

GH3000

advanced user manual

(confidential document)

<http://www.teltonika.eu>

en

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Introduction

GH3000 is hand held tracking device with built in functions and characteristics of a mobile phone. This device is intended for the surveillance and protection of people, cargo, objects. A-GPS (*Assisted-GPS*) receiver is able to identify current location coordinates and send them to operation center or a person.. In case of emergency, the device can activate the alarm function . Device can be used as GPRS modem when it is connected to computer. Also device can be used as real time navigation if computer has special software installed in it.

So this all – around device is able to execute various tasks, which are realized through GSM network and GPS system. Easy installation and operation, small size and user friendly design will help you to perform your desired task easier.

Protection of copyright

All rights protected. ©Teltonika 2010.

All rights are owned by the author. You may not copy, compile or transfer the present information to third parties or distribute it without a prior written consent by UAB Teltonika.

Other products and company names mentioned in this Manual may be trademarks or names of products of such companies.

Support

In case you have problems with the use of the product beyond your possibilities to solve it, please address them to the Technical Assistance Center (TAC) by e – mail support@teltonika.lt or contact your local seller. We would be pleased to assist you.

Notice:

Teltonika recommends to read Advanced User manual carefully. Teltonika does not take any responsibility for problems that occur due to an inappropriate usage of a device, incorrect configuration or usage of software that was issued by a third party.

Teltonika reserves a right to modify the functionality of the device without any prior notice.

About this document

Advanced device functionality description is described in this document.

For your safety

We strongly recommend to read basic safety warnings. You will run the of harm to yourself or to violet existing laws.



Turn on and use device where it is safe to do this.

Do not use device where mobile phone use is forbidden or where GSM network can be cause of the damage.



Road safety first.

Do not cross local traffic laws . Always hold your hands on a steering wheel when using a device. Most important thing when you drive is safety.



Inter fence.

All wireless devices are sensitive to inter fence, so use of device may affect the performance of another wireless device.



Limit the use of device in hospitals .

Follow any restrictions. Turn off the device while being close to medical devices, where required.



Limit the use of device in vehicles.

Follow any restrictions. Wireless devices can harm the use of electronic equipment in vehicles.



Be careful in gas stations.

Do not use device of be careful using it near flammable materials.



Limit the use of device while being near explosive materials.

Follow any restrictions. Do not use device where explosive related work are held or explosives are stored. Follow all internal rules.

Charging



Chargers, personal or laptops, device will be connected to, must comply with the requirements of DIN EN 60950-1:2003 standard.



Connection with computer

Computers, device will be connected to, must have USB slot.



Use only original batteries.

The use of a different type or manufacturer batteries can cause an explosion



Use batteries safely.

Prevent batteries from liquid. Place them in a dry and coll place when storing. Prevent device from high temperatures. Do not try to charge battery straight from electrical socket.



Other

In order to prevent device from mechanical damage and failure it is advisable to transport it in the shock – resistant packaging.

Connection quality depends on the environment in which device operates. If device stopped working properly only qualified specialist can help you. In this case, it is recommended to send device to repair.

Energy

Energy supply circuits, used for device connection, must have safeguards (automatic bipolar off), which will prevent from power leakage, short - circuiting or incorrect grounding. Switch must be installed in a readily accessible location. Power must be constant and the distance between the contacts must not to be less than 3 mm.



Safely remove device

Device can be disconnected from computer or charger by unplugging USB cable from computer or device.

GH3000 memory organization

Device uses external 1MB size memory, which is designed to: device configuration, coordinates, AGPS data files and other information device uses to work.

File system installed in the device help rationally use device memory.

As mentioned before various types of files can be written in device memory, (e.g. configuration file – cfg.xxx, SMS format file – sf.xxx, periodical data file – per.xxx, alarm data file – alarm.xxx, agps.xxx and so on.

Each file name is drawn from the abbreviation of the file name and its number of separate „.“ symbol. i.e. per.001 is periodical data file, which has number is 001 in memory.

All files stored in device memory are coded in HEX format. To read them from memory RS terminal (using special commands) or Y modem can be used (to find out more about the use of Y modem look up in internet)

per.xxx and alarm.xxx data files will be discussed in this chapter.

Data and its distribution

Maximum amount of periodical and alarm data cannot extend 500kB (other memory part is for other type of data). This kind of data can be in periodical and alarm data files :

- 1) GPS data
- 2) GSM data
- 3) Event data
- 4) Additional information

GPS data

GPS data – result of integrated GPS module calculations. It consist of:

- 1) Latitude, Longitude
- 2) Movement speed.
- 3) Altitude
- 4) Moving angle
- 5) Visible satellites.
- 6) HDOP, VDOP, PDOP.
- 7) Time of the first fix.

GSM data

GSM data is received from integrated GSM module.. It consist of :

- 1) GSM operator code,
- 2) GSM signal level,
- 3) CELL ID number.

Event data

Event data – data generated by device owner or device itself. It consist of:

- 1) Pressed button ID number,
- 2) Movement sensor current status,
- 3) USB status,
- 4) Cause of Alarm activation.

Additional data

Additional data consist of:

- 1) battery level in percent.
- 2) Battery level in mV.

Periodical data files

Periodical data files are named „per.xxx“ in a memory, where xxx stands for data file number in device memory.

Maximum periodical data amount cannot extend 500kB.

Periodical data file can consist of maximum 10kB data. It means maximum 50 different files with their unique name can be written to memory.

Alarm data file

Alarm data data files are named „per.xxx“ in a memory, where xxx stands for data file number in device memory..

Periodical alarm file can consist of maximum 10kB data. It means maximum 50 different files with their unique name can be written to memory.

Deleting data

It can happen that all device memory will be filled with data. In this case GH3000 will record new data over old data. It is also important that *alarm* data has higher priority than *periodical* data, that s why *periodical* data will never delete *alarm* data.

Alarm data can be deleted only when all memory designated to *periodical*, *alarm* and *A-GPS* data are filled only with *alarm* data or A-GPS file is being sent for the first time. In this case old *alarm* data will be deleted and new data will be written to their place.

Notice:

All data sent through GPRS is deleted immediately.

Software

Software will help you to get the most of GH3000. It is main tool for device configuration and data collection. Software files and all drivers, needed for installation process are located in compact disk. CD comes with device package. All of this also can be found in Teltonika owns internet address at : www.teltonika.lt/downloads. Before starting software installation process look to official Teltonika website if there is updated software versions.

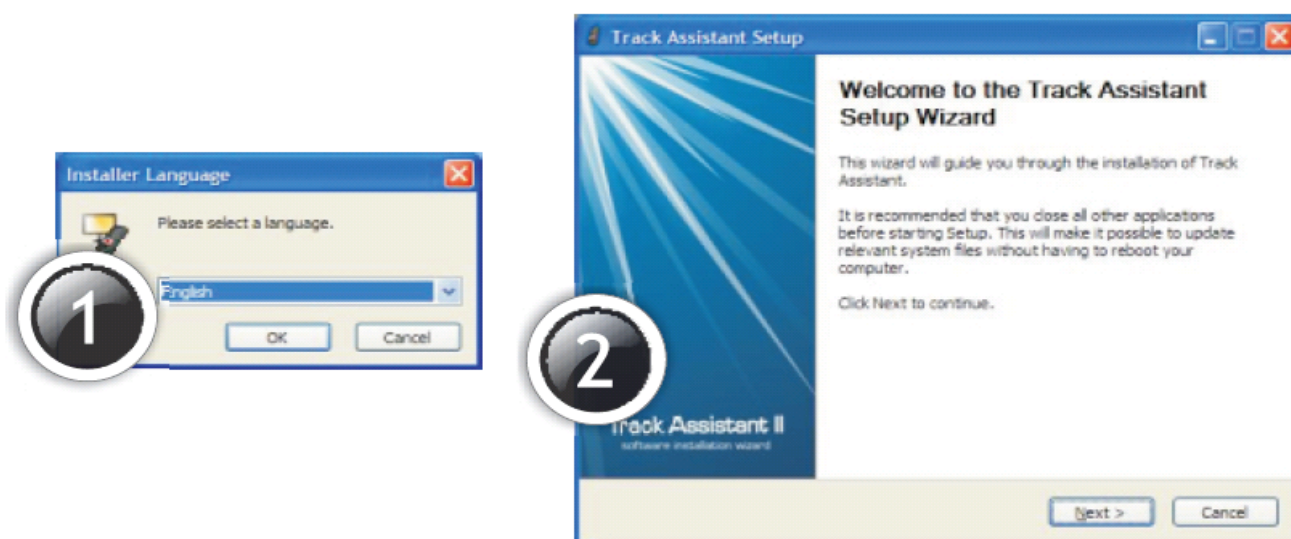
Software setup process

Install software before connecting device to computer.

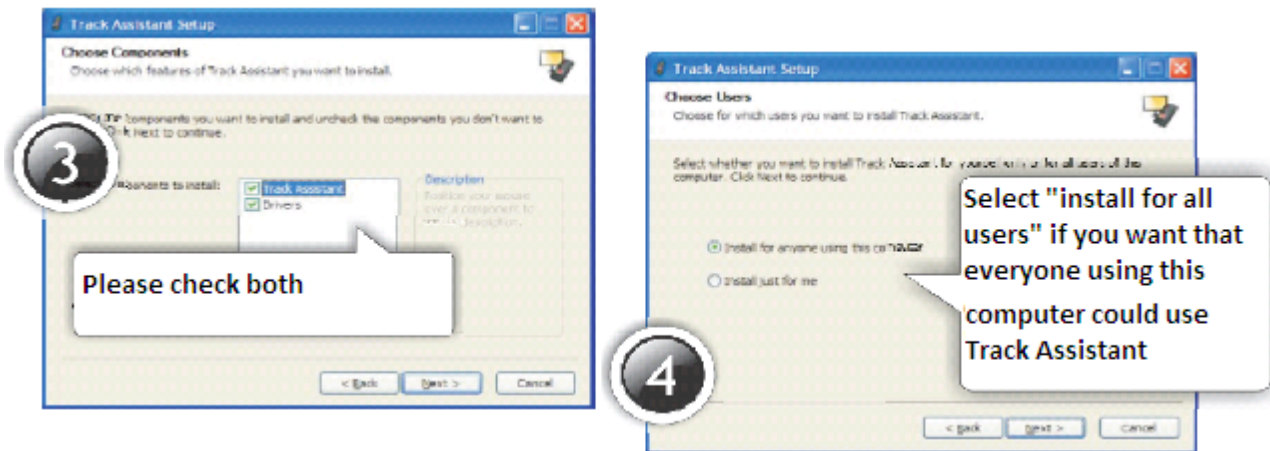
Minimal system requirements	
Operating system (OS)	MS Windows XP SP1 / Vista / 7
Hard disk space	20 MB
Display resolution	1024 x 768
Windows Installer version	3.0 or greater
Microsoft .NET framework version	V2 SP2 or greater

Notice: Contact us or your local dealer if you are using different operating system than listed above. They will help you installing our software to your operating system.

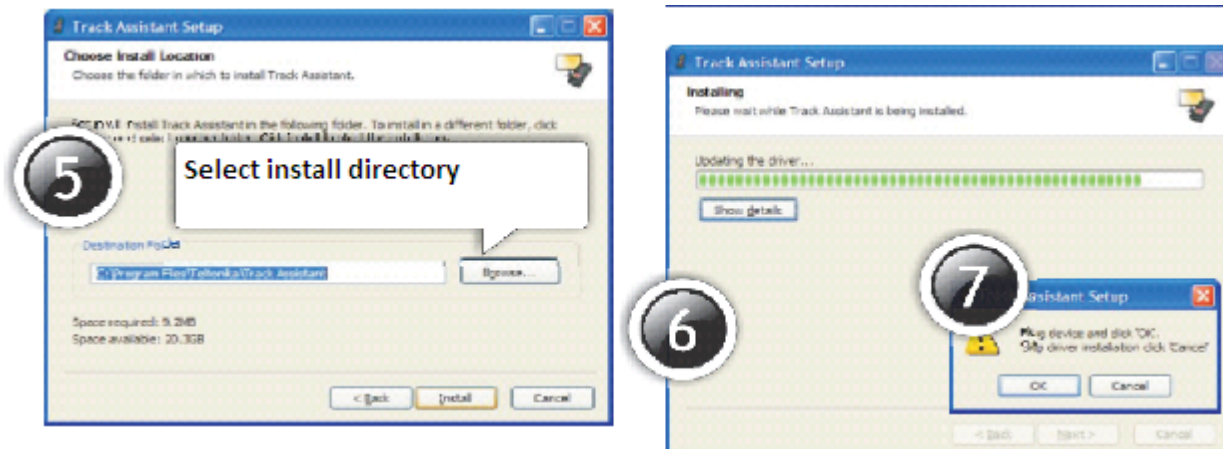
Insert compact disk to CD - ROM. Right after that setup wizard should pop out (1). Now you can choose language you want to see instructions during installation process. Now following wizard instruction install *Track Assistant* software.



2) - press *Next*.



3) - select components you want to install. i. (4) – choose software users.



5) – choose your install directory.

6) – Installing.

7) – setup wizard will ask to connect device to computer. Please connect device and press Ok. If you press cancel Device drivers will not be installed.

8) - press *Continue anyway* button if *Hardware Installation* window pops out. .

You can use installed software right after setup is finished. Software name – *Track Assistant*.

Periodical data storage

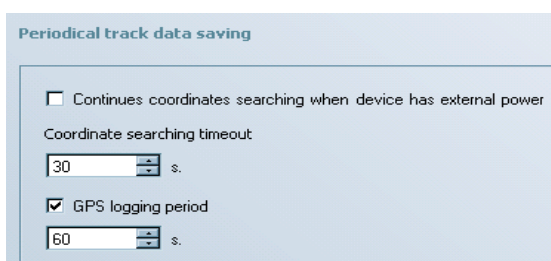
You can collect periodical data and store it to memory. It allow to read and use data later. Various types of data can be saved periodically (see *Configuration*).

By default this periodical data is saved to memory : device location (longitude, latitude), altitude, speed, visible satellites. Periodical data logging period by default is 600s (10min)

Configuration

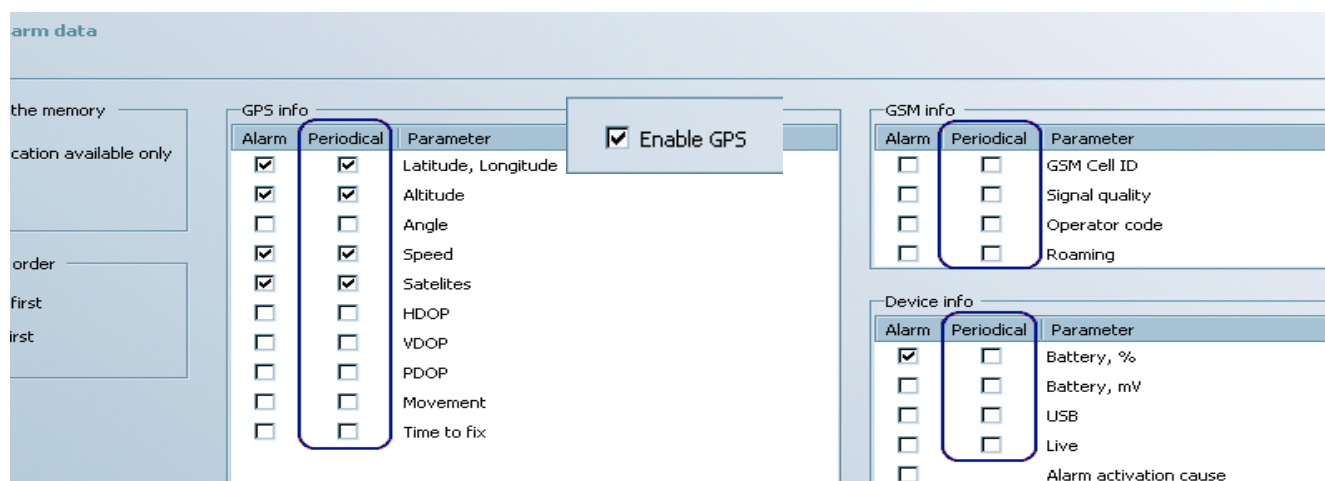
Periodical data saving configuration can be edited in *Track Assistant* software:

- *Device configuration* → *Tracking and Saving* → *Periodical track data saving*.



Periodical data saving configuration

Parameter	Description
Continues coordinates searching when device has external power	Enable/Disable. If enable GPS module is always active and looking for new coordinates.
Coordinate searching timeout	Time in seconds how long device will try to get coordinate. After this time expires device turns off GPS module (stop looking for fix) even when he has not found coordinate. By default this time is 180s (3min). Maximum searching time: 9999s.
GPS logging period	Enable/Disable periodical data saving. Time in seconds how often data will be saved. By default logging period is 600s (10min). Maximum period : 2592000s



Parameter	Description
Save data to the memory	<i>When location available only</i> – saves data only when location is available. <i>Always</i> – always saves data. It does not matter if coordinate was found or not. In this case N/A (<i>Not Available</i>) will be displayed over coordinate.
Data sending order	Specifies the manner in which data is sent through GPRS. <i>Newest first</i> – Newest data will be sent first. <i>Oldest first</i> – . Oldest data will be sent first
GPS, GSM, Device info	In these fields you can choose what information in case of emergency (<i>Alarm</i>) will be saved. Detailed explanation will be found below.

There are 3 main information categories : GPS information, GSM information and Device information.

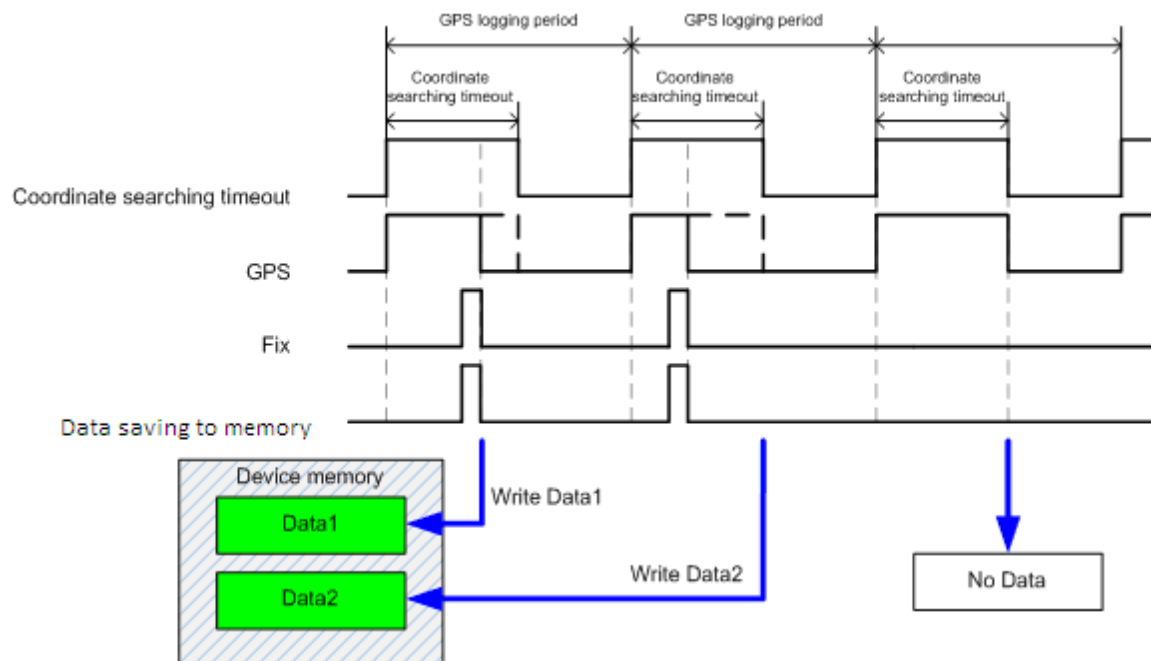
GPS info	<i>Latitude, Longitude</i>
	<i>Altitude</i>
	<i>Angle</i>
	<i>Speed</i>
	<i>Satellites</i>
	<i>HDOP</i>
	<i>VDOP</i>
	<i>PDOP</i>
	<i>Movement</i>
	<i>Time of fix</i>
GSM info	<i>GSM Cell ID</i>
	<i>Signal Quality</i>
	<i>Operator code</i>
	<i>Roaming</i>
Device info	<i>Battery, %</i>
	<i>Battery, mV</i>
	<i>USB</i>

	Live
	Pressed button ID
	Alarm activation cause

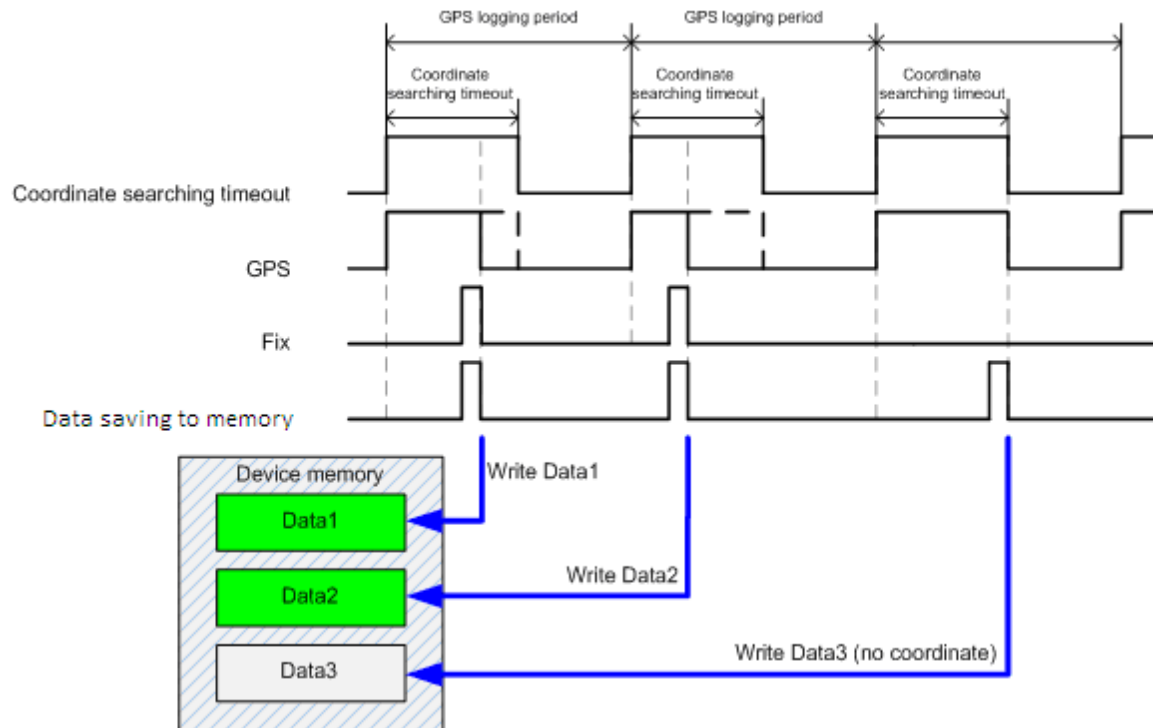
Operation

If periodical data saving is enabled, device saves data to memory after time set in logging period. Data consist of coordinate, so before saving data to memory, coordinate must be found. So device turns on GPS module and searches for coordinate for given time. If coordinate is found :

- 1) Before timeout, device turns off GPS module and writes coordinate to memory.
- 2) Not found. (No Fix), device turns off GPS module and writes N/A to memory (if **Save data to the memory** is chosen to *Always*) or does not write at all (if *When location available only* is chosen).



Exp 1 Periodical data saving, when data is saved after coordinate is found (*When location available only*)



Exp 2 Periodical data saving, when data is saved always (*Always*)

Parameter	Description
Coordinate searching timeout	Time for how long device tries to find coordinate. After this time expires device turns off GPS module.
GPS	GPS module enable/disabled.
Fix	Coordinate found.
Data writing to memory	Newest data is written to device memory.

Newest coordinates data is saved in separate BAT RAM memory. This memory has its own power supply, so coordinates data will not be lost after device is reset ed or turned off. In case of removing device battery or memory is formatted, newest coordinate data will be deleted.

