



User Manual

Galileosky OBD-II



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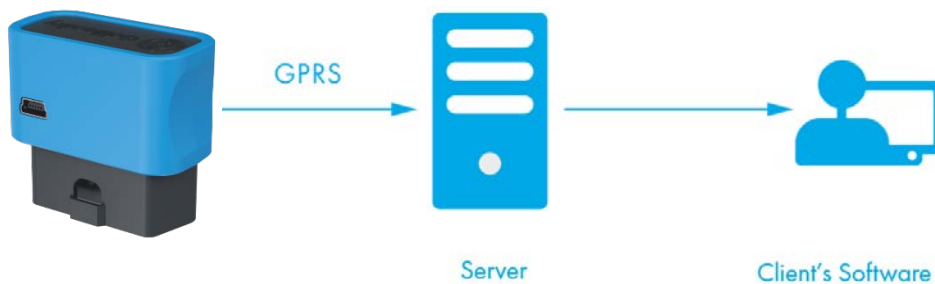
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Introduction

RSA "Galileosky", LLC produces satellite monitoring equipment (hereinafter – tracking devices, trackers) for GPS and GLONASS real time vehicles monitoring. The tracking devices determine the mobile object location recording the time and route as points with geographical coordinates and send the data to the server to be further processed and sent to the traffic controller panel.

In addition, a number of other vehicle parameters are recorded: the state of analog and discrete inputs of the tracker and the state of digital interfaces.

The tracking devices can be used in any vehicle.



Information is sent to the server by means of GPRS and then via the Internet to the operator panel.

To prevent the data from disappearing when there is no GSM signal, each Galileosky tracker has an internal nonvolatile FLASH memory. The tracker also has a built-in battery, which allows operation for 1 hour.

The tracking device provides the following opportunities:

- ✓ vehicles monitoring in real time;
- ✓ a detailed turn by turn track (without any extra points in a straight track);
- ✓ GSM enabled remote software update;
- ✓ continuous troubleshooting of the tracking device through the USB port;
- ✓ adjusting the tracker through SMS, GPRS, USB;
- ✓ and others (see sections [Operation of the Tracker's Units](#) and [Connecting external peripheral](#)).

In addition, the company provides warranty service and technical support on the site www.galileosky.com.

Before starting the work, study the instruction carefully.

Galileosky tracker receives a signal about its location from GPS, GLONASS satellites and processes input and output data

Package

The standard package includes Galileosky tracker, SIM-holder, passport, a certificate of equipping a vehicle with GLONASS/GPS devices. Everything extra should be purchased separately.

You will also need:

USB-cable	1
Power supply unit 9-39V (15 W)	1

Power supply unit is necessary for starting the GSM and GPS modules.

Technical Specifications

Parameter	Characteristics
Battery type	Li-Ion battery; 100 mAh
Average power consumption	0,48 W
ADC resolution in bits	16
CANBUS	J1939, FMS, J1979, OBD II, 29-bit and 11-bit identifiers
USB 2.0	Mini-USB, tracker setting, troubleshooting, reflashing, power supply
Accelerometer	built-in
GLONASS/GPS receiver	Sensitivity – 161 dBm Cold start 25 s; Hot start 1 s
Coordinates determination accuracy, 95% of time, not worse	5 m
SIM-card type, pcs	Nano-SIM, 2
Opportunity of installing SIM-microchip	Yes, instead of the second SIM-card
GSM modem	GSM 850/900/1800/1900, GPRS class 12
Archive capacity	up to 400 000 points
Increase of functional capabilities	yes, by means of algorithms stored and run at the device with no interference into manufactory firmware code (Easy Logic)
Protocol of data transmission	1. Galileosky: variable length-tag. 2. EGTS (GOST R 54619-2011, Order № 285 of the RF Ministry of Transportation)
GLONASS/GPS aerial	internal
GSM aerial	internal

Physical Specifications

Operating temperature range	-40...+45 °C
Storage temperature	-40...+45 °C
Relative humidity	0...90% (0...35 °C); 0...70% (35...55 °C)
Performance (height above the sea level)	0-2000 м
Storage	0-10000 м
Continuous operation form battery	depends on the tracker settings, 8hrs on average
Operating power supply	9-39V; is protected against voltage jumps in the vehicle power supply
Allowable voltage, continuously applied to power input, that does not let the tracker fail	-900...+200 V
Dimension	50,0 mm x 48,0 mm x 25,0 mm
Weight	35 g
Body material	plastic
Warranty	1 year since the purchase date;
Average service life	10 years
Internal Li-Ion battery life	500 charge/discharge cycles, three years maximum

Safe Operating Rules

Before using the tracker, study the instructions of GSM/GPRS devices safe operating.

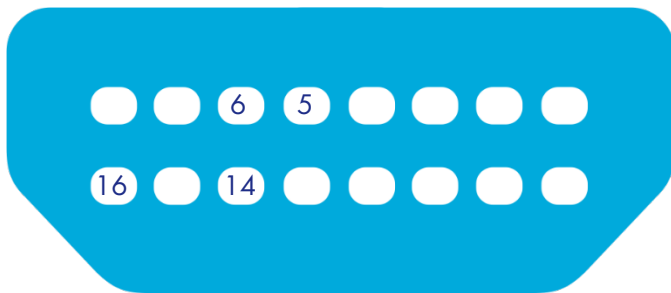
Make sure the polarity is correct when connecting to the power supply.

ATTENTION! To avoid failure:

- Make sure the contacts are connected correctly!
- Unused contacts must be well insulated!

Extra batteries are provided only in Galileosky service center. We strongly advice users NOT to change batteries on their own!

Contacts Description



Contact	Description
5 – GND	Negative supply voltage
6 – CAN_H	CAN_H contact of CAN interface
14 – CAN_L	CAN_L contact of CAN interface
16 – VCC	Positive supply voltage

Connection

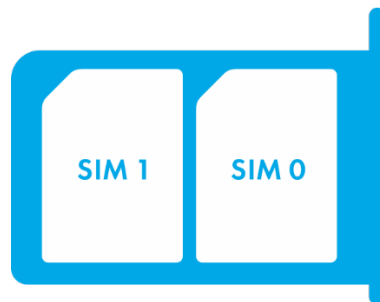
2

Inserting a SIM-card

Use a SIM-card with activated GPRS and SMS services.

Insert the card carefully without applying excessive force.

To eject a SIM-card press the hole in a SIM-holder with a needle, the holder will be ejected automatically.



SIM-card location in the holder.

Connecting Power Supply to the Device

Voltage should be supplied according to the scheme of contacts presented in section [Contacts description](#)).

When connecting the tracker to PC via mini-USB cable, voltage is supplied, but the battery is not charged and GPRS/GSM module is not activated.

LED indicators

Red LED is on when the power unit is connected to the tracking device.

Green LED shows the GLONASS/GPS unit status.

Blinking frequency, times	Description
3	GLONASS/GPS unit is not found or is at the initialization stage
2	GLONASS/GPS unit is found but correct coordinates are absent
1	GLONASS/GPS unit works properly, coordinates are found and updated once a second

Blue LED shows the GSM-unit status.

Blinking frequency, times	Description
4	GSM-unit is off
3	GSM-unit is at the initialization stage
2	GSM-unit is found, GPRS-session is activated
1	GSM-unit works properly, server is connected

Connecting to PC

In order to connect the tracking device to PC, use USB A – Mini-USB B.

Operation of the Tracker's Units

Determination of Strike and Incline

All devices can determine the tracker's strike and incline.



Accelerometer axis directions:

To determine strike:

- Install the tracker so as one of the accelerometer axes looks vertically, it will exclude false detections on road bumps;
- Turn on strike and incline determination by SHOCK command (section [Track parameters setting](#)). For example, if Z axis is vertical: SHOCK 3,90,5,1200.

A strike is an acceleration increase in horizontal plane; the correspondent bit is put in the Device state field and strike coordinates are recorded.

ATTENTION! Strike determination is possible only when the tracker is fixed to OBD connector in such a position that one of the axes is vertical to the ground.

To determine incline:

1. Install the tracking device in a vehicle;
2. By SHOCK command set maximum allowable incline angle and allowable time of this angle exceeding. For example, a maximum angle is 20°, allowable exceed time is 5 seconds; SHOCK 3,20,5,1200.

On the tracker homing position change in a vehicle, SHOCK command should be given to adopt the tracker to a new position.

Economical Driving "EcoDrive" and Determination of the Driving Style

The tracking device can detect rapid acceleration, braking, harsh turns and strikes on bumps. For correct operation of this function, the tracker must detect its orientation in space with respect to the vehicle (the direction to the ground).



The default orientation of the tracker

If the tracking device cannot be installed as illustrated in the picture, user-defined installation may be performed with the subsequent calibration of orientation.

To determine the position of the tracking device in respect to the vehicle, perform the following steps:

1. install the tracker to ensure its rigid link with the vehicle's body;
2. ensure the horizontal position of the vehicle;
3. execute the shock 0 command, which determines the direction of the tracker to the ground.

Data on the driving style can be sent using the mainpackbit 174,1 command.

Monitoring Data Transmission

Tracking device allows specifying the list of preferred GSM-networks. The main priority is given to the networks from the beginning of the list. Each network is specified with country's code and network operator's code. Tracking device supports up to 30 networks (OPSO command, section [Data transmission settings](#)). If it is impossible to connect to one of the preferred networks, the tracker connects to any network but does not establish connection to the server, thus, voice communication and SMS will be available according to a service plan of the installed SIM-card.

The tracker allows data transmission to the main and backup monitoring servers. The tracking device accounts transmitted data separately for each server, thus, both will receive full archive with the track.

Data can be transmitted according to the Galileosky or EGTS protocol (Protocol command, section [Data transmission settings](#)).

By using the EGTS protocol the tracker's number parameter (ID command, section [Data transmission settings](#)) specifies the object number by the authentication.

By using the Galileosky protocol transmitted data can be coded; XTEA3 algorithm (<http://tomstdenis.tripod.com/xtea.pdf>) is used for coding. Commands, responses and photos are not coded. The data are archived in the internal flash-memory by default. During long periods without connection the oldest records of the internal flash-memory may be erased by the new ones.

Internal Archive Structure

The data archive is stored on the internal flash memory.

The tracker stores the data from all the inputs and interfaces, even when they have no connected sensors, in the internal flash memory archive.

It is possible to choose the order in which points are sent to the server.

By default, the data are saved in the depth of the data store, i.e. current data are saved before older data. Transfer in chronological order can be set by FLASHARCHIVE command. After changing the direction of memorizing data, the flash memory will be formatted, and all previously stored data will be lost.

