, computer processing power, number of messages in the track, and time intervals between the messages. In any case, **all** messages are played even if it takes more time.

Playback

You can play tracks both in the **Tracks** panel and Track Player.

To start playing, click on the button . Press the button to stop. When the playback is completed, the unit stays in the point of its last location.

When playing a track on the map, a unit icon and/or an arrow of the movement direction (depending on the selected unit presentation method) are shown. It is convenient to use rotating icons. The name of the unit whose track is being played is colored in purple. While playback is performed, the real unit temporarily disappears from the map.

During playback, the address and speed for each message are displayed under the unit name, and the date and time are displayed above the timeline. Besides, if you have Google or Yandex keys,

you can track the movement of units along **real streets**. To do this, expand the Google Street View or **Yandex Panorama** sections located below.

In two lower sections, you can see the changing values of parameters and sensors (visible sensors only). Expand these sections to see the full list. To track only certain parameters and sensors, move them to the main section of the player. To do this, double-click on necessary items.

As the track is played, all data in these sections is updated according to the message being played at the moment. If there are images in messages, they appear in the pop-up window.

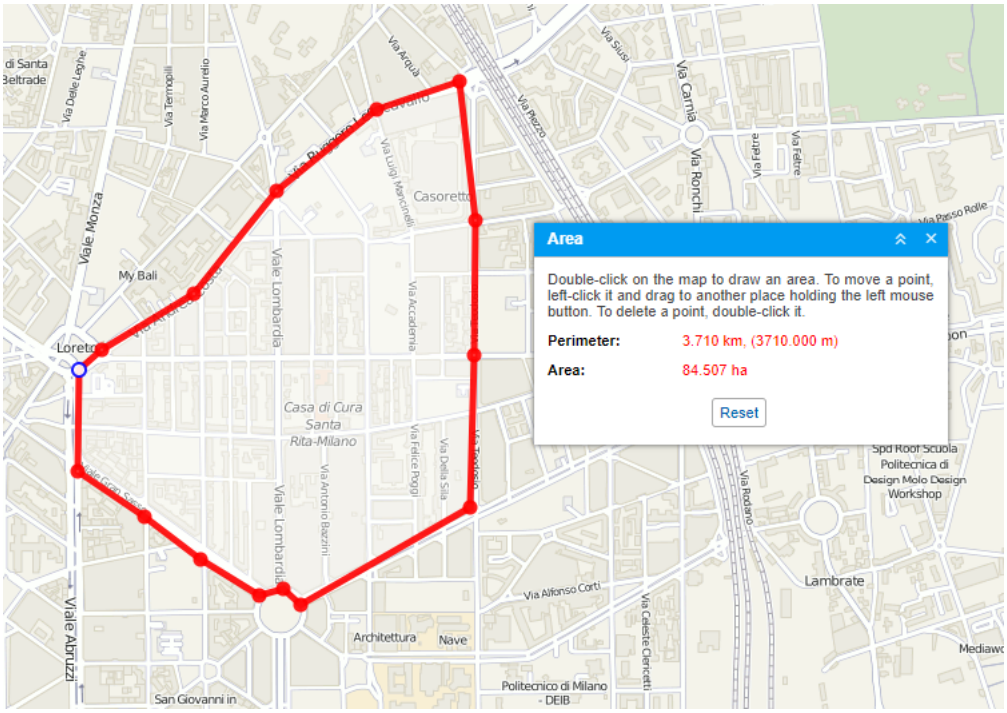
To navigate through the track, click on any place of the timeline or track itself. In addition, you can use the following buttons:

- : go to the first point (accompanied by the marker on the map),
- : go to the last point (accompanied by the marker on the map),
- : move to the next point of the track,
- : move to the previous point of the track.

You can also use a special app Track Player. This application allows playing tracks of several units at once.

Area

This tool measures the perimeter and area of the selected section. To add the section, draw a polygon (double-clicking adds a new point). The perimeter and total area are indicated in the instrument's window.



Note that for users with the metric system of measurement, the area value is given in hectares; for users with the U.S./imperial system of measurement, it is shown in square miles and square feet.

Use the **Reset** button to clear the map and draw a new section.

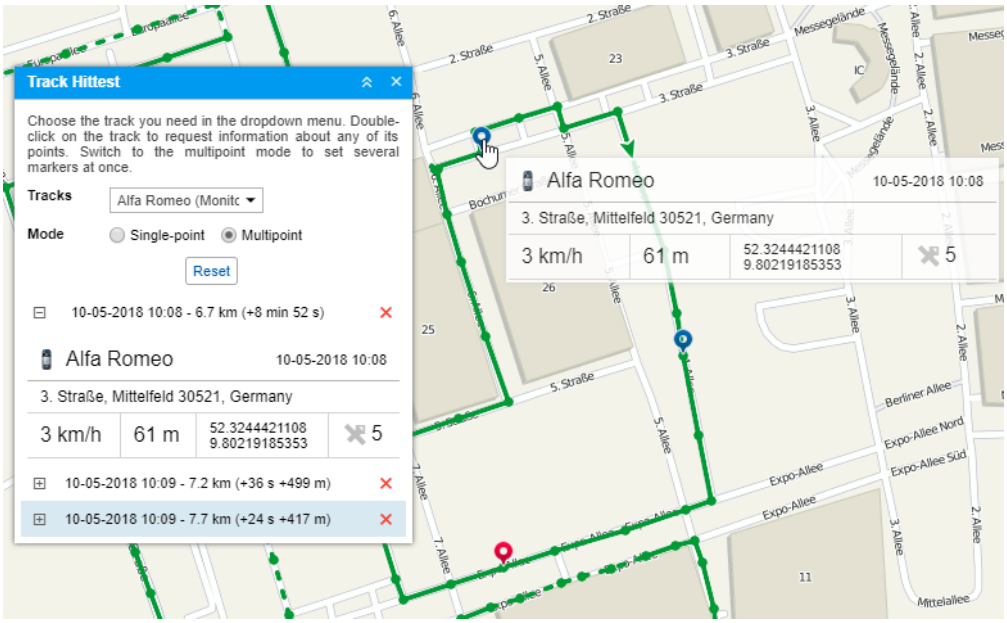
Hittest

This tool is applied to tracks only. There are four ways to get a track on the map.

- Open the Tracks tab and request tracks of unit movement for the indicated period.
- On the Messages tab, while viewing messages for the indicated period, the track is mapped automatically.
- On the Reports tab, while generating a report the track is mapped if the corresponding option (**Trip routes** or **All messages on map**) is selected in the report template.
- Tracks can be built directly from the **Monitoring** tab with the **Quick track building** button.

Choose a track in the dropdown list. Hover the cursor over track to get accurate information about any point in a tooltip. This point will be highlighted with the pulsating circle. Double-click at any place of the track (or even on the map), and the nearest to your click message will be found and indicated by the marker. The map will be centered on this point. The information from a track's tooltip can be copied to the buffer.

Two modes are available here: single-point and multi-point. Depending on your choice, you can get information about one or more points at once. The information is displayed in the popup window when placing the cursor over a marker. The information is: date and time, location, speed, altitude, coordinates, satellites, sensors values (visible sensors only). It is duplicated in the table at the top of the screen.



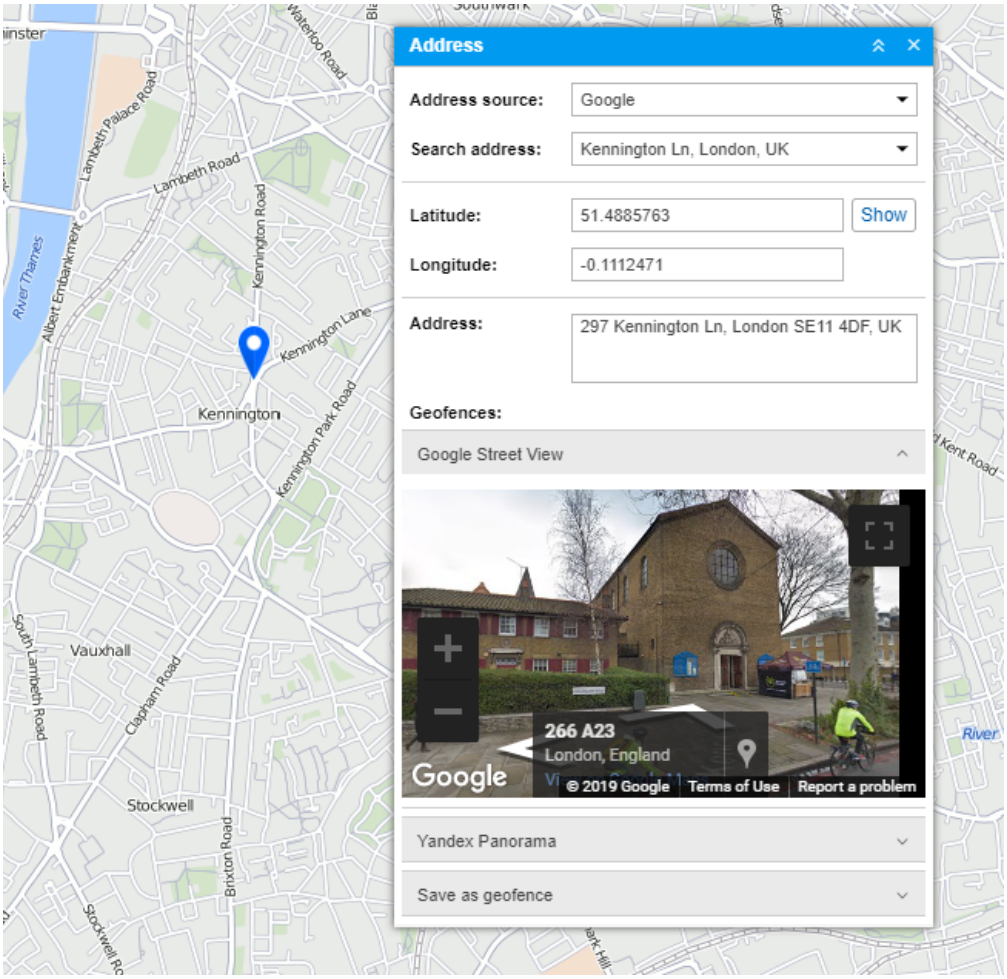
If the multi-point mode is selected, you can mark several point of the track. The active (selected) point is then blue and others are red. In the table, the active point is also highlighted by blue color. To navigate from one point to another, click on a corresponding marker on the map or corresponding row in the table. Besides, if the multi-point mode is selected, the displacement from the starting point (in time and distance) is calculated, and in brackets you can find the displacement from the previously put point.

Address

The **Address** tool is used to:

- find a place (city, house, and so on) on the map;
- detect the address of a place.

By default, Gurtam Maps is used as the source of address information. However, you can choose another source provided the maps are activated and supported: Google, Yandex, Visicom, Luxena, what3words, and so on. For more information see the Map source section).



If the city is indicated in the user settings, it will be selected automatically when you open the **Address** tool. All you will need to do is type in the street and the house number.

Search by address

Start entering address details into the **Search address** field and choose the most suitable match from the appeared list. If nothing is found, try entering the data differently. A found place is indicated on the map with the red marker.

The window of the **Address** tool displays such information as coordinates and address (if available). If the selected location is inside of geofences, their list is displayed in the **Geofences** field. The square with the geofence's color is displayed to the left of its name. If the Distance from unit to geofence option is activated, the distance between the point and the closest geofence is displayed.

If you move the map or scale it, click on the **Show** button to return to the initial location.

If you have Google or Yandex keys, you can also see panoramic pictures of the location. To do this, expand the Google Street View or **Yandex Panorama** sections of the window.

Address detection

Double-click on the map at the point whose address you want to get. After that, the latitude, longitude, and address of the point appear. The point itself is indicated on the map by a red marker. If it is inside of any geofences, they will be listed.

It is also possible to detect address by coordinates. Type in the latitude and longitude in degree form (must be separated by a dot) and click **Show**. As a result, the map is centered on this point, and the point itself is indicated by a marker. Available address information and geofences are shown.

Save as geofence

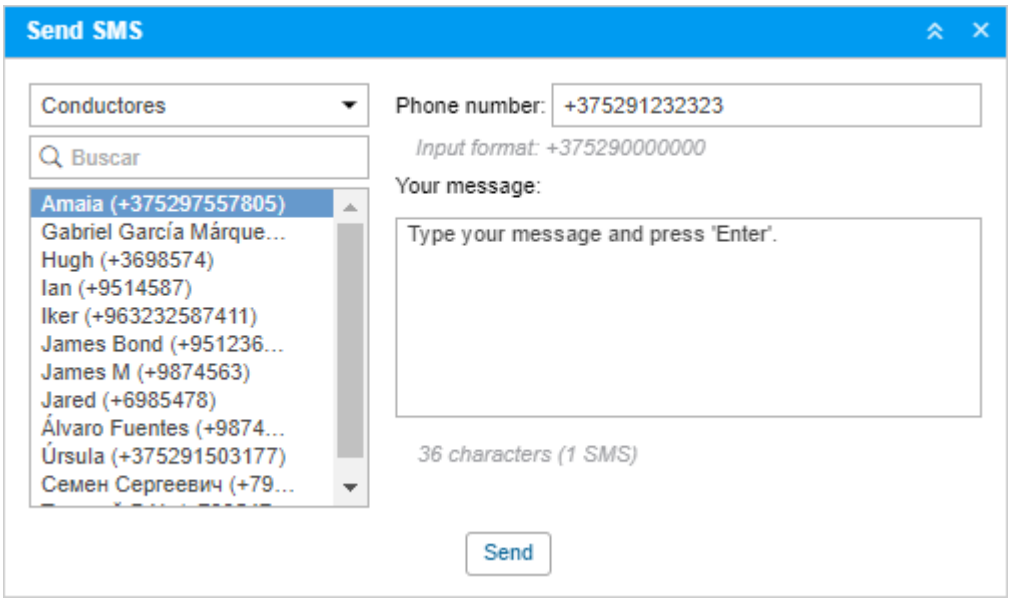
The found location can be saved as a circle-shaped geofence. To do this, there is the **Save as geofence** section at the bottom of the **Address** window. Expand the section by clicking on it. Here you can indicate the following parameters: resource (can be chosen from the drop-down list), the name of the geofence, the group (to include the geofence in an existing group) and the radius.

To save the geofence, click on the corresponding button. The saved geofence becomes available for viewing and editing on the **Geofences** tab.

SMS

SMS messages can be sent to drivers, units, and to any phone number. SMS dialog is accessible on the Monitoring, Units, and Drivers tabs as well as in the Tools dropdown menu. The buttons are not shown if the current user does not have enough rights to send SMS messages.

ⓘ To send SMS to a unit, the user is required to have the right **Edit connectivity settings** to this unit.



In the dropdown list **Drivers/Units** select addressee. Below you will see the list of objects of the selected type, but only objects that have a phone number in their properties. This phone number is displayed in brackets after object's name. If a unit has two phone numbers, such unit is displayed on the list twice — with each number. To quickly find a needed object on the list, use the dynamic filter.

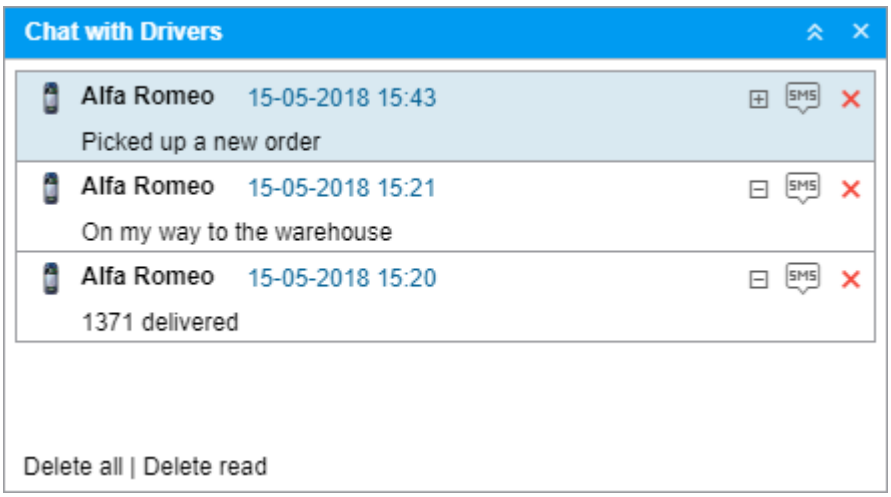
On the right of the dialog, the phone number of the selected item is displayed. It is taken from the object's properties. However, you can input any other number in international format.

As you type your message, below you can see the number of symbols used and the number of SMS messages that will be needed to send your message. Remember that letters of the Latin alphabet are optimal.

After you have typed the text, press **Send**. After that, in the dialog as well as in the log there will be a record about how successful the operation has been.

A driver can send SMS to a dispatcher from his phone. This phone number must be indicated in driver's properties. Drivers' messages appear in the log and popup in a special window (the same as for drivers' messages sent from a device in the form of a command). Besides, if there are

unread messages, the number of them is shown in a red circle next to the chat icon in the bottom panel. To reply to an SMS, click on the **SMS** button against the message.



SMS chat of a dispatcher with a driver can be shown in a special table called SMS.

Correspondence with driver can be also fulfilled with the help of a specially developed app — Chatterbox.

LBS Detector

LBS Detector is a tool which helps to detect unit's location on the map using mobile network.

> ⚠ This tool enables you to determine the location of the nearest base station only. So, the knowledge of the base station location implies the unit is nearby.

To open **LBS Detector**, select the same name item on the **Tools** tab. Further actions are listed below.

Working with LBS detector

Choose a necessary unit in the dropdown list. Its contents depend on the work list of the **Monitoring** tab and access to those units (**Query reports or messages**). Besides, the list contains only the units with corresponding parameters.

After the unit is chosen, a search starts automatically. Then the map is centered on the found location identified with the blue marker. Also, unit's name can be enabled/disabled below the marker by pressing the corresponding button in the bottom panel. Moreover, LBS Detector's window shows such information as the time of defining the latest location and its address. To the right of this data, there is a **Refresh** button pressing which the location information will be updated.

Apps

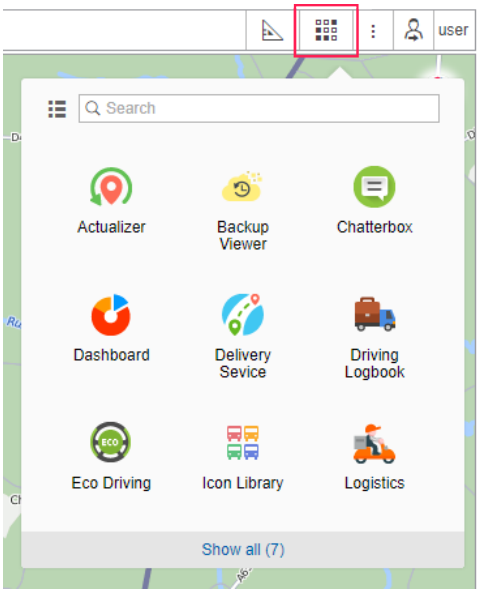
Along with the basic features of Wialon, you can get access to additional applications. Those applications can be highly customized reports, specialized tools, or just a calculator.