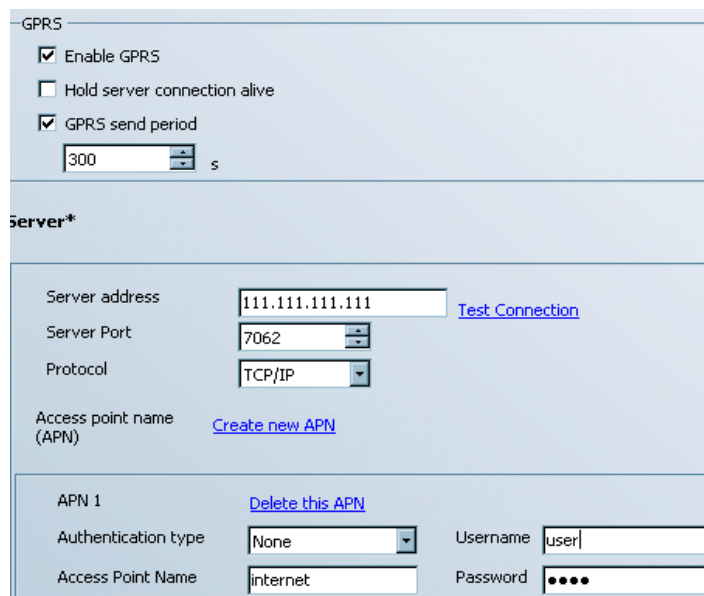
Periodical data sending

It is device ability to send data through GPRS (Packet Radio Service) to server (remote computers). All collected data will be transferred this way. Data will be deleted from device memory after it will be successfully transferred to server. The storage will be ready to save new data.

Configuration

Periodical data sending configuration will be found in *Track Assistant* software:

- *Device configuration* → *Connection and Data* → *GPRS* and *Server* columns.



Periodical data sending configuration

Parameter	Definition
GPRS	
Enable GPRS	Enable/Disable GPRS
Hold server connection alive	Enable/Disable function, which allows you to hold connection with server in order not to reconnect every time. Recommended if data sending period is less than 30s. Network operators charge for connecting to server so you will save too.
GPRS send period	Enable/Disable periodical data sending and set sending period. Maximum period 65535s
Server	
Server address	Server (remote computer) address. IP or DNS address can be filled in. <i>Test connection</i> button allows to simulate connection with server.

Server port	Server port number. Maximum number 65535.
Protocol	Data sending protocols. Device supports: TCP/IP and UDP. More about these protocols will be found here: www.en.wikipedia.org/wiki/TCP/IP www.en.wikipedia.org/wiki/UDP
Access point name (APN) (Used when trying connect through GPRS)	Create new APN – press in order to create new access point name (APN).
	Authentication type. If there is no authentication select <i>none</i> . Your network operator will provide which type of authentication to choose. 2 types are possible: <i>PAP (Password Authentication Protocol)</i> – password requiring authentication. It is most common and used almost by every network operator. <i>CHAP (Challenge Handshake Authentication Protocol)</i> – more complex authentication type.
	Access point name
	User name
	Password

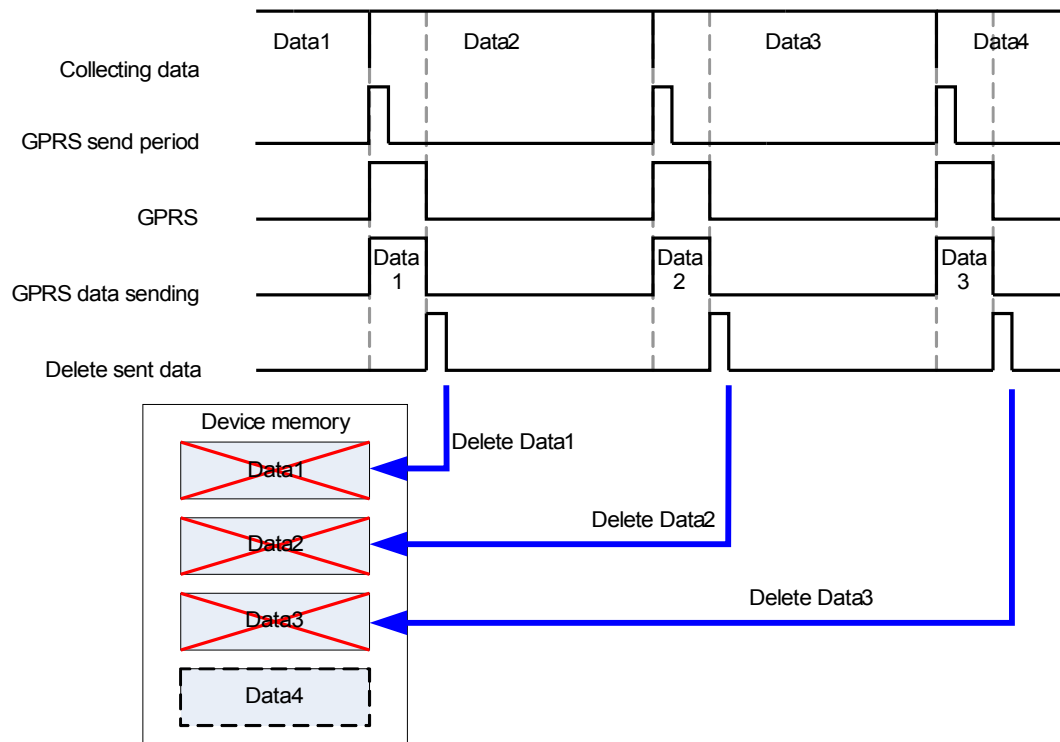
APN stands for access point name and is important when connecting through GPRS. APN is provided from network provider. When device tries to connect to internet, network provider, depending on a given APN will give a device certain way to reach internet connectivity. If you keep APN tab blank, device will try connect using APN – internet or without any APN. So sometimes it is enough to get connectivity without entering APN. If you fail to get connection without entering APN, please enter it. Your network provider will gladly give this information. Device can store 4 APN addresses.

Operation

Periodical data saving and periodical data sending through GPRS is enabled. Also server which will get all data information is entered too. Device periodically sends collected data to dedicated server. Sent data is deleted from device memory.

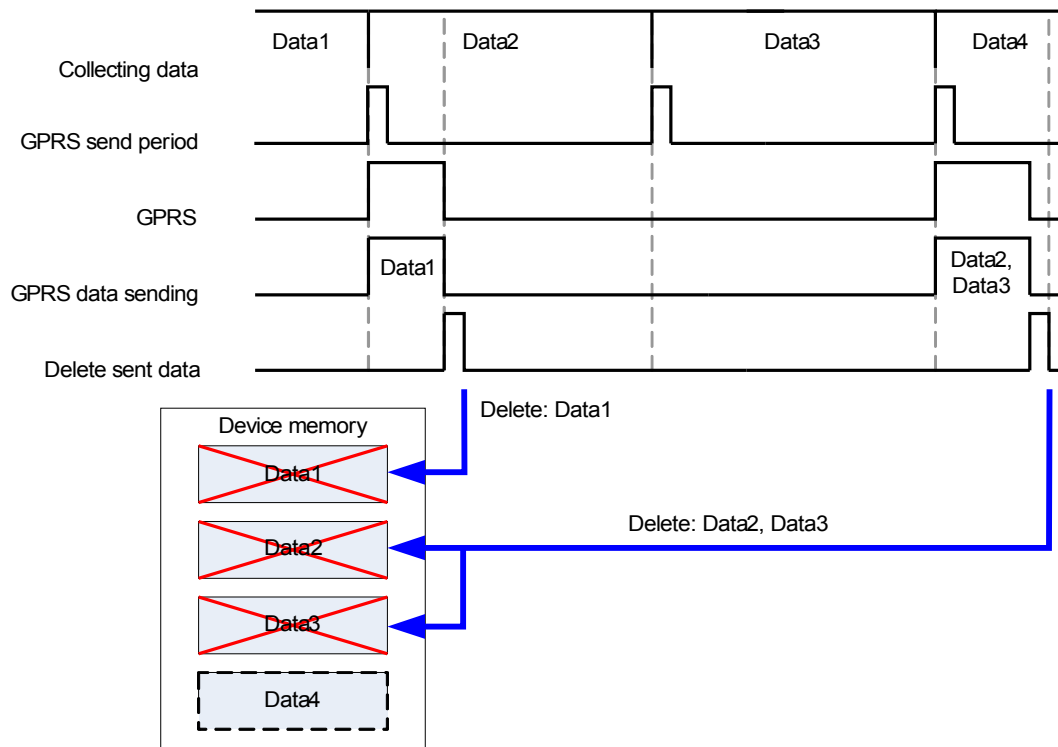
Communication with the server

After given time device connects to server through GPRS and sends its unique IMEI code. Server confirms device log-in. Right after that device sends data in packets and after every packet server sends confirmation if data is received correctly. The data are sent until all data saved in memory is sent.



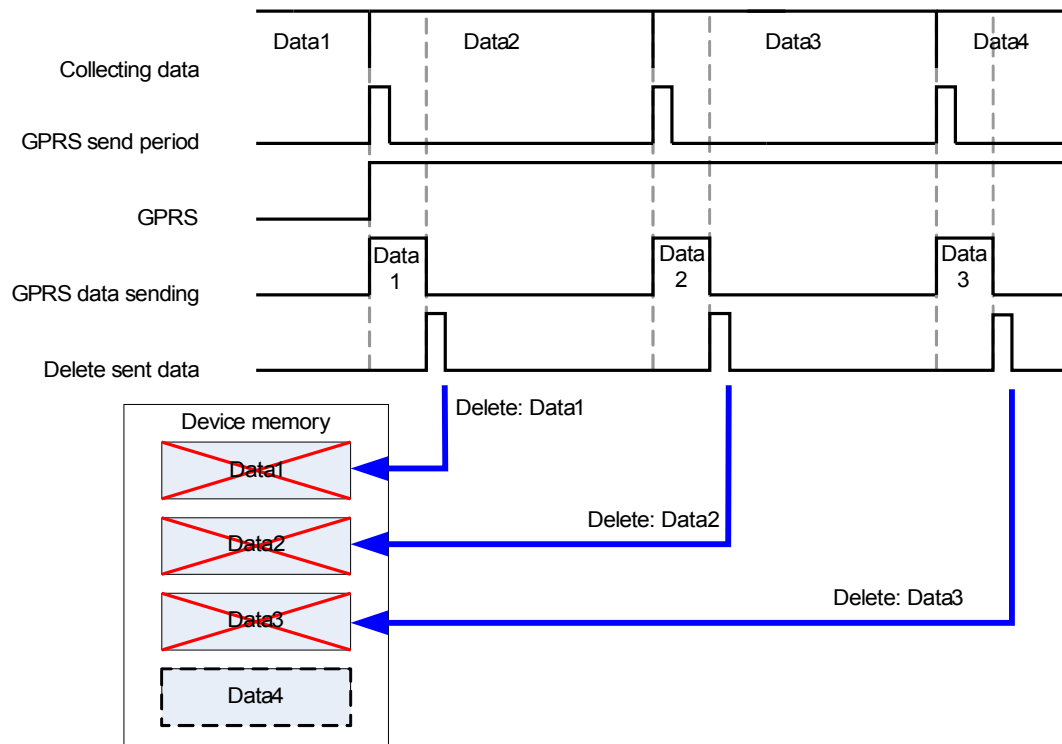
Exp 1 Periodical data saving : after given time to send data, device connects to server through GPRS and sends data. Right after that device deletes sent data.

When device fails to send data, it does not delete data and tries to send it when the next period comes. (show in an example below)



Exp 2 Periodical data sending when device fails to send data. (Data2)

If you are sending data very often, device has to connect to server very often too. In order to avoid often connectivity, *Hold server connection alive* parameter should be enabled. Now you will avoid often connectivity, because now when you connect to server connection wouldn't be lost. Device working scheme is show below.



Exp 3 Periodical data sending when Hold server connection alive parameter is enabled : device keeps connection with server alive.

Keyboard

Device has 5 configurable buttons, reset button, lock button. Keyboard helps user to control device. Every configurable button can perform users set-ed functions, exp : call, activate alarm, etc..



Configurable buttons are numbered. By default red button (5) activates alarm. Reset button is show with the arrow. It can be pressed only with something long and sharp like paper clip. Lock button is located on device right side.

Keyboard configuration

To configure keyboard open *Track Assistant* software:

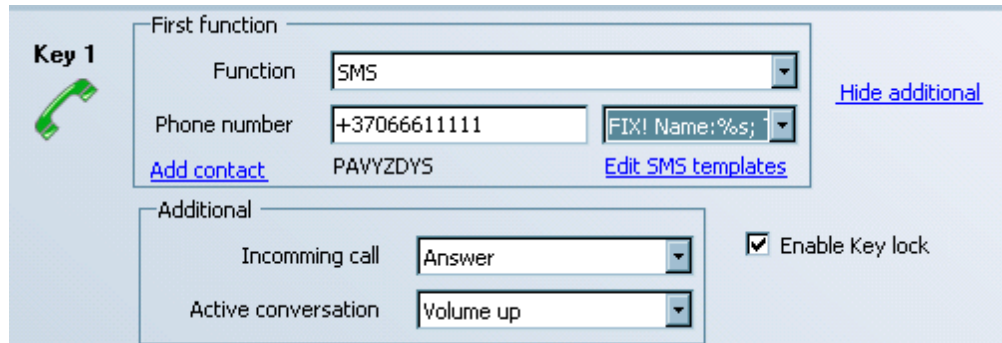
- *Device configuration* → *Keyboard* tab.



Key	Function	Phone number	Add contact	Show additional
Key 1	Undefined			Show additional
Key 2	None			Show additional
Key 3	None			Show additional
Key 4	None			Show additional
Key 5	None			Show additional

When you press show additional you can choose more buttons configuration parameters will

be show after pressing *show additional* :



Please find explained tab description in tables below.

Table 1.

First function	First function
Function	
Phone number	If number is required to perform a function (call, SMS) it is entered in this tab. Desired SMS format is chosen there too.
Additional	Additional
Incoming call	
Active conversation	Function which will be activated when device has active conversation.
Enable Key lock	If you enable this function buttons would not work when keyboard is locked. If you disable this function buttons will work even if keyboard is locked.
First function	First function

First functions :

Table 2.

Function	Description
None	No function
Undefined	Function has not been chosen.
Alarm on	Activate alarm.
Alarm off	Deactivate alarm.
SMS Track on	Activate SMS track.

SMS Track off	Deactivate SMS track.
SMS Track Switch	Switch SMS track. If it was on, now it is off. If it was off, no it is on.
Send data thru GPRS	Send data saved in device memory through GPRS, all sent data will be deleted from memory.
NMEA On	Activate NMEA.
NMEA Off	Deactivate NMEA.
NMEA Switch	Switch NMEA. If it was on, now it is off. If it was off, no it is on.
Emulate modem On	Activate modem.
Emulate modem Off	Deactivate modem.
Power Off	Turn off device.
Reset	Reset device.
Parking On	Activate <i>Parking</i> (dynamic Geo - zone) function.
Parking Off	Deactivate <i>Parking</i> (dynamic Geo - zone) function.
Parking Switch	Switch <i>Parking</i> . If it was on, now it is off. If it was off, no it is on.
Call	Call to the entered number.
SMS	Number and SMS format is selected in <i>Phone numbers</i> tab.

Operation

Function activation/deactivation

Press and hold button for 0.5s. Green GSM and battery LED's should light up, and device will make a short tone. So desired function is activated right after button is released after this minimal time (0,5s). This is made to prevent accidental function activation. Then function is activated short tone must be heard too.

If button is not released and pressed longer than 3s, function is not activated. Green GSM and battery LED's stops to light and short tone will inform about device not activating this function. So if you accidentally pressed button and do not want function to be activated just hold button for more than 3s and function will not be activated.



Turn off button

Red phone (no. 2) button is used to turn off device. Device turn off is activated then this button is pressed and hold for 5s or longer. Short tone and green and red battery LED will indicate device

turning off.

Attention: time of the buttons is configurable through terminal or special commands (see *configuration through terminal*).

Locking the keyboard

Keyboard can be locked with a button on a device right side. Two positions is possible : - keyboard is locked and - keyboard is unlocked. Keyboard will be inoperable unless certain buttons have *Enable Key lock* function disabled.

Reset button

Device can be reset by pressing the reset button. In order to prevent accidentally pressing this button it is reached only with something sharp and long. Use paper clip or needle to to this job. Reset button is right below 5 button keyboard.

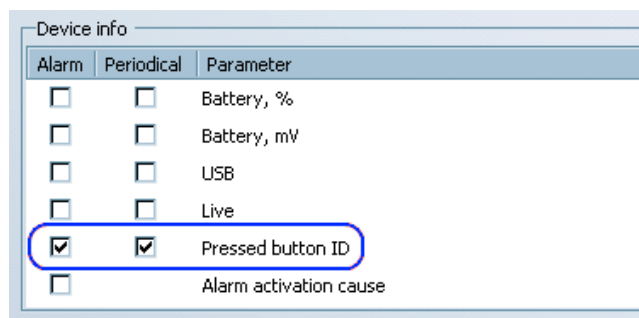
Button ID

Every button on the device has its ID number, which can be sent or not (depending on a configuration) to the server with other data as IO element. Now user can identify which button activated GPRS data transfer.

Configuration

Identifier can be enabled:

- *Device configuration* → *Connections and Data* tab choose *Periodical and alarm data*.



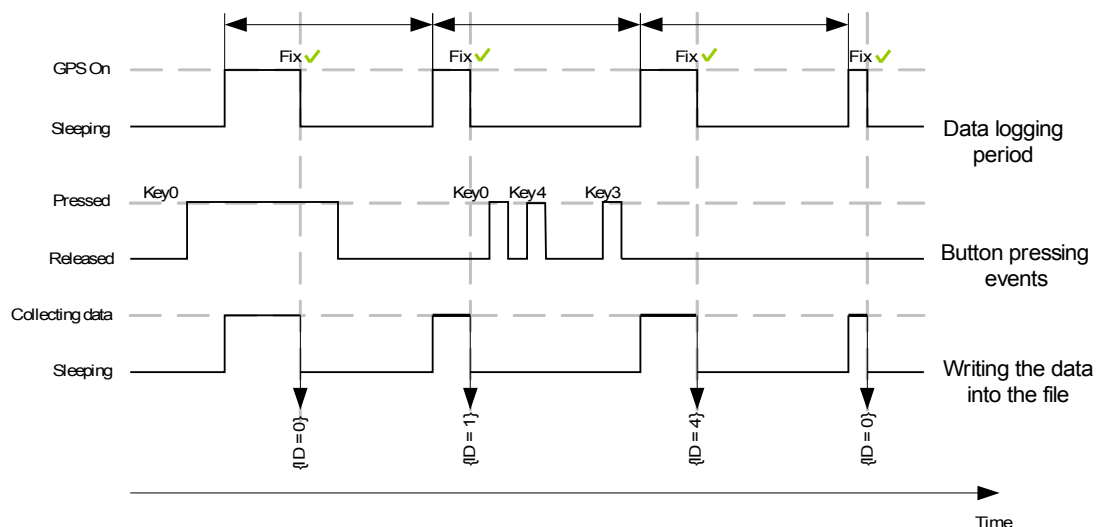
Identifier of pressed button ID is activated

Alarm – button ID will be sent with Alarm data.

Periodical – button ID will be send with periodical data.

Operation

Device will attach information about last pressed button when sending data to server



Sending of pressed button ID

Buttons and they ID numbers:

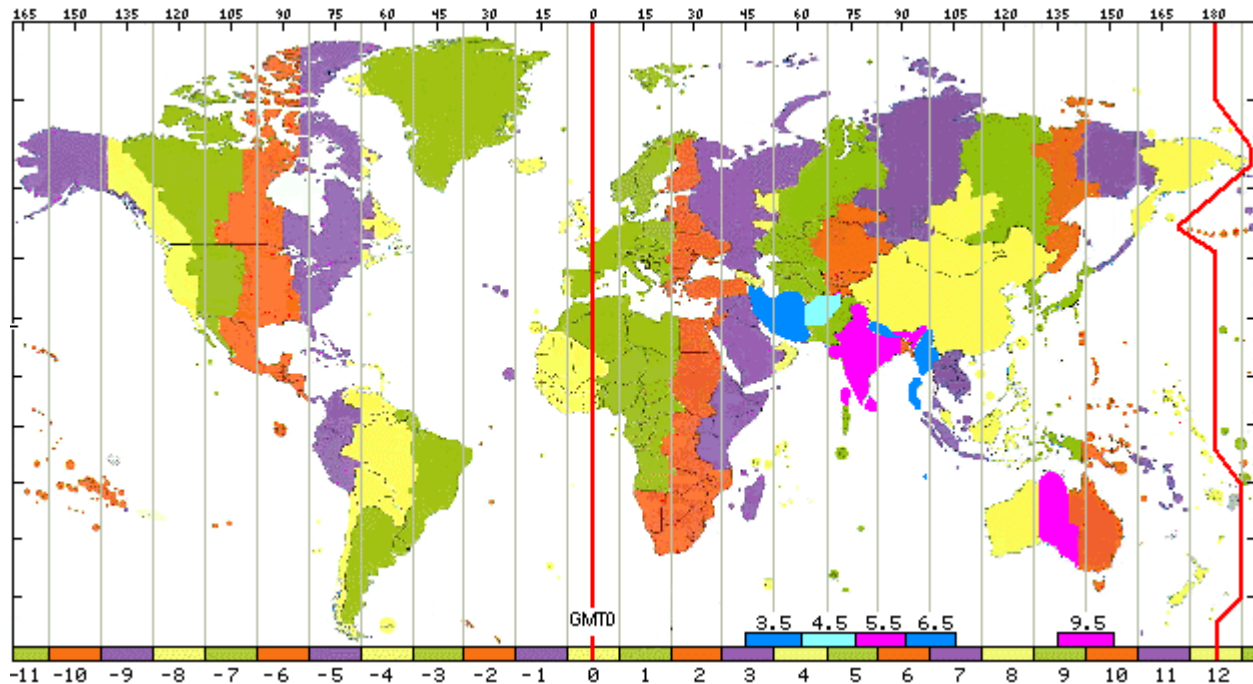
Button	ID
key0	1
key1	2
key2	3
key3	4
key4	5

Attention:

Button event will be generated when device will log button press and release actions only. So button event – press and release.

Time zones (GMT)

There are 24 time zones in the world. The difference is 1 hour between two zones located one next to another. There are some derivative zones, which differs $\frac{1}{2}$ hour located too. This helps people living in different locations to use same time. Zero time zone is at Greenwich (United Kingdom). Additional hours are added or subtracted in order to set local time.



Time zone map.

Time zones are classified according how many hours are added or subtracted from Greenwich time. This time is marked as GMT (Greenwich Mean Time). For example GMT+2 is used in Lithuania (2 hours are added to Greenwich time).


Time is divided into summer and winter times in a a lot of countries. One hour is usually added in a winter time (8 : 00 → 9 : 00). It is called *Daylight saving*. Dates are called officially by the government of the country when winter or summer times are enabled.

Configuration

Time configuration:

- *Device configuration → Date and Time.*

Date and Time

 Refresh

Computer Local Time: 14:49

Device Time: N/A

Computer Local Time

Time offset: GMT+02:00 hours

GPS device works with UTC. Offset is the difference between local time and UTC measured in hours. This offset is used to automatically convert and represent UTC to local time.

Device Time*

Time zone: GMT+02:00

Time format: %Y.%d.%m %H:%M:%S

Daylight saving: ☒ Enable ☐ Disable

Delta: 1

Start: Spl 4th week Sk 00:00

End: Kov 4th week Sk 00:00

Parameter	Description
1. Time	<u>Computer Local Time</u> – displays current time. <u>Device Time</u> – displays device time.
Computer local time	
2. Time offset	Device works on UTC (GMT0) time. So difference between local which is show by computer and UTC time must be entered here. This difference is used to automatically change UTC time to local time.
Device Time	
3. Time zone	Time zone selection
4. Time format	Time format can be changed. Y – years, d – days, m – months, H – hours, M – minutes, S – seconds. Just change order of the letters.

5. Daylight saving	<p>Time when device starts using winter time (<i>Start</i>) and goes back to summer time (<i>End</i>) can be set here. Also difference between winter and summer times is set here too.</p> <p><i>Enable</i> – turn on, <i>Disable</i> – turn off.</p> <p><i>Delta</i> – Time difference between winter and summer time.</p> <p><i>Start</i> – date and time when winter time starts.</p> <p><i>End</i> – date and time when winter time ends.</p>
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Operation

Factory set time 2008.01.01 will be used until device gets first fix. In order to set local time place the device under clear sky. Device will get time information from satellites. In order to change time zone, send SMS or use *Track Assistant* (*Device configuration* → *Date and Time* → *Time zone*). So GH3000 sets time from received satellites data. This time is UTC (GMT0). Device recalculates this time depending on configuration and uses new local time.

Device configuration and operation through SMS messages

Device has unique ability to communicate through SMS without any physical connection. Device configuration can be changed through SMS messages. There are 2 types of configuration : fast (easy) and advanced configurations. Various requests can be sent to device too. Device after receiving this time of message will respond with the answer or by activating/deactivating a function. Remote device configuration is very handy and extends device usability. There are three types of messages : fast, advanced and requests. Extended description will be displayed later in the document. It is not important **capital or not** are used when typing the message (excepts password). Here is an example :

Psw:0000;inf?

pSw0000 GMT+2

Attention: Maximum length of the message is 160 characters.