Operation with SIM-microchip

The tracking device has a slot for a SIM-card and a place for SIM-microchip sealing. Only SIM-card or SIM-microchip can be active and support the registration in GSM-network at the same time. When the SIM-chip is installed, the second slot for SIM-cards (SIM1) becomes inactive. APN can be set for SIM-card and SIM-microchip. The tracker supports the following algorithm of SIM-card operation:

1. Only SIM0 card is always active.

2. Automatic switching to SIM-microchip or SIM1, if the data cannot be sent to the server within 9 minutes. Switching occurs in cycles, i.e. first SIM0 is used, then SIM1 or SIM-microchip and after that SIM0 again.
3. Switching between the SIM-cards and SIM-microchip according to the list of preferred GSM-networks. If the tracking device detects the availability of one of the specified GSM-networks, it switches to the corresponding SIM-card or SIM-microchip. If both networks specified for a SIM-card and SIM-microchip are available at the same time, the preference will be given to SIM0.
4. Always only SIM1 or SIM-microchip is activated.

The second algorithm is always used for remote firmware updating; the tracker attempts to get the connection to the server with firmware via SIM 0, and if it fails – via SIM1 or SIM-microchip.

GPRS Traffic Costs Optimization

GPRS-traffic costs decrease by online monitoring may be reached by following these steps:

1. Turn off the transmission of unused data, for example, acceleration. It can be made in the Configurator on Settings/Protocol tab or by MainPack and HeadPack commands (section [Server exchange protocol settings](#)).
2. Increase points record period. It can be made in the Configurator on Settings/Track tab or by WrPeriod command (section [Track parameters settings](#)).
3. Increase turning angle at which the device records a point, and distance at exceed of which the point is recorded. It can be made in the Configurator on Settings/Tracks tab or by Turning command (section [Track parameters settings](#)).
4. Find out the time of disconnection because of the tracker inactiveness from the server software developers. This parameter should be taken into account by points' record period setting otherwise the traffic will increase because of costs for restoring connection to the server. Example: points' record period at a stop is 1200 seconds (20 minutes), the server disconnection because of the tracker inactiveness is 180 seconds (3 minutes). The tracking device determines that a vehicle has stopped and switches on a timer for the next point record in 20 minutes, in 3 minutes the server disconnects as it hasn't received the data from the tracking device. The tracking device tries to reconnect the server at once. It happens 6 times, and only in 20 minutes the tracker sends the next point. As a result, traffic costs considerably exceed savings from points record interval increase.
5. Set filtering of coordinates at a stop so as the tracking device can correctly choose points' record period. The tracker can determine a stop according to several elements:
 - accelerometer data (AccSens command, section [Track parameters setting](#));
 - external supply voltage (MHours command, section [Track parameters setting](#));
 - ignition sensor indications (Ignition command, section [Track parameters setting](#)).

Remote Configuration

Remote configuration can be performed through several data transfer channels:

1. SMS. The tracking device has a list of 4 authorized phone numbers, the messages from which are treated as configuration commands. The available commands are described in the section [Settings for SMS control](#). A phone number can be added to the list of authorized numbers either through the Configurator, or by sending a message with AddPhone command (section [Settings for SMS control](#)).
2. GPRS. Commands can be sent from the monitoring data processing server. The format of the commands is described in the section [Galileosky protocol data](#).
3. GPRS. Commands can be sent via the Configurator and the remote configuration server of RSA "Galileosky", LLC. In this case, the tracking device supports two parallel connections: the first – with the monitoring data processing server, and the second – with the remote configuration server. Remote configuration can be enabled using RemoteConfig 1 command (section [Service commands](#)). It is possible to send commands to the tracking device, to receive current information from the sensors connected and to receive diagnostic messages, when working with the remote configuration server. Using the Configurator, it is possible to create a command pack to configure the tracker and to save it on the server. These commands will be sent to the tracker when it establishes the connection to the server.

Connecting External Peripheral

CAN-interface

The tracker allows extracting information from the CAN-bus.

The following protocols are supported:

- J1939 (FMS). According to this protocol, the tracking device is not a device transmitting to CAN-bus, the device does not change vehicle operation, it also does not send confirmations to vehicle units packets and there is no electrical noise in the CAN-bus. In some cases, by connection to the troubleshooting socket for correct reading of information from the bus it is necessary to send confirmations to vehicle units packets, for this give ActiveCAN 1 command to the tracker (section [CAN settings](#)).
- J1979 (OBD II). This protocol works according to the question-answer mode, consequently, the tracker issues requests to the CAN-bus.

Available performance modes:

J1939_SCANNER – the bus scanner sending bus reports to the configurator.

FMS – a standard FMS protocol filter. (see www.bus-fms-standard.com).

J1939_USER_29bit – a configurable user filter. Identifier length is 29 bits.

J1939_USER_11bit – a configurable user filter. Identifier length is 11 bits.

J19379_SCANNER – the bus scanner defining bus speed and identifier capacity.

J1979_29bit – a standard J1979 protocol filter for 29 bits identifiers.

J1979_11bit – a standard J1979 protocol filter for 11 bits identifiers.

J1979_CHECK_PIDS – search of 11 and 29-bit identifiers J1979 protocol responded to requests.

J1939_SCANNER Mode

This mode is intended to study CAN-bus reports, according to J1939 protocol.

Bit rates from 10000 bit/s up to 500000 bit/s (typical values: 62500, 12500, 250000, 500000) are supported.

11- and 29-bit identifiers are supported.

The scanning mode works as follows:

- 1.The **CAN. Start scan.** message is displayed;
- 2.The CAN-bus reports are displayed with a delay indicated by the CAN Regime command. (section [CAN settings](#)).

29bit identifiers are displayed in the following format:

ID= 00000009 (8) 06 07 08 09 00 CC DD EE

Where:

ID - is a 29bit message identifier;

(8) - is the number of received bus bytes.

06 07 08 09 00 CC DD FF - is an 8byte message. (The lower byte is on the left, the higher byte is on the right),

11 bit identifiers are displayed as

ID=009 (8) 06 07 08 09 00 CC DD EE

Where:

ID - is an 11 bit message identifier;

(8) - is the number of received bus bytes;

06 07 08 09 00 CC DD EE is an 8byte message. (The lower byte on the left, the higher byte on the right).

3.After all the identifiers have been displayed, you can see the **CAN. End scan** message.
To enable this mode:

- 1) connect the tracker to the vehicle CAN-interface;
- 2) in the Configurator on Settings/CAN tab select bus rate and delay time (time of message waiting time);
- 3) click Start Scanning J1939. Received data are displayed in the right panel.

FMS Mode

This mode is activated in all tracking devices by default; it allows retrieving and decoding messages relevant to FMS protocol:

- total fuel consumption: the amount of fuel the vehicle had used since it was made;
- tank fuel level: measured in percent. 0%-empty, 100%- full;
- coolant temperature;
- engine speed;
- total mileage;
- operating hours;
- axis load.

ATTENTION! Many car manufacturers support FMS protocol partially or do not support it at all.

To enable this mode:

- 1) connect the tracker to the vehicle's CAN-interface;
- 2) give the CanRegime 2,250000,2000 command (section [CAN settings](#)) or select FMS filter type in the Configurator on Settings/CAN tab;
- 3) make sure that the device receives bus data and sends them to Device tab in the Configurator;
- 4) set data transmission to the server using the MainPack command (section [Server exchange protocol settings](#)) or in the Configurator on Settings/Protocol tab.

J1939_USER_29bit Mode

This mode enables us to receive 29bit identifiers (ID) messages from the vehicle CAN-bus, according to J1939 protocol.

To enable this mode:

- 1) connect the tracking device to the vehicle's CAN-interface;
- 2) select Custom filter (29bit identifiers) type in the Configurator on Settings/CAN tab, set the bus rate and delay time or give CanRegime command with necessary parameters (section [CAN settings](#));
- 3) set filters for CAN-bus messages.
- 4) set sending of received data to the server with the help of MainPack command (section [Server exchange protocol settings](#)) or in the Configurator on Settings/Protocol tab.

Notes:

- 1) In protocol of the first and the main packet of the tracker there are 1-byte, 2-bytes and 4-bytes tags for this mode operation, i.e. if the necessary ID needs only one byte from all data, better choose 1-byte tag.
- 2) Any of these tags can correspond to the right CAN message ID

ATTENTION! The data should be recorded in the decimal system in the tracking device. The hexadecimal notation is used for convenience only.

Let us consider an example:

The CAN message identifier is ID=Ox18F00300.

We need only the first byte of all the sent content with this ID.

As we need only one byte, we shall choose the tag CAN_R0 as an example.

The command to set the tag is as follows: CAN8BITRO ID,Shift

- 1) The tag number ID=Ox18FEEEOO will look as 419360256 in the decimal system.
 - 2) The byte we need is shifted by one byte, i.e. the second parameter is equal to 1.
- So, we have the following filter settings: CANBITRO 419360256, 1.

Now when this message is passing through the bus, the first effective load byte will automatically be placed to the tag R0 and sent to the server.

These settings are easier to make in the Configurator:

1. Scan the bus;

2. Indicate identifier in the first column;
3. Select the correspondent tag;
4. Visually indicate the shift using a mouse. The number, transmitted to the server, will be displayed in the Value column.

J1939_USER-11bit mode is set similarly.

J1979_SCANNER Mode

This mode is used to define data transfer rate and Identifier length according to J1979 protocol. If the parameters of transfer are known, it is recommended to use the J1979_29bit and J1979_11bit modes, having specified the necessary rate of the bus.

The rate of 250000 bits per second and 500000 bits per second and 11- and 29-bit identifiers are supported.

To enable this mode:

- 1) connect the tracker to the vehicle's CAN-interface;
- 2) press "Scan OBD II". Received data are displayed in the right panel.
- 3) if scanning is finished successfully, data transfer rate and Identifier length will be set automatically.

ATTENTION! Scanning can cause failures in on-board equipment operation. RSA "Galileosky", LLC bears no responsibility for any failures after CAN-bus scanning.

J1979_29bit Mode

This mode allows extracting and decoding the messages with 29-bit identifiers, transferred according to J1979 protocol automatically:

- tank fuel level: measured in percent. 0%-empty, 100%- full;
- coolant temperature;
- engine speed;
- errors codes.

ATTENTION! Many car manufacturers support J1979 partially or do not support it at all.

To enable this mode:

- 1) connect the tracker to the vehicle's CAN-interface;
- 2) give the CanRegime command (section [CAN settings](#)) or select OBD II 29bit filter type in the Configurator on Settings/CAN tab;
- 3) make sure the device receives bus data and sends them to Device tab in the Configurator;
- 4) set the received data transmission to the server using the MainPack command (section [Server exchange protocol settings](#)) or in the Configurator on Settings/Protocol tab.

J1979_11bit mode is set in a similar way.

ATTENTION! If your vehicle doesn't support J1939 protocol, J1979_29bit and J1979_11bit modes operation can cause failures of board equipment operation. RSA "Galileosky", LLC bears no responsibility for failures after activation of these modes.

J1979_USER_29bit Mode

The mode allows to receive messages from a CAN-bus of a vehicle with 29bit identifiers (ID) defined by the user, by J1979 protocol. The setting is similar to the mode J1939_USER_29bit.

