



## Personal tracker ADM50 GLONASS/GPS-GSM/GPRS

Operation manual

Edition 1.0



This Guide extends to the telematic terminal ADM50 (hereinafter referred as terminal or tracker), determines the order of its operation, and also contains a description of the tracker functioning and its management.

Installation and configuration of the tracker should be carried out by qualified specialists to ensure its proper functioning. For successful application of the tracker, it is necessary to familiarize with the working principle of the entire monitoring system, and understand the purpose of all its components separately. Therefore, it is strongly recommended to familiarize with the basics of the functioning of the global navigation satellite systems GLONASS and GPS, GSM communications, the features of data transfer via short text messages (SMS), GPRS and the Internet.

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# 1 Purpose and Function

The ADM50 terminal consists of a microcontroller, non-volatile memory, a GLONASS/GPS module, a GSM / GPRS module, an accelerometer, an alarm button.



Picture 1 — General view of the ADM50

GLONASS/GPS module is for receiving signals from GLONASS/GPS satellites and determining the geographical coordinates of the location (latitude, longitude and altitude), as well as the exact time (GMT), speed and moving direction.

The GSM/GPRS module establishes and supports outgoing TCP/IP connection, periodically transmitting information packets to a dedicated server with a static IP address or domain name, and also receives and sends SMS messages by means of GPRS packet data transmission technology.

The accelerometer is used to determine the level of vibration, which manages switching of energy-saving functions in the automatic mode.

The "SOS" alarm button is used to activate a mechanism for sending an SMS message and sending an information packet with the alarm flag to the server.

After switching-on the tracker receives information from the satellites of the GLONASS/GPS system, determines its location, speed, time and establishes a connection to the server. After establishing the connection, tracker transmits the accumulated data with given frequency to the dedicated server, from which it can be received via the Internet for further analysis and processing with use of corresponding software on personal computers and other supported computing devices.

In case of absence of communication with the server, the tracker writes information packets to non-volatile memory, and upon the appearance of the connection, transmits them.

Depending on the selected mode of operation, it is possible to perform the functions of a car tracker, a personal tracker, or a beacon (bookmark). Tracker can be used to track the location of any mobile or stationary object - vehicle, cargo, person, animal, etc.

## 2 Technical specifications

- GLONASS/GPS receiver: chipset: MT3333 (MediaTek);  
frequency ranges: GLONASS - L1 (CT-code), GPS - L1 (C/A code);  
cold start/tracking sensitivity: -148 dBm/-163 dBm;  
number of tracking/capturing channels: 33/99;  
accuracy of determining the coordinates, 95% of the time, no worse than: 3 m.
- Communication standard: GSM 850/900/1800/1900, GPRS Multi-slot Class 12.
- GSM transmitter power: 2 W.
- Number of SIM cards: 1.
- Accelerometer type: digital, tri-axial.
- Alarm button.
- Li-Po battery: capacity 3000 mAh (11.1 W\*h), weight 60 g.
- Number of storable entries about route: 100000.
- PC communication interface: USB.
- Operating temperature in battery discharge mode: -20..+60°C.
- Operating temperature in battery charging mode: 0..+45°C.
- Maximum current consuming in standby mode: to 1 A.
- Charger voltage: 5 V.
- Dimensions: 89x56x25mm.
- Weight: not more than 125 g.

## 3 Turning on and off

### 3.1 Turning on and off with the power button

To turn on the tracker, press and hold the power button at least for three seconds. When the three LEDs begin to glow, you can release the button. The blue and green LEDs will turn off, and the red LED will produce the flashes series according to the battery charge level (watch section "Indication" - "Determining the battery charge level"). Tracker switched on.

To turn off the tracker, press and hold the Power button in the pressed state. When the button is pressed, the three LEDs will light up, and after 3 seconds the LEDs will turn off. Release the button. Tracker switched off.

### **3.2 Automatic switching-on by the charger connection**

If this function is activated, the inclusion of the tracker is automatic, when it is connecting to a charger or personal computer. Regardless of how the disabling occurred, using the Power button or because the battery is completely discharged. By default, this feature is disabled.

The configuration performs locally - using the configurator via the USB interface or remotely by sending commands via GPRS or SMS.

PENU X

X=0 – Automatic switching-on disabled.

X=1 – Automatic switching-on enabled.