Fast configuration (easy)

Remember that **space ()** or semicolon (**;**) characters are used to separate parameters. Parameter psw and password can be written without separation character (**psw0000** or **psw:0000**). Example:

psw0000 alarm on


If there is no password, SMS format starts with **psw** too. Example:

psw parking off

Some device parameters can be changed through fast configuration. They are displayed in a table below. Device will respond with SMS message after successful change of configuration.

Parameter	Description	SMS text
Change of user password	Configuration password can be changed with SMS message. By default password is : 0000. Use only allowed characters (Aa – Zz) and (0 – 9). Remember new password in order to change device configuration later.	psw<old password> ch<new password>
		Example: psw0000 ch1234 Result: Password was 0000, now it is 1234 <i>Attention:</i> if you send this SMS: psw<password> ch password is removed. Maximum length of the password is 32 characters.
Time zone configuration	Factory set time 2008.01.01 will be used until device gets first fix. In order to set local time place the device under clear sky. Device will get time information from satellites. In order to change time	psw<password> gmt<+-time difference> Example: psw0000 gmt+2

	zone, send SMS or use <i>Track Assistant</i> (<i>Device configuration</i> → <i>Date and Time</i> → <i>Time zone</i>)	Result: GMT was 10.23.22, now it is 12.23.22
Periodical data saving	By default device saves new coordinates every 600s (10min.), In order to change this time send SMS or use <i>Track Assistant</i> (<i>Periodical data saving</i>).	<i>psw</i><password> <i>t</i><new period in seconds> Example: <i>psw0000 t3600</i> Result: Time period was 600s, now it is 3600s. Maximum saving period is: 2592000s.
Notifications about battery level	In order to get information about device battery phone number to which SMS will be sent must be entered. When battery will reach set level, device will inform about it by SMS message.	<i>psw</i><password> battery on/off <phone number> Example: <i>psw0000 battery +37060011111</i> Result: Function reporting about battery level is activated and critical charge level is set. After reaching this level SMS will be sent to number +37060011111 Example: <i>psw0000 battery on</i> Result: Function reporting about battery level will be enabled. Phone number will be used the same as entered before. Example: <i>psw0000 battery off</i> Result: Function reporting about battery level will be disabled.
Reset to factory settings	If device starts to work the way it should not, just reset device to factory settings.	<i>psw</i><password> restore Example: <i>psw0000 restore</i> Result: Device will reseted to factory settings.
Keyboard configuration	Every keyboard button can be set to call to designated phone number. Buttons	<i>psw</i><password> key<button ID> <phone number>

	<p>are numbered as displayed bellow.</p>  <p><i>keyboard buttons numbers</i></p>	<p>Example:</p> <p>psw0000 key1 +37060011111</p> <p>Result:</p> <p>Device will call to number +37060011111 after pressing the button.</p>
Man-down function	<p>Man-down function can be enabled/disabled.</p>	<p>paw0000 mandown on</p> <p>Result:</p> <p>Man-down function is enabled.</p> <p>psw0000 mandown off</p> <p>Result:</p> <p>Man-down function is disabled.</p>
Parking function	<p>Parking function can be enabled/disabled. Zone radius can be set too (zone has shape of a circle). Zone radius will remain unchanged if zone radius is not mentioned in SMS. By default zone radius is 200m.</p>	<p>psw<password> park on r<zone radius></p> <p>Example:</p> <p>psw0000 park on r300</p> <p>Result:</p> <p>Parking function is enabled and zone radius is 300m</p> <p>Maximum length of the radius is $3,4 \cdot 10^{38}$.</p> <p>psw0000 park on</p> <p>Result:</p> <p>Parking function is enabled</p> <p>psw0000 park off</p> <p>Result:</p> <p>Parking function is disabled.</p>
ALARM configuration		
Operation of an alarm	<p>Alarm function can inform in three way :</p> <ol style="list-style-type: none"> 1) SMS method - m1 2) Call method - m2 3) GPRS or SMS method – m3 	<p>psw<password> alarm <method> t<alarm duration time> <phone number></p> <p>Example:</p> <p>psw0000 m1 3600 +37060011111</p> <p>Result:</p> <p>When alarm will be activated, device will inform about this by sending SMS messages. Alarm duration time 3600s (60min). SMS will be sent to number +37060011111</p> <p>Maximum duration time:</p>

		2592000s.
Deleting all number from the list	You can delete all the numbers from alarm phone number list.	<p>psw<password> alarm del</p> <p>Example:</p> <p>psw0000 alarm del</p> <p>Result:</p> <p>All numbers from alarm phone number list are deleted.</p>
Removing phone number	You can delete chosen phone number from alarm phone number list.	<p>psw<password> alarm del <phone number></p> <p>Example:</p> <p>psw0000 alarm del +37060011111</p> <p>Result:</p> <p>Phone number +37060011111 is deleted from alarm number list.</p>
GPRS		
GPRS configuration	<p>Main GPRS preferences can be changed. Please contact your GSM network provider in order to get information about unknown data. <i>Periodical data sending</i>. SMS message can consist of :</p> <ol style="list-style-type: none"> 1) data send period 2) IP address 3) PORT number 4) Type of authentication (0 – none, 1 – PAP, 2 – CHAP) 5) Access Point Name APN 6) Log-in name 7) Log-in password 	<p>psw<password> gprs sp<data send period> ip<IP address> p<port number> apn<type of authentication>,<access point name>,<login name>,<login password></p> <p>Example:</p> <p>psw0000 gprs sp60 ip212.59.13226 p7012 apn0,banga,bite,bite</p> <p>Result:</p> <p>Device periodically every 60s (1 min), will connect to server, which has IP address 212.59.13.226, PORT – 7012, APN – banga, authentication type – none, login name and password – bite.</p>
	<p>Shorter message can be sent if server does not ask for log-in name and password.</p> <p>Attention! Authentication number is written together with word <i>apn</i>. <i>apn</i>, log-in name and password are appointed by commas.</p>	<p>psw<password> gprs sp<data send period> ip<IP address> p<port number> apn<type of authentication>,<access point name></p> <p>Example:</p> <p>psw0000 gprs sp60 ip212.59.13226 p7012 apn0,banga</p> <p>Result:</p> <p>Exactly the same as the example mentioned above, except sever does</p>

		not as for login name and password. Maximum data send period is 86400s
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Advanced configuration

This type of configuration is for experienced users. Precise SMS message formats and rules how to correctly write them will be found in ***GH3000 SMS Configuration Protocol*** document. You can get this document from Teltonika. Structure of the message is similar to one when configuration is made through terminal. You must follow these rules in order to change configuration :

- 1) maximum length of the message – **160** characters
- 2) every command in the same line is separated by **semicolon (;)**
- 3) command must be separated from parameter with **colon (:)**
- 4) parameters must be separated with **comma (,)**
- 5) in order to delete commands parameters type **(~)** symbol
- 6) last command must be **RST** (RESET, device must to reset in order to work with new configuration)
- 7) it is not allowed to split command message in other two (first message has begging and other end)

Advanced configuration text message looks like this :

```
psw:<password>;CFG1;<command>:<parameter1>;<parameter2>;<parameter3>;RST
```

Example:

```
psw:0000;CFG1;GPS:1;130;300;1;RST
```

Device will respond with SMS message after successful change of configuration.

SMS requests

SMS requests can be divided into two groups : getting information and remotely controlling device. Request about information is used to get desired information from the device and other one is for activation/deactivating certain functions on a device. Remember that symbol separating parameter **psw** and password is not important (**psw0000**) although colon can be used too (**psw:0000**). **Semicolon (;)** is used to separate request from password. Here is an example of SMS :

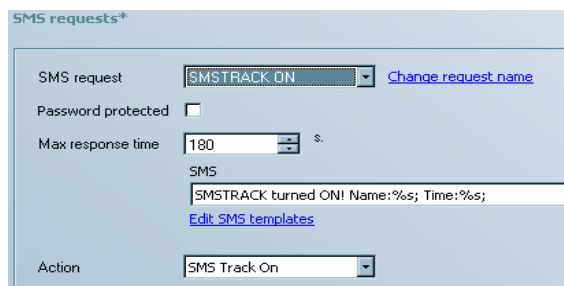
```
psw:0000;Fix?
```

Do not type **psw;;** if there is no password. Just write a command. For example :

SMSTRACK ON

SMS request preferences can be found :

Device configuration → GSM choose SMS requests tab.



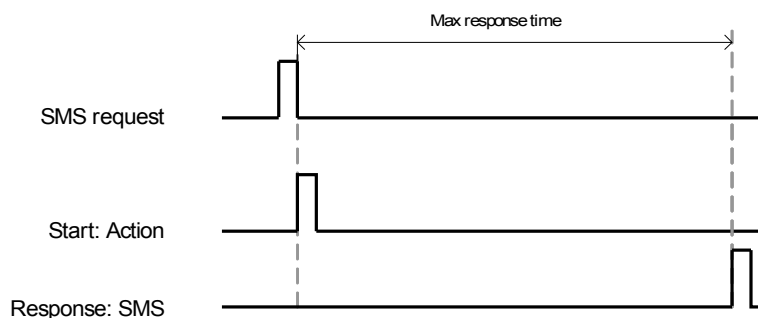
Configuration of SMS requests

Parameter	Description
SMS request	SMS request name can be changed. Type whatever you want.
Password protected	Enable/disable password protection for SMS requests. If request are protected with password, password must be typed before request with appropriate separation symbols. . Exp: psw:<password>;fix? If there is no password : Exp.: alarm on
Max response time	Maximum type in second how much type device should take before responding. Different value can be set for various request. This is handy if your request need time to respond (exp : <i>fix?</i> Device will try to get new coordinate before responding). Maximum time 255s.
SMS	Format of the message device will respond with after getting the request.
Action	Action which device will perform after receiving SMS request. Possible actions :
	None No action is performed
	Alarm on <i>Alarm</i> mode is activated
	Alarm off <i>Alarm</i> mode is deactivated
	Alarm Call terminate This action stops cyclic calls when <i>Alarm</i> mode is set to <i>Call</i> (cyclic call) mode <u>Attention</u> : <i>Alarm</i> mode is not deactivated

	SMS Track On	SMS Track function is activated
	SMS Track Off	SMS Track function is activated
	Send data thru GPRS	Data in device memory is being sent through GPRS.
	Power Off	Turn off device
	Reset	Reset device.
	Parking On	<i>Parking</i> function is activated.
	Parking Off	<i>Parking</i> function is deactivated.

Device will always respond to correctly sent request unless other restrictions (exp: *authorized SMS*) are enabled. SMS respond will be sent to the number device got request from.

Device will perform *action* immediately if certain *action*, device should perform, is mentioned in request. Respond will be sent after **Max response time**.



Operation of SMS request and respond

If *action*, sent to device, is *Reset* or *Power off* and *Max response time* is 5s or more, device will not respond with message (except info request).

Device will respond immediately after getting info request no matter that time is set in *Max response time*.

SMS information requests

Information can be found out by sending SMS information request to device. In SMS message text column SMS format is described in two ways: request is password protected (first one) and not protected (second one).

Request	SMS message text	Description
Information about the location of the device	psw:<password>;fix? fix?	Device will respond: FIX! Name: <device name>; Time: <local time>; Fix: <coordinates>; Alt: <altitude>; Sat: <visible satellites>; CellId: <GSM operator cell ID>; Angle: <movement angle>; Speed: <movement speed>; Device location can be determined after typing these coordinates to online map website (exp: Google Maps).
Information about the current state of the device	psw:<password>;inf? inf?	Device will respond: INF! Name: <device name>; Time: <local time>; Batlvl: <battery charge level>; OpId: <GSM operator recognition ID>; GSMSignlvl:<GSM signal level>; Prof: <>;ExtPower:<if device has external power>; IMEI:<device IMEI code>; <u>Attention:</u> Device will respond immediately after getting inf? request no matter that time is set in <i>Max response time</i> .
Information about Geo - zones	psw:<password>;geo? geo?	Device will respond with names of Geo - zones where he currently is : GEO! Name: <device name>; Time: <local time>;Geo - zone:<geozone1,geozone2...>;
The position of the device	psw:<password>;mn? mn?	Device will respond will respond with information which can be displayed in a mobile phone (digital map) with NAVIGOM Mobile Navigator 6.3 or greater. Mobile phone must support Symbian OS. Please contact Teltonika or NAVIGON for detailed information.

Device will send last coordinates data if he fails to get new one. Last coordinate data is saved in separate BAT RAM memory. This memory has its own separate power supply. So last coordinate data will not be lost after turning off device or device reset.

Last coordinates data will be deleted if device battery will be removed or device memory is formatted. Device will respond with <N/A> (Not Available) instead of <coordinate>.

SMS management requests

Device operation can be changed with SMS requests. Various functions can be activated/deactivated (see table below). In SMS message text column SMS format is described in two ways: request is password protected (first one) and not protected (second one).

Request	SMS message text	Description
SMS tracking function	psw:<password>;SMSTRACK ON smstrack on	Activate <i>SMS track</i> function
	psw:<password>;SMSTRACK OFF smstarck off	Deactivate <i>SMS track</i> function
Alarm function	psw:<password>;ALARM ON alarm on	Activate <i>Alarm</i> function
	psw:<password>;ALARM OFF alarm off	Deactivate <i>Alarm</i> function
Termination of the call	psw:<password>;TERMINATE terminate	Termination of the call
Spy call	psw:<password>;SPY spy	Activate <i>SPY</i> function
Device reset	psw:<password>;RST rst	Reset device

Combined SMS requests are possible. This way couple of request can be sent in one message. In order to correctly send requests, please follow this typing construction :

psw:<password>;<request1>;<request2>;<request3>

Example:

psw:0000;fix?;geo;alarm on

SMS management messages, which are not requests

Couple of SMS management messages can activate/deactivate functions, but they are treated as configuration messages, because device configuration is changed after receiving this type of message. So structure of the text is different and is exactly the same as configuration SMS. For separating space () or semicolon (;) is used and there is no symbol or colon (:) between parameter **psw** and password. Here is an example when where is no password used :

psw park off

Function (for detailed description look to *fast configuration*)

- a) **MANDOWN** ON/OFF – man-down function activated/deactivated.
- b) **PARKING** ON/OFF – dynamic Geo - zone.

Device will respond with SMS message after successful change of configuration.


Alarm function

This feature can turn on *Alarm* mode. This is one of the main features of the device. GH3000 work entirely different when *Alarm* mode is activated : battery is not saved anymore, device is always looking for new coordinates, tries to notify about current location by set methods. So Alarm mode is for worn that accident (or other important event) has happened and inform about current location.

Configuration

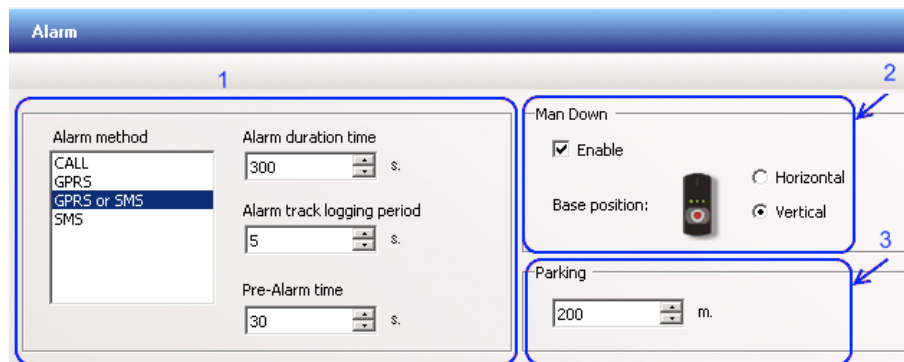
Alarm mode can be activated/deactivated in 5 ways : by *ALARM* button, by SMS message, by activation by call, by *parking* function, by *man – down* function.

Activation/Deactivation

Type of activation	Description
Keyboard button	<p>Button is configured in <i>Track Assistant</i> software (see <i>Keyboard configuration</i>). Function is activated right after pressing the button. By default alarm button is the red button in the center of the keyboard.</p> 
SMS request	<p>Alarm mode is activated/deactivated when this type of SMS request is sent to device :</p> <p>"psw<password> alarm on" – activate. "psw<password> alarm off" – deactivate. Exp.: psw0000 alarm on When where is no password: alarm on</p>
Action On Call	<p>Function is activated/deactivated when device receives a call. <i>Action on Call</i> function must be set to Alarm on. (For detailed information look to <i>Function activation on call</i>)</p>
Parking	<p>Parking function is enabled. Alarm mode will be activated if device will leave parking zone. (For detailed information look to <i>dynamic Geo - zone function</i>).</p>
Man-down	<p>Man – down function is enabled. Alarm mode will be activated if device will change its position more than 45° degrees or logs fast movement. (For detailed information look to <i>Man – down function</i>).</p>

Alarm mode function configuration is located in *Track Assistant* software:

- *Device configuration* → *Alarm* tab.



Alarm table

1. Alarm

This is main *Alarm* configuration section. Choose Alarm method, its duration time, PreAlarm duration time and coordinate logging period here. Please find these parameters explained in a table below:

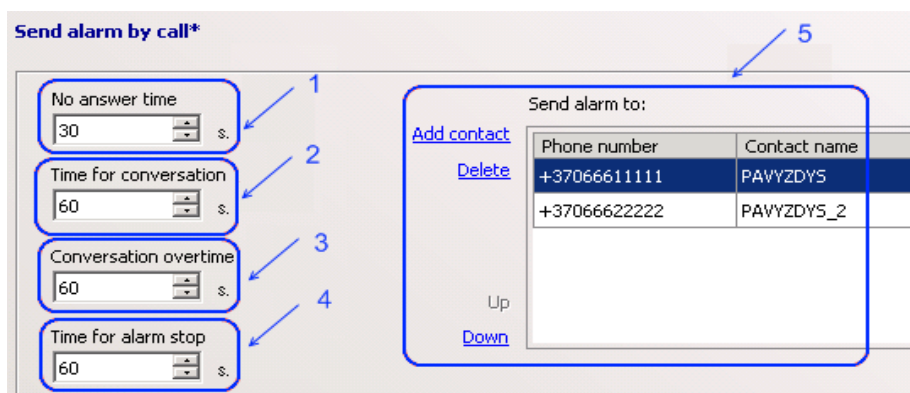
Parameter		Description
Alarm method	CALL	Device will inform about alarm by cyclic call.
	GPRS	Device will send saved data to server through GPRS.
	GPRS or SMS	Device will send saved data to server through GPRS. If connection is not possible, device will start sending SMS messages.
	SMS	Device will inform about a alarm by sending SMS messages.
Alarm duration time		Set <i>Alarm</i> duration time. Maximum time: 2592000s.
Alarm track logging period		Set coordinate saving period when alarm mode is activated. Maximum period: 65535s.
Pre-alarm time		Set <i>PreAlarm</i> time. <i>PreAlarm</i> takes place before <i>Alarm</i> . It is possible to stop <i>Alarm</i> activation before <i>PreAlarm</i> time runs out.

Here is detailed alarm method explanation :

1) CALL (cyclic call)

Contact list must be made in order to make cyclic call work when alarm is activated.

Cyclic call preferences are displayed bellow.



Parameter	Description
1. No answer time	Describes how long device will wait until contact will answer the call. Device will call to next number in a contact list after this time ends. Maximum waiting time : 180s.
2. Time for conversation	Describes how much time is given to conversation. Device will inform by short sound tone after this time ends. Maximum conversation time: 300s.
3. Conversation overtime	Describes for how long conversation will last after <i>Time for conversation</i> ends. Device will terminate call and will call to next number in a contact list. Maximum overtime time: 300s
4. Time for alarm stop	Describes time for how long device will way until calling to next number in a contact list after call was answered by contact before. This command can be stopped by pressing (alarm off) button or by SMS (exp: terminate). Maximum waiting time: 300s.
5. Send alarm to	Describes contact list. Devices will call to these numbers one by one from to top to bottom. Maximum amount of number is 5 .

2) GPRS (Global Packet Radio Service)

Server information must be entered in order to send data through GPRS (nr.2 *GPRS info* picture bellow). To configure these parameters go here :

Device configuration → Connections and data → Server

Send alarm by GPRS

GPRS send period

600 s.

GPRS info

Server Address: 111.111.111.111 APN 1 - Off

Port: 1111 APN 2 - Off

Protocol: TCP/IP APN 3 - Off

GSM: Enabled APN 4 - Off

GPRS: Enabled

Parameter	Description
1. GPRS send period	After this time ends device will send data to server when alarm mode is activated. Action will be repeated periodically. Maximum period: 65535s.

To set up what kind of data You want to send to server go here :

Device configuration → Connections and data → Periodical and alarm data

GPS info

Alarm	Periodical	Parameter
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Latitude, Longitude
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Altitude
<input type="checkbox"/>	<input type="checkbox"/>	Angle
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Speed
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Satelites
<input type="checkbox"/>	<input type="checkbox"/>	HDOP
<input type="checkbox"/>	<input type="checkbox"/>	VDOP
<input type="checkbox"/>	<input type="checkbox"/>	PDOP
<input type="checkbox"/>	<input type="checkbox"/>	Movement
<input type="checkbox"/>	<input type="checkbox"/>	Time to fix

GSM info

Alarm	Periodical	Parameter
<input type="checkbox"/>	<input type="checkbox"/>	GSM Cell ID
<input type="checkbox"/>	<input type="checkbox"/>	Signal quality
<input type="checkbox"/>	<input type="checkbox"/>	Operator code
<input type="checkbox"/>	<input type="checkbox"/>	Roaming

Device info

Alarm	Periodical	Parameter
<input type="checkbox"/>	<input type="checkbox"/>	Battery, %
<input type="checkbox"/>	<input type="checkbox"/>	Battery, mV
<input type="checkbox"/>	<input type="checkbox"/>	USB
<input type="checkbox"/>	<input type="checkbox"/>	Live
<input type="checkbox"/>	<input type="checkbox"/>	Alarm activation cause

3) SMS method

Contact list to which device will send SMS messages must be set up already in order to make

Send alarm by SMS*

Alarm SMS sending period

60 s.

SMS

ALARM! Name:%s; Time:%s; Lat:%s Lon:%s; Sat:%s; CellId:%s; BatLvl:%s; Cause:%s;

[Edit SMS templates](#)

Send alarm to:

Phone number	Contact name
+37066611111	PAVYZDYS
+37066622222	PAVYZDYS_2

[Add contact](#) [Delete](#)

Up

SMS message method work. Configuration and detailed explanation of SMS method is described below. Device always sends newest coordinate.

Parameter	Description
1. Alarm SMS sending period	Describes time period. After this time ends device will send SMS to numbers entered in <i>Send alarm to</i> list when alarm mode is activated. Action will be repeated periodically. Minimal time period: 30s. Maximum time period: 2592000s.
2. SMS	Choose format of SMS message which will be sent when alarm mode is activated.
3. Send alarm to	Contact list to which device will send SMS messages one by one from top to bottom is entered here. Maximum number of numbers is 5.

4) **GPRS or SMS method**

This is combined GPRS or SMS method. Configuration is same as described in GPRS or SMS method (see GPRS method, SMS method).

2. **Man Down**

Configuration of Man-down function is here. Detailed explanation is described in *Man-down* section.

3. **Parking**

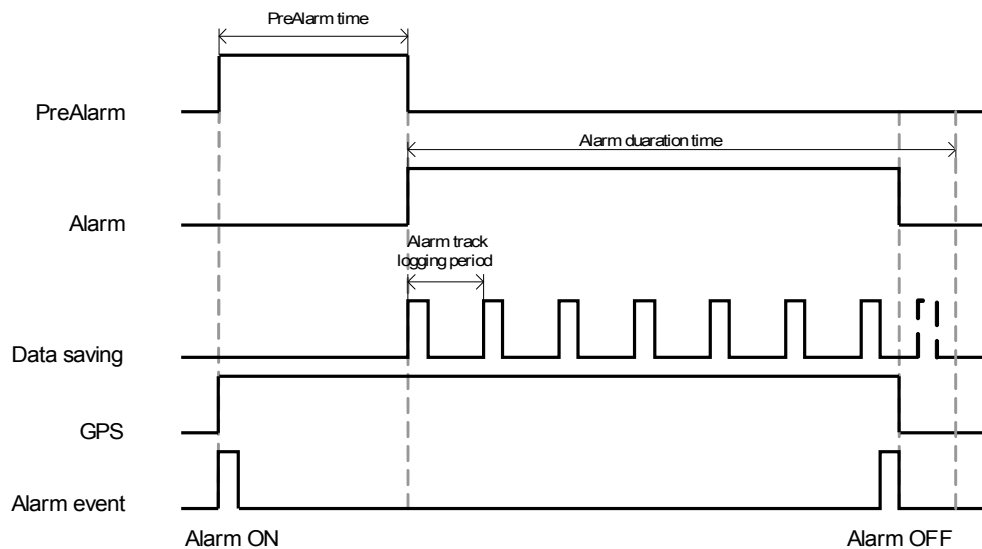
Configuration of *Parking* function (dynamic Geo - zone) is here. Detailed explanation is described in *Parking* section.