Setting of *J1979_USER_11bit* mode is carried out in the same way.

J1979_CHECK_PIDS Mode

The mode allows to search for 11 bit and 29bit identifiers of J1979 protocol automatically. The tracking device sends requests to identifiers in the range 1...255, first to 11bit, then to 29bit in the same range. Identifiers that respond, will be displayed in diagnostics "CAN detailed". After scanning, CAN will be transferred to "CAN disabled" mode.

The order of procedures in this mode:

- 1) Connect the tracker to CAN-interface of a vehicle.
- 2) Send CanRegime command ([CAN settings](#)) with parameter Mode=8. In 5 seconds, the tracking device will start searching for identifiers.
- 3) Go to tab "Troubleshooting" and tick "CAN detailed" parameter to display the process of searching. In case the parameter is not ticked, or you go to another tab while scanning, data will not be saved.
- 4) «CAN mode: J1979. Searching PIDs...» message means that searching has started.
- 5) «CAN mode: J1979. Checking 11bit PIDs ...» message displays the results of search for 11bit identifiers. The tracking device will report on the current scanning process. In case of response by one of the identifiers, the message will be displayed.
- 6) «CAN mode: J1979. Checking 29bit PIDs ...» message displays the results of search for 29bit identifiers. The process is similar to the previous point.
- 7) «CAN mode: J1979. Search is finished» message means that the search is completed. CAN will automatically be transferred to the mode "CAN disabled".

ATTENTION! Many manufacturers of vehicles partially support J1979 protocol or do not support it at all.

ATTENTION! Activation of the mode in the vehicles with no support of J1979 protocol may lead to a failure in operation of onboard equipment. RSA "Galileosky", LLC bears no responsibility for failures after activation of these modes.

Configurator

Configurator is a PC program, which allows:

- configuring the tracker via graphic interface and with the help of commands;
- troubleshooting the tracking device saving the results in a log-file;
- seeing the tracker units state in real time mode;
- downloading monitoring data from the internal memory and a SD card;
- sending the downloaded data to the server;
- specifying areas for autoinformer.

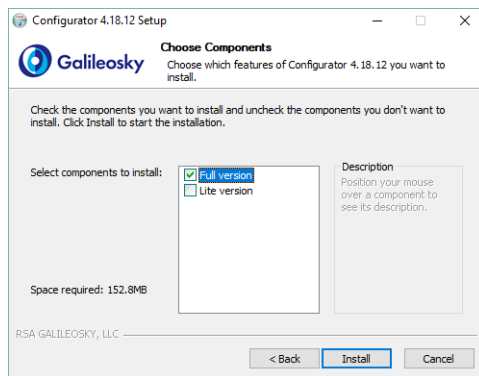
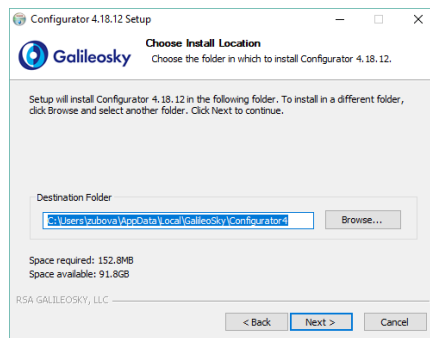
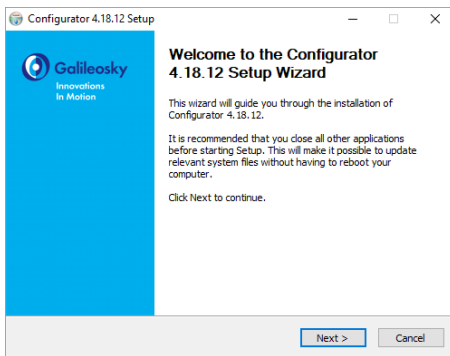
32- and 64-bit OS are supported: Windows 7, Windows 8, Windows 10 and installed ServicePack 1.

ATTENTION! Program installation may require changes of crucial OS elements. Do not let your antivirus program block the installer operation.

Launching the Software

Download the Configurator program from the [site](#) and launch it.

In case of a security system warning, confirm launching the program.



During the installation of the Configurator old drivers will be deleted and new ones will be installed. It is possible to install the major version of the Configurator or a limited one. The latter one allows uploading archive and receiving the current parameters of sensors, but not changing the settings.

Start the Configurator program (from Start menu\Programs\Galileosky\Configurator4).

Connect the tracker to the computer via a USB-cable. After the tracker connection the program loads all the device`s settings parameters automatically. If the program identifies the tracker, all the buttons on the vertical left-hand panel will be active.

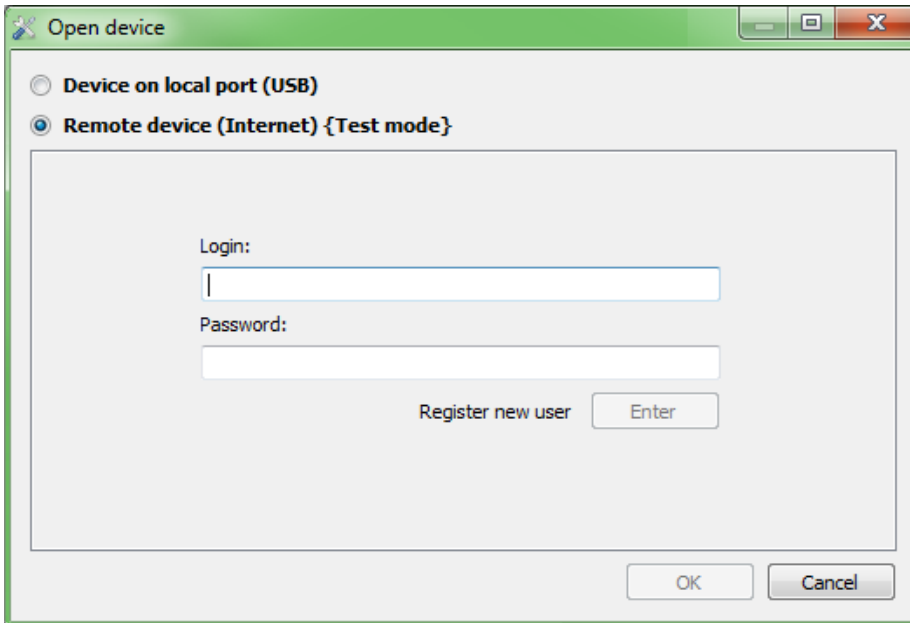
Device tab

The tab displays the information about the tracker state and allows its resetting. Parameter values, which are beyond the limits, wrong coordinates, exceeding of maximum incline angle and responses on inputs are shown in red.

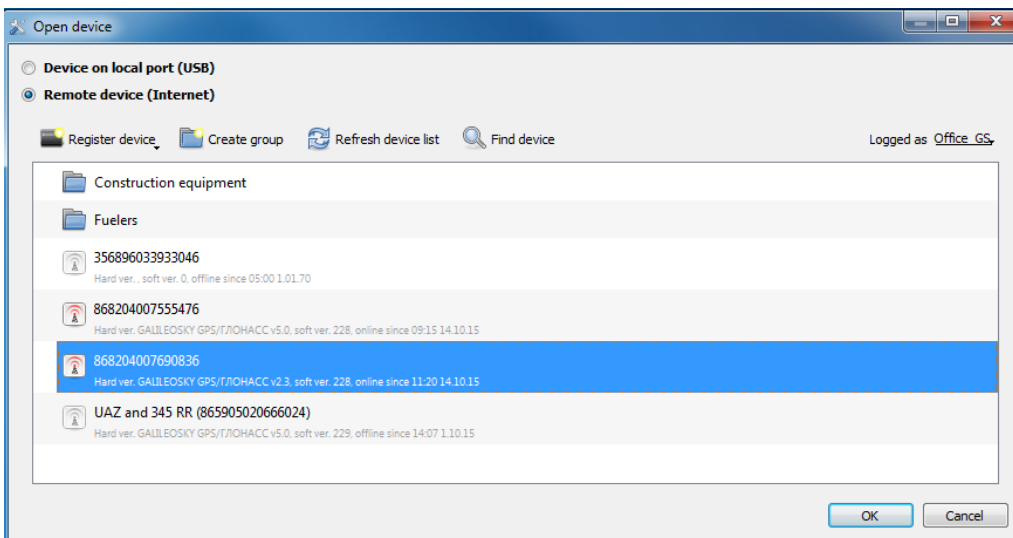
Section	Parameter	Value
Identification data	Device	50
	IMEI	883316143434
	Firmware	21.2
	Type	Galileosky OBD-II
	EasyLogic	not loaded
	Filters	not loaded
Navigation data	Date and time, UTC	21.05.2019 11:02:31
	Latitude	0
	Longitude	0
	Altitude	0
	Speed, km/h	0
	Angle, °	0
	The number of satellites for coordinate calculation	0
GPS odometer, m	GPS odometer, m	0
	Packet ID	12109
	Stealth mode	off
	Mi hours filtration	disabled
	Motion (using accelerometer)	stop
	Analog ins	Input 0
Input 1		
Input 2		
Input 3		
Input 4		
Input 5		
Input 6		
Analog ins2 (service ins)	Vbat, mV	
	Vant, mV	
	Vdc, mV	
	Temperature inside device, °C	
	CAN	
	Fuel consumption, l	
	Fuel level, %	
	Engine coolant temperature, °C	
	Engine speed, rpm	
	Odometer reading, km	
	Button	
	Button1	
	Button2	
	Button state	
Digital ins	Temp. sensor 0	
	Temp. sensor 1	
	Temp. sensor 2	
	Temp. sensor 3	
	Temp. sensor 4	
	Temp. sensor 5	
	Temp. sensor 6	
	Temp. sensor 7	
	DS1923 0	
	DS1923 1	
	DS1923 2	
	DS1923 3	
	DS1923 4	
	DS1923 5	
DS1923 6		
DS1923 7		

If there is a PIN code in the tracker, the program will request it to access the settings. By wrong code entering the tracking device will disconnect from the computer, reset, connect to the Configurator again and wait for the right code enter.

For remote configuration and troubleshooting of the tracker, click Select device... button. In the window appeared, enter your login and password to get the access to the remote configuration server. You can get the login and the password in RSA "Galileosky", LLC. department of technical support or by clicking the Register new user button.



After successful authorization on the server, the form of devices list management will become available. When connecting for the first time, the list of the controlled tracking devices will be empty. To add a tracker to the list, click "Register device" button. During registration the Configurator will request a password for a particular tracker, by-default password corresponds to IMEI of the tracking device; this can be later changed in the Configurator by the user. Trackers may be grouped.



After selecting a particular tracking device, it can be controlled via the Configurator, the same way as it occurs with the USB-connection.

Troubleshooting tab

This tab allows us to see the current device state through the troubleshooting reports.