### **3.3 Power button lock**

If this function is activated, disabling of the tracker becomes impossible with the Power button. Even so, switching-on the tracker and the function of determining the battery charge level are still available. By default, the lock is disabled.

The configuration performs locally - using the configurator via the USB interface or remotely by sending commands via GPRS or SMS.

POFF X

X=0 – Power button unlocked.

X=1 – Power button locked.

To disable the tracker using the button, you must disable the Power button lock.

Indication

### **4.1 Green LED - GLONASS/GPS module status**

- flashes three times during the period - GLONASS/GPS module is on, but there is no data from it yet;
- flashes twice during the period - there is data from the GLONASS/GPS module, but the data is invalid;
- flashes once during the period - there is data from the GLONASS/GPS module and the data is valid;
- no flashes - GLONASS / GPS module is turned off or the ADM50 is in a sleeping state.

In the beacon mode, the LED does not light regardless of the GLONASS/GPS module state during sleep.

## 4.2 Blue LED - GSM module status

- flashes three times during the period — cellular network is available, GPRS connection is not established, connection with the server is not established;
- flashes twice during the period — cellular network is available, the GPRS connection is established, the connection to the server is not established;
- flashes once during the period — cellular network is available, a GPRS connection is established, a connection to the server is established;
- no flashes — GSM/GPRS module is turned off or GSM network registration is in progress. It is also possible in case the ADM50 is in a sleeping state.

In the beacon mode, the LED does not light regardless of the GSM module state during sleep.

## 4.3 Red LED - battery charge process status

- LED flashes once a second — charging;
- LED lights permanently — charging completed;
- LED flashes more often than once a second — the charging process is completed abnormally. It is possible if the temperature of the device has exceeded the allowed limits, or the device's charging time has been exceeded;
- LED does not lit — there is no external power. It is possible if the USB cable is not connected or there is no contact in the USB connector.

## 4.4 Determining the battery charge level

To determine the battery charge level, briefly press the Power button. Thereafter, red LED would make several flashes, the number of which will correspond to the battery charge level:

- three flashes – maximum charge level;
- two flashes – average charge level;
- one flash – low charge level, you need to charge the battery.

# 5 Operating Modes

The ADM50 terminal can be in one of two modes: Beacon or Tracker. The operating mode of the ADM50 can be selected locally by using the configurator via the USB interface or remotely by sending commands via GPRS or SMS.

## ***DMODE X***

X=0 – Beacon Mode, X=1 – Tracker Mode

### **5.1 Beacon Mode**

In the beacon mode, the ADM50 is periodically in the active state, performs certain actions, such as: determining coordinates, waiting and processing incoming SMS, and others, and between activity states the tracker is in the sleep state (energy saving).

Beacon mode setting commands:

## ***BTIME X,Y,Z,A***

X – minimum activity time;

Y – maximum activity time;

Z – sleep time after successful activity;

A – sleep time after error,

Where X, Y, Z, A sets in seconds.

- minimum activity time - the time during which the ADM50 will guaranteed be in the active state, even if all the necessary actions were performed. This time allows to wait for an incoming SMS containing the command;
- maximum activity time — the time after which the ADM50 will go to sleep, even if it didn't not perform all the necessary actions, for example, determine the coordinates or send data to the server;
- sleep time after successful activity — the time for which the ADM50 will be in sleep state, if all the necessary actions were performed during the ADM50 activity;
- sleep time after error — the time for which the ADM50 will be in sleep state, if during the activity were not executed all the tasks or errors occurred, for example, it was not possible to establish connection to the server.

## ***BMODE X,Y,Z***

X – GSM module status during sleep: 0 – off., 1 – on.;

Y – GLONASS/GPS module status during sleep: 0 or 1 – off.;

Z – determination of coordinates during activity:

0 – Disabled;

1 – GLONASS/GPS;



2 – LBS;  
3 – Auto;

- status of the GSM/GPRS module during sleep - this parameter determines the possibility of receiving an SMS command during sleep;
- status of the GLONASS/GPS module during sleep - turned off. The ability to turn on the GLONASS/GPS module during sleep (Y=1) will be implemented soon.
- determination of coordinates during activity - this parameter determines the need to determine the coordinates during the activity and their source.

«Disabled» (Z=0) – determination of coordinates is not performing, the mode is used for maximum energy saving. That allows to determine the coordinates only on request. The tracker establishes a connection to the server during waking, but does not send packets - only waits for GPRS or SMS command.