Operation

Alarm mode operation and activation method can be selected depending on Your needs. There are couple of ways and we are sure You will find one right for You. Alarm function has higher priority

than other functions. So if couple of device functions are doing same action, exp. : periodical data saving and alarm data saving. Device will save alarm data only.

The use of *PreAlarm* is recommended when using *Alarm* function. *Prealarm* is made to prevent accidental alarm activation. *Alarm* activation can be canceled until *PreAlarm* time ends because *Prealarm* is activated first. So user can stop false alarm when using this function. Detailed operation of alarm mode is showed here :



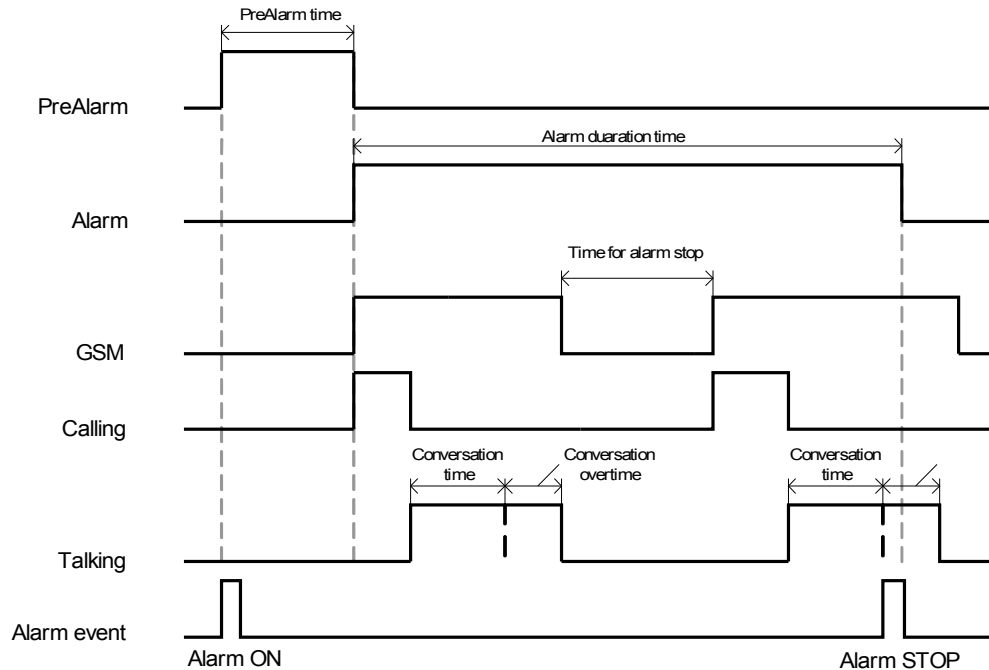
Operation of alarm mode

Device operation on potential situations is explained here :

1. Cyclic call method

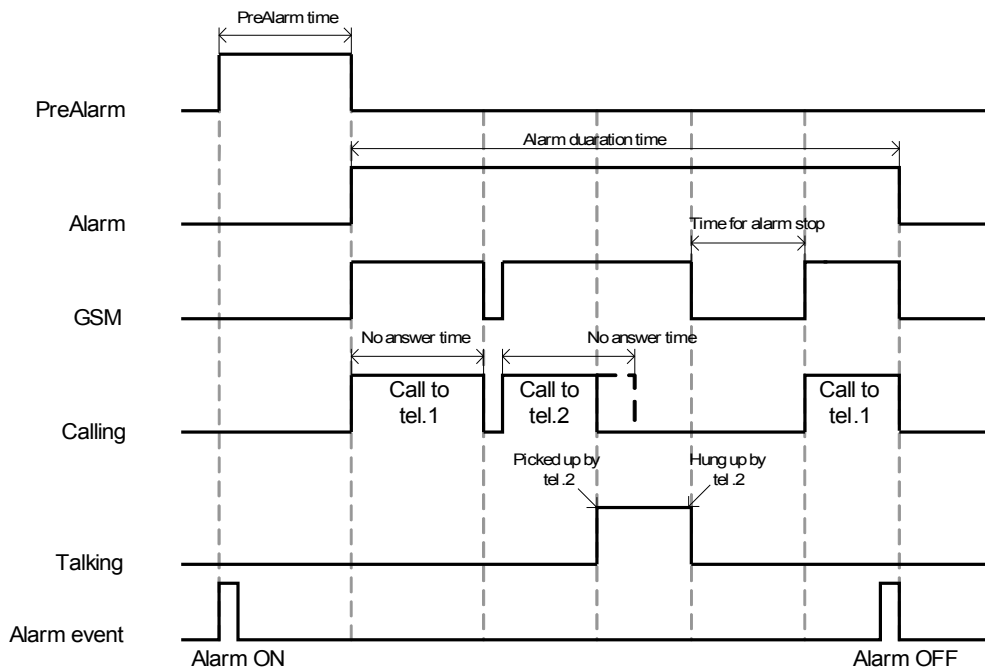
1.1 Device has **number1 (phone.1)** and **number2 (phone.2)** numbers in **Send alarm to list**. Alarm mode is activated.

a) GH3000 calls to **number1** number. Number1 answers the call. Call now is active. Short tone sounds after time *Time for conversation* runs out. It means that *Conversation overtime* time has started. After *Conversation overtime* time runs out call is terminated. Now device wait for time *Time for alarm stop*. After this time device calls to next number in *Send alarm to* contact list – **number2**.



Cyclic call method

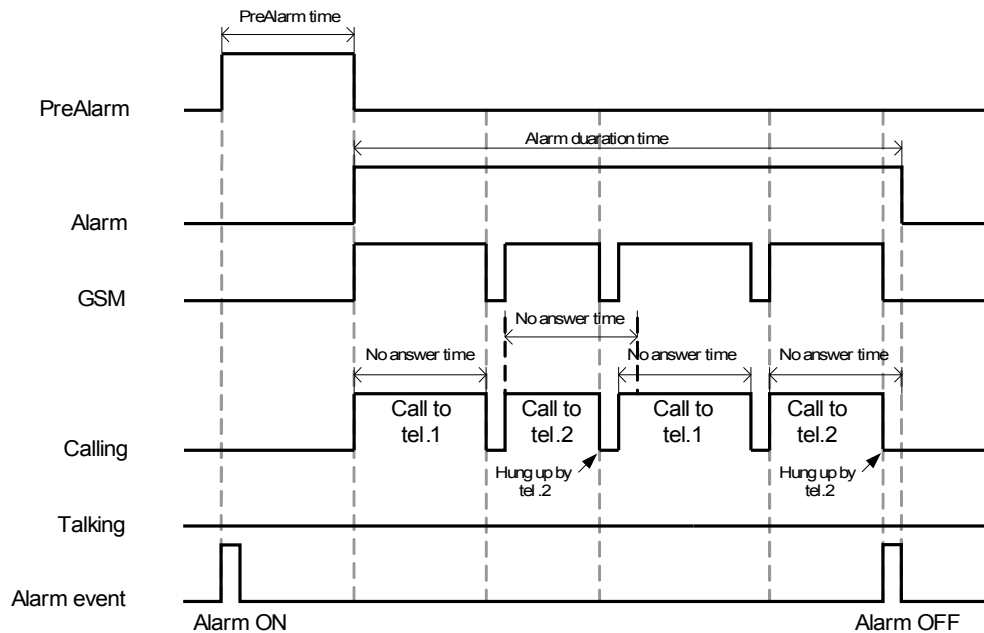
b) **number1** does not answer the call. After time *No answer time* runs out GH3000 terminates the call and calls to next number in *Send alarm to* contact list – **number2**.



Cyclic call method. **number1** does not answer the call

c) **number1** terminates incoming call (or is busy). GH3000 immediately calls to next number in

Send alarm to contact list – **number2**.



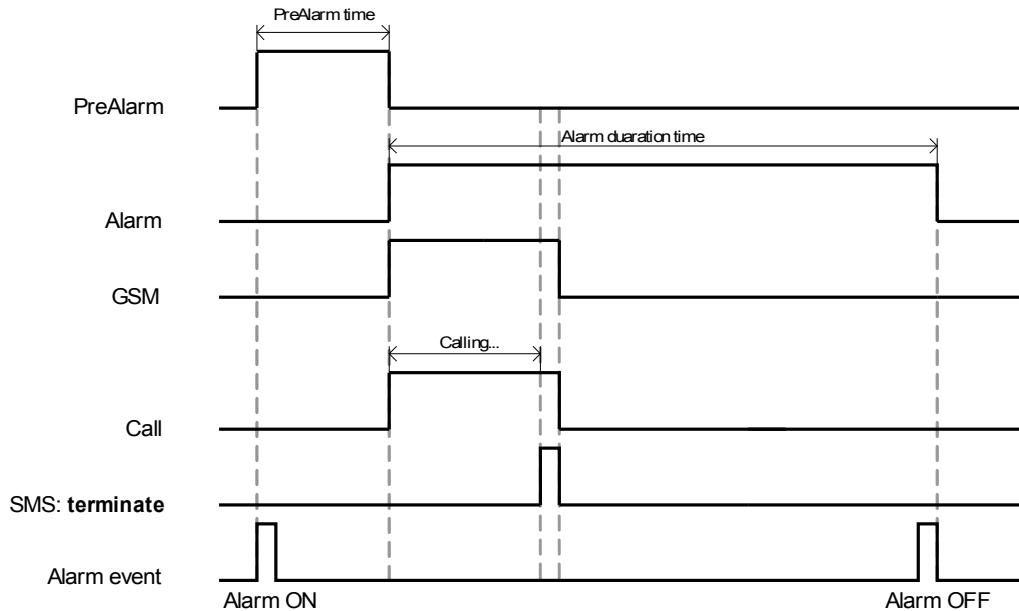
Cyclic call method. **number1** does not answer the call and **number2** hung up the call.

Comments:

- Device will start from beginning after trying to call to all numbers entered in *Send alarm to*.
- Device stops calling to contacts, but alarm mode is active after SMS command **terminate** is sent to device. GH3000 continues collecting *Alarm* data. To deactivate alarm send **alarm off** SMS command.
- Device stops calling after *Alarm* mode is deactivated.

1.2 Alarm mode is activated.

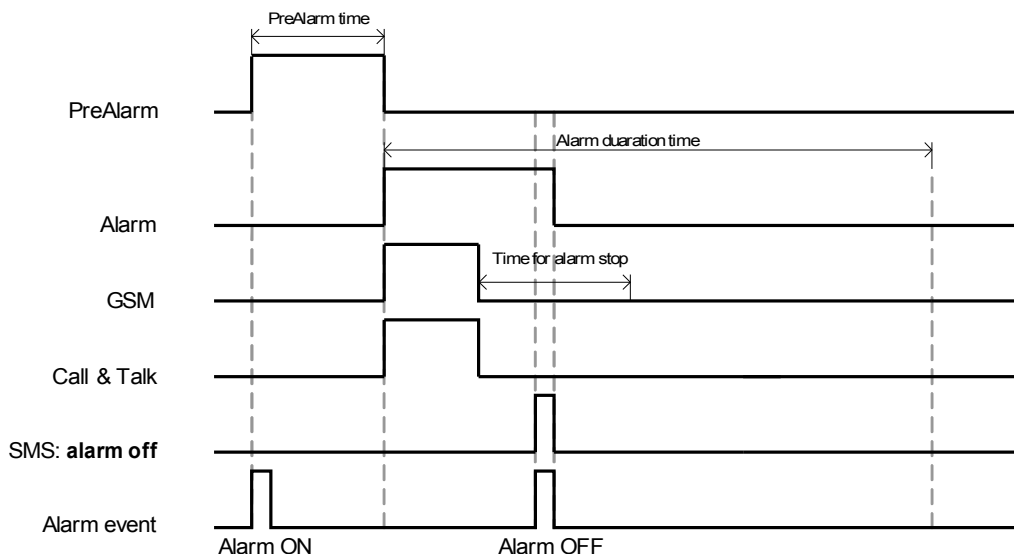
GH3000 calls to **number1**. SMS command **terminate** is sent to device. Device **terminates** active call but Alarm mode is still activated.



Cyclic call method when SMS **terminate** is sent to device. Device is still in *Alarm* mode, but stopped calling to contacts

1.3 The need of *Time for alarm stop* parameter.

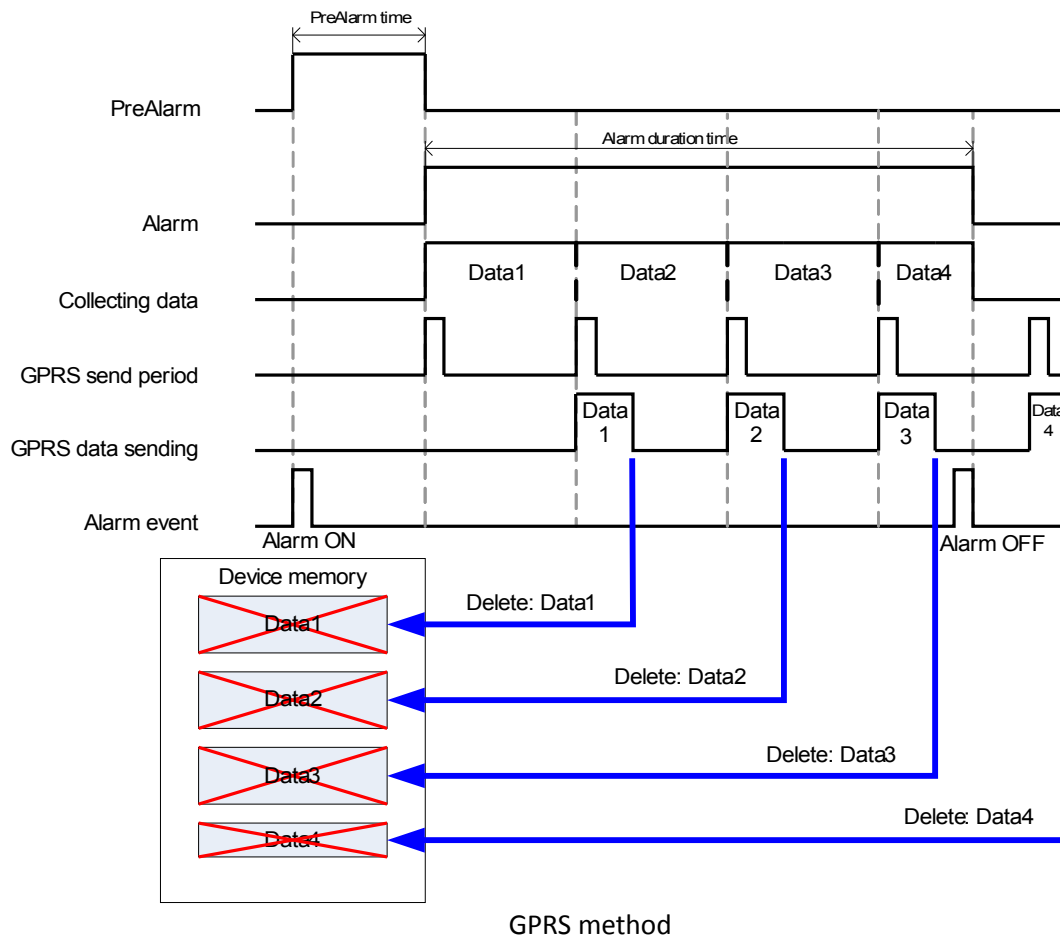
Device called to **number1**. **Number1** answered and was informed about the accident. So now **number1** can send SMS command **alarm off** to device in order to deactivate alarm. Device will stop calling to next numbers in *Send alarm to* contact list too. Alarm can be deactivated by pressing the button (button function – **Alarm off** must be set up)



Cyclic call method when **alarm off** SMS is sent to device. Device deactivates *Alarm* mode.

2. GPRS method

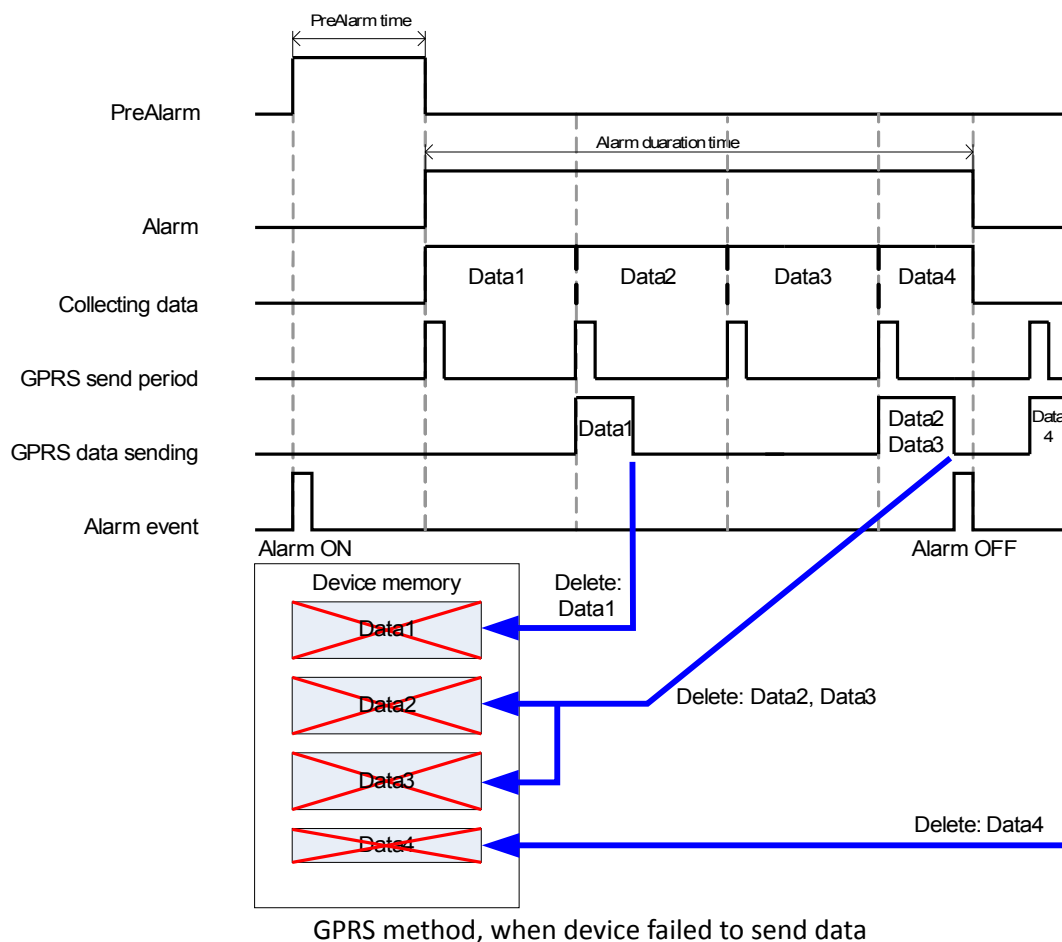
Alarm mode is activated. Device will send saved *alarm* data to server periodically. To set up go (Send alarm by GPRS → *GPRS send period*. This and periodical data sending *GPRS send period* parameters are different, please pay attention. Data will be deleted from the device memory after successfully transferred to server,



Attention:

Data *Data4* will not be sent through GPRS if *Alarm* mode is deactivated. This data will be sent when *Alarm duration time* will be set to last longer.

Data is not deleted if device fails to send it. Device tries to send this data when the next period starts. (example is showed bellow)



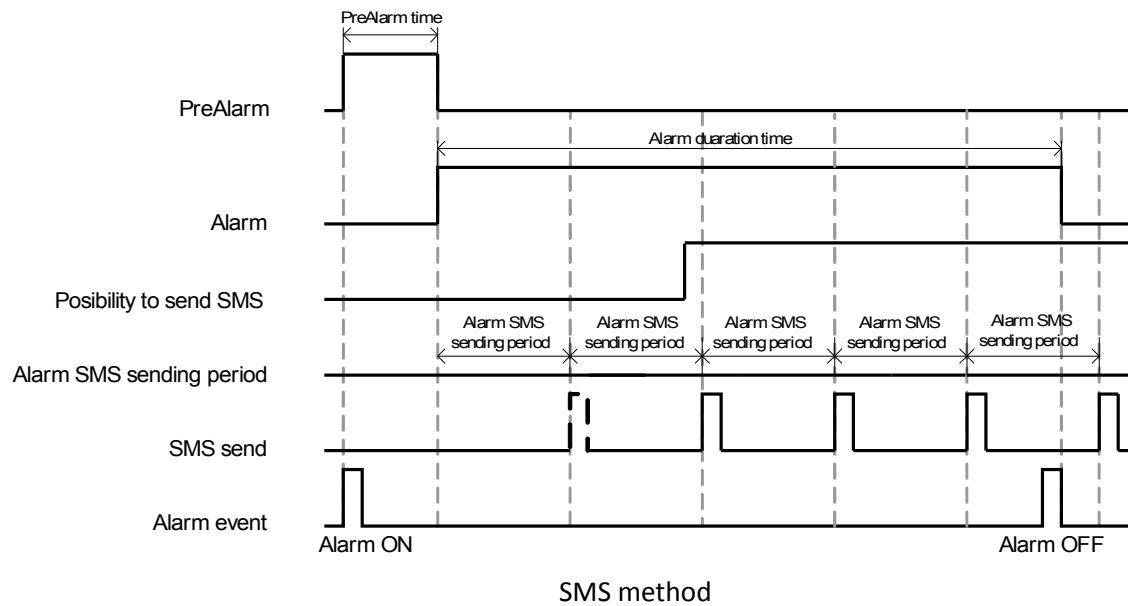
3. SMS method

Alarm mode is activated. After time *Alarm SMS sending period* device will send SMS message to contacts entered in *Send alarm to* contact list. If device fails to send SMS message (device tries to send last unsent SMS message 5 times every next period) it saves data to memory at the same time it should send SMS message. Device immediately sends last coordinate on a memory and waits for time to send a new one when earliest opportunity to send data occurs.

By default SMS format consist of : device name (GH3000), device identification number (IMEI), local time (Time), coordinate, number of visible satellites (Sat), GSM Cell ID (Cell), battery charge level (Bat_Lvl), cause of *alarm* activation (Cause). Cause is indicated by digit. Causes of alarm activation is displayed in this table :

Number	Cause
1	Alarm function is activated by pressing a button.
2	Alarm function is activated by SMS message.
3	Alarm function is activated by „Action on Call“ function.
5	Alarm function is activated by „Man – Down“ function.

6	Alarm function is activated by „Parking“ function.
7	Alarm function is extended after device reset.



Attention:

Parameter *Max response time* (see Device configuration and operation with SMS messages → SMS request) does not affect Alarm SMS method.

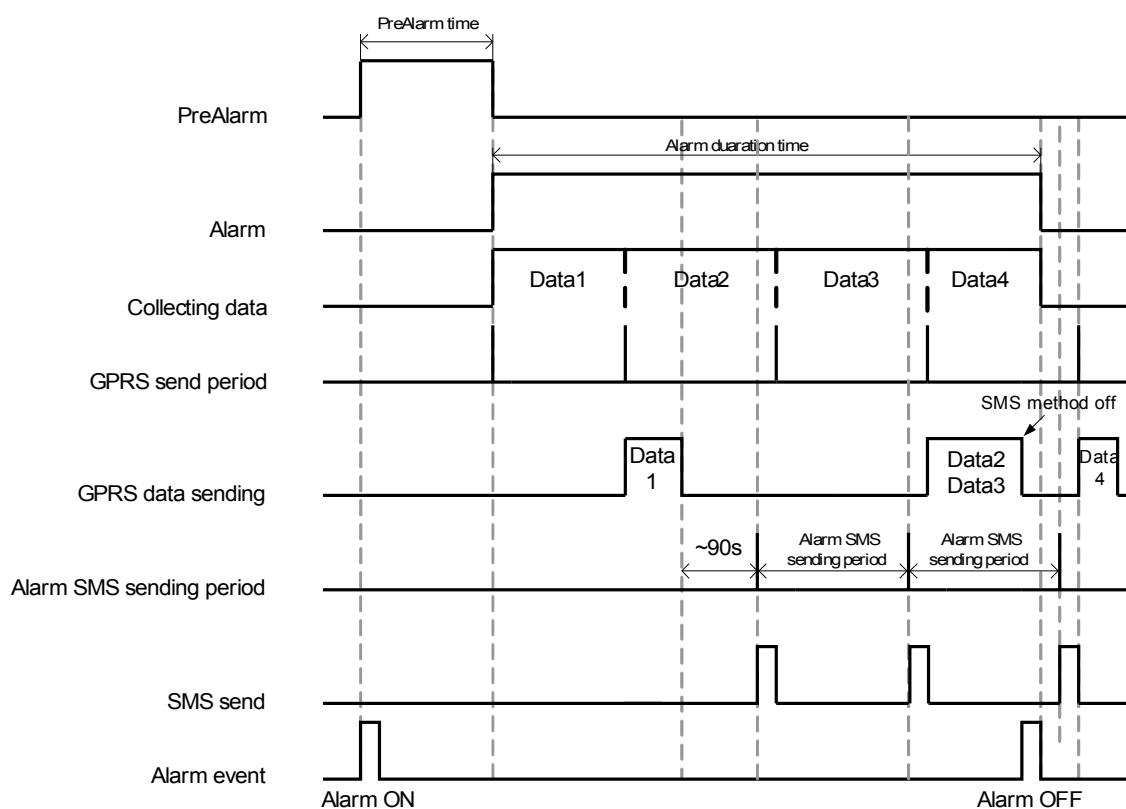
4. GPRS or SMS method

Alarm mode is activated. Device starts sending *Alarm* data through GPRS. GPRS method is switched SMS method if device fails to connect to server. It can be caused by typing server address and PORT incorrectly or caused by other reasons.