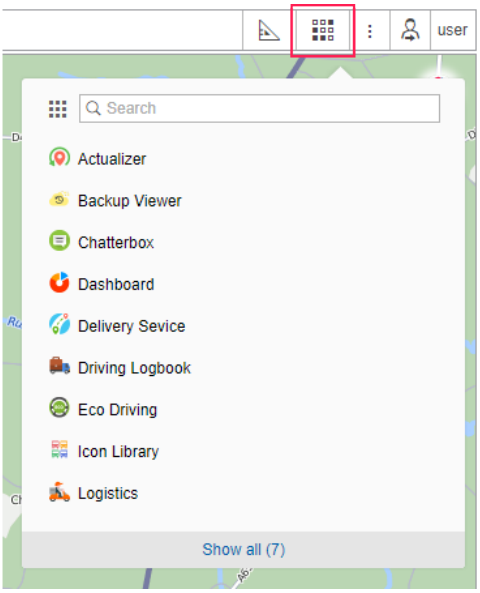
Applications are implemented and added by the administrator of your tracking service.

To open the **Apps** menu, choose the corresponding icon in the top panel or click the necessary item in the main menu customizer.

The appeared menu contains the list of available applications. In its upper part there is a dynamic filter; in the lower — the **Show all** button (the number of hidden apps is shown in parenthesis).

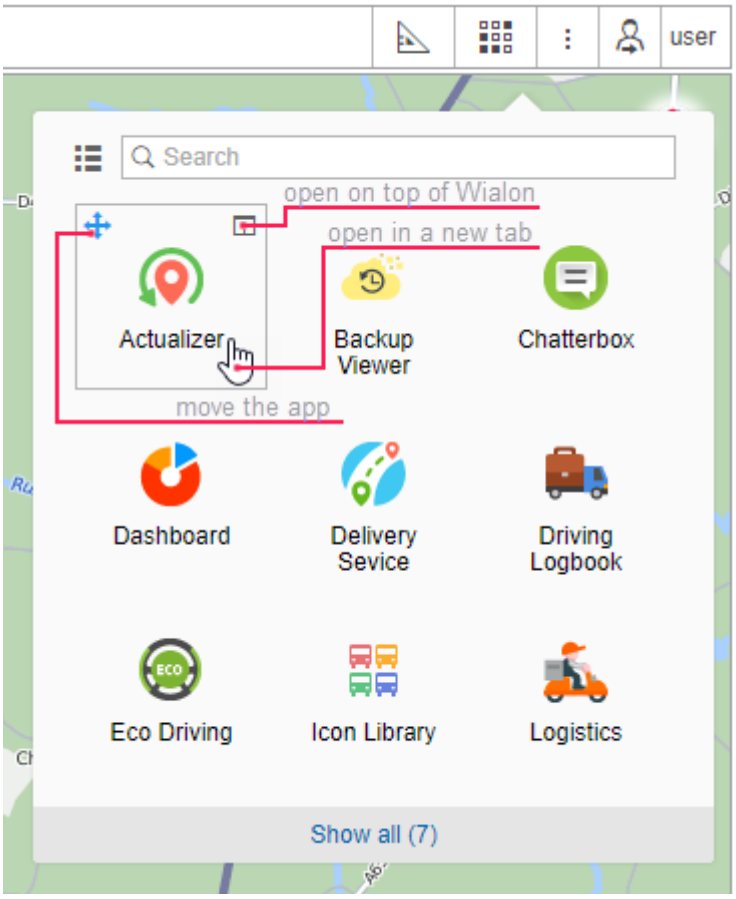
Using the buttons / in the upper left corner of the menu you can change its type. There are two options: grid and list.





The applications are arranged in alphabetical order by default. You can change their positions in the menu using the arrow-shaped buttons that appear when hovering over the name of an application in the list. The option is available in both modes (grid and list). Click the left mouse button on such arrow and, while holding it, drag the application to the place you need. If you open the menu later, the order of applications you have set up will be saved. New applications will be added to the end of the list.

An application can be opened either in a new tab of the browser or in a separate window over Wialon. To open an application in a new tab, click its logo (name). In order to open it over Wialon, use the button which appears when hovering the cursor over the app logo.

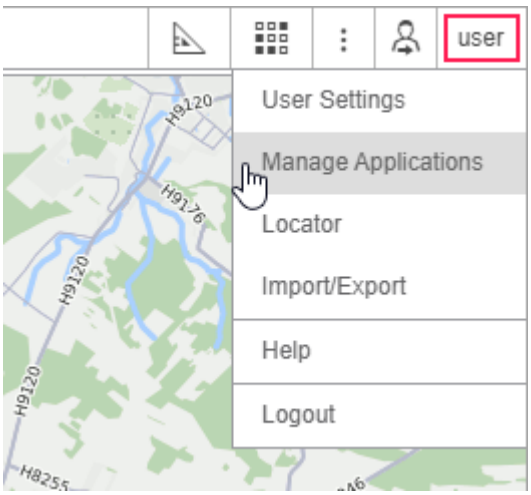


You can open any number of apps simultaneously. The windows with applications can be dragged over the screen, resized, and closed down.

Manage Applications

The **Manage applications** window shows the list of applications that have access to your account and the list of devices that can receive mobile notifications from Wialon. The lists are formed automatically after logging in to the application.

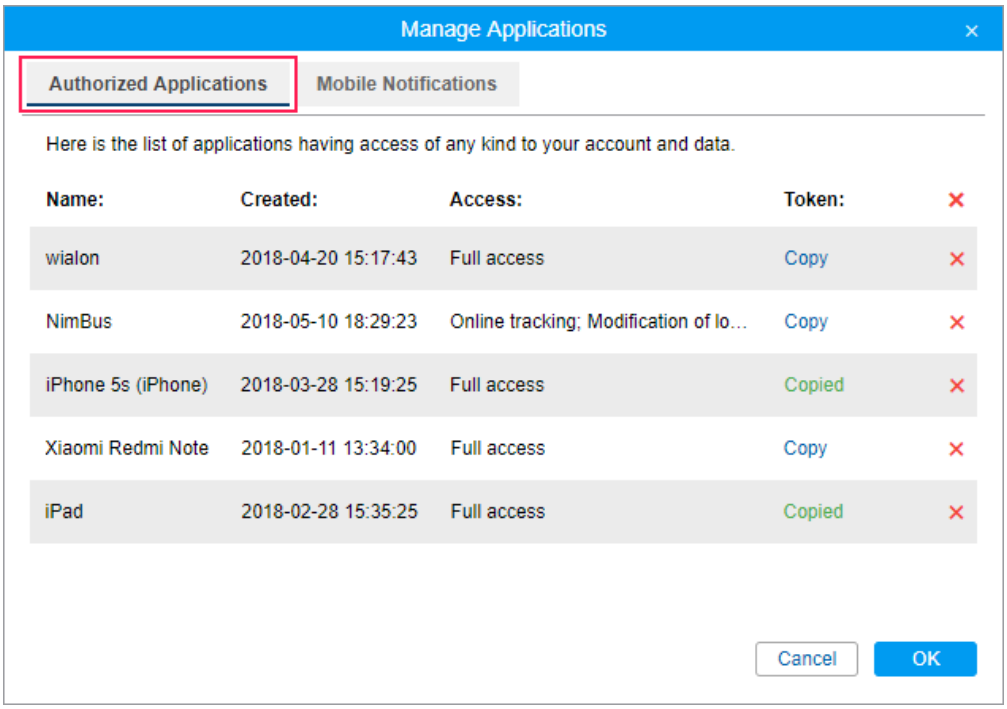
To open the window, click on the username in the upper-right corner and select the **Manage applications** item.



The window consists of two tabs: **Authorized applications** and **Mobile notifications**.

Authorized applications

This tab shows the list of applications that have access to your account data. If you log in to the application from a mobile device, the device name is displayed instead of the application name.



The line of each application shows the following information:

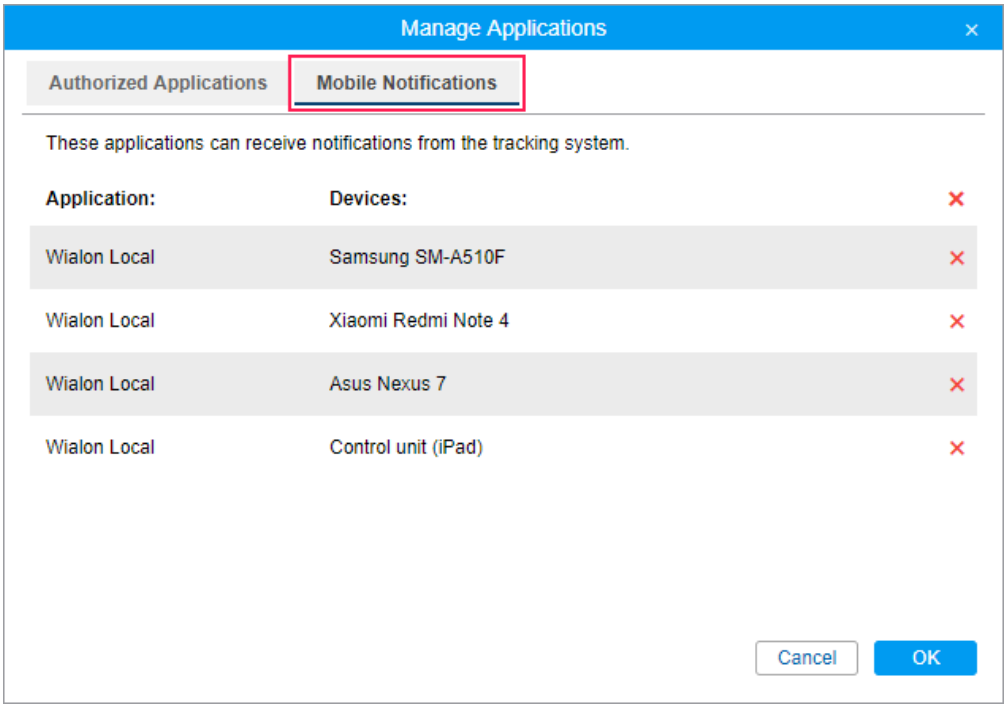
- application name (mobile device name);
- token creation date and time;
- access rights of the application to the account;
- link to copy the token.

To copy a token, click **Copy** in the required line. The token is copied to the clipboard.

To prevent the application from accessing the account data, remove it from the list by clicking on the icon ✕ at the end of the line. To save the changes, click **OK**.

Mobile notifications

This tab shows the list of applications that can send notifications to your mobile devices.



To prevent the application from sending mobile notifications, remove it from the list by clicking on the icon ✕ at the end of the line. To save the changes, click **OK**.

Wialon on Mobile

You can track your units not only from a desktop computer but also from a smartphone, tablet, and other mobile devices. The interface adapts to any device. Moreover, there is a web application Wialon Mobile v2 and the Wialon application for Android and iOS:

The user guide for the Wialon mobile application is available at the link: Wialon for Android and iOS.

SDK

SDK is a software development kit that allows you to integrate Wialon with other systems, as well as create additional applications and sites for Wialon platform. It provides an API (application programming interface) as a source code based specification intended to be used as an interface by software components to communicate with each other. All documentation is available at http://sdk.wialon.com

Two areas of SDK development are available at the moment:

- Remote API gives access to data through low-level HTTP (hypertext transfer protocol) requests. Using it, you can develop your own web services, mobile device applications, etc. on Wialon basis.
- JavaScript API gives you access to Wialon functions from your web application using JavaScript. It considerably decreases the time of creating a web application because basic procedures have been already implemented.

Supported Devices

Below is the list of devices integrated into the Wialon Local version 2004. Only the functionality that was added before April 21, 2021 is available for them.

The devices supported by previous Wialon Local versions are listed in PDF files in the archive.

Manufacturer	Device	Device type in Wialon
1M2M	ED1608	ED1608
2-Track	STARTRACKER GOLD	STARTRACKER GOLD
3D Telemetry	Emcraft MTDS-300	Emcraft MTDS-300
Absolut Mobile	Absolute Mobile AM3800	Absolute Mobile AM3800
Absolut Mobile	Absolut Mobile OG300	Absolut Mobile OG300
ADD Technologies	REVT107-140	REVT107-140
Aerial Communications	BTT One	BTT One
Agent GPS	AGENT Brown B	AGENT Brown B
Agent GPS	Agent GOLD	Agent GOLD
Agent GPS	Agent Iridium	Agent Iridium
Agent GPS	AGENT Like	AGENT Like
Agent GPS	Agent Personal	Agent Personal

Manufacturer	Device	Device type in Wialon
Agent GPS	AGENT Silver	AGENT Silver
Agent GPS	Agent Silver I	Agent Silver I
Agent GPS	AGENT Silver S	AGENT Silver S
AGIS	A-GIS	A-GIS
AiRunner	BiTreker	BiTreker
Aktivconnect	Aktivconnect 200	Aktivconnect 200
Aktivconnect	Aktivconnect 400	Aktivconnect 400
Aktivconnect	Aktivconnect 500	Worldtrack
Albatross System	Terminal GPRS S8.3	Terminal GPRS S8.3
Alematics	AE1 Series	AE1 Series
Alematics	AM1 Series	AM1 Series
Alematics	AM3 Series	AM3 Series
Alerts911	Alerts 911	Alerts 911
Alt-Proect	ALT-P12	ALT-P12
AMIT	4G IIoT RTU	4G IIoT RTU

Manufacturer	Device	Device type in Wialon
AMIT	VHG760 Vehicle Telematics Router	VHG760 Vehicle Telematics Router
Amity	Amity VTA 5700	Amity VTA 5700
AMT Information Technology Co., Limited	MT10	MT10
AMT Information Technology Co., Limited	MT20	MT20
AMT Information Technology Co., Limited	MT50H	MT50H
AMT Information Technology Co., Limited	MT65	MT65
AMT Information Technology Co., Limited	MT-OBD	MT-OBD
Amwell	Amwell	Amwell
Amwell	Amwell series	Amwell series
Anelto	OnTheGo LiTE	OnTheGo LiTE
Antx, Inc.	ANTX Messenger	ANTX Messenger
Anycaregps	Anytrack V400ww	Anytrack V400ww

Manufacturer	Device	Device type in Wialon
Anycaregps	VI420	VI420
APEL	Apel T-104	Apel T-104
APK COM	ASC	ASC
APK COM	ASC test	ASC test
APK COM	GEOPOS-01	GEOPOS-01
Aplicom	A11	A11
Aplicom	A9 IPEX	A9 IPEX
Aplicom	A9 TRIX	A9 TRIX
Aplicom	Aplicom A1 BASIX	Aplicom A1 BASIX
Aplicom	Aplicom A1 MAX	Aplicom A1 MAX
Aplicom	Aplicom A1 MAX-RDL	Aplicom A1 MAX-RDL
Aplicom	Aplicom A1 TRAX	Aplicom A1 TRAX
Aplicom	Aplicom A5 GLX	Aplicom A5 GLX
Aplicom	Aplicom R1	Aplicom R1
Aplicom	Aplicom R8	Aplicom R8

Manufacturer	Device	Device type in Wialon
ARKNAV	Arknav CT-X8	Arknav CT-X8
Armoli	Armoli L300-Wi	Armoli L300-Wi
Artal	ARTAL	ARTAL
Arusnavi	Arnavi	Arnavi
Arusnavi	Arnavi PRO	Arnavi PRO
Arusnavi	ARUSNAVI	ARUSNAVI
Asiatelco Technologies	AS31	AS31
Aspicore	Aspicore GSM Tracker	Aspicore GSM Tracker
Astra Telematics	AT110	AT110
Astron	Astron GT-3	Astron GT-3
ASV-Technics	ASV-RF04	ASV-RF04
A-telematics	AT08	AT08
A-telematics	AT09	AT09
A-telematics	AT10	AT10
A-telematics	AT200	AT200

Manufacturer	Device	Device type in Wialon
A-telematics	AT201	AT201
A-telematics	AT400	AT400
Atlanta Systems Pvt Ltd.	L-100	L-100
Atlanta Systems Pvt Ltd.	O-300	Atlantasys O-300
Atlanta Systems Pvt Ltd.	PT-100	P-100
Atlanta Systems Pvt Ltd.	WP-20C	WP-20C
Atlanta Systems Pvt Ltd.	WP-30C	WP-30C
ATOL	ATOL Drive 5	ATOL Drive 5
Atomika	Atomika-300	Atomika-300
ATPP	Dialog M2	Dialog M2
ATPP	Dialog M3	Dialog M3
ATrack	ATrack AK11	ATrack AK11
ATrack	ATrack AK1-lite	ATrack AK1-lite
ATrack	ATrack AK7	ATrack AK7
ATrack	ATrack AK7S	ATrack AK7S

Manufacturer	Device	Device type in Wialon
ATrack	ATrack AK7V	ATrack AK7V
ATrack	ATrack AL11	ATrack AL11
ATrack	ATrack AL1	ATrack AL1
ATrack	ATrack AL7	ATrack AL7
ATrack	ATrack AP1	ATrack AP1
ATrack	ATrack AS11	ATrack AS11
ATrack	ATrack AS1	ATrack AS1
ATrack	ATrack AS3	ATrack AS3
ATrack	ATrack AT1E Pro	ATrack AT1E Pro
ATrack	ATrack AT5i	ATrack AT5i
ATrack	ATrack AT5W	ATrack AT5W
ATrack	ATrack	ATrack
ATrack	ATrack AU5i	ATrack AU5i
ATrack	ATrack AU7	ATrack AU7
ATrack	ATrack AX11	ATrack AX11

Manufacturer	Device	Device type in Wialon
ATrack	ATrack AX5	ATrack AX5
ATrack	ATrack AX7	ATrack AX7
ATrack	ATrack AX7P	ATrack AX7P
ATrack	ATrack AX9	ATrack AX9
ATrack	ATrack AY5i	ATrack AY5i
ATrack	ATrack BHP1	ATrack BHP1
Autocop Trackpro	Autocop TL-2000	Autocop TL-2000
Autocop Trackpro	Autocop TL-250	Autocop TL-250
Autocop Trackpro	Autocop TL-500	Autocop TL-500
Autoescort	Autoescort	Autoescort
AutoFon	Autofon Alpha-2XL-Mayak	Autofon Alpha-2XL-Mayak
AutoFon	Autofon Alpha-Mayak	Autofon Alpha-Mayak
AutoFon	Autofon Alpha-XL-Mayak	Autofon Alpha-XL-Mayak
AutoFon	Autofon Mayak	Autofon Mayak
AutoFon	Autofon Mayak D	Autofon Mayak D