«GLONASS/GPS» (Z=1) – determination of coordinates performs only via GLONASS/GPS system.

«GSM base stations» (Z=2) – determination of coordinates performs only via LBS technology. This mode of determining the coordinates has lower accuracy than navigation using GLONASS/GPS systems, but significantly saves battery power.

«Auto» (Z=3) – selecting the source of coordinates is in automatic mode. The priority system is GLONASS/GPS. In the case if signal strength from satellites is low and the coordinates are not valid, the location determines by GSM base stations.

## ***BWAKEUP***

The command carries out an extraordinary switching the tracker into the beacon mode activity state. In the sleep state, SMS command *WAKEUP* will be received and executed if the parameter X of the *BMODE* command is 1. Executing the command *BWAKEUP* causes restart of the sleep time timers (Z and A parameters) of the command *BTIME*.

## ***WHERE***

The command makes a request for a link to "Yandex.Maps". The response to the command will be received as a text SMS message containing a hyperlink with the last valid coordinates.

## **5.2 Tracker Mode**

In Tracker mode, the ADM50 determines the coordinates every two seconds, filters the resulting coordinates with a series of filters and if the coordinates satisfy all conditions, generates data packets and sends them to the server. The algorithm for smart point recording uses the

parameters set by the PERIOD and TRACK commands (see the Appendix A). In the absence of communication with the server, the tracker writes information packets to the "black box" and, upon communication with the server, carries out their unloading. In Tracker mode, the ADM50 never goes into sleep states, but has some energy-saving features.

"Statics" is a motionless device mode. In this mode, the last valid coordinate is fixed, and all subsequent coordinates are ignored until the movement begins.

"Deep Statics" is a motionless device mode, in which GSM/GPRS and/or GLONASS/GPS modules can be additionally switched off.

To configure the parameters of the Deep Static mode, available commands are:

### ***TSTIME X***

X – The time through which the Deep Static mode activates, in seconds.

### ***TSMODE X,Y***

X – the status of the GSM module in the Deep Static mode: 0 - off, 1 - on.

If in the Deep Statics mode the GSM module stay enabled then regardless of the GLONASS/GPS module status the tracker will send packets with the last valid coordinate to the server;

Y – the state of the GLONASS/GPS module in the Deep Static mode: 0 - off, 1 - on. The parameter impacts on the navigation data availability speed when leaving the Deep Statics mode!

## **6 Functioning of the SOS Button**

The SOS button in ADM50 can be triggered by pressing (closing) or releasing (opening).

When the SOS button triggers, activates the processing script, which includes:

- sending SMS with text «device\_name ALARM» to the listed numbers. Maximum quantity of numbers - 4.
- determining the coordinates and sending a packet with the alarm flag to the server. The device will not exit the SOS processing script state until at least one point with an alarm flag is sent.

The execution of the SOS button processing script state does not impact on the sleep time timers of the Beacon mode (parameters Z and A), specified by command *BTIME*

To set the operating mode of the SOS button, use the command

## **SOSPOL X**

X=0 – reaction to pressing the button (closing),

X=1 – reaction to releasing the button (opening).

The commands to work with the list of telephone numbers for sending alarm SMS (no more than 4 phone numbers are stored):

### ***EventListAdd X***

Add a phone number to the list to send alarm SMS,

X – phone number in format «7xxxxxxxxxx»;

### ***EventListClear***

Erase all numbers from the list of phone numbers for sending alarm SMS;

### ***EventListShow***

Show list of phone numbers for sending alarm SMS.

## **7 Low Battery Warning**

Upon reaching the set voltage level on the battery, an SMS message with the text «device\_name: battery low!» will be sent to authorized by command *EventListAdd* phone numbers. The activation of the function and the setting of the critical voltage level is performed using the command:

### ***BATALARM X,Y***

X=0 – alert function disabled, X=1 – function enabled. Y – critical battery voltage level, mV.

## **8 Updating the terminal software**

Terminal software upgrade (firmware) might be performed through the USB-interface by means of configuration program or via GPRS-channel.

### **8.1 Updating the terminal software via USB**

Configuration program checks the valid firmware version in the upgrade server, and if necessary downloads the firmware file.