SMS method is switched back to GPRS method when connection with server is possible.

Operation of this combine method:

- Device sends data through GPRS (GPRS method).
- Connection with server is lost or nor possible.
- Device starts sending SMS messages (SMS method) after 90s expires past failure of GPRS method.
- Device tries to send data through GPRS on every set period. Device turns off SMS method if device successfully connects to server. SMS method can be turned on again if device fails to connect to server again.
- Device sends SMS one more time after SMS method is turned off.
- Device sends left *Alarm* data through GPRS after *Alarm* is deactivated and time for periodical data sending starts.



GPRS or SMS method. Situation when device failed to send data through GPRS

Name	Description
PreAlarm	Warning signal.
Alarm	Alarm signal.
GSM	Connectivity with GSM operator (necessary for SMS sending, calling, GPRS)
Calling	Calling to chosen number
Taking	Active call.
Alarm event	Alarm activation (Alarm ON) and deactivation (Alarm OFF).
Call to tel.*	Calling to number *.
Call stopped by tel.*	Call terminated by number *.
SMS: terminate	SMS message with command terminate is being sent.
SMS: alarm off	SMS message with command alarm off is being sent.
SMS sent	SMS message is sent.

Collecting data	Data is being collected and saved to memory.
GPRS send period	GPRS data send period.
GPRS data sending	Device sends data through GPRS.

Call function

This function allows to make and answer calls with the device as with ordinary cellular phone. Button must be configured in order to call to selected number. By default to answer the call press green button (*Answer*). It is possible to make that only allowed contacts could call to device (detailed : *Authorized contact list*).

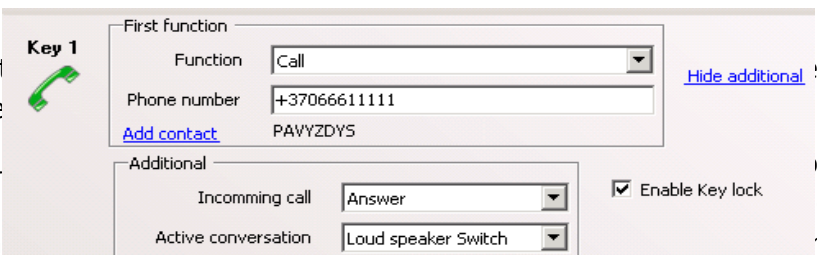
Configuration

Button must be configured in order to make calls. To configure buttons open *Track Assistant* software and go :

- *Device configuration* → *Keyboard* tab.

First select 1 number to which de

Additional fu should be assigned is assigned to green and volume down – blue button ●.



or select contact

o. *Answer* function default this function me up – light red ●

Parameter		Description
Incoming call	None	There is no function.
	Answer	Call is answered.
	Hang up	Call is rejected.
	Loud answer	Call is answered and loud speaker function is activated.
Active conversation	None	There is no function.
	Hang up	Call is rejected.
	Volume up	Volume is increased.
	Volume down	Volume is decreased.
	Mute on	Enables mute.
	Mute off	Disables mute.
	Loud speaker Switch	Enable/Disables loud speaker function.

Call function can be configured using fast SMS configuration. Type in this format
 psw<password> key<button number> <contact number>. This picture displays buttons numbers :



Example of SMS: **psw1111 key1 +37066611111**

Other options:

- 1) Detailed explanation of *Auto answer* function configuration is found in *Auto answer function* section.
- 2) Detailed explanation of *Sound notifications* configuration is found in *Sound notifications* section.
- 3) Detailed explanation of *Vibration notification* configuration is found in *Vibration notification* section.

Operation

Device answers calls (after pressing answer button) and can call itself (after pressing configured button). There are more additional functions, which are described below.

Loud speaker function

Device turns on speaker when *Loud speaker* function is activated. Now voice can be heard even from distance. *Loud speaker* function can be turned on :

- 1) After answering the call press button which has *Loud speaker Switch* function assigned to it.
- 2) Answer the call with button with assigned *Loud answer* function.

Loud speaker function is deactivated after call is terminated.

Auto answer

Device has functionality to answer incoming call by itself. Detailed function explanation is found in *Auto answer* section.

Authorized contact list

Device has functionality to select only those incoming call which are from *authorized contact list*. Detailed function explanation is found in *authorized contact list* section.

LED indication on incoming call is displayed in *LED indication* section.

Modem emulation

This function allows to use GH3000 as ordinary GSM/GPRS modem which is connected to computer via USB cable. It is possible to surf internet, transfer data after modem emulation is activated and connection is established. Device responds to AT commands (*attention commands or Hayes commands set*), so modem can be managed using them.

Configuration

Modem emulation:

Action	Description
Modem Emulation On	Emulation can be turned on by pressing assigned button. (see <i>Keyboard configuration</i>)
Modem Emulation Off	Emulation can be turned on by pressing assigned button. (see <i>Keyboard configuration</i>) or simply by disconnecting USB cable.

Operation

Modem emulation is turned on. Device switches to modem emulation mode. Sound notification will indicate this switch. All three LED s will light up green. Device no longer operates as a Tracker after modem emulation is turned on. In order to use device as a Tracker again just turn modem emulation mode off.

Attention:

How to configure Your computer in order to connect to internet with GH3000 modem You will find here :

www.teltonika.lt/downloads → [GH120x](#) → [Documentation](#) →
[D008_GH120x modem installation manual _WinXP_2k_v0.4.pdf](#)

or just copy this link to your browser address bar.

http://92.61.34.5/Downloads/GH120x/Documentation/D008_GH120x%20modem%20installation%20manual%20_WinXP_2k_%20v0.4.pdf

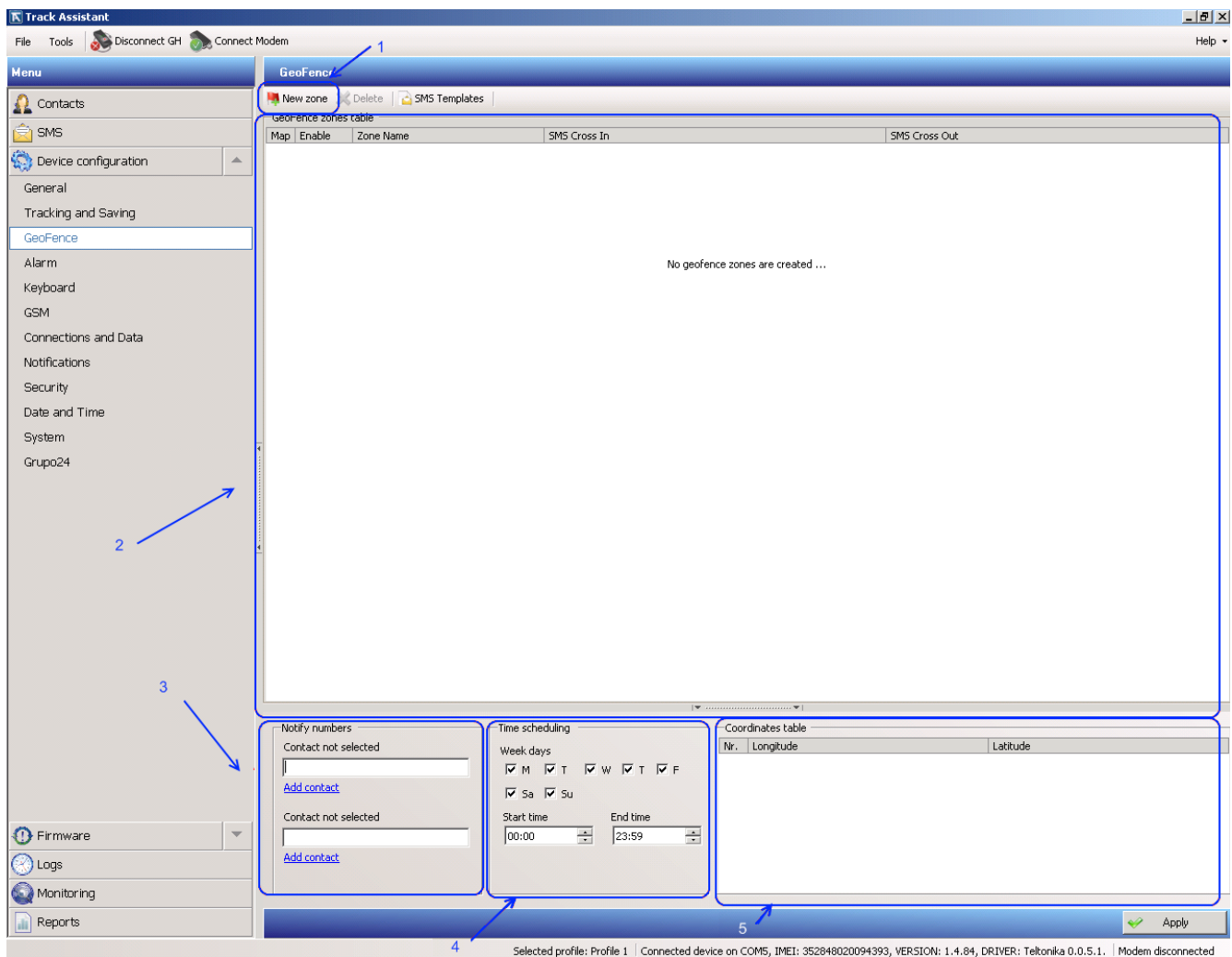
Geo - zone function

This function allows to set up active zones on a map. Device will inform about cutting the edge of the zone by sending SMS message. This is very handy and easy way to track object when it is important that object will not leave or enter some kind of territory. Also it is possible to set times when a zone will be active.

Configuration

To configure Geo - zone function open *Track Assistant* software and go:

- *Device configuration* → *Geo-fence* tab.



Geo - zone configuration window

Field	Description
1. New zone	Creating new Geo - zones (for detailed information look <i>creating new Geo - zone</i>)
2. Geo - Fence zones table	All created Geo - zones are written here. SMS format can be changed here. Geo - zones can be activated/deactivated or deleted here too.
3. Notify numbers	Numbers to which device will send SMS message (maximum 2 no.) are entered here.
4. Time scheduling	Time when device will response while cutting Geo - zones.
5. Coordinates table	Shows coordinates of Geo - zone.

Creating new Geo - zone:

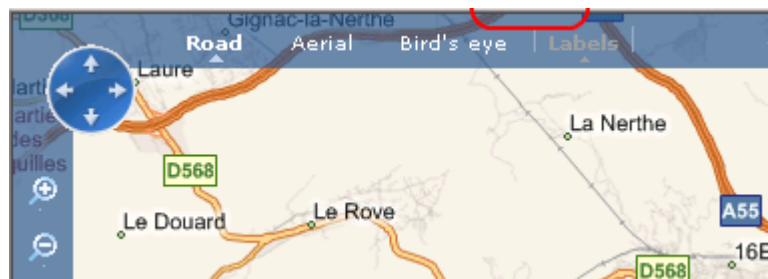
- 1) Press *New zone* button (1). Map, where Geo - zone can be draw-ed shows up.
- 2) In the toolbar choose type of Geo - zone : Circle or Polygon.



Toolbar

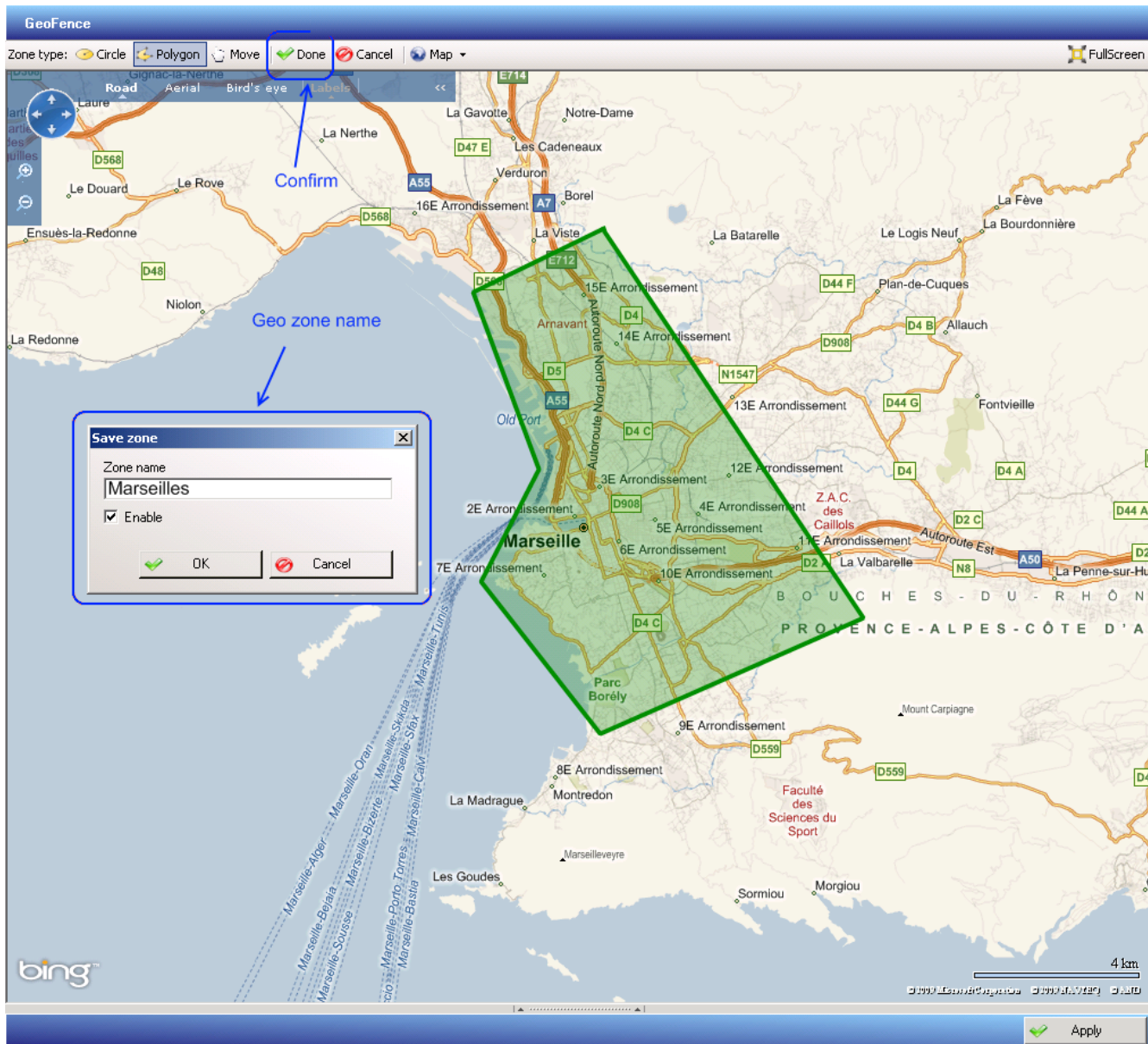
Parameter	Description
Circle	Draws circle zone.
Polygon	Draws polygon zone.
Move	Navigation in a map
Done	Confirm when zone drawing is finished.
Cancel	Cancel zone drawing.
Map	Choose what map You want to use.

- 3) Choose a site on a map and draw the zone.



Navigation panel

- 4) Press *Done* (located in a toolbar) confirming the zone. Enter name of the zone, tick *Enable* if zone will be active.



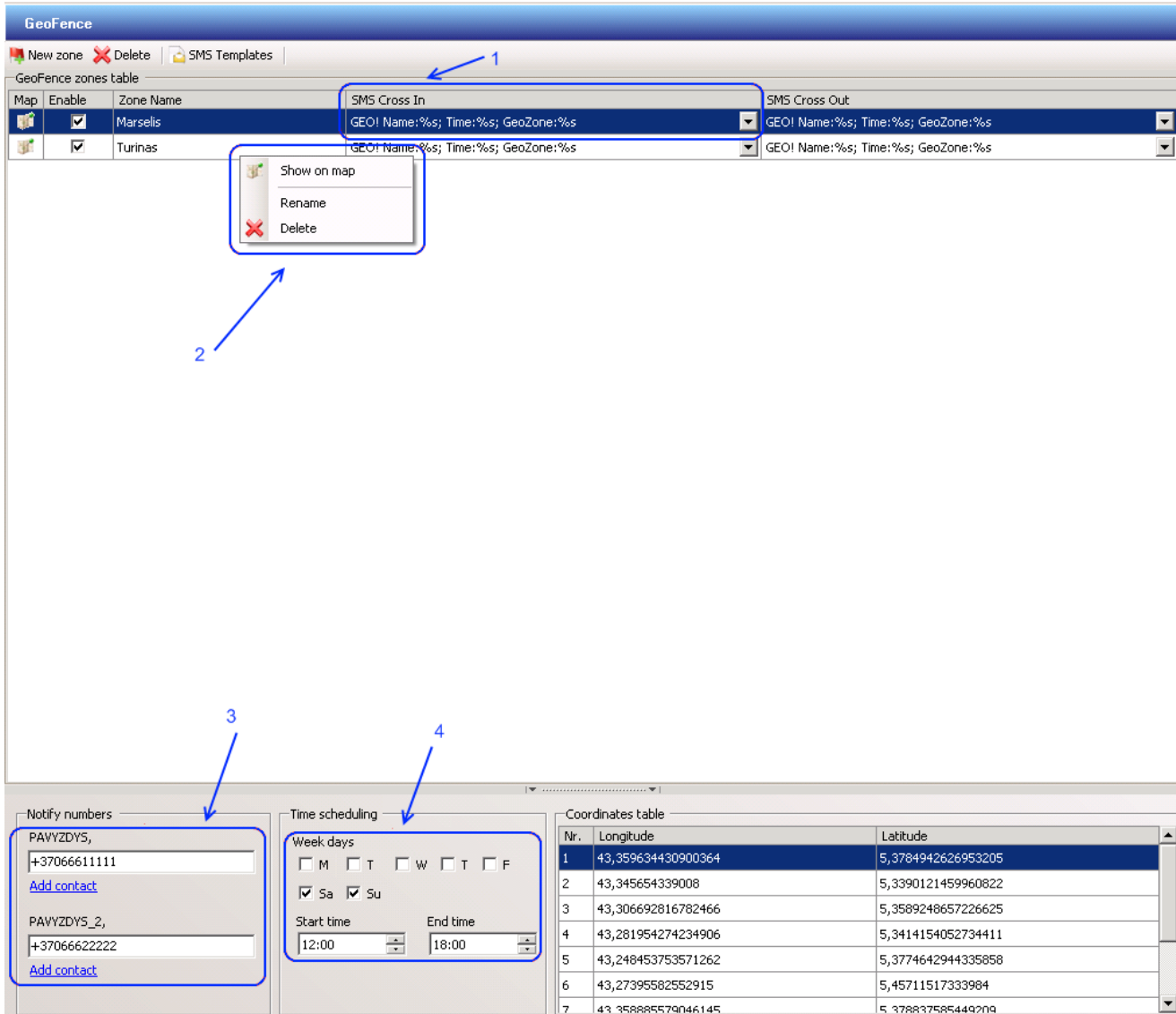
Creating new Geo - zone

Notice:

- Polygon can consist of maximum 10 angles.
- Device can save maximum 50 zones in a memory.
- Maximum thickness of a Geo - zone is about 100 meters. Pay attention to this because

minimum space, where Geo - zone will be active is necessary.

Geo - zones are displayed in *GeoFence table*. Set up of Geo - zone function is showed below :



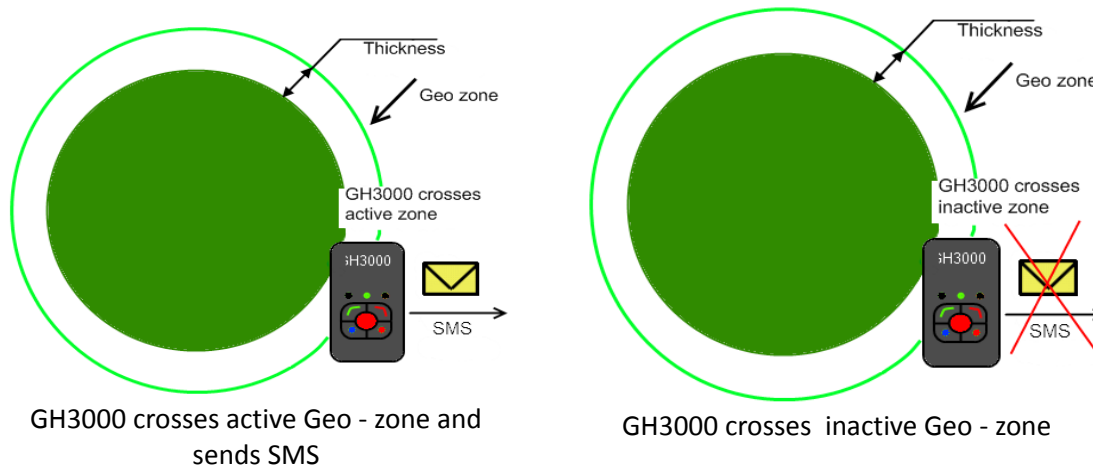
The screenshot shows the 'GeoFence' configuration window. At the top, there are buttons for 'New zone', 'Delete', and 'SMS Templates'. Below is the 'GeoFence zones table' with columns: Map, Enable, Zone Name, SMS Cross In, and SMS Cross Out. Two zones are listed: 'Marselis' and 'Turinas'. A context menu is open over the 'Marselis' zone, showing options: 'Show on map', 'Rename', and 'Delete'. At the bottom, there are three sections: 'Notify numbers' (with two phone numbers and 'Add contact' links), 'Time scheduling' (with week day checkboxes and start/end time fields), and 'Coordinates table' (a table with 7 rows of coordinates).

Nr.	Longitude	Latitude
1	43,359634430900364	5,3784942626953205
2	43,345654339008	5,3390121459960822
3	43,306692816782466	5,3589248657226625
4	43,281954274234906	5,3414154052734411
5	43,248453753571262	5,3774642944335858
6	43,27395582552915	5,45711517333984
7	43,358885579046145	5,378837585449209

- 1) Set up message format. GH3000 will send this format SMS message when device will enter active zone. On a right is another field, which defines SMS message format device will send when leaving the zone.
- 2) You can see Geo - zone on a map, rename it or delete it. Just press on a Geo - zone with right mouse click.
- 3) Device will call to number, which are entered here.
- 4) Set up days when zone will be active. Day time when zone will be active can be configured too.

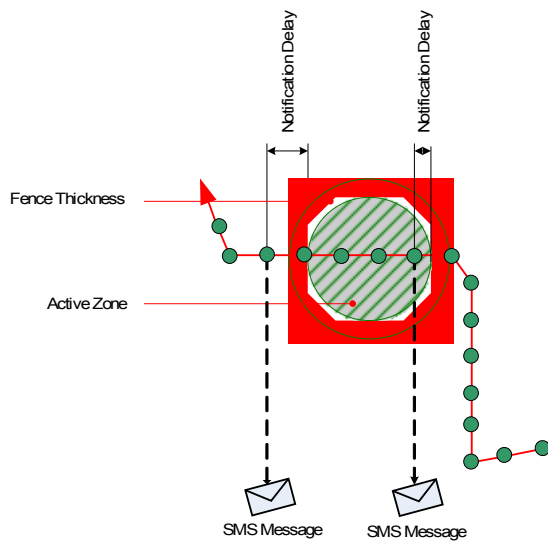
Operation

- Geo - zone is created and activated. GH3000 cuts edge of Geo - zone. Device sends chosen format SMS to entered numbers. If Cross ID! Format is chosen device will send this format SMS : time, name of Geo - zone, number 0 or 1 depending on whether zone was crossed out or crossed in, latitude, longitude, Cell ID.
- Zone is created but no activated. Device will not send SMS message if zone is crossed.