The troubleshooting mode has the following buttons:

- 1) **Start /Stop**
The time scale displays the information about the server connection, packet recording, updating coordinates etc. and with a 10 sec interval.
- 2) **Clear troubleshooting window**
- 3) **Save** the tracker`s troubleshooting results as a log-file which can be opened by any text editor.
- 4) **Search** in the troubleshooting history file.

GSM-unit debug info

The screenshot shows the Galileosky Configuration application window. The 'Troubleshooting' tab is active, displaying a list of diagnostic messages. The messages include:

```

SGNSMC,110309.00,V,,,,,210919,,N*67
SGNSGA,110309.00,,,,,0.00.99.99,,,,*72
SGNSGA,A,1,,,,,,99.99.99.99,99*2E
SGNSGA,A,1,,,,,,99.99.99.99,99*2E

SGNSMC,110310.00,V,,,,,210519,,N*6F
SGNSGA,110310.00,,,,,0.00.99.99,,,,*7A
SGNSGA,A,1,,,,,,99.99.99.99,99*2E
SGNSGA,A,1,,,,,,99.99.99.99,99*2E

SGNSMC,110311.00,V,,,,,210519,,N*6E
SGNSGA,110311.00,,,,,0.00.99.99,,,,*7B
SGNSGA,A,1,,,,,,99.99.99.99,99*2E
SGNSGA,A,1,,,,,,99.99.99.99,99*2E

SGNSMC,110312.00,V,,,,,210519,,N*6D
SGNSGA,110312.00,,,,,0.00.99.99,,,,*7B
SGNSGA,A,1,,,,,,99.99.99.99,99*2E
SGNSGA,A,1,,,,,,99.99.99.99,99*2E
    
```

The right-hand panel shows a checklist of system components for debugging:

- *
- Time
- Navigation data
- Navigation data detailed
- Data transmission
- Data transmission detailed
- Memory
- Memory detailed
- CAN
- CAN detailed
- GPS/GLONASS-unit
- GSM/GPRS-unit
- Accelerometer
- Algorithms
- Algorithm and script diagnostics

At the bottom of the window, there is a search bar and three buttons: 'Stop', 'Clear', and 'Save to file'.

Command mode tab

This tab is intended to message a single command or a set of commands to the tracking device.

The command mode has the following buttons:

- 1) Run commands;
- 2) Run single command;
- 3) Open from file;
- 4) Save to file.

The commands will be identified whether you use capital or lower-case letters or both in turn.

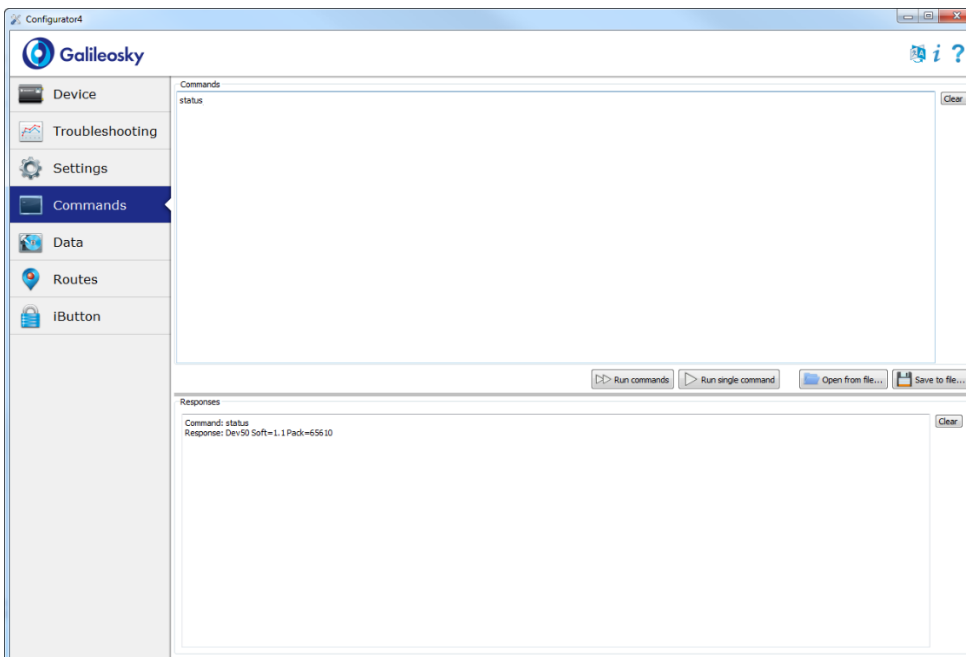
ATTENTION!

There are no spaces in command name!

Spaces between parameters are not allowed!

Commands and parameters are separated by space.

Commands are separated by Enter.



Single command example

An example of a command with a parameter:

Enter APN internet.beeline.ru,beeline,beeline as shown in the figure above and press **Run single command** button. The command and a response will be displayed in the Responses window.

Command: APN internet.beeline.ru,beeline,beeline

To access the parameters in the device memory, you should use a command without parameters!

Example of saving and downloading parameters set

For quick configuration of several tracking devices with the same set of commands it is recommended to run the commands from a pre-saved file. To do this, enter a list of commands in the Command window. Make sure that they are typed correctly by pressing the **Run commands** button and then press **Save to file**.

The file will be saved in log configurator folder. Then press **Open from file...** button.

To run several commands at the same time press **Run commands** button.

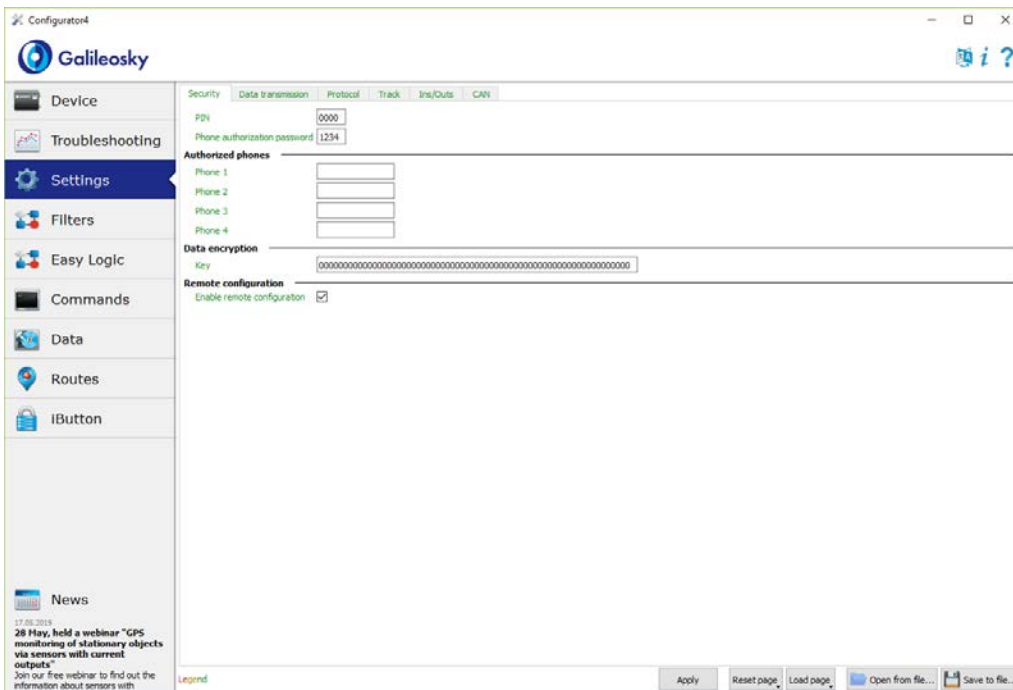
To run only one command, it is necessary to go to it in Commands window and press **Run single command** button.

Graphic interface settings

All main settings of the tracker are placed on tabs in the program upper part.

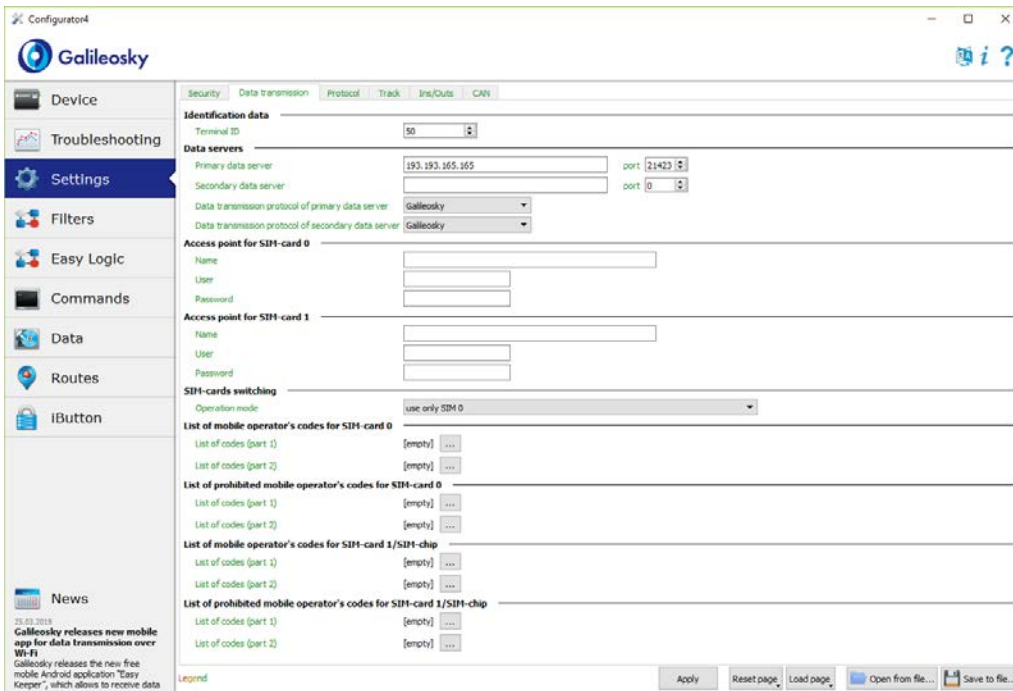
Security

This tab allows setting SIM-cards PIN code, phone authorization password, list of authorized phone numbers and encryption key for data transfer to the server.



Data Transmission

This tab allows setting SIM-card PIN code, APN for the Internet access, monitoring data processing servers, Wi-Fi access point.