Manufacturer	Device	Device type in Wialon
AutoFon	Autofon Mayak D-moto	Autofon Mayak D-moto
AutoFon	Autofon Mayak SE+	Autofon Mayak SE+
AutoFon	Autofon Mayak SE	Autofon Mayak SE
AutoFon	Autofon Mayak v5	Autofon Mayak v5
AutoFon	Autofon Mayak v7	Autofon Mayak v7
AutoFon	Autofon Mayak v8	Autofon Mayak v8
AutoFon	Autofon Micro Mayak	Autofon Micro Mayak
AutoFon	Autofon Omega	Autofon Omega
AutoFon	Autofon Omega v2	Autofon Omega v2
Auto Leaders	Auto Leaders 800C	Auto Leaders 800C
Auto Leaders	Auto Leaders AL-900E	Auto Leaders AL-900E
Auto Leaders	ST-901	ST-901
Auto Leaders	ST-902	ST-902
AutoSat	AutoSat	AutoSat
Autoseeker Electronics	AT-12	AT-12

Manufacturer	Device	Device type in Wialon
Autotechnology	S-5000	S-5000
Autotechnology	S-500	S-500
Avema	AT35	AT35
Avema	MT99	MT99
AVP Technology	RZD	RZD
AVTELS	AvtEls Ant.01	AvtEls Ant.01
AvtoPeleng	AvtoPeleng	AvtoPeleng
Avtopoisk	Bars	Bars
Avtopoisk	Bars-TP1	Bars-TP1
AvtoScan	AvtoScan	AvtoScan
B37A	QazTrack Pro	QazTrack Pro
Babelstar	CMSV6 Gateway	CMSV6 Gateway
back2you.com	Back2you	Back2you
BCE (now Xirgo Global)	BCE FM Blue+	BCE FM Blue+
BCE (now Xirgo Global)	BCE FM Blue	BCE FM Blue

Manufacturer	Device	Device type in Wialon
BCE (now Xirgo Global)	BCE FM Light+	BCE FM Light+
BCE (now Xirgo Global)	BCE FM Light	BCE FM Light
BCE (now Xirgo Global)	BCE FMS500 Light+	BCE FMS500 Light+
BCE (now Xirgo Global)	BCE FMS500 Light	BCE FMS500 Light
BCE (now Xirgo Global)	BCE FMS500 ONE	BCE FMS500 ONE
BCE (now Xirgo Global)	BCE FMS500 StCAN	BCE FMS500 StCAN
BCE (now Xirgo Global)	BCE FMS500 TACHO	BCE FMS500 TACHO
BCE (now Xirgo Global)	BCE FM Tacho	BCE FM Tacho
BCE (now Xirgo Global)	BCE FM Tacho Protocol	BCE FM Tacho Protocol
BCE (now Xirgo Global)	BCE IOTM	BCE IOTM
Beagle	Beagle	Beagle
Belcommunmash	CANby	CANby
Benway	Benway ET300	Benway ET300
Besprovodka	BSP-GLONASS-001	BSP-GLONASS-001
BeWhere	Bewhere Gateway	Bewhere Gateway

Manufacturer	Device	Device type in Wialon
BikeTV	BikeTV	BikeTV
BiosTurk	MT865/ST868	MT865/ST868
BitCord	Geopath	Geopath
BitCord	Geopath PRO-2	Geopath PRO-2
BitCord	Geopath PRO	Geopath PRO
BITLOCK	axoLOCK	axoLOCK
Bitrek	BI 520 TREK	BI 520 TREK
Bitrek	BI 520 TREK R	BI 520 TREK R
Bitrek	BI 530R TREK	BI 530R TREK
Bitrek	BI 810 CONNECT	BI 810 CONNECT
Bitrek	BI 810 TREK	BI 810 TREK
Bitrek	BI 820 CONNECT	BI 820 CONNECT
Bitrek	BI 820 TREK	BI 820 TREK
Bitrek	BI 820 TREK OBD	BI 820 TREK OBD
Bitrek	BI 868 TREK	BI 868 TREK

Manufacturer	Device	Device type in Wialon
Bitrek	BI 910 TREK	BI 910 TREK
Bitrek	BI 920 TREK	BI 920 TREK
Bitrek	Bitrek BI 310	Bitrek BI 310
Bitrek	Bitrek	Bitrek
Bitrek	MDVR Module (3G) BITREK	MDVR Module (3G) BITREK
Bitrek	MeteoTrek	MeteoTrek
Blueberry Technology	Blueberry GT06N	Blueberry GT06N
Blueberry Technology	GT02A	GT02A
Blueberry Technology	GT02B	GT02B
Blueberry Technology	GT06	GT06
Blueberry Technology	GT07	GT07
Blueberry Technology	GT09B	GT09B
Blueberry Technology	TR02	TR02
Blueberry Technology	TR06A	TR06A
Blueberry Technology	TR06	TR06

Manufacturer	Device	Device type in Wialon
Blue Idea	TAKIT Smart Watch V01	TAKIT Smart Watch V01
BlueTraker	BlueTraker	BlueTraker
Bofan	Bofan PT100	Bofan PT100
Bofan	Bofan PT502	Bofan PT502
Bofan	Bofan PT510	Bofan PT510
Bofan	Bofan PT520	Bofan PT520
Bofan	Bofan PT600	Bofan PT600
Bofan	PT-20	PT-20
Bolid	Bolid UO 4C	Bolid UO 4C
Bolid	UR-03	UR-03
Borderless Hub	Borderless(flespi)	Borderless(flespi)
Borderless Hub	Borderless VT100(flespi)	Borderless VT100(flespi)
Borderless Hub	Borderless VT801	Borderless VT801
Borderless Hub	Borderless VT801(flespi)	Borderless VT801(flespi)
BOX telematics	BOX Tracker	BOX Tracker

Manufacturer	Device	Device type in Wialon
BS Technotronics	BSTPL-14	BSTPL-14
BS Technotronics	BSTPL 17IS	BSTPL 17IS
Btraced	Btraced	Btraced
BZET	Stab Liner	Stab Liner
C2STEK	Cat 1E	Cat 1E
C2STEK	FL-2000G	FL-2000G
C2STEK	GPS-1200	GPS-1200
C2STEK	X1	X1
CalAmp	ATU-620	ATU-620
CalAmp	CalAmp Gateway	CalAmp Gateway
CalAmp	LMU-1100 Series	LMU-1100 Series
CalAmp	LMU-1200 Series	LMU-1200 Series
CalAmp	LMU-2000 Series	LMU-2000 Series
CalAmp	LMU-200	LMU-200
CalAmp	LMU-2100 Series	LMU-2100 Series

Manufacturer	Device	Device type in Wialon
CalAmp	LMU-2600 Series	LMU-2600 Series
CalAmp	LMU 26G400-G 1000	LMU 26G400-G 1000
CalAmp	LMU-2700 Series	LMU-2700 Series
CalAmp	LMU-2720	LMU-2720
CalAmp	LMU-2820	LMU-2820
CalAmp	LMU-3000	LMU-3000
CalAmp	LMU-300 Series	LMU-300 Series
CalAmp	LMU-3030	LMU-3030
CalAmp	LMU-400 Series	LMU-400 Series
CalAmp	LMU-4200 Series	LMU-4200 Series
CalAmp	LMU-4225	LMU-4225
CalAmp	LMU-4520 Series	LMU-4520 Series
CalAmp	LMU-5000 Series	LMU-5000 Series
CalAmp	LMU-700 Series	LMU-700 Series
CalAmp	LMU-800 Series	LMU-800 Series

Manufacturer	Device	Device type in Wialon
CalAmp	LMU-900 Series	LMU-900 Series
CalAmp	RMU-900	RMU-900
CalAmp	TTU-1200 Series	TTU-1200 Series
CalAmp	TTU-2820 Series	TTU-2820 Series
CalAmp	TTU-700 Series	TTU-700 Series
CalAmp	VDK-3641	VDK-3641
Camos	CAMOS BGA-100G	CAMOS BGA-100G
CapNavi	CAP Angler-1000	CAP Angler-1000
CapNavi	CAP WP AVL	CAP WP AVL
Cargo UFC	Cargo Collar	Cargo Collar
Cargo UFC	CarGo Light 2	Cargo Light 2
Cargo UFC	CarGo Light	Cargo Light
Cargo UFC	CarGo Mini 2	Cargo Mini 2
Cargo UFC	CarGo Mini	Cargo mini
Cargo UFC	CarGo Pro 2	Cargo Pro 2

Manufacturer	Device	Device type in Wialon
Cargo UFC	CarGo Pro	Cargo Pro
Cargo UFC	CarGo Spy	CarGo Spy
Cargo UFC	CarGo Unit	CarGo Unit
Carmani	Carmani	Carmani
CarNeTek	TK100S	TK100S
Cars Control	Gryphon M-01	Gryphon M-01
Cars Control	Gryphon MINI	Gryphon MINI
Cars Control	Gryphon PRO	Gryphon PRO
Cars Control	Gryphon v1.5	Gryphon v1.5
Carscop	CCTR-623	CCTR-623
Carscop	CCTR-800	CCTR-800
Carscop	CCTR-828	CCTR-828
Castel Group	Castel ID-212G	Castel ID-212G
Castel Group	Castel MPIP-618W	Castel MPIP-618W
Castel Group	Castel MSD-901	Castel MSD-901

Manufacturer	Device	Device type in Wialon
Castel Group	Castel SAT802	Castel SAT802
Castel Group	IDD-211T	IDD-211T
Castel Group	IDD-212T	IDD-212T
Castel Group	MPIP-620	MPIP-620
Castel Group	Sinocastel IDD-213N	Sinocastel IDD-213N
Castel Group	Sinocastel LT-160	Sinocastel LT-160
Castel Group	Sinocastel LT-162	Sinocastel LT-162
Castel Group	Sinocastel PT-718	Sinocastel PT-718
CB Engineering	CARSAT - KB1024	CARSAT - KB1024
Centronix	Satellite-T	Satellite-T
cGuard	cGuard Beacon	cGuard Beacon
cGuard	cGuard	cGuard
cGuard	cGuard Personal	cGuard Personal
Cheng Holin Technology	iTrackGold	iTrackGold
ChenTian TSP	ChenTian TSP OBDII Series	ChenTian TSP OBDII Series

Manufacturer	Device	Device type in Wialon
ChinaGPS	TGL30	TGL30
Chuang Shi JI Technology	Genesis S05	Genesis S05
CLAAS	CLAAS Gateway	CLAAS Gateway
CLS Group	THORIUM-X	THORIUM-X
C.Nord	MB-04-L	MB-04-L
C.Nord	MB-06-M	MB-06-M
C.Nord	T-06H	T-06H
Comtac	Lorawan E1374 Tracker ONE SW	Lorawan E1374 Tracker ONE SW
ComWinTop	CWT5016	CWT5016
ComWinTop	CWT T20	CWT T20
Continental Corporation	Rastrear Evolution	Rastrear Evolution
Cradlepoint	Cradlepoint IBR900	Cradlepoint IBR900
Cybergraphy Technology	GlobalTrack G200X	GlobalTrack G200X
Cypress Solutions	Cypress CTM-200	Cypress CTM-200
DAGAMA	DaGama TKM	DaGama TKM

Manufacturer	Device	Device type in Wialon
DAGAMA	DaGama TKM Pro	DaGama TKM Pro
DATECS	DATECS DFM-5000	DATECS
Daviscomms	Br828PGT	Br828PGT
DCT	Antares 5	Antares 5
DCT	Syrus Pegasus Gateway	Syrus Pegasus Gateway
DCT	Syrus	Syrus
DeLorme	inReach SE	inReach SE
Digital Matter Telematics	Bolt OBD	Bolt OBD
Digital Matter Telematics	Dart	Dart
Digital Matter Telematics	Eagle	Eagle
Digital Matter Telematics	Falcon	Falcon
Digital Matter Telematics	G100	G100
Digital Matter Telematics	G52S SOLAR	G52S SOLAR
Digital Matter Telematics	G60	G60
Digital Matter Telematics	G62	G62

Manufacturer	Device	Device type in Wialon
Digital Matter Telematics	Oyster Cellular	Oyster Cellular
Digital Matter Telematics	Oyster (Sigfox)	Oyster (Sigfox)
Digital Matter Telematics	Remora2	Remora2
Digital Matter Telematics	Remora	Remora
Digital Matter Telematics	Yabby	Yabby
Digital Monitoring Solutions	Blue Zeplin	Blue Zeplin
Digital Security Technologies	DTK-53	DTK-53
Digital Systems	DSF21	DSF21
Digital Systems Poland	Tytan SAT DS520	Tytan SAT DS520
Digital Systems Poland	Tytan SAT DS540	Tytan SAT DS540
Dingtek	DF702_NB-IoT	DF702_NB-IoT
Dingtek	DF702_NB TCP	DF702_NB TCP
Dingtek	Dingtek DF550	Dingtek DF550
Dolphin	DO-107 GPS	DO-107 GPS
D-TEG	D-TEG TX1000D	D-TEG TX1000D

Manufacturer	Device	Device type in Wialon
D-TEG	D-TEG TX4000	D-TEG TX4000
D-TEG	Smarty BX2000	Smarty BX2000
Duotec	DTM Series	DTM Series
DX Control	SAT 7	SAT 7
Eagle Eye Telematics	Eagle Eye	Eagle Eye
Easyroad Technology	Easyroad Technology GT98	Easyroad Technology GT98
Easy Storage Technologies	HDVR8045W	HDVR8045W
EBS	Active Track GPS	Active Track GPS
EcoTelematics	NaviFleet ET100	NaviFleet ET100
Electronics Design	ED Pointer	ED Pointer
Electronics Design	ED Watch	ED Watch
Electronics Design	Tracer X2	Tracer X2
Eleko	TMTC-2	TMTC-2
ENDS Russia	UTP Navigator	UTP Navigator
Enfora	Enfora	Enfora

Manufacturer	Device	Device type in Wialon
Enfora	Enfora GSM-2248	Enfora GSM-2448
Envotech	RadioSecure SLM	RadioSecure SLM
EPCOM	EPCOM XMR404HD	EPCOM XMR404HD
eRaytech Internation	AVTS-1500	AVTS-1500
Erco and Gener	GenLoc 41e	GenLoc 41e
ERM Advanced Telematics	StarLink Asset	StarLink Asset
ERM Advanced Telematics	StarLink AVL	STaRLink AVL
ERM Advanced Telematics	StarLink eBike	STaRLink eBike
ERM Advanced Telematics	StarLink GLONASS	Starlink GLONASS
ERM Advanced Telematics	StarLink MCR	StarLink MCR
ERM Advanced Telematics	StarLink OBD	StarLink OBD
ERM Advanced Telematics	StarLink One	StarLink One
ERM Advanced Telematics	StarLink SVR	StarLink SVR
ERM Advanced Telematics	StarLink ToGo	StarLink ToGo
ERM Advanced Telematics	StarLink Tracker	StarLink Tracker

Manufacturer	Device	Device type in Wialon
ERM Advanced Telematics	Zee AVL	Zee AVL
Escort	Escort TD online	Escort TD online
eSky Wireless	eSky ES810	eSky ES810
eTrans Solutions	eTrans ETFG 200	eTrans ETFG 200
Eview	EV-04	EV-04
Eview	EV-07B	EV-07B
Eview	EV-09	EV-09
Eview	EV-202	EV-202
Expert Telematika	Informer	Informer
Extremtrac Technology	ET700C	ET700C
ezTracker	ezTracker	ezTracker
ezTracker	ezTracker OBD G2	ezTracker OBD G2
FALCOM GmbH	Falcom BOLERO-LT2	Falcom BOLERO-LT2
FALCOM GmbH	Falcom FOX-EN	Falcom FOX-EN
FALCOM GmbH	Falcom FOX-IN	Falcom FOX-IN

Manufacturer	Device	Device type in Wialon
FALCOM GmbH	Falcom STEPP II	Falcom STEPP II
FALCOM GmbH	FOX3	FOX3
FALCOM GmbH	HYBRID TRACK TECH	HYBRID TRACK TECH
Farvater	CAN-WAY-L10 E	CAN-WAY-L10 E
Farvater	CAN-WAY-L10 N	CAN-WAY-L10 N
Farvater	CAN-WAY-L10 W	CAN-WAY-L10 W
Farvater	CAN-WAY-L20 E	CAN-WAY-L20 E
Farvater	CAN-WAY-L20 N	CAN-WAY-L20 N
Farvater	CAN-WAY-L20 W	CAN-WAY-L20 W
Farvater	CAN-WAY-L30 E	CAN-WAY-L30 E
Farvater	CAN-WAY-L30 N	CAN-WAY-L30 N
Farvater	CAN-WAY-L30 W	CAN-WAY-L30 W
Farvater	CAN-WAY-L40 E	CAN-WAY-L40 E
Farvater	CAN-WAY-L40 N	CAN-WAY-L40 N
Farvater	CAN-WAY-L40 W	CAN-WAY-L40 W

Manufacturer	Device	Device type in Wialon
Fifotrack	Fifotrack A100	Fifotrack A100
Fifotrack	Fifotrack A200	Fifotrack A200
Fifotrack	Fifotrack A300	Fifotrack A300
Fifotrack	Fifotrack A500	Fifotrack A500
Fifotrack	Fifotrack A600	Fifotrack A600
Fifotrack	Fifotrack A700	Fifotrack A700
Fifotrack	Fifotrack Q1	Fifotrack Q1
Fifotrack	Fifotrack S20	Fifotrack S20
Fifotrack	Fifotrack S30	Fifotrack S30
Fleetilla	FL940	FL940
Fleetilla	FL950	FL950
FLEETLOGIC Co	GUARDIAN 3.0	GUARDIAN 3.0
FLEETLOGIC Co	GUARDIAN	GUARDIAN
FLEETLOGIC Co	HAWK	HAWK 3.0
FLEETLOGIC Co	HAWK II	HAWK II

Manufacturer	Device	Device type in Wialon
FLEETLOGIC Co	MINDER II	MINDER II
FLEETLOGIC Co	MINDER	MINDER 3.0
FLEETLOGIC Co	SENTRY 4.0	SENTRY 4.0
FLEETLOGIC Co	TRACK n TAG	TRACK n TAG
Fleetminder	Fleetminder FM	Fleetfinder FM
Flextrack	Lommy 7A2	Lommy 7A2
Flextrack	Lommy Eye	Lommy Eye
Flextrack	Lommy Personal	Lommy Personal
Flextrack	Lommy Pro 2	Lommy Pro 2
Fora Solutions	4a Vision	4a Vision
FORTSYSTEMS	AutoControl	AutoControl
Fort-Telecom	Fort-111	Fort-111
Fort-Telecom	FORT-300	FORT-300
Fortuna Impex	Disha-9310	Disha-9310
Franson Technology	GPSGate for PocketPC v2.6	GPSGate for PocketPC v2.6