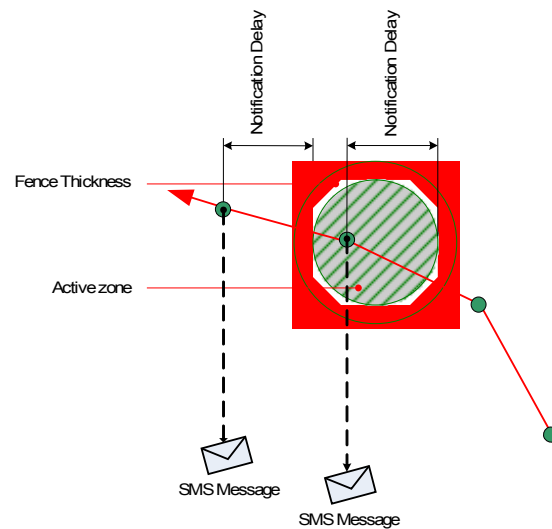


Pay attention to device GPS coordinate logging period.

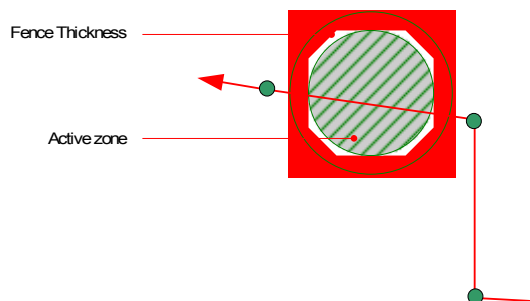
- 1) Device will inform immediately after crossing the zone if coordinate logging period is short. (example no.1.)
- 2) Device coordinate logging period is pretty long, but device manages to record a coordinate while being in a zone. In this situation device will send SMS message a little later. (example no.2).
- 3) If coordinate logging period is long enough it is possible that device will cross in the zone and cross out not even noticed. In this situation GH3000 will not inform about crossing the zone. (example no.3).



no.1. Coordinate logging period is short.



no.2. Coordinate logging period is pretty long.
SMS will be sent a little later.



no.3. Coordinate logging period is long. Zone crossing is not logged.

It is possible to send SMS request in order to find out in which Geo - zones You currently are at.

geo?

or

psw:<password>;geo?

Device will check in which Geo - zones it is currently at and will send SMS message with zones names to the number request was got from. Device will send zone name „N/A“ (Not Available) if it is not in any created zone.

Protection of device configuration

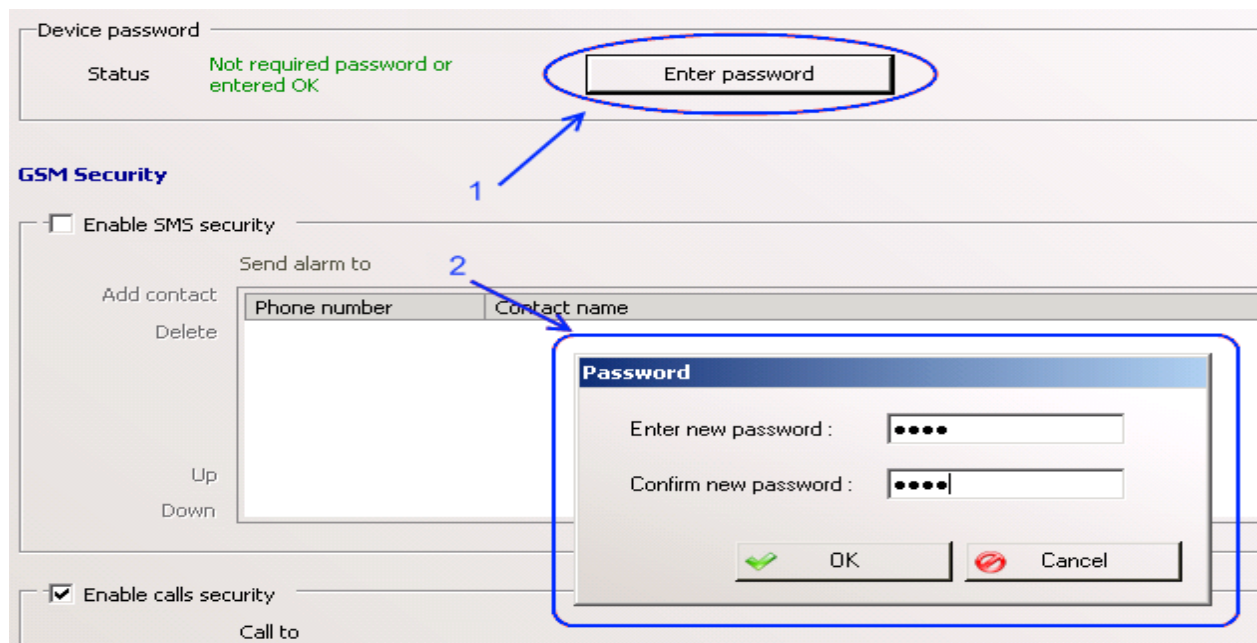
This function allows to protect device configuration. User will be asked to enter device password in order to read or change configuration parameters. So device configuration can not be changed by a stranger. This password will be used when sending SMS requests or configuration SMS. Password is saved in device memory. By default password is **0000**. Maximum length of the password is 32 characters.

Configuration

Password will be asked every time after GH3000 reset. Password must be entered when device is connected via USB cable and *Device configuration* tab is chosen in *Track Assistant* software.

To change device password go here:

1. *Device configuration* → *Security* choose *Device password* tab.
2. Press *Enter password* (1). Now type new password two times (2).



Password changing: Press *Enter password* (1) and type new password two times (2)

Field	Description
Status	Password status

It is only one way to remove password. This format of configuration SMS message must be sent to device :

psw0000 ch

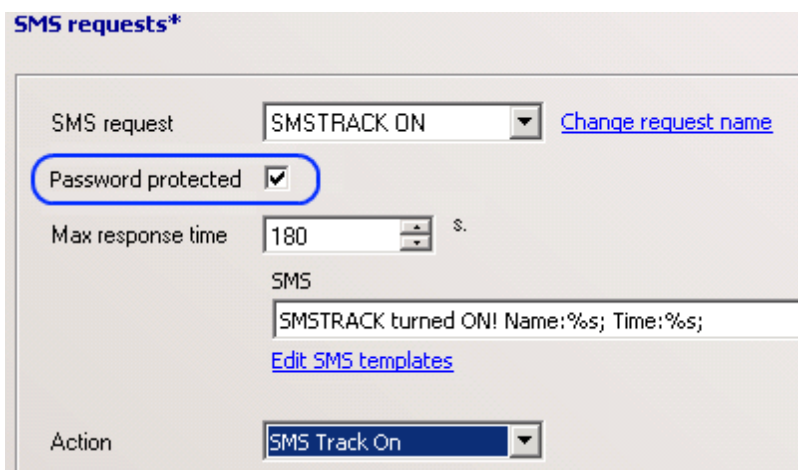
Operation

- 1) Connect GH3000 to *Track Assistant* software and choose *Device configuration* tab. You will be asked to enter password. Enter password. Now it is possible to change configuration.
- 2) Request or configuration SMS is sent. Format will be : „psw**** *command*“. Enter password instead of stars. SMS message will be ignored if wrong password will be entered

• SMS request:	psw:0000;smstrack on
• Group request:	psw:0000;spy;Fix?
• Configuration SMS:	psw0000 battery +37066611111
• Configuration extended SMS :	psw:0000;CFG1;GSM:1,60,1;RST

In order to activate password for **SMS request** You need go here :

- 1) *Device configuration* → *GSM* tab choose *SMS requests*.
- 2) Select *Password protected*.



Example:

SMS request is password protected: **psw:0000;inf?**

SMS request is not password protected: **inf?**

Attention!

It is allowed to type wrong password in *Track Assistant* software only **5 times**. Device will be blocked after fifth time. Now You will need RPC code (*Remove Password Code*). RPC code is located on GH3000 package, near IMEI code. If You lost Your package please contact Your sales manager. RPC code can be entered wrongly 20 times. Device will be blocked finally after 20th time. Now firmware must be rewritten in order to unblock device.

Man-down function

This function activates monitoring of device position. If position is changed, GH3000 activates notification signal (*PreAlarm*, if this function is activated) and after this time runs out *Alarm* is activated. Device has to change its position by more than 45° degrees or fast position change must be monitored in order to activate *PreAlarm*. Consider the most stable position while using *Man – Down* function. It is important to keep device in its own special case. Case must be attached to belt or any place, which is stable while moving.

Man – down function can help, for example, when user can not activate alarm button by himself (exp : Loss of consciousness). Also in other situations, where object movement is important this function is very handy.

Configuration



To configure Man-down function open *Track Assistant* software and go here:

- *Device configuration* → *Alarm* tab and choose *Man Down* section.

Detailed description is displayed in the picture:



Man-down configuration window

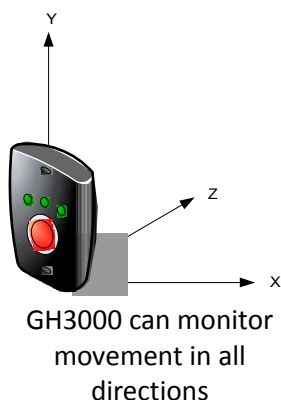
Parameter	Description
Enable	Enable/disable man-down function.
Base position	<p>This is a position, which GH3000 will use as true (normal) position. All other positions will be treated as false ones and <i>Alarm</i> will be activated. There are 2 base positions to choose from:</p> <p><u>Horizontal</u> – horizontal position. <i>Attention!</i> GH3000 must to lay on the side which has USB connectors on it.</p>  <p><u>Vertical</u> – vertical position. <i>Attention!</i> GH3000 will use this position as its base only if it stands as displayed in a picture :</p> 

Man – down function can be activated in two ways: in *Track Assistance* (look above↑) and with SMS request:

Type	Description
SMS request	<p>Man-down function is enabled/disabled, when GH3000 receives this type of request message: "psw<password> mandown on" – enables. "psw<password> mandown off" – disables. Exp.: psw0000 mandown on If there is no password: mandown on</p>

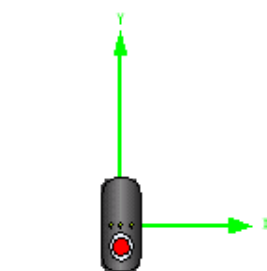
Operation

An integrated accelerometer (An **accelerometer** is a device that measures proper acceleration) is used while using Man – Down function. Tilt angle is calculated from this data

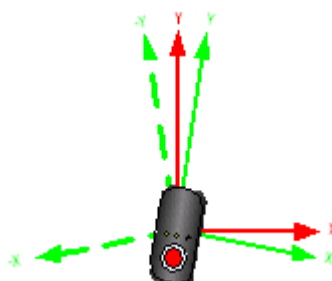


There are a lot of side effects (eg. Vibration) which can affect measurement of an accelerometer. That's why GH3000 has integrated filter, which helps to reduce the influence of such factors.

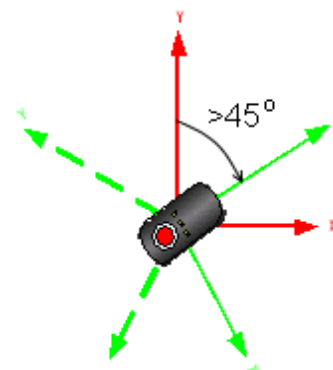
Device reaction when Man – Down is enabled is displayed in a pictures below :



True (base) position

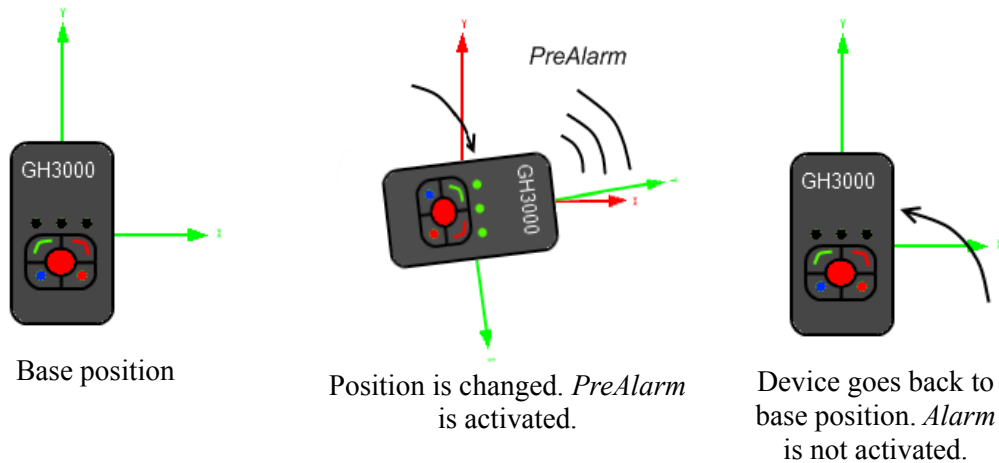


Position changed less than 45° degrees. *PreAlarm* is not activated

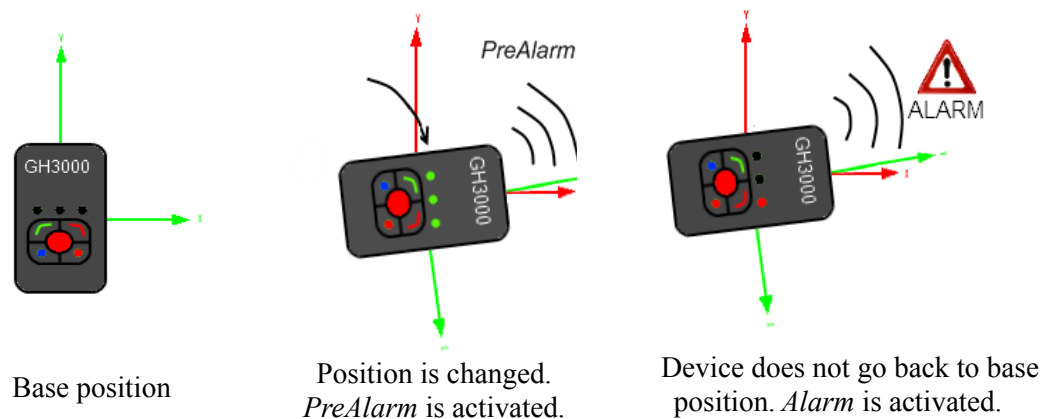


Position changed more than 45° degrees. *PreAlarm* is activated

- 1) Man – down function is enabled. Device position is changed more that 45° degrees. *Prealarm* is activated. Device goes back to its true (base) position until *PreAlarm* time runs out. *Alarm* is not activated. Device continues monitoring its position.



- 2) Man – down function is enabled. Device position is changed more that 45° degrees. *Prealarm* is activated. Device does not go back to its true (base) position until *PreAlarm* time runs out. *Alarm* is activated.

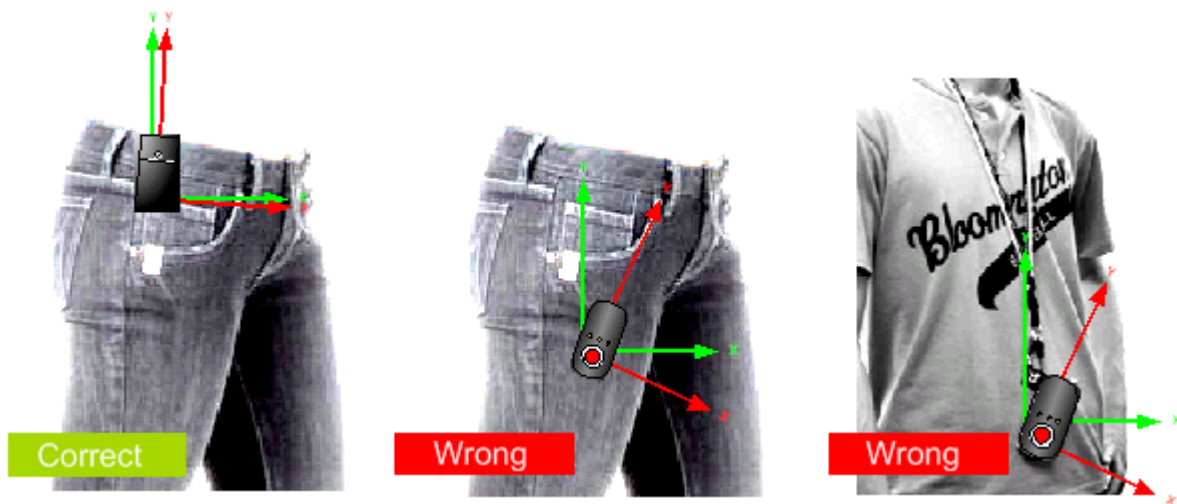


The use of Man – Down function

It is recommended to use *PreAlarm* in order to avoid false *Alarm* activation when device position changed accidentally. Firstly device indicate change of the position with short tone. It means that *Alarm* will be activated soon. You can stop *Alarm* activation by bringing device back to its base position until *PreAlarm* time runs out. *PreAlarm* time should be 30 seconds or greater.

Do not carry device in a pocket while using Man – Down function in order to avoid false *Alarm*

activation. Use only special case, which has to be attached to Your belt :



Example how correctly carry GH3000

Device position is changing about 30° degrees while carrying it in a pocket. Add 15° degrees of accelerometer error and result will be about 45° degrees. So now false *Alarm* can be activated. The same happens if the device is worn hanging on a neck. However device position is much more stable when carrying it in a special case.

Note:

- Error of accelerometer is about ~15° degrees.
- Please contact Your sales manager if accelerometer is too sensitive.

Authorized contact list. Call security.

This function allows to control incoming calls. Now only those numbers, which are already added to authorized contact list, will be able to call to device. Use *Track Assistant* to enable this function and to add new numbers to Authorized contact list.

Configuration

To configure this function open *Track Assistant* software and go :

1. *Device configuration* → *Security* tab choose *GSM security*.
2. Select *Enable calls security*.

added

☒ Enable calls security

Call to

[Add contact](#)

[Delete](#)

Phone number	Contact name
+37066611111	Example
+37066622222	Example_2

Up

[Down](#)

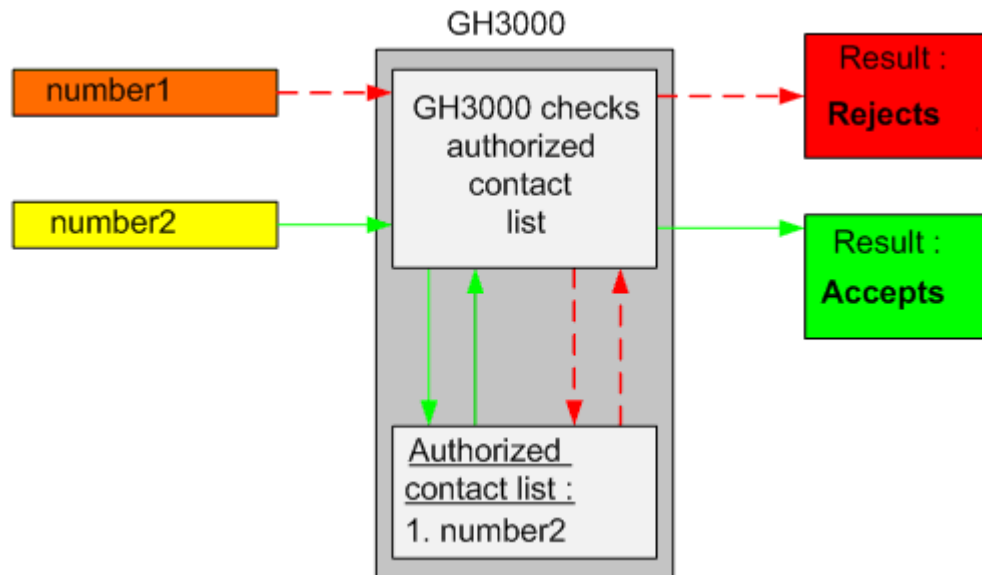
can be

Parameter	Description
Enable calls security	Enable/disable authorized contact list.
Call to	
Add contact	Press in order to add new contact to authorized contact list
Delete	Press in order to delete contact from authorized contact list
Up/Down	Number distribution can be changed.

Operation

Call security is enabled. Number2 is in a contact list and number1 is not in a contact list :

- GH3000 receives a call from number2. Device accepts the call and is able to answer it.
- GH3000 receives a call from number1. Device denies the call and is unable to answer it.



Operation of GH3000 when calls security is enabled

Notice:

- Maximum 10 numbers can be added to authorized contact list.
- *Action On Call* function will be activated regardless of whether the caller is the authorized contact list or not.

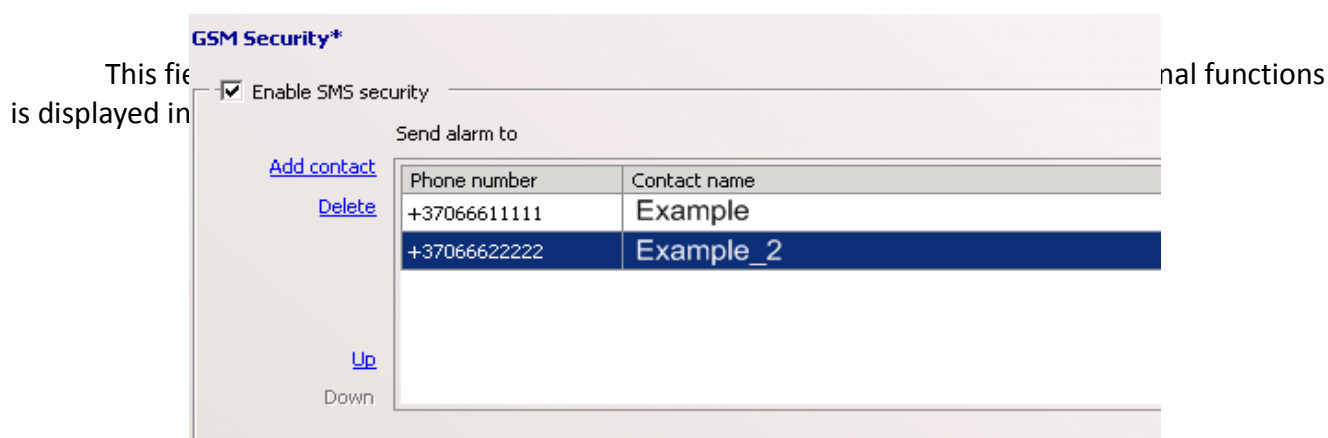
Authorized contact list. SMS security.

This function allows to control request SMS messages. Now only those numbers, which are already added to authorized contact list, will be able to get a response from the device. Use *Track Assistant* to enable this function and to add new numbers to Authorized contact list.

Configuration

To configure this function open *Track Assistant* software and go :

3. *Device configuration* → *Security* tab choose *GSM security*.
4. Select *Enable SMS security*.



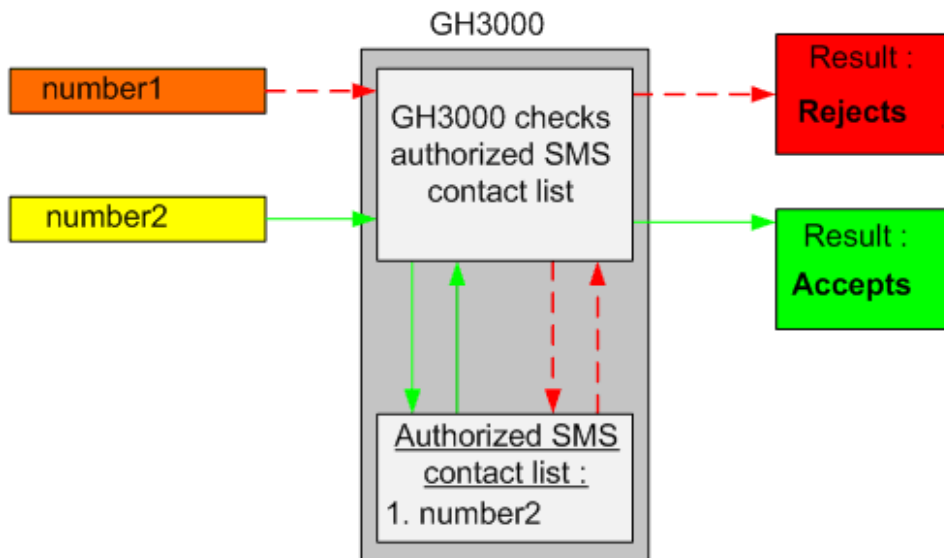
Parameter	Description
Enable SMS security	Enable/disable authorized contact list.
Send alarm to	
Add contact	Press in order to add new contact to authorized contact list
Delete	Press in order to delete contact from authorized contact list
Up/Down	Number distribution can be changed.

Operation

SMS security is enabled. *Number2* is in a contact list and *number1* is not in a contact list :

- GH3000 receives a message from *number2*. Device accepts the message and respond.

- GH3000 receives a message from number1. Device rejects the message and do not respond.



Operation of GH3000 when SMS security is enabled

Notice:

- Maximum 10 numbers can be added to authorized contact list.

Periodical tracking by SMS

This function allows You to send SMS messages with selected information to selected number periodically. It allows to track device remotely when GPRS connection is not possible. Everything You need is a mobile phone. All SMS messages sent from the device will be saved in the device memory so You can look through them late.