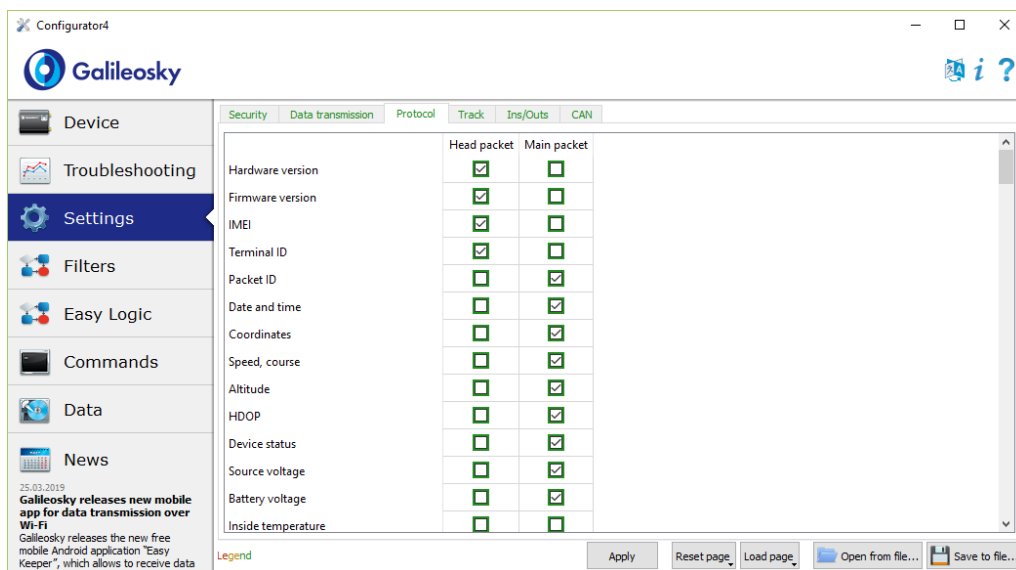
Protocol

The tracking device has its own data transmission protocol developed by RSA "Galileosky", LLC.

During device operating and data sending to the server, the following stages are possible:

- 1) Initialization of TCP/IP connection (does not need any additional settings);
- 2) Sending of initialization data described in the Head packet column (the data to be sent to the server are ticked in the first column);
- 3) If the tracking device has passed the first two stages, it starts sending accumulated packets according to the format described in the Main packet column.

To send the data the modem establishes a server connection and keeps it active even after sending the packet. It is done to save server connection traffic used to establish the connection to the server.



Track

This tab allows setting archive storage place and recording periods of coordinates at stops and in motion, details of track and false coordinates filtering.

The device filters coordinates by speed, acceleration, travelled distance, horizontal accuracy, number of satellites.

In addition, the tracking device allows filtering of coordinates crowding during stops by supply voltage at vehicles battery (Mhours command).

Parameters:

- supply voltage at stopped engine;
- supply voltage at started engine;

The first parameter is selected in the following way:

- 1) stop the engine for 5 minutes;
- 2) save the Vsupply voltage parameter from Device tab.

The second parameter is selected in the following way:

- 1) start the engine;
- 2) save the Vsupply parameter;
- 3) parameters of the mhours command are filled in and sent to the tracking device.

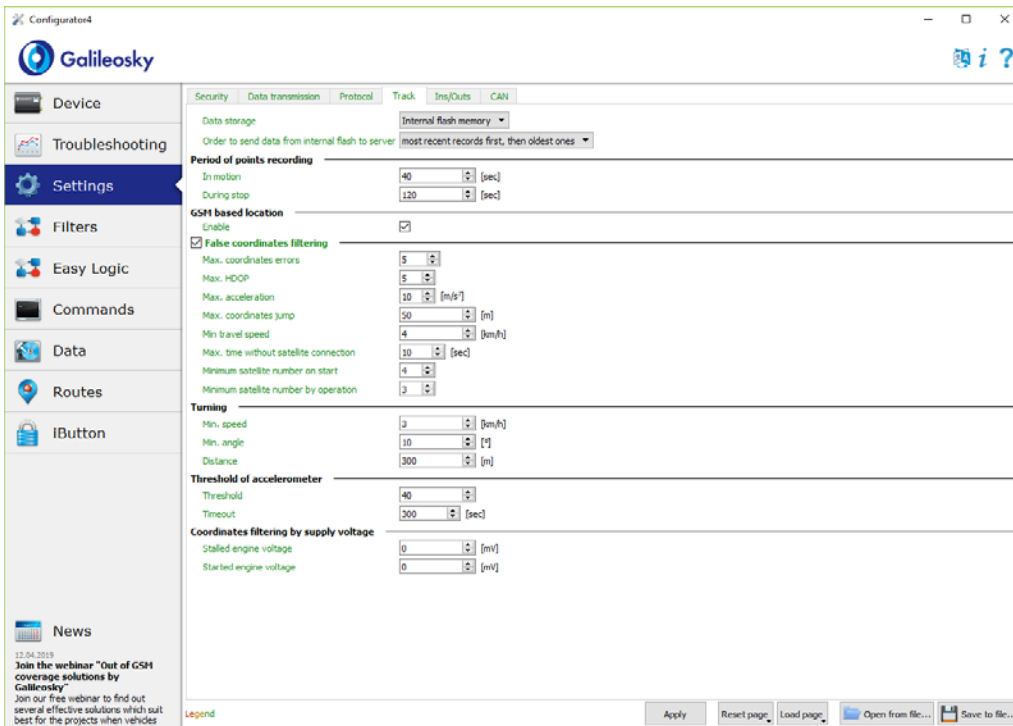
When the engine is started, the 9th bit will be set in the device status.

Each tracker is equipped with an accelerometer which allows filtering coordinates crowding during stops. It is based on vehicles vibration.

Parameters:

- Sensitivity – a standard unit, where the sensitivity of the 600 units corresponds to the acceleration of 1g (gravitational acceleration)

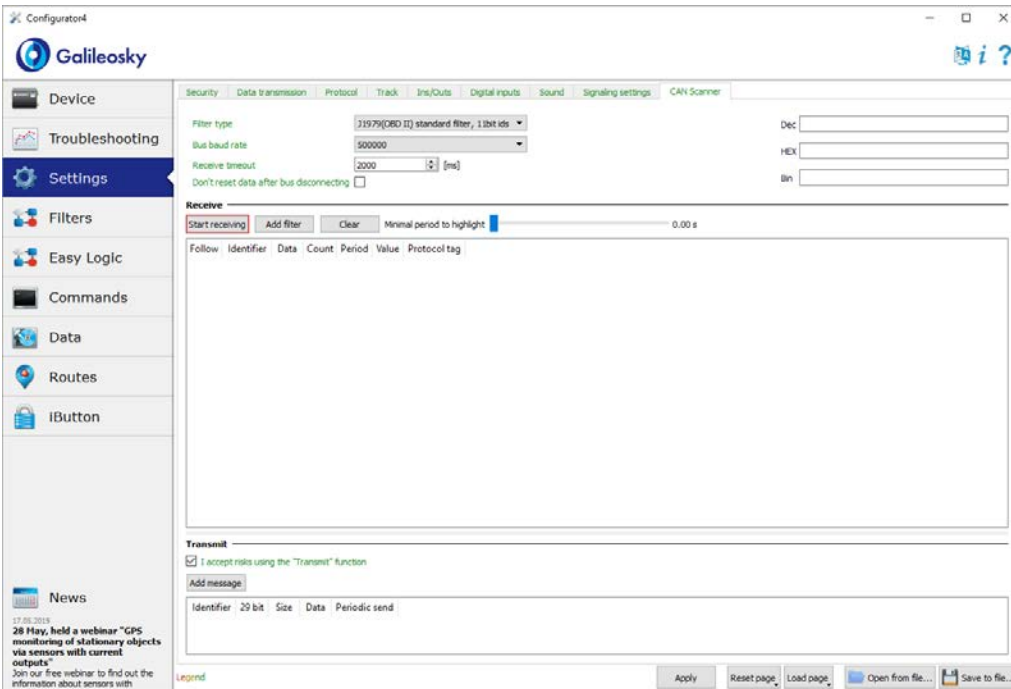
- Time parameter. The tracker switches on this filter when there is no vibration within a certain time period. The filter operates until the necessary amplitude acceleration is reached.



CAN-scanner

This option allows setting a CAN-filter and scanning the CAN-bus for message identifiers being used.

After clicking "Start receiving" the CAN-scanner is activated, and messages will be displayed in the panel. When scanning is completed, it is possible to set tags in the protocol, in which the bus data will be sent. To do this: choose CAN-identifier and tag and point transmitted part of the message with a mouse. To delete the filter the corresponding message identifier should be selected and deleted.

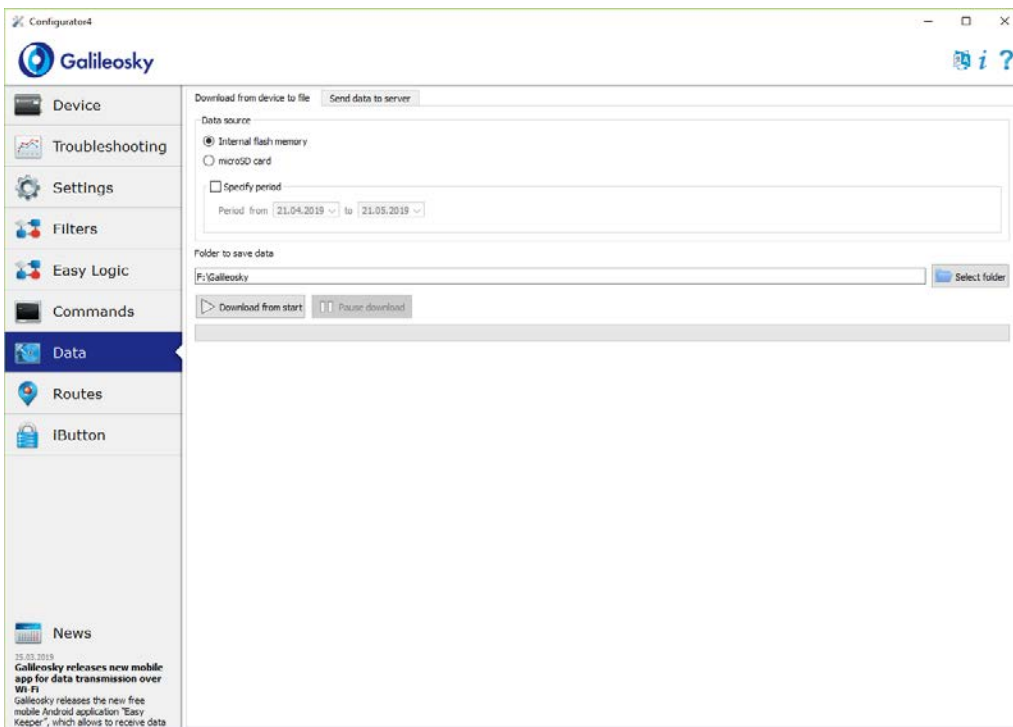


Data loading and sending to server

Data loading from the Tracker to file

This option allows transferring the data from the internal memory to a computer file via a USB cable.