Manufacturer	Device	Device type in Wialon
Freedom	PT-9	PT-9
Frotcom	Frotcom Gateway	Frotcom Gateway
FuelAlarm	Fuelalarm	Fuelalarm
Furmech Engineering	DSR-2	DSR-2
Future vision technology Inc	ML-801F	ML-801F
Future vision technology Inc	SL-802L	SL-802L
Futureway technology	Futureway Smart Shoes	Futureway Smart Shoes
Galeb	Galeb GS100	Oris GS100
Galileosky	Galileosky 3G v 5.1	GALILEOSKY 3G v 5.1
Galileosky	Galileosky 7.0	Galileosky 7.0
Galileosky	Galileosky Base Block	GALILEOSKY BASE BLOCK
Galileosky	Galileosky Boxfinder	GALILEOSKY BOXFINDER
Galileosky	Galileosky OBD-II	Galileosky OBD-II
Galileosky	Galileosky v 2.3	GALILEOSKY v 2.3
Galileosky	Galileosky v 2.3 Lite	GALILEOSKY v 2.3 Lite

Manufacturer	Device	Device type in Wialon
Galileosky	Galileosky v 2.5	Galileosky v 2.5
Galileosky	Galileosky v 4.0	GALILEOSKY v 4.0
Galileosky	Galileosky v 5.0	GALILEOSKY v 5.0
Garage-GPS	Garage	Garage
Garmin	inReach Explorer	inReach Explorer
Garmin	inReach MINI	inReach MINI
Gator	Gator M508	Gator M508
Gator	Gator M528	Gator M528
Gecko Systems	Tokay2	Tokay2
Gecko Systems	Tokay	Tokay
Gelix Wireless Enterprises	Gelix-2	Gelix-2
Gelix Wireless Enterprises	Gelix-3	Gelix-3
Geneko	Geneko FOX Lite	Geneko FOX Lite
Geomer	Lagran GLONASS-03	Lagran GLONASS-03
Geometris	whereQube OBD	whereQube OBD

Manufacturer	Device	Device type in Wialon
Geotan Industria Electrónica S.A.	Stealth MS-500	Stealth MS-500
Germes	Germes	Germes
Giti Gostar Rahbord (GGRCO)	KVL200	KVL 200
Giti Gostar Rahbord (GGRCO)	KVL220	KVL220
Giti Gostar Rahbord (GGRCO)	KVL300	KVL300
Giti Gostar Rahbord (GGRCO)	X0	X0
Giti Gostar Rahbord (GGRCO)	X1+	X1+
GlobalSat	DA-690	DA-690
GlobalSat	GlobalSat GTR-128 GLONASS	GlobalSat GTR-128 GLONASS
GlobalSat	GlobalSat GTR-388	GlobalSat GTR-388
GlobalSat	Globalsat Lorawan LT-100	Globalsat Lorawan LT-100
GlobalSat	GlobalSat TR-206	GlobalSat TR-206
GlobalSat	GlobalSat TR-300V	GlobalSat TR-300V
GlobalSat	GlobalSat TR-313	GlobalSat TR-313

Manufacturer	Device	Device type in Wialon
GlobalSat	GlobalSat TR-900	GlobalSat TR-900
GlobalSat	TR-102	TR-102
GlobalSat	TR-151	TR-151
GlobalSat	TR-203	TR-203
GlobalSat	TR-300	TR-300
GlobalSat	TR-600	TR-600
GlobalSat	TR-606	TR-606
GlobalSat	TW-100	TW-100
Global Solution	SLIMTrack	SLIMTrack
Globalstar	Globalstar SmartOneB	Globalstar SmartOneB
Globalstar	Globalstar SmartOneC	Globalstar SmartOneC
Globalstar	Globalstar SmartOne	Globalstar SmartOne
Globalstar	Globalstar SmartOne LP	Globalstar SmartOne LP
Globalstar	Globalstar SmartOne Solar	Globalstar SmartOne Solar
Globalstar	SPOT Gen3	SPOT Gen3

Manufacturer	Device	Device type in Wialon
Globalstar	SPOT X	SPOT X
Global Star Technology	Star trek 200	Star Trek 200
GlobalTelematics	GTMS 7220	GTMS 7220
GlobalTelematics	GTMS 7320	GTMS 7320
GlobusGPS	GlobusGPS GL-650	GlobusGPS GL-650
GlobusGPS	GlobusGPS GL-TR1	GlobusGPS GL-TR1
GlobusGPS	GlobusGPS GL-TR1 mini	GlobusGPS GL-TR1 mini
GlobusGPS	GlobusGPS GL-TR2	GlobusGPS GL-TR2
GlobusGPS	GL-TR2-M	GL-TR2-M
GlobusGPS	GL-TR2-S	GL-TR2-S
GlobusGPS	GL-TR3	GL-TR3
Glonass-Navigator	Glonass-Navi	Glonass-Navi
Glonass-Navigator	Glonass-Navi Pro	Glonass-Navi Pro
GLONASSsoft	UMKa300	UMKa300
GLONASSsoft	UMKa301	UMKa301

Manufacturer	Device	Device type in Wialon
GLONASSsoft	UMKa302	UMKa302
GLONASSsoft	UMKa310	UMKa310
GLONASSsoft	UMKa311	UMKa311
GLONASSsoft	UMKa312	UMKa312
GLONASS System	AGS-Lite	AGS-Lite
GLONASS System	AGS-PRO	AGS-PRO
GNSS Sistemas Globales de Posicionamiento S.L.	AGPS 0100	AGPS 010
GNSS Sistemas Globales de Posicionamiento S.L.	AGPS 020	AGPS 020
GNSS Sistemas Globales de Posicionamiento S.L.	AGPS 025	AGPS 025
GNSSTrack	SVT-C12	SVT-C12
GoPass Technical	GoPass 9xx	GoPass 9xx
Gosafe	Gosafe 6701	Gosafe 6701
Gosafe	Gosafe 6C6	Gosafe 6C6
Gosafe	Gosafe G1C	Gosafe G1C

Manufacturer	Device	Device type in Wialon
Gosafe	Gosafe G1S	Gosafe G1S
Gosafe	Gosafe G2P	Gosafe G2P
Gosafe	Gosafe G3A	Gosafe G3A
Gosafe	Gosafe G3C	Gosafe G3C
Gosafe	Gosafe G3S	Gosafe G3S
Gosafe	Gosafe G606	Gosafe G606
Gosafe	Gosafe G616	Gosafe G616
Gosafe	Gosafe G626	Gosafe G626
Gosafe	Gosafe G6S	Gosafe G6S
Gosafe	Gosafe G717(G7S)	Gosafe G717(G7S)
Gosafe	Gosafe G717	Gosafe G717
Gosafe	Gosafe G71	Gosafe G71
Gosafe	Gosafe G737	Gosafe G737
Gosafe	Gosafe G737P	Gosafe G737P
Gosafe	Gosafe G777	Gosafe G777

Manufacturer	Device	Device type in Wialon
Gosafe	Gosafe G797	Gosafe G797
Gosafe	Gosafe G91I	Gosafe G91I
Gosafe	Gosafe G91S	Gosafe G91S
Gosafe	Gosafe GAT-1000	Gosafe GAT-1000
Gosafe	Gosafe Sniper G797	Gosafe Sniper G797
Gosafe	Proma Sat 1000	Proma Sat 1000
Gosafe	Proma Sat 911	Proma Sat 911
Gosuncn	ZTEWelink VM6200S	ZTEWelink VM6200S
GOTOP	GOTOP TL-201	GOTOP TL-201
GOTOP	GOTOP TV-680/690/990	GOTOP TV-680/690/990
GOTOP	GOTOP VT-380A	GOTOP VT-380A
GPS Engineers	STAR TRACKER	STAR TRACKER
GPS Services	DeasyTrack	DeasyTrack
Green wood wood Electronics	GEP-HB ID Card	GEP-HB ID Card
GR Telecom co.,Ltd	AVL 310	AVL 300

Manufacturer	Device	Device type in Wialon
Gruzolot	Gruzolot Android	Gruzolot Android
GSM-STOROZH	GPS Storozh-UA	GPS Storozh-UA
G-TARGET	GT One	GT One
GTE	Trax S16	Trax S16
GTE	Trax S4	Trax S4
GTE	Trax S6	Trax S6
GTX Corp	SMART SOLE	SMART SOLE
Guangzhou Topten Electronics	Topten GT08	Topten GT08
Guangzhou Topten Electronics	Topten TK208	Topten TK208
Guangzhou Topten Electronics	Topten TK228	Topten TK228
Guangzhou Topten Electronics	TopTen TK510	TopTen TK510
Guardfreight	GFECL-01	GFECL-01
GuardMagic	GuardMagic FSL	GuardMagic FSL
GuardMagic	GuardMagic FSM	GuardMagic FSM
GuardMagic	GuardMagic VB	GuardMagic VB

Manufacturer	Device	Device type in Wialon
Gurtam	Distance Tag	Distance Tag
Gurtam	flespi gateway	flespi gateway
Gurtam	GPS Tag	GPS Tag
Gurtam	MGPS Tracer	MGPS Tracer
Gurtam	Mobile GPS	Mobile GPS
Gurtam	Mobile Navigator	Mobile Navigator
Gurtam	Teltonika MB Server	Teltonika MB Server
Gurtam	Wialon Combine	Wialon Combine
Gurtam	Wialon IPS	Wialon IPS
Gurtam	Wialon Retranslator	Wialon Retranslator
Gurtam	WiaTag	WiaTag
Haftcin	Haftcin112	Haftcin112
Haicom	Haicom	Haicom
HardControl	HC1013S	HC1013S
Heacent Technology Development	Heacent HC06A	Heacent HC06A

Manufacturer	Device	Device type in Wialon
HidnSeek	DigiTraq PV (Sigfox)	DigiTraq PV (Sigfox)
Hi-G-Tek	Summitec	Hi-G-Connect
Hikvision	HikVision gateway	HikVision gateway
Hilltronic	Hilltronic MCC300	Hilltronic MCC300
Hiton	ARKO-TM1	ARKO-TM1
Honeywell	Honeywell SAT-202	Honeywell SAT-202
Honeywell	Honeywell SAT-401	Honeywell SAT-401
Honeywell	Honeywell TAM-242	Honeywell TAM-242
Honeywell	Honeywell TAM-252	Honeywell TAM-252
Honeywell	Honeywell TAM-262	Honeywell TAM-262
Honeywell	Osprey SAT-232	Osprey SAT-232
Hong Kong Crown Technology	Crowntech 3G GPS Tracker	Crowntech 3G GPS Tracker
Howen Technologies	Hero-ME31-04	Hero-ME31-04
Howen Technologies	Hero-ME31-08	Hero-ME31-08
Howen Technologies	Hero-ME31-12	Hero-ME31-12

Manufacturer	Device	Device type in Wialon
Howen Technologies	Hero-ME32-04	Hero-ME32-04
Howen Technologies	Hero-ME32-08	Hero-ME32-08
Howen Technologies	Hero-ME41-02	Hero-ME41-02
Howen Technologies	Hero-ME41-04	Hero-ME41-04
Hua Sheng Telematics	HS-3000G	HS-3000G
Hua Sheng Telematics	HS-600G	HS-600G
Huato	Huato S500	Huato S500
Huawei	Huawei DA3100 OBD2	Huawei DA3100 OBD2
Huiye IoT Technology	HMB001	HMB001
HunterPro	HP-MOTO	HP-MOTO
ICARVISIONS	Icarvision IVMS	Icarvision IVMS
Icomera	Moovbox M340	Moovbox M340
IMAP - Telematics	iBeacon	iBeacon
IMAP - Telematics	iBeacon V3	iBeacon V3
Incotex	Mercury TA-001	Mercury TA-001

Manufacturer	Device	Device type in Wialon
Incotex	Mercury TA-002	Mercury TA-002
InHand Networks	InHand VT310	InHand VT310
Inmarsat	Inmarsat ISATPHONE 2	Inmarsat ISATPHONE 2
InnoComm	Eclaire	Eclaire
InspireTech Systems	Vista Trax TS15	Vista Trax TS15
In-Tech	RPTS	RPTS
IntelStol	MAC Pro	MAC Pro
Intertech International Technology, Inc.	ICS-100 Series	ICS-100 Series
IOSiX	OBD-II/CAN Interface V5	OBD-II/CAN Interface V5
Iridium	Iridium Extreme	Iridium Extreme
iRZ Monitoring	FindMe F2	FindMe F2
iRZ Monitoring	FindMe F3	FindMe F3
iRZ Monitoring	iON Connect	iON Connect
iRZ Monitoring	iON FM	iON FM
iRZ Monitoring	iON PRO/BASE	iON PRO/BASE

Manufacturer	Device	Device type in Wialon
iRZ Monitoring	iON ULC	iON ULC
iStartek	iStartek VT200L	iStartek VT200L
iStartek	iStartek VT206	iStartek VT206
iStartek	iStartek VT600	iStartek VT600
iStartek	iStartek VT900	iStartek VT900
Istrim	Drozd K-1/M-1 (UDM12)	Drozd K-1/M-1 (UDM12)
Italon	ITALON FLEX	ITALON FLEX
Italon	Italon Track	Italon Track
i-Trac Gps	Itrac Series	Itrac Series
iTriangle	AIS-140	AIS-140
iTriangle	Aquilla Asset Tracker	Aquilla Asset Tracker
iTriangle	Aquilla B101 V2	Aquilla B101 V2
iTriangle	Bharat 101	Bharat 101
iTriangle	TS101	TS101
ITS-soft	MVT 15	MVT 15

Manufacturer	Device	Device type in Wialon
ITS-soft	MVT 17	MVT 17
Ivan Glonassov	Ivanglonassov MSP350	Ivanglonassov MSP350
Ivan Glonassov	SpyBike	SpyBike
Ivanovo Monitoring	GVT-500	GVT-500
Izhevskiy radiozavod	ST 210	ST 210
Izhevskiy radiozavod	ST 260	ST 260
Izhevskiy radiozavod	ST 270	ST 270
Izhevskiy radiozavod	ST 270 TM	ST 270 TM
Izhevskiy radiozavod	TM4-2	TM4-2
Jagco Technology	IB-GT102	IB-GT102
Jagco Technology	IB-GT168	IB-GT168
Javad	Javad	Javad
Jetstar Electronics	JS-9804	JS-9804
Jetstar Electronics	JS9804-NVR	JS9804-NVR
Jetstar Electronics	JS-9808NVR HDD	JS-9808NVR HDD

Manufacturer	Device	Device type in Wialon
Jetstar Electronics	JS-DS-004 4G	JS-DS-004 4G
Jetstar Electronics	JS-DS-007 4G	JS-DS-007 4G
Jimi IoT (Concox)	BBear	BBear
Jimi IoT (Concox)	Concox AM01	Concox AM01
Jimi IoT (Concox)	Concox AT1	Concox AT1
Jimi IoT (Concox)	Concox AT2	Concox AT2
Jimi IoT (Concox)	Concox AT3	Concox AT3
Jimi IoT (Concox)	Concox AT4	Concox AT4
Jimi IoT (Concox)	Concox AT5	Concox AT5
Jimi IoT (Concox)	Concox AT6	Concox AT6
Jimi IoT (Concox)	Concox BL10	Concox BL10
Jimi IoT (Concox)	Concox CT10	Concox CT10
Jimi IoT (Concox)	Concox ET25	Concox ET25
Jimi IoT (Concox)	Concox GK309	Concox GK309
Jimi IoT (Concox)	Concox GK310	Concox GK310

Manufacturer	Device	Device type in Wialon
Jimi IoT (Concox)	Concox GT02A	Concox GT02A
Jimi IoT (Concox)	Concox GT06E	Concox GT06E
Jimi IoT (Concox)	Concox GT06F	Concox GT06F
Jimi IoT (Concox)	Concox GT06N	Concox GT06N
Jimi IoT (Concox)	Concox GT08	Concox GT08
Jimi IoT (Concox)	Concox GV20	Concox GV20
Jimi IoT (Concox)	Concox GV26	Concox GV26
Jimi IoT (Concox)	Concox GV40 4G-LTE	Concox GV40 4G-LTE
Jimi IoT (Concox)	Concox HVT001	Concox HVT001
Jimi IoT (Concox)	Concox JM-LL01	Concox JM-LL01
Jimi IoT (Concox)	Concox JM-VG01U	Concox JM-VG01U
Jimi IoT (Concox)	Concox JM-VG02U	Concox JM-VG02U
Jimi IoT (Concox)	Concox JM-VG04	Concox JM-VG04
Jimi IoT (Concox)	Concox JM-VL01	Concox JM-VL01
Jimi IoT (Concox)	Concox JM-VL02	Concox JM-VL02

Manufacturer	Device	Device type in Wialon
Jimi IoT (Concox)	Concox JM-VL03	Concox JM-VL03
Jimi IoT (Concox)	Concox OB22	Concox OB22
Jimi IoT (Concox)	Concox Q2	Concox Q2
Jimi IoT (Concox)	Concox Qbit	Concox Qbit
Jimi IoT (Concox)	Concox WeTrack lite (GV25)	Concox WeTrack lite (GV25)
Jimi IoT (Concox)	Concox X1	Concox X1
Jimi IoT (Concox)	Concox X3	Concox X3
Jimi IoT (Concox)	CRX-1	CRX-1
Jimi IoT (Concox)	CRX-1 New	CRX-1 New
Jimi IoT (Concox)	EG02	EG02
Jimi IoT (Concox)	GS503	GS503
Jimi IoT (Concox)	GT02D	GT02D
Jimi IoT (Concox)	GT03A	GT03A
Jimi IoT (Concox)	GT03D	GT03D
Jimi IoT (Concox)	GT05	GT05

Manufacturer	Device	Device type in Wialon
Jimi IoT (Concox)	GT100	GT100
Jimi IoT (Concox)	GT300	GT300
Jimi IoT (Concox)	GT350	GT350
Jimi IoT (Concox)	GT710	GT710
Jimi IoT (Concox)	GT800	GT800
Jimi IoT (Concox)	GV20	GV20
Jimi IoT (Concox)	JC100	JC100
Jimi IoT (Concox)	JC400	JC400
Jimi IoT (Concox)	Ji03	Ji03
Jimi IoT (Concox)	Ji06	Ji06
Jimi IoT (Concox)	Ji08	Ji08
Jimi IoT (Concox)	Ji09	Ji09
Jimi IoT (Concox)	JM01	JM01
Jimi IoT (Concox)	JM08	JM08
Jimi IoT (Concox)	JM-LG01	JM-LG01