By default, when this function is activated, GH3000 will send : Alias of message content (FIX!), device name (ID), device identification number (IMEI), time, when message was sent (Time), coordinate (Fix), visible satellites (Sat), operator code (Cell), GSM signal level (Sign_Lvl), battery charge level (Bat_Lvl).

Configuration

Periodical tracking by SMS function can be enabled/disabled in *Track Assistant* software (see table 2). This function can be enabled/disable without the use of *Track Assistant* software, although configuration of the function must be made already. There are three ways to enable/disable this function. They are displayed and explained in table below:

Method	Description
SMS request	Periodical tracking by SMS is enabled/disabled, when GH3000 receives this type of SMS : "psw<password> smstrack on" – enable. "psw<password> smstrack off" – disable. Exp.: psw:0000;smstrack on If there is no password: smstrack on Device will respond with confirmation SMS message after changing the status of the function.
Action On Call	Function is enabled/disabled, when GH3000 receives a call from a number, whis is from <i>Action On Call</i> list and can enable/disable periodical tracking by SMS. (detailed: <i>Function activation by call</i> section).
Keyboard button	Button, which will enable/disable periodical tracking by SMS function, has to configured in <i>Track Assistant</i> software. (detailed: <i>Keyboard configuration</i> section).

To configure Periodical tracking by SMS open *Track Assistant* software and go:

- *Device configuration* → *Tracking and Saving* tab choose *Periodical track data sending by SMS*.

Periodical track data sending by SMS*

☒ Enable periodical tracking by SMS

SMS sending period
 s.

[Add contact](#)

SMS
 [Edit SMS templates](#)

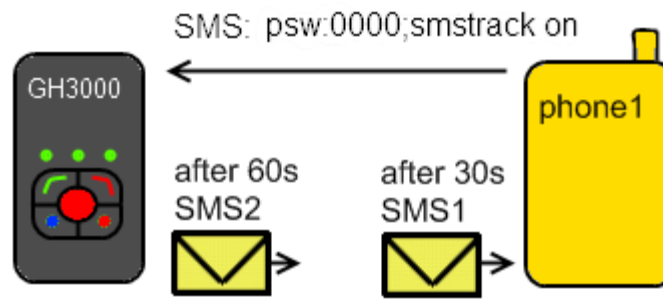
2 table. Detailed explanation:

Enable periodical tracking by SMS	Enable/disable periodical tracking by SMS
SMS sending period	Time period. Device will send SMS message with data each period. Minimum SMS message sending period is 30 seconds. Maximum; 9999s.
Add contact	Number, which will receive SMS messages can be entered or selected from contact list after pressing <i>Add contact</i> .
SMS	SMS message format can be chosen here. Press <i>Edit SMS templates</i> in order to create Your own template. <u>Attention!</u> If <i>None</i> is selected as SMS format, SMS will not be sent.

For coordinate searching timeout configuration look in Periodical *data saving* section

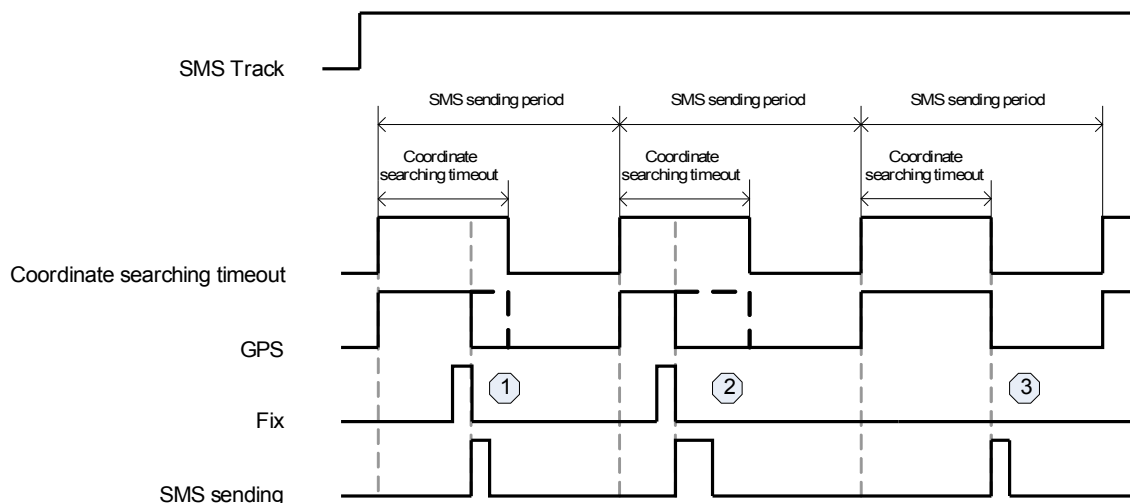
Operation

Open *Track Assitant* and select send period, SMS format, choose number, which will receive messages. Activate periodical tracking by SMS function. Use SMS, button or call (*Action On Call*) method to activate function. GH3000 will send SMS message each period to entered number. Use SMS, button or call (*Action On Call*) method to deactivate function.



Operation of periodical tracking by SMS function, when SMS method is used to activate it. SMS sending period is 30s. Number, which activated the function, will receive periodical data from GH3000 device.

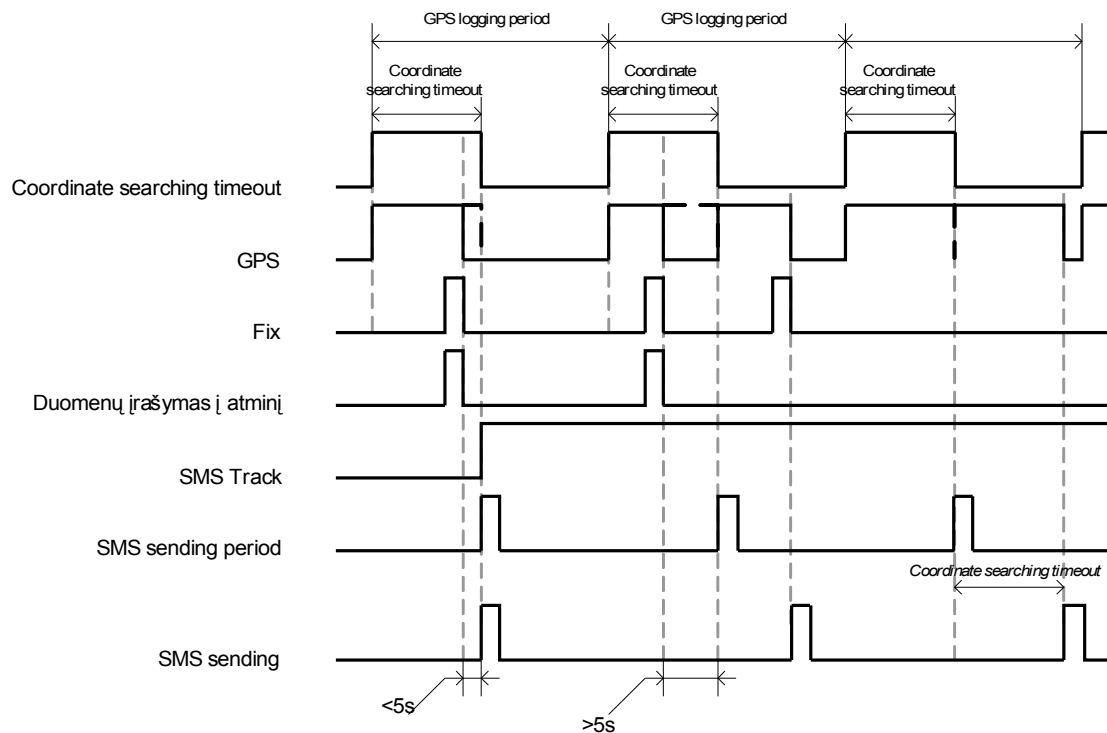
Detailed algorithm of periodical tracking by SMS function operation is displayed below. Coordinate searching timeout time is the same for periodical tracking by SMS and periodical data saving functions (detailed: *periodical data saving*). Device will send newest coordinate in memory if it fails to get new coordinate. Time of sending period is not strictly defined, because it depends on other circumstances (exp. : GSM Network Quality)



Exp. 1 Operation of periodical tracking by SMS function

- 1 – Device gets new coordinate (*Fix*) and sends SMS message with new coordinate.
- 2 – Device gets new coordinate (*Fix*) faster than the first time and sends SMS message with new coordinate.
- 3 – Device is unable to get new coordinate (*Fix*) and sends newest found coordinate.

Operation of functions - periodical tracking by SMS and periodical data saving - are displayed in a picture below. It should be noted that periodical tracking by SMS function turns on GPS module and finds new coordinates by itself if coordinate found before is older than 5 seconds.



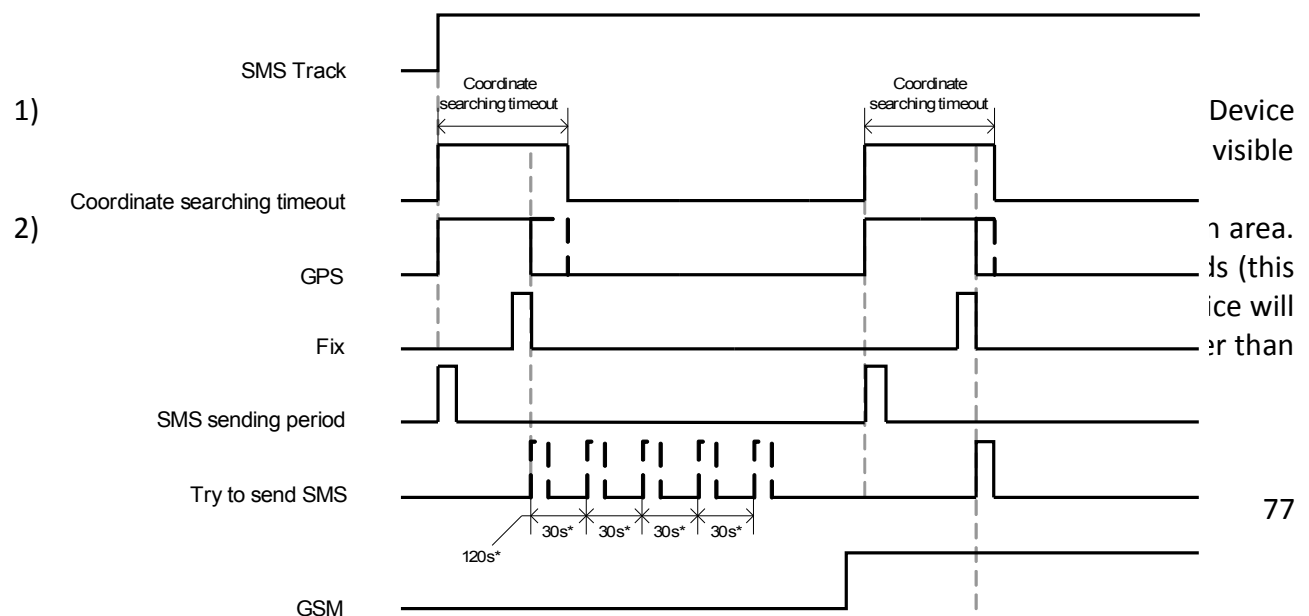
Exp. 2 Operation of functions - periodical tracking by SMS and periodical data saving when they work together

< 5 s – time interval is lower than 5 seconds.

> 5 s – time interval is greater than 5 seconds.

Dashed line indicates GPS module turning off if Fix is not available and SMS tracking function is not activated.

SMS message will be sent each period plus time, needed to get new coordinate. This time can differ from time entered in *Coordinate searching timeout*.



Acronyms	Description
SMS Track	Periodical tracking by SMS is enabled/disabled.
Coordinate searching timeout	Time, for how long device will try to get new coordinate.
GPS	GPS module turned on/off.
Fix	Device gets new coordinate.
SMS sending period	SMS message send period.
Try to send SMS	Tries to send SMS message.
GSM	GSM.

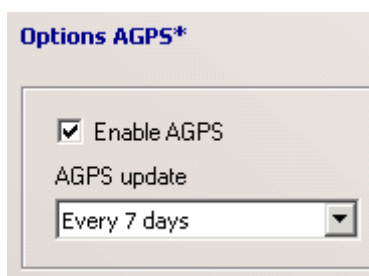
A-GPS function (Assisted GPS system)

This function improves GPS coordinate searching system. AGPS reduces the search time of the first coordinate. Time is shorter, because data, saved in a remote computer (server), is used. This data helps device to find coordinates. Data can be updated depending on a configuration.

Configuration

To configure AGPS open *Track Assistant* software and go:

- *Device configuration* → *Tracking and Saving* choose *Options AGPS* section.



AGPS configuration section

Parameter	Description
Enable	Enable/disable AGPS function.
AGPS update	Select period (from 1 to 14 days), how often AGPS data will be updated. If AGPS data is updated more often that means that device will know positions of satellites better. It will help to find first coordinate faster.

Notice:

Device **will not be able to update AGPS data** if device is configured to send data through GPRS and GPRS send period is sufficiently short. AGPS file size varies from 10 to 90 kB, depending on how often AGPS data is updated (1, 2....7 days). So device sometimes can not download AGPS data, because periodical data sending has started. Periodical data sending cancels AGPS update process.

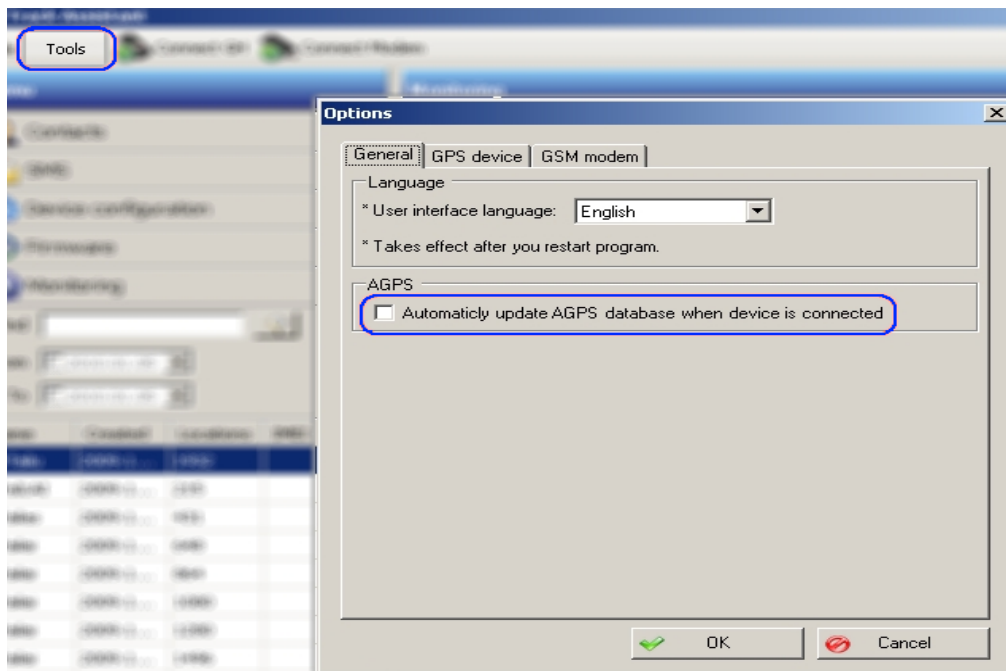
AGPS file sizes and periods needed for AGPS data update are displayed below:

- 1 day ~10 kB update process: ~25s.
- 2 day ~17 kB update process: ~40s.
- 3 day ~24 kB update process: ~60s.
- 4 day ~30 kB update process: ~1 min.
- 5 day ~37 kB update process: ~1,5 min.

7 day ~50 kB update process: ~2 min.
 10 day ~72 kB update process: ~3 min.
 14 day ~90 kB update process: ~3,5 min.

Device automatically tries to connect to AGPS server and update AGPS data. Do not check this tick in order to stop updating AGPS data :

- *Track Assistant* → *Options*



Enable / disable AGPS file update

Operation

GH3000 updates data about GPS satellites positions periodically. Period is set in AGPS configuration section. Device already knows where satellites are located at and it helps device to find them, when AGPS data is updated.

SMS notification about low battery charge

This function will inform You about low battery charge with SMS message. It is very useful to know when device needs to be charged or when device battery is fully charged (battery charge level is maximum).

Configuration

To configure this function open *Track Assistant* software and go here :

1. *Device configuration* → *Notifications* tab choose *Battery*.
2. Choose *Battery notification by SMS* tab.

Parameter	Description
Disable	Notification about battery charge level is disabled
Battery charge level lower then 20%	Device will inform by SMS message only when battery charge level will be less than 20%
Battery charge level becomes lower then 20% or battery fully charged	Device will inform by SMS message when battery charge level will be less than 20% or battery will be fully charged.
Battery charge level (%)	Set up the lowest limit of battery charge level (percentage).
SMS format Bat Low	SMS message which device will send when charge level is lower than 20% format
SMS format Bat Full	SMS message which device will send when charge level is maximum format
Phone number	Phone number to which device will send SMS messages

Battery*

Low battery indication

☒ Enable

Battery charge level (%)

Warning repeat period min.

Battery notification by SMS

☐ Disable

☐ Battery charge level becomes lower then 20%

☒ Battery charge level becomes lower then 20% or battery fully charges

Battery charge level (%)

SMS format Bat Low

[Edit SMS templates](#)

SMS format Bat Full

[Edit SMS templates](#)

Phone Number*

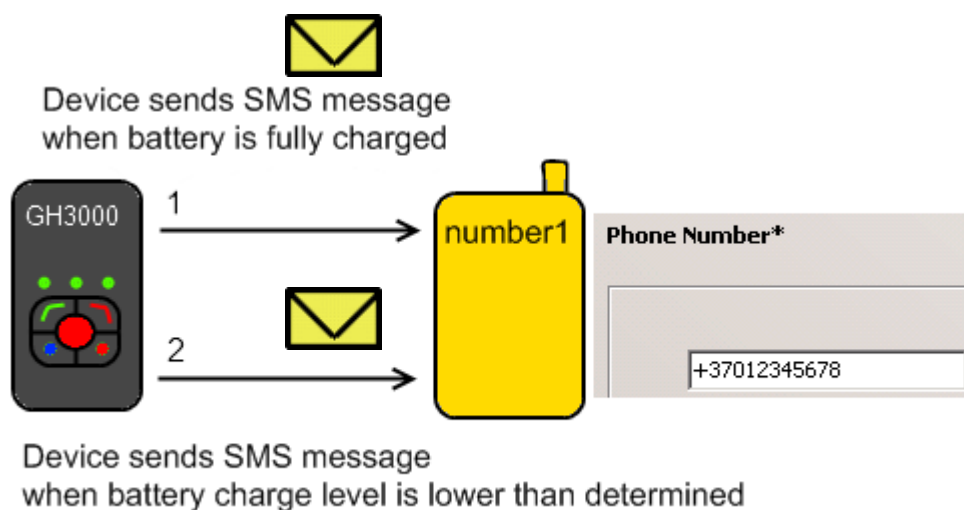
[Add contact](#)

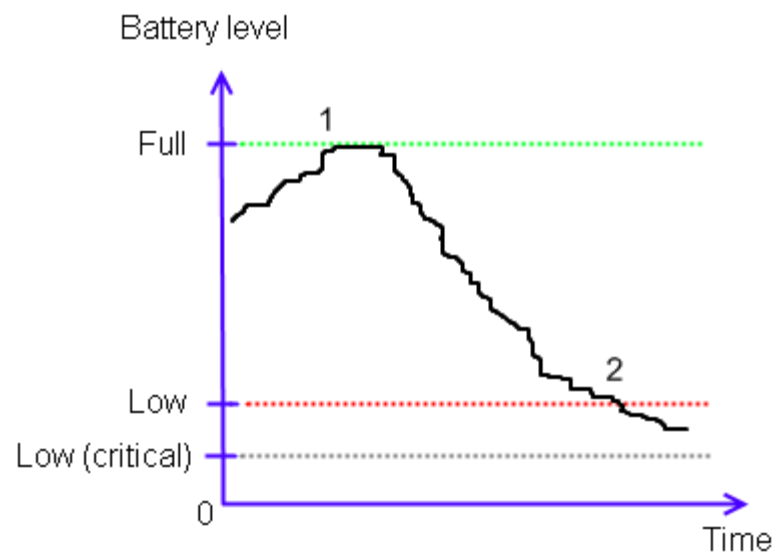
Configuration of notification about battery charge level

Operation

Device constantly monitors battery charge level. Device will inform by sending SMS message when charge level is lower than determined. Device can inform when battery is fully charged (battery charge level is maximum) too.

Operatation scheme :





Operation of notification about battery charge level

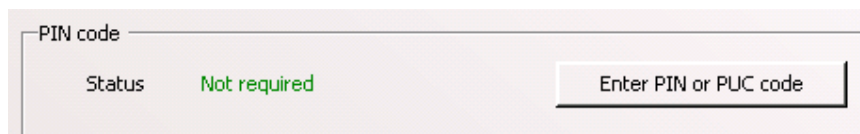
SIM PIN and PUK codes

PIN code is used commonly when SIM card protection is needed. You will not be able to use SIM card if PIN code is not entered. GH3000 GSM LED will flash red. PIN code can be removed if there is no need for it.

Configuration

PIN code can be removed with mobile phone. Code can be entered in Track Assistant software:

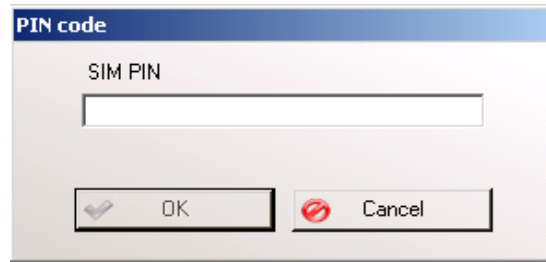
- Device configuration → Security tab PIN code section.
1. Press *Enter PIN or PUC code* and enter PIN code.



PIN code section

Parameter	Description
Status	Shows current status of SIM cards PIN code: <u>Not required</u> - PIN code is not needed.
	<u>PIN code entered but not saved in configuration</u> – PIN code is entered but not saved in configuration.
	<u>PIN not required or entered OK</u> – PIN code is not needed or entered correctly.
	<u>Required PIN or entered BAD PIN</u> – PIN code is required or entered incorrectly.

2. PIN code can be entered in a table which pops up when device is connected to *Track Assistant* software. Table pops up only when PIN code is required and is entered incorrectly or does not entered at all.

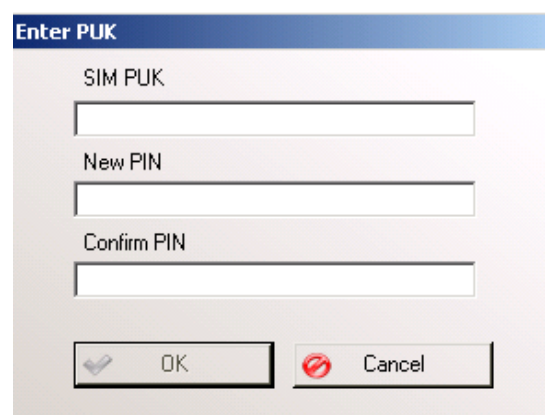


A dialog box titled "PIN code" with a blue header bar. It contains a text input field labeled "SIM PIN". Below the input field are two buttons: "OK" with a green checkmark icon and "Cancel" with a red X icon.

PIN code table

Device automatically enters PIN code if correct PIN code is entered and saved to configuration.

SIM card will be blocked after PIN code is entered incorrectly **3 times**. Now You have to enter PUK code, which consist of 8 digits (PUK is provided with Your SIM card), in order to unblock SIM card. Use mobile phone or *Track Assistant* software to enter PUK code. Table, asking to enter PUK code and new PIN code two times, will pop up when GH3000 will be connected to *Track Assistant* software.



A dialog box titled "Enter PUK" with a blue header bar. It contains three text input fields: "SIM PUK", "New PIN", and "Confirm PIN". Below the input fields are two buttons: "OK" with a green checkmark icon and "Cancel" with a red X icon.

Enter PUK code and new PIN code in this table

Attention! Do not forget to save configuration.

Also do not forget that SIM cards PIN code must be entered when writing same configuration to different device with different SIM card.

Operation

SIM card with PIN code protection is used. Device indicates GSM error. GH3000 is connected to *Track Assistant* software and correct PIN code is entered. Configuration is saved. Device searches for operator and functions after device reset.