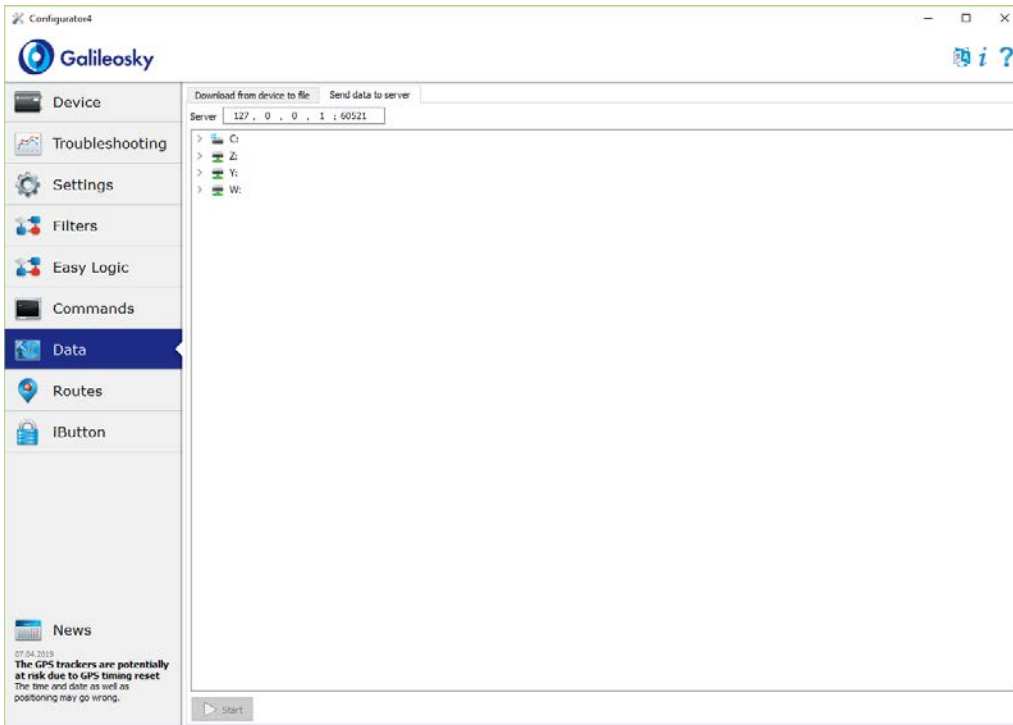
When data download from the internal memory occurs, only one file InternalFlash.csv will be created.



The Data transfer from the internal memory can be stopped and resumed.

Sending data to server

This option allows sending the data previously transferred from the tracking device to any server emulating the Galileosky protocol. To send it you should specify the IP-address and the server port and choose a file or a catalogue to be sent. If a catalogue is chosen, the program will send all its data files. The process can be stopped and resumed.



Commands List



To request current settings, you need to issue a command without any parameters.

Settings for SMS control

Command format

AddPhone xxxx[,n]

Parameters

xxxx - is a four-digit password, 1234 by default
n – slot number (0-3) where a telephone number will be saved.

Explanation

When you configure the tracker from a cell phone, you should first authorize it by using the command. Up to 4 telephone numbers can be authorized.

Example

Request: AddPhone 1234
Reply: Phones (0) = 890101243456 (1) = (2) = (3) =

Command format

ChangePass aaaa

Parameters

aaaa - is a numeric four-digit password;

Explanation

Changing and viewing the current password.

Example

Request: ChangePass 5678
Reply: Password changed to '5678'

Command format

Phones P1,P2,P3,P4

Parameters

P1,P2,P3,P4 – authorized phone numbers in international format.

Explanation

Getting and setting the list of authorized phones

Example

Request: Phones +7901012345,,,

Reply: Phones (0)=+790101243456 (1)= (2)= (3)=

Data transmission settings

Command format

APN a,u,p

Parameters

a – access point name

u – user

p – password

Explanation

Access point settings for a SIM-card (SIM0)

Example

Request: APN internet.beeline.ru,beeline,beeline

Reply: GPRS:APN=internet.beeline.ru, user=beeline, pass=beeline

Command format

APN2 a,u,p

Parameters

a – access point name

u – user

p – password

Explanation

Access point settings for a SIM-card (SIM1) or a SIM-microchip

Example

Request: APN2 internet.beeline.ru,beeline,beeline

Reply: GPRS2:APN=internet.beeline.ru, user=beeline, pass=beeline

Command format

OPSO n1,n2,n3,n4,n5,n6,n7,n8,n9,n10,n11,n12,n13,n14,n15

Parameters

n1-n15 – preferred GSM-networks

Explanation

A list of preferred GSM- networks for a SIM-card (SIM0). The network is defined by a mobile country code and a mobile operator code (the list of codes is given in http://www.itu.int/dms_pub/itu-t/opb/sp/T-SP-E.212A-2010-PDF-E.pdf), for example, the Russian Federation code is 250.

Example

Request: OPSO 25001,25099

Reply: OPSO:25001,25099,,,,,,,,,,,,;

Command format

OPS02n16,n17,n18,n19,n20,n21,n22,n23,n24,n25,n26,n27,n28,n29,n30

Parameters

n16-n30 – preferred GSM-networks

Explanation

Additional list of preferred GSM-networks for a SIM-card (SIM0).

Example

Request: OPS02 25001,25099

Reply: OPS02:25001,25099,,,,,,,,,,,,;

Command format

OPS1 n1,n2,n3,n4,n5,n6,n7,n8,n9,n10,n11,n12,n13,n14,n15

Parameters

n1-n15 – preferred GSM-networks

Explanation

A list of preferred GSM-networks for a SIM-card (SIM1) or a SIM-microchip.

Example

Request: OPS1 25001,25099

Reply: OPS1:25001,25099,,,,,,,,,,,,;

Command format

OPS12 n16,n17,n18,n19,n20,n21,n22,n23,n24,n25,n26,n27,n28,n29,n30

Parameters

n16-n30 – preferred GSM-networks

Explanation

Additional list of preferred GSM-networks for a SIM-card (SIM1) or a SIM-microchip.

Example

Request: OPS12 25001,25099

Reply: OPS12:25001,25099,,,,,,,,,,,,;

Command format

SIMSwitch mode

Parameters

mode – SIM-cards switching algorithm:

0 – only SIM0 is used

1 – cyclic switching between the SIM-cards, if you cannot send the data for 9 minutes

2 – switching according to the preferred GSM-networks list.

3 – only SIM1 or SIM-microchip is used;

Explanation

Setting of an algorithm of switching between a SIM-card and a SIM-microchip.

Example

Request: SIMSwitch 1

Reply: SIMSwitch: 1;

Command format

Serverip host,port

Parameters

host – domain name of a server or its IP-address;

port – server port.

Explanation

Main server parameters where the monitoring data will be transmitted to.

Example

Request: Serverip m.7gis.ru,60521

Reply: SERVERIP=m.7gis.ru:60521

Request: Serverip 46.146.233.216,60521

Reply: SERVERIP=46.146.233.216:60521

Command format

Serverip2 ip1,ip2,ip3,ip4,port

Parameters

host – domain name of a server or its IP-address;

port – server port.

Explanation

Additional server parameters.

Example

Request: Serverip2 m.7gis.ru,60521

Reply: Serverip2=m.7gis.ru:60521

Command format

ID n

Parameters

n - tracker number.

Explanation

Changes device number. The same number is used as the device identifier in the EGTS protocol.

Example

Request: ID 123

Reply: ID=123

Command format

Protocol s, s2

Parameters

s1 – version of data transmission protocol for the main server:

0 – Galileosky protocol;

3 – EGTS;

4 – Galileosky protocol with compression.

s2 – version of data transmission protocol for the additional server:

0 – Galileosky protocol;

3 – EGTS;

4 – Galileosky protocol with compression.

Explanation

Choosing a protocol of monitoring data transmission to the server

Example

Request: Protocol 0,0

Reply: PROTOCOL:0,0;

Galileosky server exchange protocol settings

Command format

HeadPack bbbbbbbbbbbbbbb

Parameters

bbbbbbbbbbbbbb - tag set from 1 to 128.

If b is replaced by 1, the tag is on.

If b is replaced by 0, the tag is off.

Tag numeration order is given in section [Galileosky protocol data](#).

Explanation

Head packet configuring.

Example

Request: HeadPack 1 1 1 0

Reply: HeadPack=

0001 1 1 0 b,

This means that tags from the second to the fourth inclusive are on and the first and the rest tags inclusive are off.

Command format

HeadPack2 bbbbbbbbbbbbbbb

Parameters

bbbbbbbbbbbbbb - tag set from 129 to 256.

If b is replaced by 1, the tag is on.

If b is replaced by 0, the tag is off.

Tag numeration order is given in section [Galileosky protocol data](#).

Explanation

Head packet configuring.

Example

Request: HeadPack2 1 1 0 0 0 0

Reply: HeadPack= 1 1 0 0 0 0 b,

This means that tags 129, 130, 131, 132 are off and tags 133 and 134 are on. All the following tags are off.

Command format

HeadPackBit **index,value**

Parameters

index – is tag number, which is on or off for transmission to the server

value – 1 if the tag should be transmitted to the server

0 if tag should not be transmitted to the server

Tag numeration order is given in section [Galileosky protocol data](#).

Explanation

Head packet configuring.

Example

Initially the second tag is off:

HeadPack=1100b

Switch on this tag.

Request: HeadPackBit 2,1

Reply: HeadPack=1100b

Command format

MainPack **bbbbbbbbbbbbbb**

Parameters

bbbbbbbbbbbbbb – tag set from 1 to 128.

If b is replaced by 1, the tag is on.

If b is replaced by 0 the tag is off.

Tag numeration order is given in section [Galileosky protocol data](#).

Explanation

Main packet configuring.

Example

Request: MainPack 111111111111111111110000

Reply: MainPack= 00000000000000000000111111111111111111110000b

This means that tags 1, 2, 3, 4 are off and tags 5-26 inclusive are on. All the following tags are off.

Command format

MainPack2 bbbbbbbbbbbbb

Parameters

bbbbbbbbbbbbbb – tag set from 129 to 256.

If b is replaced by 1, the tag is on.

If b is replaced by 0 the tag is off.

Tag numeration order is given in section [Galileosky protocol data](#).

Explanation

Main packet configuring.

Example

Request: MainPack2 110000

Reply: MainPack2=110000b

This means that tags 129, 130, 131, 132 are off and tags 133 and 134 are on. All the following tags are off.

Command format

MainPackBit index,value

Parameters

index –tag number, which is on or off for transmission to the server

value – 1 if this tag should be transmitted to the server

0 if this tag should not be transmitted to the server

Tag numeration order is given in section [Galileosky protocol data](#).

Explanation

Main packet configuring.

Example

Initially the second tag is off:

HeadPack=1100b

Switch on this tag.

Request: HeadPackBit 2,1

Reply: HeadPack=1100b

Command format

DataKey key

Parameters

Key – data encryption key in hexadecimal form, if it is equal to 0, data are not encoded.

Explanation

Specifies the key that encrypts the transmitted data.

Track parameters setting

Command format

Turning V,A,D,S,dS

Parameters

V – minimum speed that enables drawing of the track at turnings, [km/h];
A – minimum turn angle for the tracking device to record a track point, [°];
D – the distance above which the next packet will be saved to the device memory, [m];
S – the speed above which for dS-multiple value track point will be recorded, [km/h];
dS – speeding interval, [km/h].