Manufacturer	Device	Device type in Wialon
Jimi IoT (Concox)	JM-VG03	JM-VG03
Jimi IoT (Concox)	JM-VW01	JM-VW01
Jimi IoT (Concox)	JV03	JV03
Jimi IoT (Concox)	JV100	JV100
Jimi IoT (Concox)	JV200	JV200
Jimi IoT (Concox)	MT200 (MOPLUS)	MT200
Jimi IoT (Concox)	TZ-GT02	TZ-GT02
Jimi IoT (Concox)	Wetrack 140	Wetrack 140
Jimi IoT (Concox)	WeTrack 2	WeTrack 2
Jimi IoT (Concox)	WeTrack lite (GV25)	GV25
JIMU Intelligent	Jimu	Jimu
JIMU Intelligent	Jimu Media	Jimu Media
Jointech	Jointech GP4000A	Jointech GP4000A
Jointech	Jointech GP4000	Jointech GP4000
Jointech	Jointech GP5000	Jointech GP5000

Manufacturer	Device	Device type in Wialon
Jointech	Jointech GP6000F	Jointech GP6000F
Jointech	Jointech GP6000	Jointech GP6000
Jointech	Jointech JT600C	Jointech JT600C
Jointech	Jointech JT600	Jointech JT600
Jointech	Jointech JT701D	Jointech JT701D
Jointech	Jointech JT701	Jointech JT701
Jointech	Jointech JT701T	Jointech JT701T
Jointech	Jointech JT702	Jointech JT702
Jointech	Jointech JT704	Jointech JT704
Jointech	Jointech JT705A	Jointech JT705A
Jointech	Jointech JT705	Jointech JT705
Jointech	Jointech JT706	Jointech JT706
Jointech	Jointech JT707A	Jointech JT707A
Jointech	Jointech JT707	Jointech JT707
Jointech	Jointech JT709A	Jointech JT709A

Manufacturer	Device	Device type in Wialon
Jubilee Experts	STAR TRACKER JB-100	STAR TRACKER JB-100
Karibia Solutions	Speed Governor	Speed Governor
Keson	KS168	KS168
Keson	KS668	KS668
KGK-Global	KGK-GLOBAL	KGK-GLOBAL
KHD	KHD KC200	KHD KC200
KHD	KHD KC300	KHD KC300
KHD	KHD KG100	KHD KG100
KHD	KHD KG200	KHD KG200
KHD	KHD KG300	KHD KG300
Kingneed	Kingneed T1124FC	Kingneed T1124FC
Kingneed	Kingneed T12SE	Kingneed T12SE
Kingneed	Kingneed T13	Kingneed T13
Kingneed	Kingneed T15400	Kingneed T15400
Kingneed	Kingneed T4400	Kingneed T4400

Manufacturer	Device	Device type in Wialon
Kingneed	Kingneed T500	Kingneed T500
Kingneed	Kingneed T580	Kingneed T580
Kingneed	Kingneed T630	Kingneed T630
Kingneed	Kingneed T8800	Kingneed T8800
Kingneed	Kingneed TK05	Kingneed TK05
Kingneed	Kingneed TK-101	Kingneed TK-101
Kingneed	Kingneed TK10	Kingneed TK10
Kingneed	Kingneed TK20	Kingneed TK20
KingSword Industries	Kingsword GML-E3	Kingsword GML-E3
Kingwo	Kingwo MT Series	Kingwo MT Series
KoCoS	ME15 LiMo	ME15 LiMo
Kodinis Raktas	Elita GSW CAN	Elita GSW CAN
Kodos-B	Era 112	Era 112
KSM-Intech	Atlas Telemetry	Atlas Telemetry
Kvant	GLONASS-NP-1K	GLONASS-NP-1K

Manufacturer	Device	Device type in Wialon
Kvant LLC	KURS 7	KURS 7
KZTA	Kasbi DT-20	Kasbi DT-20
LADIA Telematika	LT-Electra 906-108	LT-Electra 906-108
Laipac Tech	Laipac S-911 Bracelet	Laipac S-911 Bracelet
Laipac Tech	Laipac S-911	Laipac S-911
Laipac Tech	Look Watch	Look Watch
Laipac Tech	StarFinder AVL 110	StarFinder AVL 110
Laird	Laird LT-100	Laird LT-100
Laird	Laird LT-300	Laird LT-300
Laird	Laird TR-100	Laird TR-100
Leadtek	L1 Tracker	L1 Tracker
Leadway	Leadway TKV118	Leadway TKV118
Ledesma	Ledesma	Ledesma
Lell	LELL-510	LELL-510
Lell	Lell-520	Lell-520

Manufacturer	Device	Device type in Wialon
Lell	Lell-530	Lell-530
Lell	Lell S-10	Lell S-10
Lell	Lell S-20	Lell S-20
Lell	Lell S-40	Lell S-40
LEVEL Systems (Positrex)	Level GC077	Level GC077
LEVEL Systems (Positrex)	Level GC092 Solar Total Finder	Level GC092 Solar Total Finder
LEVEL Systems (Positrex)	Level GC092 Total Finder	Level GC092 Total Finder
LEVEL Systems (Positrex)	Level GC095 Total Tracker	Level GC095 Total Tracker
Libelium	Waspmote	Waspmote
LLC “X-KEEPER”	X-Keeper Invis DUOS	X-Keeper
Locarus	Locarus 702	Locarus 702
Locarus	Locarus 702R	Locarus 702R
Locarus	Locarus 702S	Locarus 702S
Locarus	Locarus 702x	Locarus 702x
Locol	LocolPM	LocolPM

Manufacturer	Device	Device type in Wialon
Lofandi	AT4G-365	AT4G-365
LogicTrail	LT1010	LT1010
LOKA	LOKA	LOKA
Lookout	GSM VENDING	GSM VENDING
M2Media Group	M2Media-1080p	M2Media-1080p
M2Media Group	M2Media-720p	M2Media-720p
M2M Ukraine	M2M-Mini	M2M-Mini
M2M Ukraine	M2M-Smart	M2M-Smart
M2M Ukraine	M2M-UA GPS	M2M-UA GPS
Maestro	Maestro MicroTracker	Maestro MicroTracker
Magic System	MS PGSM4	MS PGSM4
Master Kit	MasterKit BM8009	MasterKit BM8009
Maxtrack	MaxTrack MXT	MaxTrack MXT
MCC Ukraine	Magnum MM-350-R01	Magnum MM-350-R01
MCC Ukraine	Magnum MT-300	Magnum MT-300

Manufacturer	Device	Device type in Wialon
MCS	MCS-1	MCS-1
Megapage	Autolocator Base Fleet	Autolocator Base Fleet
Megapage	Autolocator EGTS	Autolocator EGTS
Megapage	Autolocator Satellite X	Autolocator Satellite X
Megastek Technologies	GMT-368	GMT-368
Megastek Technologies	Megastek GT88/GPT68	Megastek GT88/GPT68
Megastek Technologies	Megastek GVT-430	Megastek GVT-430
Megastek Technologies	Megastek GVT-510	Megastek GVT-510
Megastek Technologies	Megastek GVT-800	Megastek GVT-800
Megastek Technologies	Megastek GVT-900	Megastek GVT-900
Megastek Technologies	Megastek MT110	Megastek MT110
Megastek Technologies	Megastek MT200X	Megastek MT200X
Megastek Technologies	Megastek MT300	Megastek MT300
Megastek Technologies	Megastek MT60X	Megastek MT60X
Megastek Technologies	Megastek MT80	Megastek MT80

Manufacturer	Device	Device type in Wialon
Megastek Technologies	TwinMask MT90	TwinMask MT90
Megastek Technologies	ZD-01	ZD-01
Meitrack	GT30/GT60	GT30/GT60
Meitrack	Meitrack K211G	Meitrack K211G
Meitrack	Meitrack MD522S	Meitrack MD522S
Meitrack	Meitrack MT80i	Meitrack MT80i
Meitrack	Meitrack MT90	Meitrack MT90
Meitrack	Meitrack P88L	Meitrack P88L
Meitrack	Meitrack P99G	Meitrack P99G
Meitrack	Meitrack T1	Meitrack T1
Meitrack	Meitrack T311	Meitrack T311
Meitrack	Meitrack T322	Meitrack T322
Meitrack	Meitrack T333	Meitrack T333
Meitrack	Meitrack T355	Meitrack T355
Meitrack	Meitrack T366G	Meitrack T366G

Manufacturer	Device	Device type in Wialon
Meitrack	Meitrack T366	Meitrack T366
Meitrack	Meitrack T622G	Meitrack T622G
Meitrack	Meitrack T622	Meitrack T622
Meitrack	Meitrack T633L	Meitrack T633L
Meitrack	Meitrack TC68L	Meitrack TC68L
Meitrack	Meitrack TC68	Meitrack TC68
Meitrack	Meitrack TC68SG	Meitrack TC68SG
Meitrack	Meitrack Trackids	Meitrack Trackids
Meitrack	Meitrack TS299L	Meitrack TS299L
Meitrack	MT80	MT80
Meitrack	MT88	MT88
Meitrack	MVT100	MVT100
Meitrack	MVT340	MVT340
Meitrack	MVT380	MVT380
Meitrack	MVT400	MVT400

Manufacturer	Device	Device type in Wialon
Meitrack	MVT600	MVT600
Meitrack	MVT800	MVT800
Meitrack	VT300/VT310	VT300/VT310
Meta System	Meta API	Meta API
Micro Line	Autoscan GPS	Autoscan GPS
Micronet	Micronet SmarTab	Micronet SmarTab
Micronet	Micronet SmartHub	Micronet SmartHub
Micronet	TREQ-317	TREQ-317
Micron	Micron AT ME	Micron Mini Tracker
Micron	Micron Prime ATA CATM	Micron Prime ATA CATM
Micron	Micron Prime AT Lite	Micron Prime AT Lite
Micron	Micron Prime AT	Micron Prime AT
Micron	Micron Prime AT Plus	Micron Prime AT Plus
Micron	Micron Prime Bolt 4g	Micron Prime Bolt 4g
Micron	Micron Prime One LTE	Micron Prime One LTE

Manufacturer	Device	Device type in Wialon
Micron	Micron Prime ONE	Micron Prime ONE
Micron	Micron Prime PT	Micron Prime PT
Micron	Prime ATC	Prime ATC
Micron	Prime AT V	Prime AT V
MICROTRACKER	EPS Microtracker	EPS Microtracker
Mielta Technology	Mielta M1 Lite	Mielta M1 Lite
Mielta Technology	MIELTA M1	MIELTA M1
Mielta Technology	MIELTA M3	MIELTA M3
Mielta Technology	MIELTA M7	MIELTA M7
Minda iConnect	Minda TCU A882	Minda TCU A882
MiniFinder Sweden AB	EV-200	EV-200
MiniFinder Sweden AB	MiniFinder Atto	MiniFinder Atto
MiniFinder Sweden AB	MiniFinder Atto Pro	MiniFinder Atto Pro
MiniFinder Sweden AB	MiniFinder Nano	MiniFinder Nano
MiniFinder Sweden AB	MiniFinder Pico	MiniFinder Pico

Manufacturer	Device	Device type in Wialon
MiniFinder Sweden AB	MiniFinder Zepto	MiniFinder Zepto 2.0
MiniFinder Sweden AB	MiniFinder Zepto One	MiniFinder Zepto One
MiniFinder Sweden AB	MiniFinder Zepto Plus	MiniFinder Zepto Plus
MiniSentry	MiniSentry K7	MiniSentry K7
Ministry of Transport of the Russian Federation	EGTS	EGTS
Minsk Watch Plant	UTR-02L	UTR-02L
Mircom	Mircom M500	Mircom M500
Mircom	Mircom M770	Mircom M770
MiREP	TraceLogger	TraceLogger
MKB Compass	Naviland AT-01	Naviland AT-01
MKB Compass	Sledopyt-T	Sledopyt-T
Mobile Devices	Mobile Devices C4D	Mobile Devices C4D
Mobile monitor	Mobile monitor	Mobile monitor
Mobilogix	Mobilogix MT2000	Mobilogix MT2000
Mongol GPS	Mongol GPS	Mongol GPS

Manufacturer	Device	Device type in Wialon
MonitoringAuto	SmartLink	SmartLink
Monitoringovye sistemy	MT CKAT	MT CKAT
Montrans	Montrans DVR	Montrans DVR
Montrans	MONTRANS M-1	MONTRANS M-1
Montrans	MONTRANS M-3	MONTRANS M-3
Montrans	Montrans M-5	Montrans M-5
Morion	AT-300	AT-300
M-Plata	GPS Marker	GPS Marker
MTSK LLC.	Mickchel 101	Mickchel 101
MUK Device	MUK-A1	MUK-A1
Multi Portal	RST-TG100	RST-TG100
MyGPS	MyGPS-M1	MyGPS-M1
myPhone	MySafe T300A	MySafe T300A
NAL Research	Shout GSM	Shout GSM
NAL Research	Shout Nano	Shout Nano

Manufacturer	Device	Device type in Wialon
NAL Research	Shout ns	Shout ns
NAM system	NCL 20	NCL 20
Navion	GSMTrack	GSMTrack
Navion	Navion Tracker	Navion Tracker
NAVIS	CH-4713	CH-4713
Navitrack (Navika)	Navi-Track 200	Navi-Track 200
Navitrack (Navika)	Navi-Track 257	Navi-Track 257
Navitrack (Navika)	Navi-Track	Navi-Track
Navitrack	Navitrack GSTM32V2	Navitrack GSTM32V2
Navitrek	NaviTrek 310	NaviTrek 310
Navitrek	NaviTrek 520 Series	NaviTrek 520 Series
Navitrek	NaviTrek 530R	NaviTrek 530R
Navitrek	NaviTrek 810	NaviTrek 810
Navitrek	NaviTrek 820	NaviTrek 820
Navitrek	NaviTrek 820 OBD	NaviTrek 820 OBD

Manufacturer	Device	Device type in Wialon
Navitrek	NaviTrek 868	NaviTrek 868
Navitrek	NaviTrek 910	NaviTrek 910
Navitrek	NaviTrek 920	NaviTrek 920
Navtelecom	Navtelecom Signal S-2115	Navtelecom Signal S-2115
Navtelecom	Navtelecom Signal S-2117	Navtelecom Signal S-2117
Navtelecom	Navtelecom Signal S-2550	Navtelecom Signal S-2550
Navtelecom	Navtelecom Signal S-2551	Navtelecom Signal S-2551
Navtelecom	Navtelecom Signal S-26xx	Navtelecom Signal S-26xx
Navtelecom	Navtelecom Signal S-46xx	Navtelecom Signal S-46xx
Navtelecom	Navtelecom SMART S-23xx	Navtelecom SMART S-23xx
Navtelecom	Navtelecom SMART S-24xx	Navtelecom SMART S-24xx
Navtelecom	Navtelecom SMART S-44xx	Navtelecom SMART S-44xx
Navtrack	Navtrack GT3501	Navtrack GT3501
NaxerTech	NaxerTech NTT-101	NaxerTech NTT-101
Neomatica	ADM007	ADM007

Manufacturer	Device	Device type in Wialon
Neomatica	ADM100	ADM100
Neomatica	ADM300	ADM300
Neomatica	ADM333	ADM333
Neomatica	ADM50	ADM50
Neomatica	ADM600	ADM600
Neomatica	ADM700	ADM700
Neotech Electronics	Neotech	Neotech
Neotech Electronics	Neotech NEO VTR100	Neotech NEO VTR100
Neotech Electronics	Neotech NEO VTR500	Neotech NEO VTR500
Neotech Electronics	Neotech UDP	Neotech UDP
Neoway	NEOWAY 4G OBDII N2610	NEOWAY 4G OBDII N2610
NET TRACKER S.A.	Lantrix T1800	Lantrix T1800
NET TRACKER S.A.	T1700 3G	T1700 3G
NIS GLONASS	Nis	Nis
Noran International Technology	Noran-NR008	Noran-NR008

Manufacturer	Device	Device type in Wialon
Noran International Technology	Noran NR100	Noran NR100
Noran International Technology	Noran series	Noran series
Novacom	MT-2000A	MT-2000A
Novacom Wireless	Novacom GNS-GLONASS	Novacom GNS-GLONASS
Novacom Wireless	Novacom GNS-GLONASS v. 5.0	Novacom GNS-GLONASS v. 5.0
Novacom Wireless	Novacom GNS-miniTRACK	Novacom GNS-miniTRACK
Novacom Wireless	Novacom GNS-TRACK Extended	Novacom GNS-TRACK Extended
Novacom Wireless	Novacom GNS-TRACK	Novacom GNS-TRACK
Novatel Wireless	Novatel Wireless MT1200	Novatel Wireless MT1200
Novatel Wireless	Novatel Wireless MT3060	Novatel Wireless MT3060
Novatel Wireless	Novatel Wireless MT4000	Novatel Wireless MT4000
Novatel Wireless	Novatel Wireless MT4100	Novatel Wireless MT4100
Novitech	Novitech 3S-8U2GX	Novitech 3S-8U2GX

Manufacturer	Device	Device type in Wialon
NPO Pioner	AutoBARIER Auto-5	AutoBARIER Auto-5
NSS	GPS NSS F1	GPS NSS F1
Numeral IOT (NIOT)	Simba	Simba
NVS Navigation Technologies Ltd	NVS-RTK-MA	NVS-RTK-MA
NVS Navigation Technologies Ltd	NVS-RTK-MD	NVS-RTK-MD
NVS Telematics Systems	NAVIS CH-5704	NAVIS CH-5704
NVS Telematics Systems	NAVIS CH-5707	NAVIS CH-5707
NVS Telematics Systems	NAVIS Signal	NAVIS Signal
NVS Telematics Systems	Navitrack UM-02	Navitrack UM-02
NVS Telematics Systems	Navitrack UM-02 (SMS)	Navitrack UM-02 (SMS)
NVS Telematics Systems	Navitrack UM-04	Navitrack UM-04
NVS Telematics Systems	SN 5001	SN 5001
Nyitech	NT-183W	NT-183W
Oigo Telematics	AR Series	AR Series

Manufacturer	Device	Device type in Wialon
Oigo Telematics	MG Series	MG Series
OKB Technoavtomatica	MPU01	MPU01
OKB Technoavtomatica	MPU-02	MPU-02
OKB Technoavtomatica	MTA-12-3	MTA-12-3
OKO	OKO-E	OKO-E
OKO	OKO-NAVI	OKO-NAVI
OKO	OKO-S2	OKO-S2
OmaticsGPS	OmaticsGPS OMU06G	OmaticsGPS OMU06G
OmaticsGPS	OmaticsGPS OMU07G	OmaticsGPS OMU07G
OmaticsGPS	OmaticsGPS OMU08G	OmaticsGPS OMU08G
OmaticsGPS	OmaticsGPS OMU26G	OmaticsGPS OMU26G
OmaticsGPS	OmaticsGPS OMU27G	OmaticsGPS OMU27G
OmaticsGPS	OmaticsGPS OMU42G	OmaticsGPS OMU42G
Omega	Omega-S-1	Omega-S-1
Omega	Omega-S-2	Omega-S-2