To upgrade firmware, do the following:

- connect USB cable (miniUSB/USB-A) to the terminal and Personal computer's USB port;
- launch “ADMConfigurator” program on personal computer;
- if a more recent firmware version than the one installed on the terminal is detected, “ADMConfigurator” program will inform you of its presence;
- press “Upgrade available”;
- in the opened tab “Notifications” press “firmware upgrade via USB”;
- after being upgraded, the terminal will be rebooted and become available for work.

**WARNING!** Don't switch the terminal's power off when upgrading the terminal's firmware until the terminal is detected by the setting program. Otherwise there is a risk of damaging the software whose recovery can be performed only in the manufacturer's office

## **8.2 Updating the terminal software via GPRS**

To upgrade the terminal software via GPRS, it is necessary to install an active SIM-card in the terminal, set the user's access point and mobile operator password (APN, user, pass). Otherwise, the terminal will have remained in the mode of firmware uploading from the server until connection attempts are over.

The upgrading process will start after the terminal receives «**UPDATE**» command via one of the possible channels USB, GPRS, SMS. After having received the «**UPDATE**» command the terminal connects to the upgrade server and uploads the relevant firmware.

After a successful upgrade the terminal passes to the standard operation mode with the access point and server address settings installed before upgrading. The remained settings should be checked after upgrade and if necessary, re-install them.

Depending on the GSM-network the upgrading process takes on average from 2 to 5 minutes. If the upgrading upload is not possible, the terminal will continue working with the existing software.

## **8.3 Updating the terminal software via USB using the firmware file**

**Firmware file should be requested in technical support.**

To upgrade the firmware via the USB interface with a firmware file, do the following:

- connect USB cable (miniUSB/USB-A) to the terminal and Personal computer's USB port;
- launch “ADMConfigurator” program on personal computer; after having connected the terminal to the program, open the “Settings” section in the “Device” tab, press “Flash the file”;
- press “Yes” in the popup;
- drag the firmware file in the respective field in the configurator window;

- after the firmware is upgraded, the terminal will be rebooted and become available for work.

**WARNING!** Don't switch the terminal's power off when upgrading the terminal's firmware until the terminal is detected by the setting program. Otherwise there is a risk of damaging the software whose recovery can be performed only in the manufacturer's office.

## 9 Storage and transportation requirements

Terminals should be stored in a warehouse at a temperature of +5 oC to +40 °C and relative humidity at most 85 %.

After terminals' transportation in sub-zero temperatures they should be stored at room temperature within 24 hours.

## 10 Warranty

The manufacturer guarantees the terminal proper function within 12 months (built-in battery - 6 months) from the day of its sale if consumer meets all the requirements and follows all the rules of transportation, storage, installation and handling.

The warranty does not cover:

- a terminal with mechanical damages and defects (cracks and chips, dents, signs of impacts, etc.) caused by consumer as a result of handling, storage and transportation rules violation. When there are signs of oxidation or other proofs of liquid penetration in the device housing;
- a terminal without housing;
- a terminal with signs of repair performed beyond the manufacturer's service center;
- a terminal with signs of electrical and/or other damages caused as a result of unacceptable changes in external power network parameters or improper use of the terminal;
- a terminal disabled because of an unauthorized software upgrade.

The device software is licensed, terms related to the manufacturer's limited liability in the framework of the License Agreement are provided at the web site <http://en.neomatica.ru/upload/files/license.pdf>

## 11 Marking and packaging

Marking is placed on the terminal housing. The terminals are packed in individual boxes, which protect them during transportation and storage. Multipack is possible.

## 12 Disposal

Device recycling is performed according to national and local norms and requirements.

## 13 Scope of supply

Name	Quantity
Terminal ADM50	1
Power Supply - Charger	1
Datasheet	1

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## Appendix A. Commands description