Explanation

Configures track detail representation.

Example

Request: Turning 3,10,300,60,20

Reply: TURNING:Speed=3,Angle=10,Distance=300,SpeedEx=60,SpeedDelta=20

Command format

WrPeriod x,y

Parameters

x – Period of packet recording in memory in motion, [sec.];
y – Period of packet recording in memory when the vehicle stops, [sec.].

Explanation

Period of packets recording when the vehicle is moving or when it stops.

Example

Request: WrPeriod 60,180

Reply: WRPERIOD move=60 parking=180

Command format

GPS.Correct OnOff,MaxWrong,HDOP,Spd,Acc,Jump,TravelSpeed

Parameters

OnOff –coordinates filtering is on (1) or off (0);

MaxWrong – the number of wrong coordinates to be filtered (the recommended number is 5). This parameter accounts errors of acceleration exceed and jump, for other parameters the coordinates are always filtered;

HDOP – Maximum HDOP above which the coordinates are not updated;

Spd – Maximum speed. When it is exceeded, coordinates are considered false and are not updated, [km/h];

Acc –GPS or GLONASS data-based acceleration [m/s²];

Jump – Maximum coordinate jump in the nearest 2 seconds, [m];

TravelSpeed – Minimum speed for coordinates to be updated, [km/h]. This function is not suitable for low speed vehicles (tractors, asphalt placing machines)

Explanation

Allows filtering false coordinates jumps when the vehicle stops, in or out of tunnels, near high-rise buildings

Example

Request: GPS.CORRECT 1,5,2,150,3,50,3

Reply: GPS.correct: OnOff=1, MaxWrong=5, MaxHDOP=2, MaxSpd=150, MaxAcc=3, MaxJump=50, MaxTravelSpeed=3;

Command format

GPS.Correct2 MaxNoSatTime,MinSatStart,MinSatWork

Parameters

MaxNoSatTime – maximum time without satellite connection when no disconnection is registered, [sec.];

MinSatStart – minimum number of satellites to be connected to when the tracking device is on;

MinSatWork– minimum number of satellites during operation of the tracker. If the number is smaller, a disconnection will be registered

Explanation

These settings affect coordinates updating, if filtering is on by **GPS.Correct** command.

Example

Request: GPS.CORRECT2 10,5,4

Reply: GPS.correct2:MaxNoSatTime=10,MinSatStart=4,MinSatWork=3;

Command format

AccSens Sens,TO

Parameters

Sens – accelerometer sensitivity.

TO – the time after the vehicle stops, during which coordinates are updated, [sec].

Explanation

This function allows avoiding unnecessary outliers after the vehicle stops.

Default value is 40,300.

Sens value equal to 600 is 1g (g –gravitational acceleration)

Example

Request: AccSens 40,300

Reply: Accelerometer sensitive: sens = 40, time out=300

Command format

Shock Mode,Angle,Timeout,ShockSens

Parameters

Mode – strike determination mode:

0 – strike determination is switched off;

1 – strike determination is switched on; X axis is in vertical position;

2 – strike determination is switched on; Y axis is in vertical position;

3 – strike determination is switched on; Z axis is in vertical position;

Angle – maximum incline angle [0°-180°], value equal to 180 switches off incline determination;

Timeout – maximum allowable time when incline angle is exceeded, [sec.].

ShockSens – maximum acceleration by exceed of which a strike is detected. 600 points – gravitational acceleration.

Explanation

Switching on strike and incline determination mode.

Example

Request: Shock 3,30,5

Reply: Shock: Mode=3, MaxAngle=30, RT=5;

Command format

Mhours LoLevel,HiLevel

Parameters

LoLevel – input voltage + supply voltage by stopped engine, [mV];

HiLevel – input voltage +supply voltage by started engine, [mV];

Explanation

Allows filtering false coordinates after the vehicle stops

Example

Request: mHours 12000,14500

Reply: Mclock: lolevel=12000, hilevel=14500;

Information commands

Command format

Status

Explanation

Allows receiving device status at the moment of sending a command.

Dev – this device number;

Soft – current firmware version;

Pack – last recorded packet serial number;

TmDt – Current time and date;

Per – Current packet saving period (different when the vehicle is moving and stops);

Nav – Coordinates determination accuracy. 0 – coordinates are found.

Lat – Latitude;

Lon – Longitude;

Speed – Linear speed (vehicle speed);

HDOP – Horizontal accuracy (The closer to 1, the better);

SatCnt – Number of available satellites;

A – movement directional angle

Example

Request: Status

Reply: Dev50 Soft=91 Pack=17230 TmDt=10:58:6 20.6.9 Per=60 Nav=0 Lat=60.4007

Lon=31.0070 Speed=0.0194 HDOP=0.88 SatCnt=10 A=27.55

Command format

imei

Explanation

Allows obtaining a unique GSM-unit identifier, 15byte and CCID of SIM-microchip, if there is one.

Example

Request: IMEI

Reply: IMEI 123456789012345, 12345678901234567890

Command format

imsi

Explanation

Allows obtaining a unique IMSI identifier of a SIM-card

Example

Request: IMSI

Reply: IMSI: 123456789012345;

Command format

Insys

Explanation

Allows obtaining external source voltage, internal battery voltage, GPS aerial voltage, the main power bus voltage of the tracking device and also the temperature inside the tracking device.

Example

Request: insys

Reply: INSYS: Pow=12438, Vbat=4196,Vant=2921,Vdc=4115,Temper=37

Command format

Canibut

Explanation

Allows obtaining current CAN-bus state in decimal value

Example

Request: canibut

Reply: CAN_lb: CANA0=0,CANA1=0,CANB0=0,CANB1=0

Command format

statall

Explanation

Allows obtaining device, inputs, outputs decimal status and mileage according to GPS/GLONASS data.

Example

Request: statall

Reply: StatAll: Dev=1,Ins=2,Outs=7,Mileage=152;

Service commands

Command format

PIN N

Parameters

N – four-digit PIN-code of SIM-cards.

Explanation

SIM-card PIN-code and password setting for settings access in the Configurator. The default PIN-code is 0. If you enter the wrong code, the tracking device will be blocked for 25 seconds, and then reset. PIN-code is identical for both SIM-cards.

Example

Request: PIN 1234

Reply: PIN:1234;

Command format

Archive type

Parameters

type – data source for sending to the server:

0 – archive from the internal flash-memory;

1 – archive from the microSD card.

Explanation

Selection of data source for sending to the server. After command execution it is necessary to reset the tracker. Before you select a microSD card, delete the archive, created by earlier firmwares, (EraseTrackSD or delete files from Track catalogue through the Card-Reader).

Example

Request: ARCHIVE 0

Reply: ARCHIVE:0;

Command format

FlashArchive SendOrder

Parameters

SendOrder – order of data transmission from archive to server:

0 – the data are sent deep into the archives; the most current data are sent first, then the oldest ones.

1 – the data are sent in chronological order.

Explanation

Setting of the data transmission order to the server

After changing the order of sending, it is necessary to restart the tracker.

Example

Request: FLASHARCHIVE 1

Ответ: FLASHARCHIVE: StraightSendOrder=1;

Command format

Efs begin,end

Parameters

Begin – start date of uploaded period in the format DDMMYY[HH[MM]],

End – end date of uploaded period in the format DDMMYY[HH[MM]],

Where DD is a day, MM – a month, YY – a year, HH – hours, MM – minutes.

If hours and/or minutes are not specified, the following time will be used: 00 hours 00 minutes for the start date, 23 hours 59 minutes for the end date.

Explanation

Upload data from the SD memory to the server for a specified period

Example

Request: EFS 010117,01011712

Reply: EFS: **Uploading of archive has been scheduled**

Command format

EraseCfg

Explanation

Setting default configuration.

Example

Request: EraseCfg

Reply: ERASECFG

Command format

EraseTrack

Explanation

Deleting all tracks from the memory.

Example

Request: EraseTrack
Reply: ERASETRACK

Command format

ColdStart

Explanation

GLONASS unit cold start.

Example

Request: ColdStart
Reply: GLONASS cold start

Command format

LED LED

Parameters

LED – coefficient of diode intensity of device operation modes: 0 – full absence of brightness, 100 – maximum brightness

Explanation

Installation of light intensity of light-emitting diode of device operation modes

Example

Request: LED 60
Reply: LED:LED=60

Command format

Reset

Explanation

Allows resetting the device remotely.

Example

Request: Reset
Reply: Reset of device. Please wait 15 seconds...

Command format

Upgrade N

Parameters

Firmware upgrading up to the specified one. If 0 is specified, the tracking device will upgrade firmware up to the last stable one.

Explanation

Firmware upgrading up to the specified one.

Example

Request: Upgrade 47

Reply: UPGRADE SOFT= 47

Command format

RemoteConfig OnOff

Parameters

OnOff – turning on the remote configuration function:

0 – remote configuration is off;

1 – remote configuration is on.

Explanation

Turns on and off the remote configuration (section [Remote configuration](#))..

Example

Request: RemoteConfig 1

Reply: REMOTECONFIG:1;

CAN settings

Command format

CanRegime Mode,BaudRate,TimeOut,DoNotCleanAfterTimeOut

Parameters

Mode – operating mode:

- 0 – CAN-interface is off and is not used;
- 1 – CAN-bus scanner (J1939_SCANNER mode);
- 2 – standard FMS filter (FMS mode);
- 3 – J1939 user filter 29 bit (J1939_USER_29bit mode);
- 4 – J1939 user filter 11 bit (J1939_USER_11bit mode);
- 5 – J1979 29bit identifiers (J1979_29bit mode);
- 6 – J1979 11bit identifiers (J1979_11bit mode);
- 7 – J1979 detection of bus parameters (J1979_SCANNER mode);
- 8 – J1979 user filter 29 bit (J1979_USER_29bit mode);
- 9 – J1979 user filter 11 bit (J1979_USER_11bit mode);
- 10 – J1979 search for responded identifiers (J1979_CHECK_PIDS mode).

BaudRate – data bus rate. It must be the same as the vehicle data bus rate. It can have the following values: from 10000 up to 500000. Typical values: 62500, 125000, 250000, 500000.

TimeOut – measured in msec. For CAN_SCANNER mode it is response latency. If it is too small, not all bus messages will be received. The recommended time for CAN_SCANNER is 2000 msec. For all the rest modes it is time to receive at least one message, otherwise, the value will be set to zero.

DoNotCleanAfterTimeOut – data should not be set to zero by disconnecting CAN-bus.

Explanation

General CAN-bus control.

Example

Example: switching on scanner for a 250000 b/sec bus with the message (answer) latency, equal to 2 sec.

Request: CanRegime 1,250000,2000

Reply: CANREG:Mode=1,BaudRate=250000,TimeOut=2000;

DoNotCleanAfterTimeOut=0;

Command format

ActiveCAN OnOff

Parameters

OnOff – operating mode:

0 – passive mode: packets receiving confirmations are not sent to the CAN-bus. It is a safe mode of operation. It does not interfere with the on-board equipment;

1 – active mode: packets receiving confirmations are sent to the CAN-bus.