Manufacturer	Device	Device type in Wialon
Omnicomm	FAS Standard	FAS Standard
Omnicomm	Omnicomm Light	Omnicomm Light
Omnicomm	Omnicomm Optim	Omnicomm Optim
Omnicomm	Omnicomm Profi	Omnicomm Profi
Oner	Oner CT02	Oner CT02
Oner	Oner OCT Series	Oner OCT Series
ORBCOMM	CargoWatch	CargoWatch
ORBCOMM	ORBCOMM GT 1000	ORBCOMM GT 1000
ORBCOMM	ORBCOMM GT 1100	ORBCOMM GT 1100
ORBCOMM	ORBCOMM GT 600	ORBCOMM GT 600
ORBCOMM	ORBCOMM IDP-782	ORBCOMM IDP-782
ORBCOMM	Orbcomm IGWS2	Orbcomm IGWS2
ORBCOMM	ORBCOMM RT 6000 Plus	ORBCOMM RT 6000 Plus
ORBCOMM	Orbcomm ST 6100	Orbcomm ST 6100
ORBCOMM	Orbcomm ST 9100	Orbcomm ST 9100

Manufacturer	Device	Device type in Wialon
Orion Technology	Choco	Choco
Orion Technology	Easytrac	Easytrac
Orion Technology	Easytrac mini	Easytrac mini
Orion Technology	OBDtrac	OBDtrac
Orion Technology	Orion BD2012-V8	Orion BD2012-V8
Orion Technology	Speedtrac	Speedtrac
Ortem Electronics	APL Tracker	APL Tracker
Ortem Electronics	Xtakip M40A	Xtakip M40A
Pacific Track	PT40	PT40
Pandora	Pandora DX 5200	Pandora DX 5200
Pandora	Pandora DXL 5200L	Pandora DXL 5200L
Parsiantech	Parsiantech VT05	Parsiantech VT05
Parsiantech	Parsiantech VT06	Parsiantech VT06
PCL TECHNOLOGY CO., LIMITED	OBD-200L	OBD-200L
Peak Tech Power Limited	PT-SmartWatch G09	PT-SmartWatch G09

Manufacturer	Device	Device type in Wialon
Pentode Technologies	TK-99	TK-99
Peplink	BR1 Mini router	BR1 Mini router
Phillips Connect Technologies	AssetTrac	AssetTrac
Phillips Connect Technologies	EZTrac	EZTrac
Phillips Connect Technologies	SolarNet	SolarNet
Phillips Connect Technologies	StealthNet	StealthNet
PILIGRIM	Piligrim M-5000	Piligrim M-5000
Planar	Planar-GG101	Planar-GG101
Pointer Telocation	CelloCan IQ	CelloCan IQ
Pointer Telocation	Cellocator Cello-F	Cellocator Cello-F
Pointer Telocation	Cellocator CelloTrack	Cellocator CelloTrack
Pointer Telocation	Cellocator Compact CAN	Cellocator Compact CAN
Pointer Telocation	Cellocator Compact Security	Cellocator Compact Security
Pointer Telocation	Cellocator CR200	Cellocator CR200
Pointer Telocation	Cellocator CR300	Cellocator CR300

Manufacturer	Device	Device type in Wialon
Pointer Telocation	Cello IQ	Cellocator IQ
Pointer Telocation	CelloTrack Nano	Cello Track Nano20
Pointer Telocation	CelloTrack Nano Sensor	CelloTrack Nano Sensor
Pointer Telocation	Minitrack	Minitrack
Pomcell	PomCell	PomCell
Portman GPS	Portman GT2000	Portman GT2000
Portman GPS	Portman GT3101MG	Portman GT3101MG
Positioning Universal	FJ1000	FJ1000
Positioning Universal	FJ110G	FJ110G
Positioning Universal	FJ2050	FJ2050
POWERPACK	GPS-TK105	GPS-TK105
PowerTrace	PowerTrace C series/EB 501	PowerTrace C series/EB 501
Pretrace Technologies	Pretrace TC55	Pretrace TC55
Pretrace Technologies	Pretrace TC56	Pretrace TC56
Pretrace Technologies	Pretrace TC80	Pretrace TC80

Manufacturer	Device	Device type in Wialon
Pretrace Technologies	Pretrace TC85	Pretrace TC85
Pricol	Pricol	Pricol
PrimaVista	AliceTracker	AliceTracker
Princip	LUPUS	LUPUS
Progress	Progress 01	Progress 01
QOHO Electronics	Hybrid MDVR	Hybrid MDVR
Quake Global	Quake Global Q4000 Iridium	Quake Global Q4000 Iridium
Quake Global	Quake Global Q-Pro Iridium	Quake Global Q-Pro Iridium
Quasar Electronics	QRT02	QRT02
Quasar Electronics	RPC200	RPC200
Queclink Wireless Solutions	Queclink GB100MG	Queclink GB100MG
Queclink Wireless Solutions	Queclink GB100	Queclink GB100
Queclink Wireless Solutions	Queclink GL100M	Queclink GL100M
Queclink Wireless Solutions	Queclink GL100	Queclink GL100
Queclink Wireless Solutions	Queclink GL200	Queclink GL200

Manufacturer	Device	Device type in Wialon
Queclink Wireless Solutions	Queclink GL3000W	Queclink GL3000W
Queclink Wireless Solutions	Queclink GL300A	Queclink GL300A
Queclink Wireless Solutions	Queclink GL300M	Queclink GL300M
Queclink Wireless Solutions	Queclink GL300	Queclink GL300
Queclink Wireless Solutions	Queclink GL300VC	Queclink GL300VC
Queclink Wireless Solutions	Queclink GL300W	Queclink GL300W
Queclink Wireless Solutions	Queclink GL3028W	Queclink GL3028W
Queclink Wireless Solutions	Queclink GL500M	Queclink GL500M
Queclink Wireless Solutions	Queclink GL500	Queclink GL500
Queclink Wireless Solutions	Queclink GL501 LTE	Queclink GL501 LTE
Queclink Wireless Solutions	Queclink GL505	Queclink GL505
Queclink Wireless Solutions	Queclink GL50B	Queclink GL50B
Queclink Wireless Solutions	Queclink GL50MG	Queclink GL50MG
Queclink Wireless Solutions	Queclink GL520	Queclink GL520
Queclink Wireless Solutions	Queclink GL52S (Sigfox)	Queclink GL52S (Sigfox)

Manufacturer	Device	Device type in Wialon
Queclink Wireless Solutions	Queclink GL530	Queclink GL530
Queclink Wireless Solutions	Queclink GMT100	Queclink GMT100
Queclink Wireless Solutions	Queclink GMT200	Queclink GMT200
Queclink Wireless Solutions	Queclink GS100	Queclink GS100
Queclink Wireless Solutions	Queclink GT200	Queclink GT200
Queclink Wireless Solutions	Queclink GT300	Queclink GT300
Queclink Wireless Solutions	Queclink GT301	Queclink GT301
Queclink Wireless Solutions	Queclink GT500	Queclink GT500
Queclink Wireless Solutions	Queclink GV100	Queclink GV100
Queclink Wireless Solutions	Queclink GV200G	Queclink GV200G
Queclink Wireless Solutions	Queclink GV200	Queclink GV200
Queclink Wireless Solutions	Queclink GV300CAN	Queclink GV300CAN
Queclink Wireless Solutions	Queclink GV300	Queclink GV300
Queclink Wireless Solutions	Queclink GV300W	Queclink GV300W
Queclink Wireless Solutions	Queclink GV320	Queclink GV320

Manufacturer	Device	Device type in Wialon
Queclink Wireless Solutions	Queclink GV350M	Queclink GV350M
Queclink Wireless Solutions	Queclink GV500MAP	Queclink GV500MAP
Queclink Wireless Solutions	Queclink GV500	Queclink GV500
Queclink Wireless Solutions	Queclink GV50LTA	Queclink GV50LTA
Queclink Wireless Solutions	Queclink GV50 LTE	Queclink GV50 LTE
Queclink Wireless Solutions	Queclink GV50MB_KW	Queclink GV50MBKW
Queclink Wireless Solutions	Queclink GV50MG	Queclink GV50MG
Queclink Wireless Solutions	Queclink GV50M	Queclink GV50M
Queclink Wireless Solutions	Queclink GV50	Queclink GV50
Queclink Wireless Solutions	Queclink GV50VC	Queclink GV50VC
Queclink Wireless Solutions	Queclink GV51MG	Queclink GV51MG
Queclink Wireless Solutions	Queclink GV55 Lite	Queclink GV55 Lite
Queclink Wireless Solutions	Queclink GV55	Queclink GV55
Queclink Wireless Solutions	Queclink GV55S	Queclink GV55S
Queclink Wireless Solutions	Queclink GV56	Queclink GV56

Manufacturer	Device	Device type in Wialon
Queclink Wireless Solutions	Queclink GV56RS	Queclink GV56RS
Queclink Wireless Solutions	Queclink GV57	Queclink GV57
Queclink Wireless Solutions	Queclink GV600MA	Queclink GV600MA
Queclink Wireless Solutions	Queclink GV600W	Queclink GV600W
Queclink Wireless Solutions	Queclink GV628W	Queclink GV628W
Queclink Wireless Solutions	Queclink GV65 Lite	Queclink GV65 Lite
Queclink Wireless Solutions	Queclink GV65 Plus	Queclink GV65 Plus
Queclink Wireless Solutions	Queclink GV65	Queclink GV65
Queclink Wireless Solutions	Queclink GV75 LTE	Queclink GV75 LTE
Queclink Wireless Solutions	Queclink GV75M	Queclink GV75M
Queclink Wireless Solutions	Queclink GV75	Queclink GV75
Queclink Wireless Solutions	Queclink GV75W	Queclink GV75W
Queclink Wireless Solutions	Queclink GV800	Queclink GV800
Quest Guard Alliance	QG-202HA	QG-202HA
Race Information Technology	MT-4	MT-4

Manufacturer	Device	Device type in Wialon
Race Information Technology	MT-7	MT-7
Race Information Technology	MT-9	MT-9
RadioComm	RadioComm TRAP-1S	RadioComm TRAP-1S
Radio Terminal	GLONASS Storozh New	GLONASS Storozh New
Radio Terminal	GLONASS Storozh PRO	GLONASS Storozh PRO
Radio Terminal	GPS Storozh STD	GPS Storozh STD
Radio Terminal	Navitech	Navitech
Radio Terminal	NaviTech UTP-1	NaviTech UTP-1
Rainbow Technologies	Skipper 01-E/EM	Skipper 01-E/EM
Rainbow Technologies	Skipper GPRS	Skipper GPRS
RAM Proect	Fidelity Platform Tracker	Fidelity Platform Tracker
Ranavi	Ranavi	Ranavi
Rateos	Azimuth GSM 5	Azimuth GSM 5
Rateos	Azimuth GSM	Azimuth GSM
Rateos	Azimuth Retranslator	Azimuth Retranslator

Manufacturer	Device	Device type in Wialon
Rateos	Azimuth WIFI 5	Azimuth WIFI 5
Rateos	Krot	Krot
Raveon	Raveon	Raveon
RCN Conti	NaviFleet Telematic	NaviFleet Telematic
RCS	Teletrack 64	Teletrack 64
RCS	Teletrack	Teletrack
R&D Group	AT0285-GPS GNSS AUTOLINE PRO	AT0285-GPS GNSS AUTOLINE PRO
R&D Group	AT2013-GPS GNSS AUTOLINE LITE	AT2013-GPS GNSS AUTOLINE LITE
R&D Group	AT2017-GPS GNSS AUTOLINE S.LITE	AT2017-GPS GNSS AUTOLINE S.LITE
R&D Group	AUTO-LINE	AUTO-LINE
R&D Group	Auto-Line.Lite	Auto-Line.Lite
Real Telematics (RTS)	Magnetic pickup	Magnetic pickup
RealTrac Technologies	PROD TAG 210	PROD TAG 210
RealTrac Technologies	PROD TAG 400	PROD TAG 400

Manufacturer	Device	Device type in Wialon
RealTrac Technologies	PROD TAG 710	PROD TAG 710
RealTrac Technologies	PROD TAG 711	PROD TAG 711
RedView	RedView VT310	RedView VT310
Renome	Orient T-1001	Orient T-1001
Renome	Orient TP-1003	Orient TP-1003
Report System	RS-1102	RS-1102
Report System	RS-906	RS-906
Report System	RS-909	RS-909
Research Institute “Space Engineering”	GLOSPACE SGK-T	GLOSPACE SGK-T
RESIONT Technology	TK110	TK110
Resurscontrol	RC mini	RC mini
ReyConns China	ReyConns GPS168G	ReyConns GPS168G
Rico Electronics	SmartGPS	SmartGPS
Rilla Technology	Rilla G19	Rilla G19
RITI Technology	Riti SLS-00886	Riti SLS-00886

Manufacturer	Device	Device type in Wialon
RITI Technology	Riti SLS-012SF	Riti SLS-012SF
Ritm	Voyager 07.500	Voyager 07.500
Ritm	Voyager 2N	Voyager 2N
Ritm	Voyager 2	Voyager 2
Ritm	Voyager 3N	Voyager 3N
Ritm	Voyager 3	Voyager 3
Ritm	Voyager 4N	Voyager 4N
Ritm	Voyager 4	Voyager 4
Ritm	Voyager 5N	Voyager 5N
Ritm	Voyager 6N	Voyager 6N
Ritm	Voyager RTS	Voyager RTS
R-Link	R-link	R-link
Roadefend Vision Technology	Roadefend RDT-300	Roadefend RDT-300
RoadKey	RoadKey HM-31x	RoadKey HM-31x
Roadsay Technology	Roadsay RS3000	Roadsay RS3000

Manufacturer	Device	Device type in Wialon
Robustel	Robustel iGT06	Robustel iGT06
Rope Innovation Co., Ltd	Rope M508	Rope M508
Rope Innovation Co., Ltd	Rope M528	Rope M528
RTIG	RTIG	RTIG
Ruptela	Ruptela FM Eco3	Ruptela FM Eco3
Ruptela	Ruptela FM-Eco4+ E RS T	Ruptela FM-Eco4+ E RS T
Ruptela	Ruptela FM-Eco4 light+ RS T	Ruptela FM-Eco4 light+ RS T
Ruptela	Ruptela FM Eco4 Light	Ruptela FM Eco4 Light
Ruptela	Ruptela FM Eco4 light T series	Ruptela FM Eco4 light T series
Ruptela	Ruptela FM Eco4	Ruptela FM Eco4
Ruptela	Ruptela FM Eco4 S	Ruptela FM Eco4 S
Ruptela	Ruptela FM Eco4+ T series	Ruptela FM Eco4+ T series
Ruptela	Ruptela FM Plug4	Ruptela FM Plug4
Ruptela	Ruptela FM Plug4+	Ruptela FM Plug4+
Ruptela	Ruptela FM Pro3	Ruptela FM Pro3

Manufacturer	Device	Device type in Wialon
Ruptela	Ruptela FM Pro4	Ruptela FM Pro4
Ruptela	Ruptela FM Tco3	Ruptela FM Tco3
Ruptela	Ruptela FM Tco4	Ruptela FM Tco4
Ruptela	Ruptela HCV5	Ruptela HCV5
Ruptela	Ruptela LCV5	Ruptela LCV5
Ruptela	Ruptela PRO5	Ruptela PRO5
Ruptela	Ruptela Trace5 NA	Ruptela Trace5 NA
Sanav	GC-101	GC-101
Sanav	GSS Micro MV	GSS Micro MV
Sanav	Sanav CT-24	Sanav CT-24
Sanav	Sanav MU-201 S1	Sanav MU-201 S1
Sanav	Sanav MU-201	Sanav MU-201
Sanful Technologies	Sanful GPS-NSO24	Sanful GPS-NSO24
Santel Navigation	Granit Navigator	Granit Navigator
Santel Navigation	Granit v6	Granit v6

Manufacturer	Device	Device type in Wialon
Sapir	Almaz-02	Almaz-02
Sascar	Sascar	Sascar
Satamatics	SAT-202	SAT-202
Satellite Solutions	SAT-LITE 2	SAT-LITE 2
Satellite Solutions	SAT-LITE 3 NP	SAT-LITE 3 NP
Satellite Solutions	SAT-LITE 3	SAT-LITE 3
Satellite Solutions	SAT-LITE 4 NP	SAT-LITE 4 NP
Satellite Solutions	SAT-LITE 4	SAT-LITE 4
Satellite Solutions	SAT-LITE CAN	SAT-LITE CAN
Satellite Solutions	SAT-LITE	SAT-LITE
Satellite Solutions	SAT-PRO	SAT-PRO
Satellite Solutions	SUPER-LITE	SUPER-LITE
SAY Technology	Robotrack	Robotrack
SBS Technologii Monitoringa (Dozor)	Dozor X2	Dozor X2

Manufacturer	Device	Device type in Wialon
Scandinavian Radio Technology	SRT 278	SRT 278
Scandinavian Radio Technology	SRT 306i	SRT 306i
Scandinavian Radio Technology	SRT 306	SRT 306
Scandinavian Radio Technology	SRT 326i	SRT 326i
Scandinavian Radio Technology	SRT 326	SRT 326
Scandinavian Radio Technology	SRT 334	SRT 334
Scandinavian Radio Technology	SRT EMU	SRT EMU
SCHILLER	Fred EasyPort 2 Defibrillator	Fred EasyPort 2 Defibrillator
Scope Technology	MProfiler	MProfiler
SCOUT	Scout MT-500	Scout MT-500
SCOUT	Scout MT-600 Pro Open	Scout MT-600 Pro Open
SCOUT	Scout MT-700 DVR	Scout MT-700 DVR

Manufacturer	Device	Device type in Wialon
SCOUT	ScoutOpen 2	ScoutOpen 2
SCOUT	ScoutOpen	ScoutOpen
SCOUT	Scout Retranslator	Scout Retranslator
SCOUT	Scout RX Extended	Scout RX Extended
SCOUT	Scout RX Extended v2	Scout RX Extended v2
SCOUT	Scout MT-700 Pro 285	Scout MT-700 Pro
SEEWORLD Technology Corporation	Seeworld S03B	Seeworld S03B
SEEWORLD Technology Corporation	Seeworld S116	Seeworld S116
SEEWORLD Technology Corporation	Seeworld S208	Seeworld S208
Semar	Semar Pedinator	Semar Pedinator
Sensatag	Sensatag WIFI	Sensatag WIFI
Senseit	Senseit S7	Senseit S7
SEO Electronics	RZ 100	RZ 100
ServiceSoft	LookOut	LookOut