No	Command	Response	Parameters	Description
1	Name X Example: Name bus8	Device Name 'X' Example: Device Name 'bus8'	X – terminal name	Set the name of the terminal. The name can contain only letters of the Latin alphabet and numbers. The name cannot exceed 10 characters in length. The terminal name is added to the alarm SMS messages.
2	ADD ME X,Y (only SMS) Example: ADD ME 1234 ADD ME 1234,2	PHONES (0)= (1)= (2)= (3)= Example: PHONES (0)= +79876543210 (1)= (2)= (3)= PHONES (0)= (1)= (2)= +79876543210 (3)=	X – password, the default is "0". Y=0..3 – number of the memory location to store the number. Optional parameter.	Authorize the phone number from which the SMS was received and write it to the memory cell Y. The command is needed only to create a list of numbers for controlling the terminal via SMS.
3	PHONES X Example: PHONES 1234	PHONES (0)= (1)= (2)= (3)= Example: PHONES (0)= (1)= +79876543210 (2)= (3)=	X – password, the default is "0".	Request a list of authorized phone numbers.
4	STATUS	Example:  ID=1 Soft=0x09 GPS=9291 Time=11:21:39 25.02.10 Nav=0 Lat=57.2359 Lon=56.2593 Speed=0.0 SatCnt=5 Stat=0x0000	Command without parameters.	Current terminal condition. ID – the number of the terminal (ID=1 always), Soft – the software version, GPS – the current number of the information packet, Time – current time and date according to Greenwich Mean Time, Nav – coordinates validity, Lat – latitude,

				Lon – longitude, Speed – speed, SatCnt – number of satellites, Stat – status.
5	PASS X,Y		X – the old password by default X=0. Y – new password.	Setting password.
6	IMEI Example: IMEI	IMEI Example: IMEI 359587013832624	Command without parameters.	Request IMEI of the GSM module installed in the tracker. The command works 20 seconds after power on.
7	PIN0 Example: PIN0 1234	PIN0=X Example: PIN0=1234	X–PIN code	Setting PIN code for SIM card.
8	PIN1 Example: PIN1=1234	PIN1=X Example: PIN1=1234	X–PIN code	Setting PIN code for SIM chip.
9	SETGPRS0 X,Y,Z Example:	GPRS0: APN=X, user=Y, pass=Z Example:	X – access point, by default X=internet.beeline.ru Y – login, by default Y=beeline	Set GPRS parameters for SIM-card. The command without parameters restores to the current settings GPRS.
	SETGPRS0 internet.beeline.ru beeline,beeline	GPRS0: APN= internet.beeline.ru,user= beeline,pass= beeline	Z – password, by default Z=beeline	



10	SETGPRS1 X,Y,Z  Example:	GPRS1: APN=X, user=Y, pass=Z  Example:	X – access point by default X=internet.beeline.ru Y – login by default Y=beeline	Set GPRS parameters for SIM-chip. The command without parameters restores to the current settings GPRS.
	SETGPRS1 internet.beeline.ru beeline,beeline	GPRS1: APN=internet.mts.ru, user=mts, pass=mts	Z – password by default  Z=beeline	
11	SIMPRIORITY X	SIM PRIORITY X	X=0 – no priority X=1 – main SIM card X=2 – main SIM chip by default X=0	Setting priority between SIM-card and SIM-chip.
12	SETHOST0 X,Y  Example:  SETHOST0 134,236,21,2,123 00	HOST0=X,Y  Example:  HOST0=134,236,21,2:12300	X – IP address, use commas instead of dots.  Y – server port	Setting IP-address and server port, which the terminal is connected to for data transmission. The command without parameters restores to the current server address and port.
13	DN0 X:Y  Example:  SETHOST0 <u>www.test.ru:1000</u>	HOST0=X:Y  Example:  HOST0= <u>www.test.ru:1000</u>	X – server domain name,  Y – server port	Setting domain name and server port, which the terminal is connected to for data transmission. The command without parameters restores to the current server address and port.
14	DMODE X  Example:  DMODE 1	DMODE=X  Example:  DMODE=1	X=0 – Beacon mode X=1 – Tracker mode	Selecting current mode of the tracker.

15	BMODE X,Y,Z  Example: BMODE 1,0,1	BMODE=X, Y, Z  Example: BMODE=1, 0, 1	X – GSM module status during sleep, X=0 – off, X=1 – on.  Y – GLONASS/GPS module status during sleep, Y=0 – off, Y=1 – on.  Z – determination of coordinates during activity, Z=0 – no; Z=1 – GLONASS/GPS; Z=2 – LBS; Z=3 – Auto.	Setting the GSM and GLONASS/GPS modules disabling in Beacon mode.
16	BTIME X,Y,Z,A  Example:	BTIME=X,Y,Z,A  Example:	X – minimum activity time in seconds.	Setting the duration of activity and sleep states in Beacon mode.
	BTIME 30,180,600,300	BTIME=30,180,600,300	Y – maximum activity time in seconds.  Z – sleep time after successful activity.  A – sleep time after error in seconds.	
17	BWAKEUP	BWAKEUP OK		Extraordinary awakening the tracker in the Beacon mode.
18	WHERE			Request for a link to «Yandex.Maps» with the last valid coordinates. Answer is in text SMS-message.
19	PERIOD X,Y  Example: PERIOD 60,300	PERIOD min=X max=Y  Example: PERIOD min=60 max=300	X – recording period during movement in seconds  Y – recording period in modes "Statics" in seconds.	Setting the recording period in the memory of information packets during the movement and in the "Statics" modes.