Explanation

Control of packets confirmation sending to the CAN-bus.

Confirmation sending may be necessary by connection to the troubleshooting socket if the data cannot be read in passive mode.

Example

Request: ActiveCAN 1

Reply: ACTIVECAN:1;

Command format

CAN8BitR0 ID,Shift,BigEndian

Parameters

ID – captured bus identifier:

Shift – useful data shift in the received packet

BigEndian – byte order, 0 – from the lower byte to the higher, 1 – from the higher to the lower.

Explanation

Single CAN-tag content control.

Example

Request: Can8BitR0 419360256,1,0

Reply: CAN8BITR0:ID=419360256,BigEndian=0;

Commands: **CAN8BitR1**, ..., **CAN8BitR30**, **CAN16BitR0**, ..., **CAN16BitR14**, **CAN32BitR0**, ..., **CAN32BitR14** are similar to CAN8BitR0 command.

Bootloader

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The processor program (firmware) is a set of algorithms developed by RSA "Galileosky", LLC specialists. Owing to this program, the central processor receives the data from different system units, processes them logically and mathematically and takes decisions for control commands of controller units to be worked out depending on the situation.

Bootloader is a device`s sub-program allowing the main program part being updated.

The main program can be downloaded via the USB or GPRS channel in the tracking device.

USB Channel Download

Install Configurator for updating via USB-channel, after connecting the tracking device, select "Upgrade firmware".

GPRS channel download

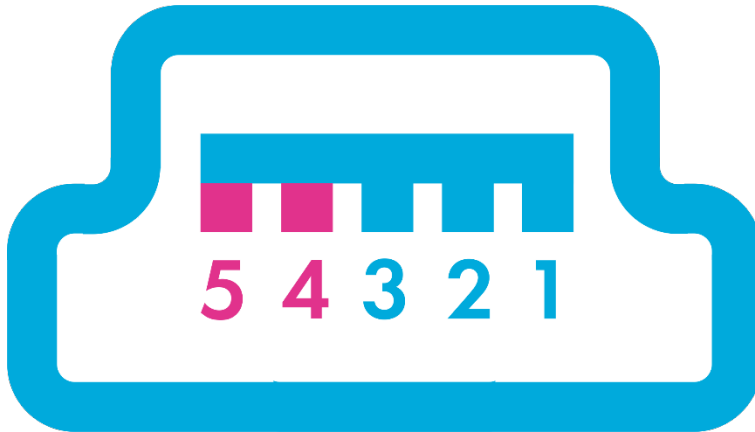
1. Connect the tracking device to the external power supply;
2. APN settings must conform to the SIM-card inserted in the tracker, otherwise, the device flashing will not happen, and the tracking device will return to the operating mode;

Give the following command: UPGRADE firmware^{Nº} using any of the available channels (SMS, GPRS, USB), where firmware^{Nº} is the necessary firmware version. UPGRADE 0 initiates downloading the latest firmware;

3. You may see if the flashing is in progress by LEDs blinking;
4. In 15-25 minutes (depending on connection conditions and GPRS terms of service by operator) upgrade will be completed, and the tracking device will turn into operation mode automatically.

Using mini-USB cable to enter bootloader mode

To enter bootloader mode, you will need a mini-USB cable with connected 4 and 5 pins, as it is shown in the picture below.



This function is used to force the tracker to enter boot loader mode.

LED operation during reflashing

Depending on the GSM-modem and microcontroller units activation stages, the tracking device will go through the following stages:

Yellow LED blinking, times	GSM-modem activation stage
6	Procedure of GSM-unit activation was successful.
5	GPRS-service registration was successful.
4	Firmware update connection to the server.
3	The tracking device switched to downloading mode.
2	Server connection is not lost, and the tracker is in downloading mode.
1	First request sending was successful.

Galileosky Protocol Data

Bit number is entered in mainpackbit and headpackbit commands for selecting parameters, transmitted to the server.

Bit №	Description
1	Hardware version
2	Firmware version
3	IMEI
4	Device's identifier
5	Number of an archive record
6	Greenwich date and time
7	Coordinates in degrees, number of satellites, indication of coordinates determination correctness
8	Speed in km/h and direction in degrees
9	Height, m
10	HDOP
11	Status of device
12	Supply voltage, mV
13	Battery voltage, mV
14	Device temperature, °C
15	Acceleration
33	CAN-bus (CAN_A0). Fuel used by a vehicle from the date of manufacturing, l.
34	CAN-bus (CAN_A1); Fuel level, %; Temperature of coolant °C; Engine speed, rotations/min.
35	CAN-bus (CAN_B0). Vehicle`s mileage, m.
36	CAN_B1
37	CAN8BITR0
38	CAN8BITR1
39	CAN8BITR2
40	CAN8BITR3

Bit Nº	Description
41	CAN8BITR4
42	CAN8BITR5
43	CAN8BITR6
44	CAN8BITR7
45	CAN8BITR8
46	CAN8BITR9
47	CAN8BITR10
48	CAN8BITR11
49	CAN8BITR12
50	CAN8BITR13
51	CAN8BITR14
53	Total mileage according to GPS/GLONASS units, m.
55	Depending on settings: 1. CAN16BITR0 2. the 1st vehicle`s axle load, kg 3. failure code OBD II
56	Depending on settings: 1. CAN16BITR1 2. the 2 nd vehicle`s axle load, kg 3. failure code OBD II
57	Depending on settings: 1. CAN16BITR2 2. the 3 rd vehicle`s axle load, kg 3. failure code OBD II
58	Depending on settings: 1. CAN16BITR3 2. the 4 st vehicle`s axle load, kg 3. failure code OBD II
59	Depending on settings: 1. CAN16BITR4 2. the 5 th vehicles axle load, kg 3. failure code OBD II
60	Depending on settings: 1. CAN32BITR0 2. total time of engine operation, h.
61	CAN32BITR1
62	CAN32BITR2

Bit Nº	Description
63	CAN32BITR3
64	CAN32BITR4
129	CAN8BITR15
Tags CAN8BITR16 - CAN8BITR29 similar to CAN8BITR16 with numbers 130-143	
144	CAN8BITR30
145	CAN16BITR5
Tags CAN16BITR6 – CAN16BITR13 similar to CAN16BITR5 with numbers 146-153	
154	CAN16BITR14
161	CAN32BITR5
Tags CAN32BITR6 – CAN32BITR13 similar to CAN32BITR5 with numbers 162-169	
170	CAN32BITR14
177	User 0 data
Tags from users data with numbers 178-183	
184	User 7 data
185	User data array

Example1.

The tracking device should be configured so that the head pack (HeadPack) contains information about the device version (HardVersion), firmware version (SoftVersion), unique 15-digit GSM-unit identifier

(IMEI), device user ID (ID device).

Correspondent tag mask: 000000000000000000000000000000001111.

To apply the settings, we should use the following command

HeadPack 000000000000000000000000000000001111, or omitting zeros,
HeadPack 1111

Example2.

It is necessary to configure the main packet (sent in normal mode) so that the tracker`s user ID (ID device), packet number (NumberOfPacket), date and time of packet record (TimeDate), coordinates are sent. Correspondent tag mask: 00000000000000000000000000001111000

To apply the settings, we should use the command: MainPack 1111000.

In this case, we have omitted zeros at once.

Additional Information

Certifying

The tracking device is certified to comply with GOST R.

Warranty

RSA "Galileosky", LLC hereby guarantees the realization of consumers' rights provided by the local laws throughout Russia and the CIS.

RSA "Galileosky", LLC guarantees the operability of the tracking device subject to compliance with the instructions set out in the above user`s manual.

Warranty conditions

The warranty period is 12 months since the day of purchase.

Note: a defective tracker (with cracks and fissures, dents and impact marks and etc.) due to consumer's fault resulting from inappropriate maintenance, storage and transportation is not liable to warranty.

The above also holds for a device without the body or battery.

In case the guarantee document proving the device sale to the customer does not contain the date of purchase, the name and seller's seal, the warranty period starts since the day of production.

The consumer has the right for free maintenance in the manufacturer's service center if a production or design defect appeared during the warranty period. The consumer has the right for maintenance during the whole period of operation of the device. The consumer has all the other rights provided by the laws of the Russian Federation and the CIS.

If the failure cause cannot be found at the moment of appeal, a technical examination is held, which cannot exceed 30 days since the moment of appeal.

The warranty does not apply in case of:

- Inappropriate transportation, storage or maintenance, described in User's Manual;
- Unauthorised opening the device during the warranty period;
- Repairing controlled by someone or some organization not authorised by Galileosky during the warranty period;
- Signs of electrical and/or other damage due to prohibitive mains parameter changes, misapplication and neglect of the device;
- Physical damage of the device body and board, SIM holder, aerals or wires break;
- Traces of oxidation of outer and inner parts or exposure of the device body to moisture;

- Theft or criminal damage of the external aerial or cable;
- Damages caused by foreign objects, substances, liquids, insects coming into body;
- Damage caused by exposure to high temperature or intense microwave radiation;
- Damage caused by elemental forces, fire, social factors, random external factors and accidents;
- Damage caused by parameters incompatibility or inappropriate attachment of additional devices or sensors to the tracker;
- Operation of the tracking device by the vehicle network voltage deviating from the range mentioned in technical specifications.
- Damages caused by incorrect installation of the tracking device to the vehicle;
- Failure in tracker's operating due to incompatibility of software version and tracker version.
- Connection socket, contacts and SIM-holders are not covered under warranty.
- Warranty period for aeriels – 6 (six) calendar months from the moment of realization note in device passport, but not more than 8 (eight) calendar months from the moment of device shipping to the Buyer from the Manufacturer storage included in delivery note.
- Warranty period for a processor, GSM module, GLONASS/GPS module – 34 (thirty-four) calendar months from the moment of realization note in device passport, but not more than 36 (thirty-six) calendar months from the moment of device shipping to the Buyer from the Manufacturer storage included in delivery note.

ATTENTION! The manufacturer shall in no case be liable for claims concerning the damage or loss of the data exceeding the cost of the product, as well as claims for incidental, special or consequential damages (including in each case, without limitation, damages for inability to use the equipment, loss of the data, loss of business, loss of profit, loss of savings, loss of time), arising out of the use or inability to use the equipment within legal limits.

ATTENTION! The Warranty does not affect the statutory rights of the consumer, such as the guarantee of satisfactory quality of work or conformity of the product to the purpose for which analogous products are used under normal conditions and service maintenance and also your rights with regard to the seller of the product resulting from the fact of purchase and contract of sale and purchase.

ATTENTION! Terms of Warranty service, which are in conflict with the current law, have no legal effect and are subject to the current law.

ATTENTION! If the Purchaser fails to comply with the Terms of Warranty, the validity of the Warranty is void.

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