Manufacturer	Device	Device type in Wialon
SerVision	IVG400-N	IVG400-N
Seven Seals	TSS-705pg	TSS-705pg
Sheng Yeong	OBD2 5100S	OBD2 5100S
Shenzhen Boshijie Technology	A5C-8	A5C-8
Shenzhen Cantrack Technology Co., Ltd	Cantrack G05	Cantrack G05
Shenzhen Cantrack Technology Co., Ltd	Cantrack TK100	Cantrack TK100
Shenzhen Cantrack Technology Co., Ltd	Cantrack TK100 v2	Cantrack TK100 v2
Shenzhen Cantrack Technology Co., Ltd	Cantrack TK103B	Cantrack TK103B
Shenzhen Cantrack Technology Co., Ltd	G500 OBD GPS Tracker	G500 OBD GPS Tracker
Shenzhen Cantrack Technology Co., Ltd	Secumore G200	Secumore G200
Shenzhen Chainway ITS	Shenzhen CW-GPS 801	Shenzhen CW-GPS 801
Shenzhen Coban Electronics	Coban GPS102	Coban GPS102

Manufacturer	Device	Device type in Wialon
Shenzhen Coban Electronics	Coban GPS303-C	Coban GPS303-C
Shenzhen Coban Electronics	GPS103-B	GPS103-B
Shenzhen Coban Electronics	GPS306	GPS306
Shenzhen Coban Electronics	GPS311 Series	GPS311 Series
Shenzhen Diwei Machinery	OBD II	OBD II
Shenzhen Dragon Bridge Technology	DB-8S	DB-8S
Shenzhen Dragon Bridge Technology	G-MT005	G-MT005
Shenzhen Dragon Bridge Technology	G-OBD002	G-OBD002
Shenzhen Eelink Communication Technology	Eelink GPT12	Eelink GPT12
Shenzhen Eelink Communication Technology	Eelink GPT15	Eelink GPT15
Shenzhen Eelink Communication Technology	EELINK GPT18	EElink GPT GPS SOS Watch
Shenzhen Eelink Communication Technology	Eelink K20	Eelink K20

Manufacturer	Device	Device type in Wialon
Shenzhen Eelink Communication Technology	Eelink OBD GOT10	Eelink OBD GOT10
Shenzhen Eelink Communication Technology	EELINK TK115	EELINK TK-115
Shenzhen Eelink Communication Technology	EELINK TK115 v2.0	EELINK TK-115 v2
Shenzhen Eelink Communication Technology	EELINK TK116	EELINK TK-116
Shenzhen Eelink Communication Technology	EELINK TK116 V2.0	EELINK TK-116 v2
Shenzhen Eelink Communication Technology	Eelink TK121	Eelink TK121
Shenzhen Eelink Communication Technology	Eelink TK121-S	Eelink TK121-S
Shenzhen Eelink Communication Technology	EELINK TK319-H	EELINK TK319-H
Shenzhen Eelink Communication Technology	EELINK TK319-L	EELINK TK319-L
Shenzhen Eelink Communication Technology	Eelink TK418	Eelink TK418

Manufacturer	Device	Device type in Wialon
Shenzhen Eelink Communication Technology	EELINK TK419	EELINK TK419
Shenzhen Esino Technology	ES-GP06	ES-GP06
Shenzhen Flycomos	China TK-106	China TK-106
Shenzhen HHD Technology	GPS Padlock G-400	GPS Padlock G-400
Shenzhen HHD Technology	Shenzhen HHD T800	Shenzhen HHD T800
Shenzhen HuaBao Electronic Technology	HB-DV03	HB-DV03
Shenzhen HuaBao Electronic Technology	Huabao HB-A1L	Huabao HB 1AL
Shenzhen HuaBao Electronic Technology	Huabao	Huabao
Shenzhen HuaSunTek Technology	HuaSunTeK-09	HuaSunTeK-09
Shenzhen Inteliot Technologies	IT100	IT100
Shenzhen iTrybrand Technology Co.,Ltd	VT05S	VT05S
Shenzhen iTrybrand Technology Co.,Ltd	VT08S	VT08S

Manufacturer	Device	Device type in Wialon
Shenzhen Jeo Technology	Appello 4P	Appello 4P
Shenzhen Jin Sheng International	JSP008	JSP008
Shenzhen Langkun Times Technology	GT03	GT03
Shenzhen LHYK Communication Technology Co., Ltd	LKGPS LK106	LKGPS LK106
Shenzhen LHYK Communication Technology Co., Ltd	LKGPS LK110	LKGPS LK110
Shenzhen LHYK Communication Technology Co., Ltd	LKGPS LK208	LKGPS LK208
Shenzhen LHYK Communication Technology Co., Ltd	LKGPS LK330	LKGPS LK330
Shenzhen MycartuTechnology	MK8000	MK8000
Shenzhen P.M Global Technology	V680	V680
Shenzhen Rayoid Technology Co	Tbt300	Tbt300

Manufacturer	Device	Device type in Wialon
Shenzhen Reachfar Technology	Pet Tracker RF-V40	Pet Tracker RF-V40
Shenzhen Reachfar Technology	RF-V8	RF-V8
Shenzhen Supermate Electronic Technology	K10	K10
Shenzhen V-sun Electronics	TLT-2H	TLT-2H
Shenzhen V-sun Electronics	TLT-2K	TLT-2K
Shenzhen Winstar Technology	Winstar W203	Winstar
Shenzhen Zhixingsheng Electronic	ZXS Series	ZXS Series
Shtrih-m	Shtrih	Shtrih
Shtrih-m	Shtrih-TahoRUS	Shtrih-TahoRUS
SibLink	Naviset GT100	Naviset GT100
SibLink	Naviset GT-10	Naviset GT-10
SibLink	Naviset GT-20	Naviset GT-20
SibLink	Naviset MINI	Naviset MINI

Manufacturer	Device	Device type in Wialon
SibLink	Naviset SatLocator	Naviset SatLocator
SibLink	Naviset SeaPOINT	Naviset SeaPOINT
SiConsult	BGuard	BGuard
Sierra Wireless / GenX Mobile	GenX Mobile FMI Protocol	GenX Mobile FMI Protocol
Sierra Wireless / GenX Mobile	GNX-3	GNX-3
Sierra Wireless / GenX Mobile	GNX-5P	GNX-5P
Sierra Wireless / GenX Mobile	GNX-6	GNX-6
Sierra Wireless / GenX Mobile	GNX Binary	GNX Binary
Sierra Wireless / GenX Mobile	GNX brief reports	GNX brief reports
SIMBIOTECHA	GATE-FM100	GATE-FM100
Simple Truck ELD	Simple Track ELD	Simple Track ELD
Sinocastel	IDD-213GD	IDD-213GD
Sinocastel	IDD-213L	IDD-213L
Sinocastel	IDD-213N	IDD-213N
Sinocastel	IDD-213W	IDD-213W

Manufacturer	Device	Device type in Wialon
Sinocastel	LT-160	LT-160
Sinocastel	LT-162	LT-162
Sinocastel	LT-162S	LT-162S
Sinocastel	LT-164	LT-164
Sinocastel	LT-165	LT-165
Sinocastel	LT-166	LT-166
Sinowell Industrial	Sinowell G10	Sinowell G10
Sistema NK	SNK	SNK
SKB Kamerton	TINS-02	TINS-02
SKS	Autokeeper	Autokeeper
Sky Microwave	CAT-5	CAT-5
Sky Microwave	CAT-6	CAT-6
SkyMobile	SkyMobile SM8570	SkyMobile SM8570
SkyMobile	SkyMobile SM9570	SkyMobile SM9570
Skypatrol	Skypatrol Evolution	Skypatrol Evolution

Manufacturer	Device	Device type in Wialon
Skypatrol	Skypatrol SP1600	Skypatrol SP1600
Skypatrol	Skypatrol SP2600 Series	Skypatrol SP2600 Series
Skypatrol	Skypatrol SP3600	Skypatrol SP3600
Skypatrol	Skypatrol SP4600	Skypatrol SP4600
Skypatrol	Skypatrol SP5600 Series	Skypatrol SP5600 Series
Skypatrol	Skypatrol SP7600 Series	Skypatrol SP7600 Series
Skypatrol	Skypatrol SP8502	Skypatrol SP8502
Skypatrol	Skypatrol SP8600	Skypatrol SP8600
Skypatrol	Skypatrol SP9600 Series	Skypatrol SP9600 Series
Skypatrol	Skypatrol ST7200	Skypatrol ST7200
Skypatrol	Skypatrol ST8050	Skypatrol ST8050
Skypatrol	Skypatrol TT8750N Plus	Skypatrol TT8750N Plus
Skypatrol	Skypatrol TT8750	Skypatrol TT8750
Skypatrol	Skypatrol TT8850	Skypatrol TT8850
Skypatrol	Skypatrol TT9200	Skypatrol TT9200

Manufacturer	Device	Device type in Wialon
Skypatrol	Skypatrol TT9505P	Skypatrol TT9505P
SkyTrack	Skytracking Transport Security	Skytracking Transport Security
SkyTrack Telematics	Skytrack 01	Skytrack 01
SkyWave Mobile Communications	SkyWave DMR 800	SkyWave DMR 800
SkyWave Mobile Communications	Skywave IDP-680/IDP-690	Skywave IDP-680/IDP-690
SkyWave Mobile Communications	Skywave IDP-700	Skywave IDP-700
SkyWave Mobile Communications	SkyWave IDP-782	SkyWave IDP-782
SkyWave Mobile Communications	Skywave IDP-800	Skywave IDP-800
SkyWave Mobile Communications	SkyWave SG-7100	SkyWave SG-7100
SkyWave Mobile Communications	SkyWave SureLinx 8100	SkyWave SureLinx 8100
SMA Progress	GALS-T1	GALS-T1
SMA Progress	GALS-T1M	GALS-T1M

Manufacturer	Device	Device type in Wialon
SmartInTech	Altair	Altair
SmartInTech	Altair-II	Altair-II
SmartInTech	Chameleon	Chameleon 280
Smart Surv Wireless	PFK-978	PFK-978
Smart Surv Wireless	SmartsurvFuel	SmartsurvFuel
SmartWitness	SmartWitness CP1 Gateway	SmartWitness CP1 Gateway
SmartWitness	SmartWitness Gateway	SmartWitness Gateway
SmartWitness	SmartWitness KP1	SmartWitness KP1
SOBR	SOBR Chip	SOBR Chip
Sokolinyi Glaz	AutoLink	AutoLink
Solid	GaugerGSM	GaugerGSM
Soteria Solutions	SSL-05	SSL-05
SOWA	SOWA MVR-104 series	SOWA MVR-104 series
SOWA	SOWA MVR-204 series	SOWA MVR-204 series
Spetrotec	Spetrotec Big-Watcher	Spetrotec Big-Watcher

Manufacturer	Device	Device type in Wialon
Spetrotec	Spetrotec i-Watcher AVL	Spetrotec i-Watcher AVL
Spetrotec	Spetrotec i-Watcher CAN	Spetrotec i-Watcher CAN
Spetrotec	Spetrotec i-Watcher Cellular Alarm	Spetrotec i-Watcher Cellular Alarm
Spetrotec	Spetrotec i-Watcher GUARD	Spetrotec i-Watcher GUARD
Spetrotec	Spetrotec i-Watcher lite	Spetrotec i-Watcher lite
Spetrotec	Spetrotec i-Watcher LOCK	Spetrotec i-Watcher LOCK
Spetrotec	Spetrotec i-Watcher OBD	Spetrotec i-Watcher OBD
SPP	SPP-PRO-285-ERA	SPP-PRO-285-ERA
Sputnik-Avto	Tracker TM	Tracker TM
Sputnikovyj monitoring	GeoSat	GeoSat
Squarell Technology	Squarell REMOTE	Squarell REMOTE
Stadis	Orbita-K	Orbita-K
STALKER-M	Stalker-M.10	Stalker-M.10
Standard	STD8 Full	STD8 Full
Standard	STD8 Lite	STD8 Lite

Manufacturer	Device	Device type in Wialon
Starcom	Helios	Helios
Starcom	Kylos	Kylos
Starcom	LCU-500	LCU-500
Starcom	Rainbow	Rainbow
Starcom	Tetis	Tetis
Starcom	Watchlock	Watchlock
StarLine	SLNet Retranslator	SLNet Retranslator
StarLine	StarLine EGTS	StarLine EGTS
StarLine	Starline M15	Starline M15
StarLine	Starline M17	Starline M17
Stars Navigation Technologies	PT-33	PT-33
Stars Navigation Technologies	PT-35	PT-35
Stars Navigation Technologies	Rover 8	Rover 8
Stars Navigation Technologies	Rover 9	Rover 9
STATT	CTATT-2	CTATT-2

Manufacturer	Device	Device type in Wialon
STECCOM	StecCollar	StecCollar
STECCOM	StecTrace	StecTrace
STIGPS	ST 200	ST 200
Streamax Technology	MDVR-X3A-4CH	MDVR-X3A-4CH
Streamax Technology	Streamax X3-H0402	Streamax X3-H0402
Suntech	Suntech ST210 I/E	Suntech ST210 I/E
Suntech	Suntech ST215 I/E	Suntech ST215 I/E
Suntech	Suntech ST300F	Suntech ST300F
Suntech	Suntech ST300H	Suntech ST300H
Suntech	Suntech ST300K	Suntech ST300K
Suntech	Suntech ST300P	Suntech ST300P
Suntech	Suntech ST300R	Suntech ST300R
Suntech	Suntech ST300	Suntech ST300
Suntech	Suntech ST310U	Suntech ST310U
Suntech	Suntech ST3300	Suntech ST3300

Manufacturer	Device	Device type in Wialon
Suntech	Suntech ST330	Suntech ST330
Suntech	Suntech ST340	Suntech ST340
Suntech	Suntech ST350	Suntech ST350
Suntech	Suntech ST3940	Suntech ST3940
Suntech	Suntech ST410	Suntech ST410
Suntech	Suntech ST4300	Suntech ST4300
Suntech	Suntech ST4310	Suntech ST4310
Suntech	Suntech ST4330	Suntech ST4330
Suntech	Suntech ST4340	Suntech ST4340
Suntech	Suntech ST4500	Suntech ST4500
Suntech	Suntech ST4910	Suntech ST4910
Suntech	Suntech ST4940	Suntech ST4940
Suntech	Suntech ST4950	Suntech ST4950
Suntech	Suntech ST500	Suntech ST500
Suntech	Suntech ST600R	Suntech ST600R

Manufacturer	Device	Device type in Wialon
Suntech	Suntech ST600-UP	Suntech ST600-UP
Suntech	Suntech ST650	Suntech ST650
Suntech	Suntech ST710 (SigFox)	Suntech ST710 (SigFox)
Suntech	Suntech ST730 (SigFox)	Suntech ST730 (SigFox)
Suntech	Suntech ST940	Suntech ST940
Suntech	Suntech STN100	Suntech STN100
Suntech	Suntech STU650	Suntech STU650
Surfsight	Surfsight AI-12 APIv2.0	Surfsight AI-12 APIv2.0
Surfsight	Surfsight AI-12	Surfsight AI-12
S-WINNUS	eSeal	eSeal
S-WINNUS	iLock Plus	iLock Plus
Systems and Technology	Careu P2	Careu P2
Systems and Technology	CAREU U1 Lite Plus	CAREU U1 Lite Plus
Systems and Technology	CAREU U1 PLUS	CAREU U1 PLUS
Systems and Technology	CAREU UCAN	CAREU UCAN

Manufacturer	Device	Device type in Wialon
Systems and Technology	CAREU UECO	CAREU UECO
Systems and Technology	CAREU UGO	CAREU UGO
Systems and Technology	IntelliTrac A1	IntelliTrac A1
Systems and Technology	IntelliTrac P1	IntelliTrac P1
Systems and Technology	IntelliTrac U1	IntelliTrac U1
Systems and Technology	Intellitrac X1	Intellitrac X1
Systems and Technology	IntelliTrac X8	IntelliTrac X8
Szchezhijie	GT005	GT005
Talostech	Talostech	Talostech
Tau Tecnología	TAU TU-20	TAU TU-20
TCA LLC.	Avtoinformator	Avtoinformator
TeamSharp SpaceTech	VCSTS-8	VCSTS-8
TECH360	Petra	Petra
TechnoKom	Avtograph	Avtograph
TechnoKom	Avtograph WiFi	Avtograph WiFi

Manufacturer	Device	Device type in Wialon
Technoton	CKPT 25	CKPT 25
Technoton	CKPT 45	CKPT 45
Technoton Sensors	TSPL 140	TSPL 140
TecnoCrux	TecnoCrux Compact 7	TecnoCrux Compact 7
Tecrea	Tecrea ibutton	Tecrea ibutton
Tekelek	TEK-586	TEK-586
Teksus	Teksus Mayak GPS/Glonass v5	Teksus Mayak GPS/Glonass v5
Teksus	Teksus Mayak	Teksus Mayak
Telcom	Patrol Scan V5	Patrol Scan V5
Telcom	Patrol Scan V6	Patrol Scan V6
Telemetricheskie sistemy	TMS Online	TMS Online
Telic	Telic Picotrack	Telic Picotrack
Telic	Telic SBC-AVL	Telic SBC-AVL
Telitek Wireless	GMS50T-HS	GMS50T-HS
Teltonika	Teltonika AT1000	Teltonika AT1000

Manufacturer	Device	Device type in Wialon
Teltonika	Teltonika AT2000	Teltonika AT2000
Teltonika	Teltonika FM1000	Teltonika FM1000
Teltonika	Teltonika FM1010	Teltonika FM1010
Teltonika	Teltonika FM1100	Teltonika FM1100
Teltonika	Teltonika FM1110	Teltonika FM1110
Teltonika	Teltonika FM1120	Teltonika FM1120
Teltonika	Teltonika FM1122	Teltonika FM1122
Teltonika	Teltonika FM1125	Teltonika FM1125
Teltonika	Teltonika FM1200	Teltonika FM1200
Teltonika	Teltonika FM1202	Teltonika FM1202
Teltonika	Teltonika FM1204	Teltonika FM1204
Teltonika	Teltonika FM2200	Teltonika FM2200
Teltonika	Teltonika FM3001	Teltonika FM3001
Teltonika	Teltonika FM3101	Teltonika FM3101
Teltonika	Teltonika FM3200	Teltonika FM3200

Manufacturer	Device	Device type in Wialon
Teltonika	Teltonika FM3300	Teltonika FM3300
Teltonika	Teltonika FM3400	Teltonika FM3400
Teltonika	Teltonika FM3600	Teltonika FM3600
Teltonika	Teltonika FM3612	Teltonika FM3612
Teltonika	Teltonika FM3620	Teltonika FM3620
Teltonika	Teltonika FM3622	Teltonika FM3622
Teltonika	Teltonika FM36M1	Teltonika FM36M1
Teltonika	Teltonika FM4100	Teltonika FM4100
Teltonika	Teltonika FM4200	Teltonika FM4200
Teltonika	Teltonika FM5300	Teltonika FM5300
Teltonika	Teltonika FM5500	Teltonika FM5500
Teltonika	Teltonika FM6300	Teltonika FM6300
Teltonika	Teltonika FM6320	Teltonika FM6320
Teltonika	Teltonika FMA110	Teltonika FMA110
Teltonika	Teltonika FMA120	Teltonika FMA120