20	TRACK X,Y,Z,A  Example:  TRACK 3,10,300,10	TRACK X,Y,Z,A  Example:  TRACK 3,10,300,10	X – minimum speed  Y – angle in degrees  Z – distance in meters.  A – speed change in km/h/s	Setting the quality of the route drawing. A new point on the route is setting if the direction of movement has changed more than by the angle Y or the distance to the previous point is greater than Z or the speed change per second is greater than A. This mechanism is switching off if the speed becomes less than X, in order to avoid the excess of points at maneuvers at low speeds, while the period of recording of points will be determined by the parameter X of the PERIOD command.  Changing the parameters of the TRACK command can lead to incorrect work of the tracker!
21	TSTIME X  Example:  TSTIME 300	TSTIME=X  Example:  TSTIME=300	X – the time, through which the "deep statics" mode activates, in seconds.	Setting the time through which the transition to the "Deep Statics" mode will occur when there is no movement.
22	TSMODE X,Y  Example:  TSMODE 1,1	TSMODE=X,Y  Example:  TSMODE=1,1	X – status of GSM module, X=0 – off; X=1 – on.  Y – status of GLONASS/GPS module,  Y=0 – off; Y=1 – on.	Setting of disabling of the GSM and GLONASS/GPS modules in the Deep Statics mode.
23	SOSPOL X  Example:  SOSPOL 0	SOSPOL=X  Example:  SOSPOL=0	X=0 – triggering on press (contact closure).  X=1 – triggering on release (contact opening).	Setting the triggering mode of the "SOS" button.
24	POFF X  Example: POFF 0	POFF=X  Example: POFF=0	X=0 – Power button unlocked. X=1 – Power button locked.	Setting the prohibition of disabling the tracker using the Power button.

25	PENU X  Example:  PENU 0	PENU=X  Example:  PENU=0	X=0 – Auto power on disabled. X=1 – Auto power on enabled.	Activation of the automatic turn-on of the tracker, when connected to a charger or personal computer.
26	BATALARM X,Y  Example:  BATALARM 03650	BATALARM=X,Y  Example:  BATALARM=0,3650	X=0 – function disabled. X=1 – function enabled.  Y – critical battery voltage level, in mV.	Setting up of SMS sending for low battery alarm.
27	EventListAdd X  Example:  EventListAdd 79876543210	Number was added to event list  Example:  Number was added to event list	X – adding phone number in format «7xxxxxxxxx»	Add a phone number to the list for sending alarm SMS. List is storing no more than 4 phone numbers.
28	EventListClear	Event list was cleared		Erasing all numbers from the list of phone numbers for sending alarm SMS.
29	EventListShow	Event list: (0)=779876543210 (1)=79876543211 (2)=79876543212 (3)=		Request a list of phone numbers for sending alarm SMS.
30	UPDATE	Start update		Firmware update via GPRS channel.
31	ERASE EEPROM			Reset to default settings.
32	ERASE FLASH			Cleaning the "black box".

33	USSD X  Example:  USSD *100#	USSD ok  Example:  USSD *100#	X – request text.	Sending a USSD request.
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Note: it is necessary to enter space between the command name and its parameter (or the command name and its parameters).

Parameters of commands are separated by comma without spaces, except for the DNO X:Y command, where between the parameters X and Y it is necessary to enter a colon.

## Appendix B. Description of bits of the "Status" field

Bits	Description of field «Status»	Mask value
0	The device was turned on using the power button	1
1		2
2	No connection to the server	4
3		8
4	Sign of low battery voltage	16
5	Sign of invalidity of coordinates	32
6	Coordinates were fixed within absence of movement	64
7	External power of the terminal is disconnected	128
8	Button "SOS" is pressed	256
9		512
10		1024
11		2048
12		4096
13		8192
14	Coordinates are determined using GSM base stations	16384
15		32768