Manufacturer	Device	Device type in Wialon
Teltonika	Teltonika FMA202	Teltonika FMA202
Teltonika	Teltonika FMA204	Teltonika FMA204
Teltonika	Teltonika FMB001	Teltonika FMB001
Teltonika	Teltonika FMB002	Teltonika FMB002
Teltonika	Teltonika FMB003	Teltonika FMB003
Teltonika	Teltonika FMB010	Teltonika FMB010
Teltonika	Teltonika FMB020	Teltonika FMB020
Teltonika	Teltonika FMB110	Teltonika FMB110
Teltonika	Teltonika FMB120	Teltonika FMB120
Teltonika	Teltonika FMB122	Teltonika FMB122
Teltonika	Teltonika FMB125	Teltonika FMB125
Teltonika	Teltonika FMB130	Teltonika FMB130
Teltonika	Teltonika FMB140	Teltonika FMB140
Teltonika	Teltonika FMB202	Teltonika FMB202
Teltonika	Teltonika FMB204	Teltonika FMB204

Manufacturer	Device	Device type in Wialon
Teltonika	Teltonika FMB207	Teltonika FMB207
Teltonika	Teltonika FMB630	Teltonika FMB630
Teltonika	Teltonika FMB640	Teltonika FMB640
Teltonika	Teltonika FMB900	Teltonika FMB900
Teltonika	Teltonika FMB920	Teltonika FMB920
Teltonika	Teltonika FMB962	Teltonika FMB962
Teltonika	Teltonika FMB964	Teltonika FMB964
Teltonika	Teltonika FMC001	Teltonika FMC001
Teltonika	Teltonika FMC125	Teltonika FMC125
Teltonika	Teltonika FMC130	Teltonika FMC130
Teltonika	Teltonika FMC640	Teltonika FMC640
Teltonika	Teltonika FMM001	Teltonika FMM001
Teltonika	Teltonika FMM125	Teltonika FMM125
Teltonika	Teltonika FMM130	Teltonika FMM130
Teltonika	Teltonika FMM640	Teltonika FMM640

Manufacturer	Device	Device type in Wialon
Teltonika	Teltonika FMP100	Teltonika FMP100
Teltonika	Teltonika FMT100	Teltonika FMT100
Teltonika	Teltonika FMU125	Teltonika FMU125
Teltonika	Teltonika FMU130	Teltonika FMU130
Teltonika	Teltonika GH1201	Teltonika GH1201
Teltonika	Teltonika GH3000	Teltonika GH3000
Teltonika	Teltonika GH4000	Teltonika GH4000
Teltonika	Teltonika GH5200	Teltonika GH5200
Teltonika	Teltonika MH2000	Teltonika MH2000
Teltonika	Teltonika MSP500	Teltonika MSP500
Teltonika	Teltonika MTB100	Teltonika MTB100
Teltonika	Teltonika RUT240	Teltonika RUT240
Teltonika	Teltonika RUT850	Teltonika RUT850
Teltonika	Teltonika RUT955	Teltonika RUT955
Teltonika	Teltonika RUTX11	Teltonika RUTX11

Manufacturer	Device	Device type in Wialon
Teltonika	Teltonika TAT100	Teltonika TAT100
Teltonika	Teltonika TFT100	Teltonika TFT100
Teltonika	Teltonika TMT250	Teltonika TMT250
Teltonika	Teltonika TRB245	Teltonika TRB245
Teltonika	Teltonika TST100	Teltonika TST100
TENET	DCAM001 4G Dashcam	DCAM001 4G Dashcam
TENET	T504 4CH-SD-DVR	T504 4CH-SD-DVR
TENET	T704 4CH-HD-DVR	T704 4CH-HD-DVR
TENET	T708 8CH-HD-DVR	T708 8CH-HD-DVR
TENET	TAG 7100 Media	TAG 7100 Media
Testmaster	TM32	TM32
Teswell	Teswell	Teswell
Tetron	Tetron-Smart	tetron_smart
Thingsys	TS-P1	TS-P1
Thingsys	TS-Serial	TS-Serial

Manufacturer	Device	Device type in Wialon
Think Power	Think Power TE103	Think Power TE103
ThinkRace	VT200	VT200
TK Systems	NS01 Control	NS01 Control
Tobe GPS	TOBE Etrack	TOBE Etrack
Tongya Telecom	Tongya TYN-885	Tongya TYN-885
Tongya Telecom	Tongya TYN-886	Tongya TYN-886
TOPFLYTECH Co., Limited	Topflytech T8608D	Topflytech T8608D
TOPFLYTECH Co., Limited	Topflytech T8608	Topflytech T8608
TOPFLYTECH Co., Limited	Topflytech T8803+E	Topflytech T8803+E
TOPFLYTECH Co., Limited	Topflytech T8803 PRO	Topflytech T8803 PRO
TOPFLYTECH Co., Limited	Topflytech T8803	Topflytech T8803
TOPFLYTECH Co., Limited	Topflytech T8803+	Topflytech T8803+
TOPFLYTECH Co., Limited	Topflytech T8806+R	Topflytech T8806+R
TOPFLYTECH Co., Limited	Topflytech T8806	Topflytech T8806
TOPFLYTECH Co., Limited	Topflytech T8808+	Topflytech T8808+

Manufacturer	Device	Device type in Wialon
TOPFLYTECH Co., Limited	Topflytech TLD1-A/E	Topflytech TLD1-A/E
TOPFLYTECH Co., Limited	Topflytech TLD1-DA/DE	Topflytech TLD1-DA/DE
TOPFLYTECH Co., Limited	Topflytech TLP1-LF	Topflytech TLP1-LF
TOPFLYTECH Co., Limited	Topflytech TLP1-LM	Topflytech TLP1-LM
TOPFLYTECH Co., Limited	Topflytech TLP1-P	Topflytech TLP1-P
TOPFLYTECH Co., Limited	Topflytech TLP1-SF	Topflytech TLP1-SF
TOPFLYTECH Co., Limited	Topflytech TLP1-SM	Topflytech TLP1-SM
TOPFLYTECH Co., Limited	Topflytech TLP1	Topflytech TLP1
TOPFLYTECH Co., Limited	TopflyTech TLP2-SFB	TopflyTech TLP2-SFB
TOPFLYTECH Co., Limited	Topflytech TLW1-10A/E	Topflytech TLW1-10A/E
TOPFLYTECH Co., Limited	Topflytech TLW1-4A/E	Topflytech TLW1-4A/E
TOPFLYTECH Co., Limited	Topflytech TLW1-8A/E	Topflytech TLW1-8A/E
TOPFLYTECH Co., Limited	Topflytech TLW2-12B	Topflytech TLW2-12B
Topin	Topin 365GPS	Topin 365GPS
Toplovo	TL-202	TL-202

Manufacturer	Device	Device type in Wialon
Toplovo	TL-601	TL-601
Top Peak Electronics	Top Peak GPS105	Top Peak GPS105
TopPlan	Topplan GPS Box	Topplan GPS Box
Topshine Information Technic Co., Limited	MT01	MT01
Toptraking	TP-07S	TP-07S
Toptraking	TP-200 Pet GPS Tracker	TP-200 Pet GPS Tracker
Totarget	ToTarget GPS-ELOCK	ToTarget GPS-ELOCK
Totem Tech	Totem Tech - AT05	Totem Tech - AT05
Totem Tech	Totem Tech - AT06	Totem Tech - AT06
Totem Tech	Totem Tech - AT07 3G	Totem Tech - AT07 3G
Totem Tech	Totem Tech - AT07	Totem Tech - AT07
Totem Tech	Totem Tech - AT09	Totem Tech - AT09
Totem Tech	Totemtek AT08	Totemtek AT08
Traccar	Traccar Client	Traccar Client
Tracesolutions	PTMU01	PTMU01

Manufacturer	Device	Device type in Wialon
Tracesolutions	Quatro4	Quatro4
Trackimo	Trackimo 3G Travel	Trackimo 3G Travel
Trackimo	Trackimo Guardian	Trackimo Guardian
Trackimo	Trackimo Mini	Trackimo Mini
Trackimo	Trackimo TrackiPro	Trackimo TrackiPro
Trackimo	Trackimo Universal	Trackimo Universal
TRACKnTAG	TAG II	TAG II
TRACKnTAG	TAG SOAR	TAG SOAR
TRACKnTAG	TAG SOLO	TAG SOLO
TRACKnTAG	TAG TRAX	TAG TRAX
TrackPro	TrackPro TR140	TrackPro TR140
Traclogis	Traclogis TL700	Traclogis TL700
TradeKey	AVT-2000	AVT-2000
Trakkcor	Trakkcor	Trakkcor
Trakm8	Solo	Solo

Manufacturer	Device	Device type in Wialon
Tramigo	Tramigo T23	Tramigo T23
Transcode Group	TG-201	TG-201
Transcode Group	TG-302	TG-302
Transcode Group	TG-88HD	TG-88HD
Transkom	Transcom T-12	Transcom T-12
Transkom	Transcom T-15	Transcom T-15
Transkom	Transcom V-12	Transcom V-12
Translion	Vector GPS-02	Vector GPS-02
Trans Satellite	Skif-navigator ART15	Skif-navigator ART15
TranSync	TranSync 140	TranSync 140
Trikdis	Trikdis G09	Trikdis G09
Triks Telekom	AS3.X	AS3.X
Trio Mobil	Trio Mobil ODC	Trio Mobil ODC
Trio Mobil	Trio Mobil P55	Trio Mobil P55
Trio Mobil	Trio Mobil P65	Trio Mobil P65

Manufacturer	Device	Device type in Wialon
Trivi	TRIVI-08L	TRIVI-08L
Trivi	TRIVI-V5	TRIVI-V5
Trusted	Trusted T7	Trusted T7
TS Automatica	TS Glonass	TS Glonass
Turnkey Trading	TAG 7100	TAG 7100
Twig	TWIG Protector	TWIG Protector
T-Zone	TZ-AVL02	TZ-AVL02
T-Zone	TZ-AVL03	TZ-AVL03
T-Zone	TZ-AVL05-3G	TZ-AVL05-3G
T-Zone	TZ-AVL05	TZ-AVL05
T-Zone	TZ-AVL08	TZ-AVL08
T-Zone	TZ-AVL11	TZ-AVL11
T-Zone	TZ-AVL19	TZ-AVL19
T-Zone	TZ-AVL201	TZ-AVL201
T-Zone	TZ-GT01	TZ-GT01

Manufacturer	Device	Device type in Wialon
T-Zone	TZ-LoRa Gateway	TZ-LoRa Gateway
T-Zone	TZ-RD05	TZ-RD05
T-Zone	TZ-TT11	TZ-TT11
T-Zone	TZ-TT18	TZ-TT18
U-Drive Technology	U-drive	U-drive
Uglos Tec	Netvisor 11	Netvisor 11
Ukrainskie Mobilnye Tehnologii	SmartBox	SmartBox
Ulbotech	Ulbotech T356	Ulbotech T356
Ulbotech	Ulbotech T361	Ulbotech T361
Ulbotech	Ulbotech T371	Ulbotech T371
Ulbotech	Ulbotech T373B	Ulbotech T373B
Ulbotech	Ulbotech T381	Ulbotech T381
Uni Box Devices	CMT-02	CMT-02
Uni Box Devices	Uni Box Devices CMT-04	Uni Box CMT-04
Uniguard Technology	Uniguardgps UT01	Uniguardgps UT01

Manufacturer	Device	Device type in Wialon
Uniguard Technology	Uniguard UM02	Uniguard UM02
Uniguard Technology	Uniguard UT04	Uniguard UT04
Unireach Technology	Unireach UC005	Unireach UC005
Vacron	Vacron MDVR	Vacron MDVR
Vanago	Juk-2M	Juk-2M
Vanguard Communications	VANGUARD AIS-140	VANGUARD AIS-140
VDO-Mettem	ACK	ACK
Vega-Absolut	VEGA BMK	VEGA BMK
Vega-Absolut	Vega EGTS	Vega EGTS
Vega-Absolut	Vega MT X CAN	Vega MT X CAN
Venbest	Venmax GL320	Venmax GL320
VIC-Zone	VIC-ZONE T300	VIC-ZONE T300
VIC-Zone	VIC-ZONE T30	VIC-ZONE T30
Viloc	Viloc OEM Tag	Viloc OEM Tag
Visfresh	VisFresh	VisFresh

Manufacturer	Device	Device type in Wialon
Visicom	Visicom Navigator	Visicom Navigator
VISIONTEK	8708VTU	8708VTU
Vizor	Vizor-01	Vizor-01
Vjoy Car Electronics Limited	Vjoycar T0024	Vjoycar T0024
Vjoy Car Electronics Limited	Vjoycar T12	Vjoycar T12
Vjoy Car Electronics Limited	Vjoycar T19	Vjoycar T19
Vjoy Car Electronics Limited	VJOYCar TK05	VJOYCar TK05
Vjoy Car Electronics Limited	Vjoycar TK20G	Vjoycar TK20G
Wabco	TMD210	TMD210
WanWayTech	WanWay S20	WanWay S20
Watret Technology	Watret C13	Watret C13
Waylens	Waylens Secure360	Waylens Secure360
Wialon Consulting	Wiatrack Pro	Wiatrack Pro
Wialon Consulting	Wiatrack	Wiatrack
Wialon-Service	Gepard	Gepard

Manufacturer	Device	Device type in Wialon
Winwill World	GP106M	GP106M
Wireless Links	Piccolo ST	Piccolo ST
WISOL	Wisol ihere	Wisol ihere
WMCS	WMCS AM120	WMCS AM120
Wonde Proud Technology	Wonde Proud M7	Wonde Proud M7
Wonde Proud Technology	Wonde Proud OT10 Lite	Wonde Proud OT10 Lite
Wonde Proud Technology	Wonde Proud SPT-100	Wonde Proud SPT-100
Wonde Proud Technology	Wonde Proud SPT-10	Wonde Proud SPT-10
Wonde Proud Technology	Wonde Proud VT-10	Wonde Proud VT-10
Wonde Proud Technology	Wonde Proud VT200	Wonde Proud VT200
Wonde Proud Technology	Wonde Proud VT300	Wonde Proud VT300
Wonde Proud Technology	Wonde Proud VT350	Wonde Proud VT350
Wonlex	Wonlex EW100	Wonlex EW100
Wonlex	Wonlex mini tracker S04	Wonlex mini tracker S04
Wonlex	Wonlex Waterproof kids watch	Wonlex Waterproof kids watch

Manufacturer	Device	Device type in Wialon
X3Tech	NT20	NT20
Xact Technology	Xact Trax	Xact Trax
XE Electronic Technology	Xeelectech LK106	Xeelectech LK106
XE Electronic Technology	Xeelectech LK109	Xeelectech LK109
XE Electronic Technology	Xeelectech LK206	Xeelectech LK206
XE Electronic Technology	Xeelectech LK210	Xeelectech LK210
XE Electronic Technology	Xeelectech LK330	Xeelectech LK330
XE Electronic Technology	Xeelectech XE103	Xeelectech XE103
XE Electronic Technology	Xeelectech XE120	Xeelectech XE120
XE Electronic Technology	Xeelectech XE201	Xeelectech XE201
XE Electronic Technology	Xeelectech XE209A	Xeelectech XE209A
XE Electronic Technology	Xeelectech XE209B	Xeelectech XE209B
XE Electronic Technology	Xeelectech XE209C	Xeelectech XE209C
XE Electronic Technology	Xeelectech XE710	Xeelectech XE710
XE Electronic Technology	Xeelectech XE800	Xeelectech XE800

Manufacturer	Device	Device type in Wialon
Xexun	DDX-02	DDX-02
Xexun	Xexun TK102-2	Xexun TK102-2
Xexun	Xexun TK-102	Xexun TK-102
Xexun	Xexun TK103-2	Xexun TK103-2
Xexun	Xexun TK-103	Xexun TK-103
Xexun	XT-008	XT-008
Xiamen Yaxon Network	YB-M100	YB-M100
Xirgo Global	Xirgo FMS500 Light+	Xirgo FMS500 Light+
Xirgo Global	Xirgo FMS500 Light	Xirgo FMS500 Light
Xirgo Global	Xirgo FMS500 ONE	Xirgo FMS500 ONE
Xirgo Global	Xirgo FMS500 StCAN	Xirgo FMS500 StCAN
Xirgo Global	Xirgo FMS500 TACHO	Xirgo FMS500 TACHO
Xirgo Global	Xirgo XT-2000	Xirgo XT-2000
Xirgo Global	Xirgo XT-2050	Xirgo XT-2050
Xirgo Global	Xirgo XT-2060	Xirgo XT-2060

Manufacturer	Device	Device type in Wialon
Xirgo Global	Xirgo XT-2150	Xirgo XT-2150
Xirgo Global	Xirgo XT-2169	Xirgo XT-2169
Xirgo Global	Xirgo XT-2460	Xirgo XT-2460
Xirgo Global	Xirgo XT-2469 (CoAP)	Xirgo XT-2469 (CoAP)
Xirgo Global	Xirgo XT-2469	Xirgo XT-2469
Xirgo Global	Xirgo XT3630 (SigFox)	Xirgo XT3630 (SigFox)
Xirgo Global	Xirgo XT-4000	Xirgo XT-4000
Xirgo Global	Xirgo XT-4569	Xirgo XT-4569
Xirgo Global	Xirgo XT-4750	Xirgo XT-4750
Xirgo Global	Xirgo-xt4760	Xirgo-xt4760
Xirgo Global	Xirgo XT-4800	Xirgo XT-4800
Xirgo Global	Xirgo-XT6300	Xirgo-XT6300
X-track	Pet Tracker	Pet Tracker
Yuangeng	Cainson-CN110ZS	Cainson-CN110ZS
YuLongDa Technology	YuLongDa GT06	YuLongDa GT06

Manufacturer	Device	Device type in Wialon
YuLongDa Technology	YuLongDa HY	YuLongDa HY
Yuwei	Yuwei YW-3000c	Yuwei YW-3000c
Zenda	ZD-VT1	ZD-VT1
Zenda	ZD-VT2	ZD-VT2
Zero One Technology	Navizot F2	Navizot F2
Zero One Technology	Navizot F3	Navizot F3
ZGPAX	PG88	PG88
Вест-Тер	Pilot-D	Pilot-D
Группа компаний «АСК»	Android ASK Tracker	Android ASK Tracker
Группа компаний «АСК»	Glonass ASK Tracker	Glonass ASK Tracker
Группа компаний «АСК»	iPhone ASK tracker	iPhone ASK tracker