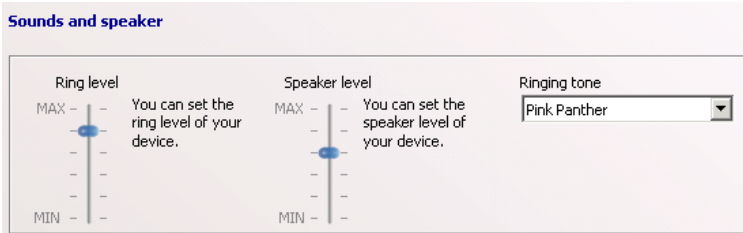
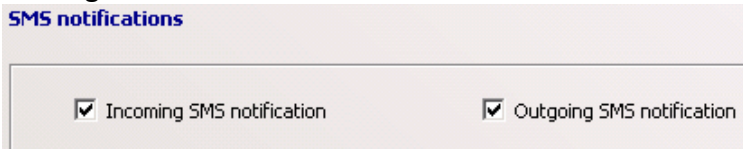
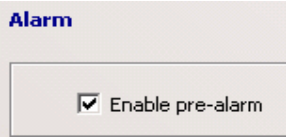
Sound notifications

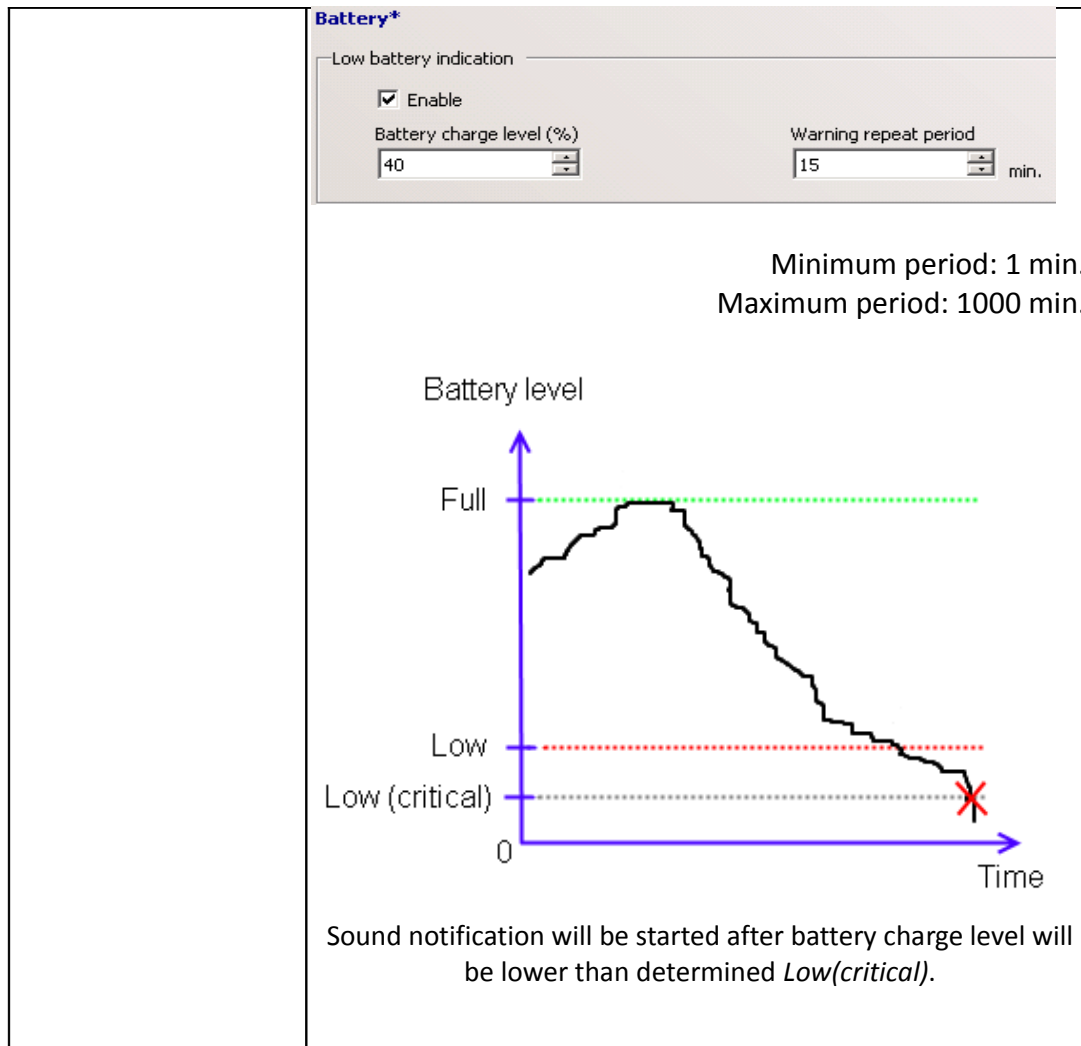
Sound notifications is widely used. It notifies about incoming calls, SMS messages, turning on/off device, low battery level and etc.. Some of sound notifications can be configured.

Configuration

Sound notifications can be configured in *Track Assistant* software:

- *Device configuration* → *Notifications* tab.

Parameter	Description
Sound and Speaker	<p><u>Ring level</u> – selected ring tone volume. <u>Speaker level</u> – selected speaker volume. <u>Ring tone</u> – selected ring tone. You can choose: Pink Panther, Baroque, Caribic, James Bond, Moon Star, Ramp, Mozart, Whenever, Imperial March.</p> 
SMS notifications	<p><u>Incoming SMS notification</u> – enable/disable incoming message notification. <u>Outcoming SMS notification</u> - enable/disable outgoing message notification.</p> 
Alarm	<p><u>Enable pre-alarm</u> – enable/disable <i>pre-alarm</i> sound notification.</p> 
Battery	<p><u>Enable</u> – enable/disable battery sound notification. <u>Battery charge level</u> – battery charge level (Low critical). Sound notification will be started after battery charge level will be lower than determined. <u>Warning repeat period</u> – time period, describing how often sound notification will be repeated.</p>



Sound notifications which are not configurable:

- Device turning on/off
- Function activation/deactivation
- Error determination (exp: SIM card is not inserted)

Operation

Sound notifications informs about event instantly, as soon as it happens. Some sound notifications can be disabled.

Melodies of Sound Notifications

You can hear sounds when GH3000 is connected to terminal (exp: Hyper Terminal) via USB cable. Terminal settings : Boud rate: 19200, PORT: COM1, Data bits: 8, Parity: none, Stop bits: 1, Flow control: none, DTR/RTS : off. When type #GH+tone=*melody code*. Codes are displayed in a table below

Device turn on	16C5,16F#4,16P,8F4,32F#4,8P,8E4,4P,4G4,8P,16C5,2P,2C5;
Device turn off	4E4,16P,8G4,2P,4B4,4P,16C5;
Function activation	8A4,8P,16C5;
Function Deactivation	4E4,32P,16C4;
Error determination	32F4,32P,32F4,32P,32F4,32P,32F4,32P,32F4,32P,32F4,32P,32F4,32P,32F4;
Received SMS message	16C4,16E4,16G4,8C5,4P,16C4,8C4,2C5;
Sent SMS message	16C4,16E4,8C5;
PreAlarm	32C5,32P,32C5,32P,32C5,32P,4C5,32P,4C5,32P,4C5,32P,32C5,32P,32C5,32P,32C5; ;
Battery Low (critical) level	16B4,8G4,32P,1C4;
Pressed button	32C5,32C4;

Example.: #GH+tone=16C4,16E4,8C5;

Vibration

Vibration is one of notifications types. It will inform You about incoming call, received/sent SMS message or activated Alarm.

Configuration

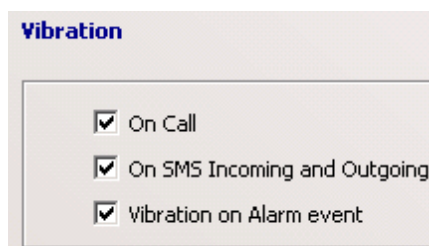
Vibration indication can be configured in *Track Assistant* software:



Device configuration → *Notifications* tab choose *Vibration*.



Vibration can be enabled or disable for these GH3000 functions.



Parameter	Description
On Call	GH3000 will vibrate when receiving an incoming call.
On SMS Incoming and Out coming	GH3000 will vibrate after SMS message is received or sent.
Vibration on Alarm event	GH3000 will vibrate after <i>Alarm</i> function is activated.

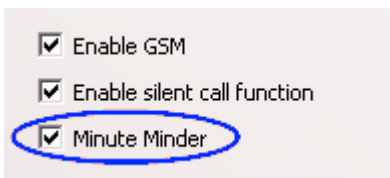
Minute Minder

You will hear this is notification every minute if this function is enabled. This helps to determinate approximate length of conversation.

Configuration

In order to enable Minute Minder open *Track Assistant* software and go here:

- *Device configuration* → *GSM* select *Minute Minder* tick.



Enable/disable Minute Minder

Operation

GH3000 starts conversation. After a minute sound notification informs that one minute has passed. After another minute same notification informs that another minute has passed.

Digital Maps

Track Assistant software is designed to find Digital Maps installed in a computer and use them. *Track Assistant* uses these digital maps:

- a) MS Map-point (2002 or 2009 versions)
- b) Google Maps (for data export only!)
- c) Akis

So if You have installed one of those Maps, You will be able to see coordinates, set up Geo - zones while using *Track Assistant* software.

MS Mappoint 2002 or MS Mappoint 2009

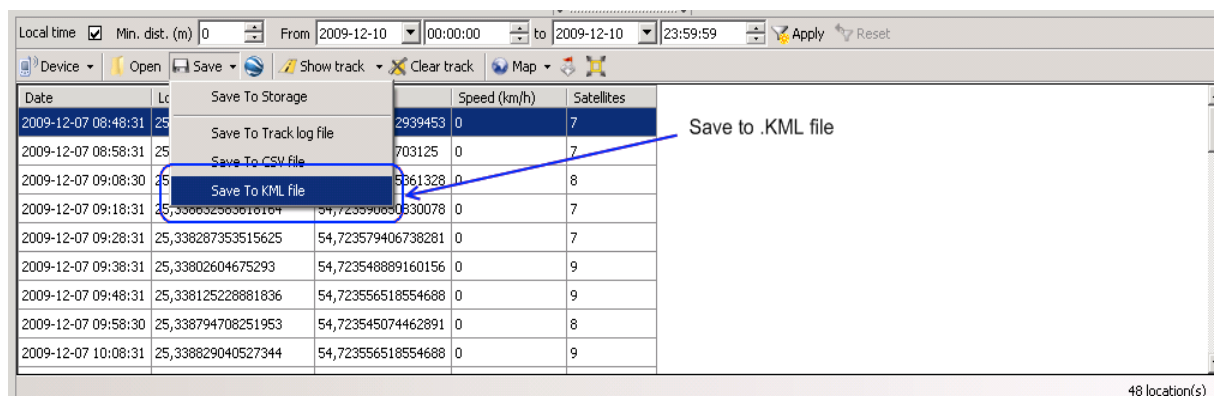
This is digital map created by *Microsoft* company. This map is not free of charge either. Please contact *Microsoft* company in order to find out local prices. To download shareware Europe map version go to this link : www.microsoft.com/uk/Mappoint/trial.aspx. *Track Assistant* will identify this type of digital map.

Attention:

Microsoft released *Mappoint 2009* version, which used to have compatibility problems. So if You are facing difficulties when using this *Mappoint* version, please contact *MS* and ask for software update.

Google Maps

This is a digital map created by *Google*. The use of this map is limited, so there is no possibility to use it in *Track Assistant* software. Only traveled distance can be displayed when using this map. In order to do this just press button *Open Google Earth (KML file)* or by saving coordinates to .KML format file (example how to this is displayed below) and after that opening it in *Google Earth* software. You will need *Google Earth* software for both methods. This software is free of charge and You can download it from here : earth.google.com. Also .KML files can be viewed using Your internet browser after opening this link : maps.google.com. Step by step guide how to do this will be found here : maps.google.com/support/bin/answer.py?hl=en&answer=155420.



Select *Monitoring* tab and choose *Save* → *Save To KML file*. Do not forget to read data from the device (Device → Periodical/Alarm points). Detailed information how to do this will be found in *Monitoring* section description.

AKIS

Digital map *AKIS* is created by – Dr. Vikroras Paliulionis, member of Mathematics and Computer Science Institute staff. This is a paid map. In order to download Lithuanian map go to this link : <http://www.akis.mii.lt/index.php?fuseaction=atsisiusti.browse> . Track Assistant will identify this type of map and You will be able to use it.

Parking function (dynamic Geo - zone function)

This function allows to activate monitoring of fixed location while using GH3000. Position monitoring is based on GPS coordinate or accelerometer (when it is not possible to get coordinate) measurements. There is no need to know where function will be activated, because device will automatically sets up borders around itself (shape of a circle which has determined radius). Alarm is activated when parking zone is crossed or movement is recorded (accelerometer mode).

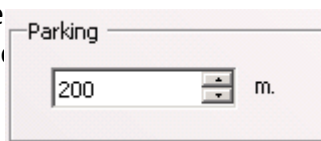
Configuration

Parking function configuration will be found in *Track Assistant* software:

- *Device configuration* → **ALARM** tab choose *Parking* section.

Only distance parameter can be changed in this section. Parking zone will be crossed after device will move determined distance from current location. Maximum radius length is $3,4 \cdot 10^{38}$ m.

Parking method can be activated by pressing keyboard button. Description of activation methods: SMS message, Action On Call or by pressing keyboard button. Description of activation methods is displayed in a table below :



Configuration of parking function

Parameter	Description
SMS	<p>Parking function enabled/disabled when GH3000 receives this type of SMS message:</p> <p>"psw<password> park on r<distance>" - enable</p> <p>"psw<password> park off" – disable.</p> <p><u>Parameter:</u></p> <p>psw<password> – password is entered</p> <p>r<distance> - length of a radius. Minimum length of a radius is 200 meters. Default radius or radius used last time will be used if radius length is not entered.</p> <p>Exp.: psw0000 park on r300 - enables parking with 300m radius.</p> <p>psw0000 park on - enables/disables parking function.</p> <p>If there is no password: psw park on</p>
Action On Call	Function is enabled/disabled when GH3000 receives a call from Action On Call list which can activated/deactivate parking mode.
Keyboard button	Button is configured in Track Assistant which will activate/deactivate parking function (see <i>Keyboard configuration</i> for detailed information). Function will be activated right after button is pressed.

Parking function can be enabled every time, except alarm mode is activated, there is an active call or an incoming call. Coordinate searching timeout is the same when using Parking function. To configure it go here:

Device configuration → Tracking and Saving tab Periodical track data saving section.

Parameter	Description
Coordinate searching timeout	Time for how long device will try to get new coordinate

Important!

Minimum time given for device to change its status from movement to sleep mode is 60s. So coordinate searching timeout can not be **less than 60s** while using Parking function.

Parking function has its PreAlarm time. Parking PreAlarm is the same as PreAlarm used in Alarm function. To configure it go here:

- *Device configuration → Alarm section.*

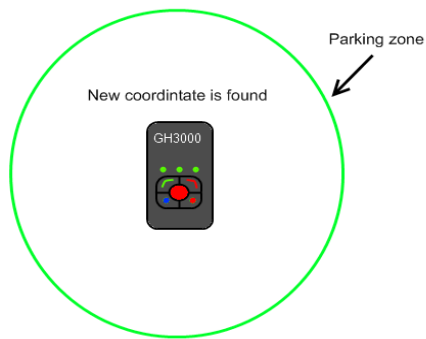
Parameter	Description
Pre-alarm time	Time of PreAlarm

Operation

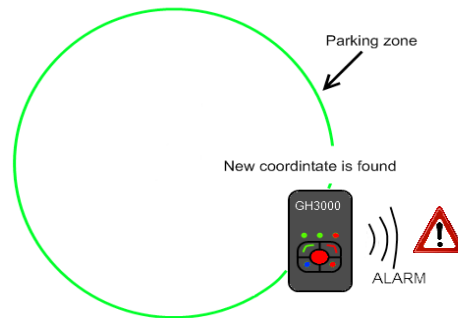
There are several possible scenarios of this function.

1. Coordinate is found

Parking function is activated. GH3000 finds new coordinate and sets up parking zone. Now new coordinates are compared to first coordinate. Distance is measured. Device logs crossing of a border and activates alarm if distance is bigger than the *Parking* distance. Device turns off its GPS module and stops searching for new coordinates (device battery is saved) when device is in a sleep mode.



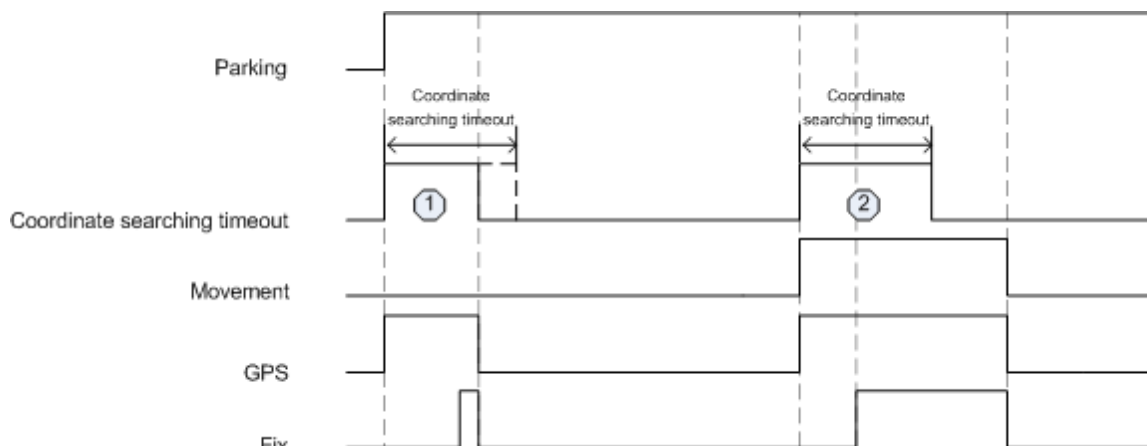
FIX 1: GPS fix quality is good



FIX 2: GPS fix quality is good

Couple scenarios, when device is able to get new coordinate, are displayed below.

a) There was no movement at first, coordinate is found, device has not left the zone :

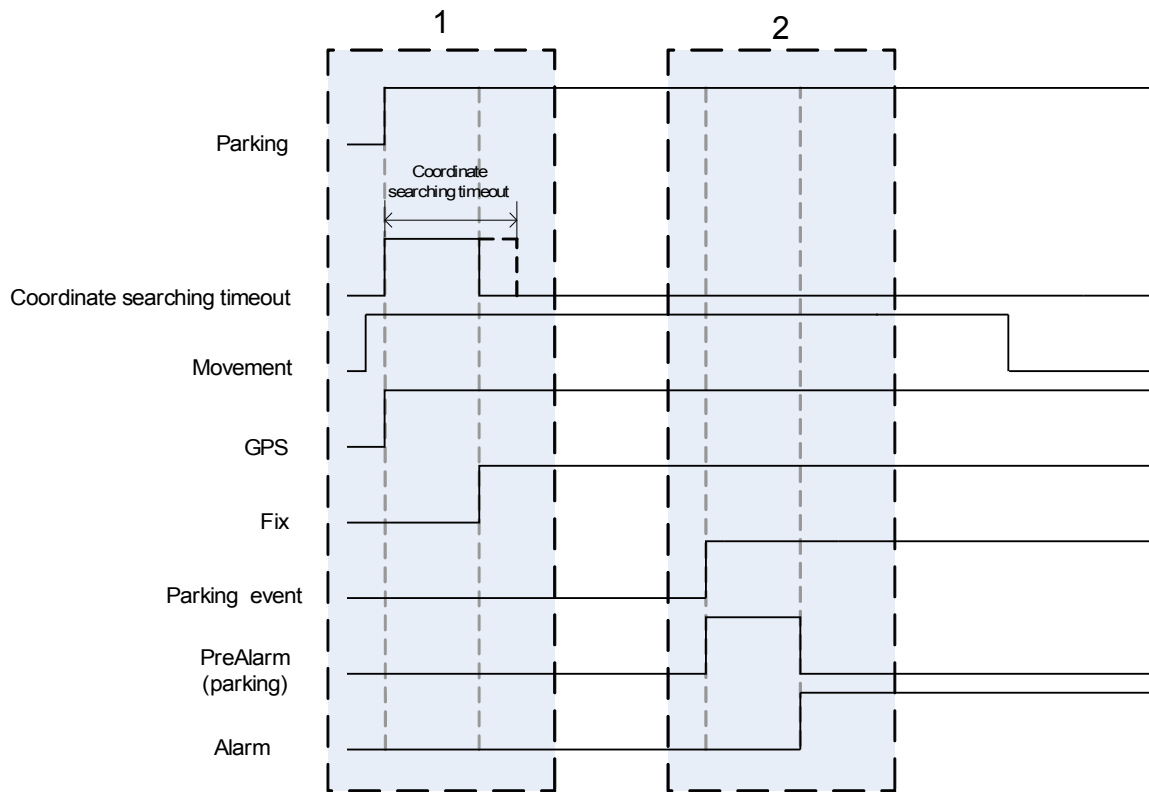


FIX 3: Operation of parking function when new coordinates are found and device does not leave the zone.

1 – Fix is found before Coordinate searching timeout time runs out.

2 – Movement of the device causes fix recording after coordinate searching timeout time runs out.

b) There was a movement at first, coordinate is found, device has left the zone :



FIX 4: Operation of parking function, when new coordinates are found and device leaves parking zone and does not come back. There was a movement at first.

1 – Parking function is activated. There is a movement. New coordinates are found. Device has not left parking zone, so there is no alarm. Device always tries to get new FIX, because there is a movement.

2 – device left parking zone (parking event). *PreAlarm* is activated. Device has not come back to parking zone, so *Alarm* is activated.

c) There was a movement at first, coordinate is found, device has left the zone and came back, but after *PreAlarm* time :

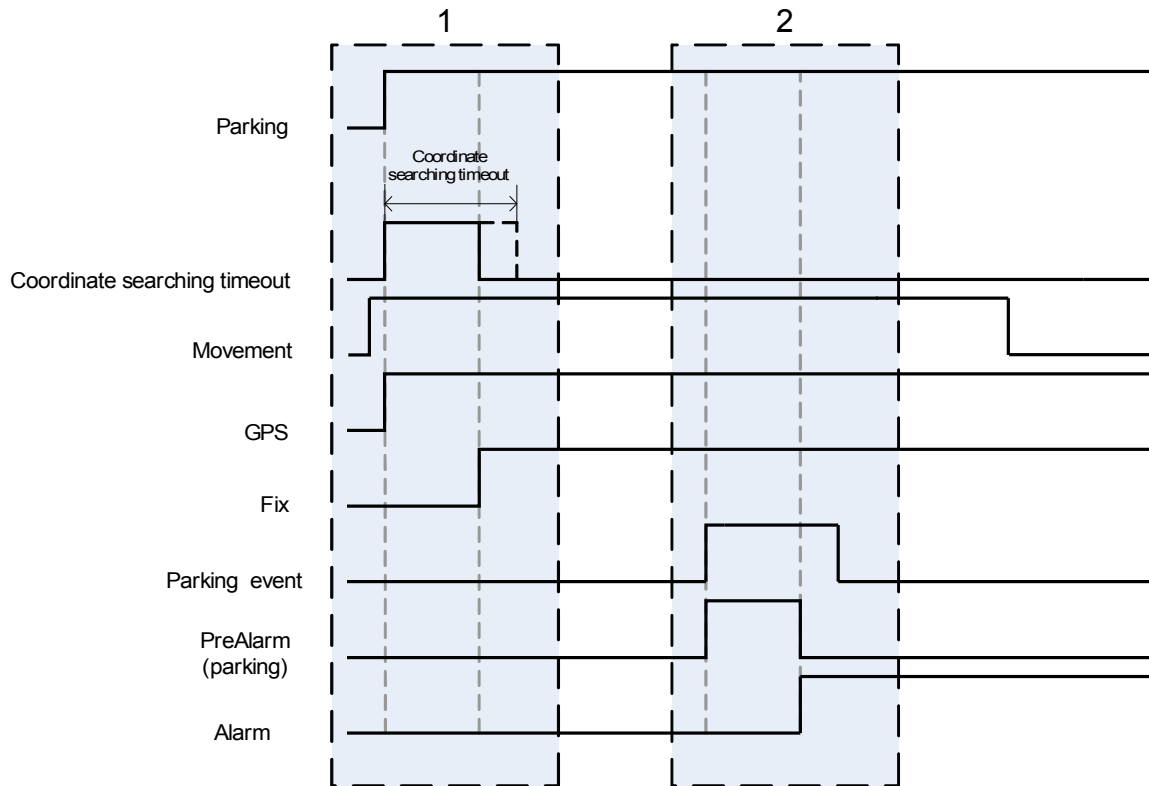


FIG 5: Operation of parking function, when new coordinates are found and device leaves parking zone and comes back after *PreAlarm* time. There was a movement at first.

1 – Parking function is activated. There is a movement. New coordinates are found. Device has not left parking zone, so there is no alarm. Device always tries to get new FIX, because there is a movement.

2 – device left parking zone (parking event). *PreAlarm* is activated. Device has come back to parking zone before *PreAlarm* time runs out, so *Alarm* is not activated.

2. Coordinate is not found

Coordinate is not found



Monitors accelerometer data

NO_FIX 1: There is no GPS signal in the zone

Coordinate is not found



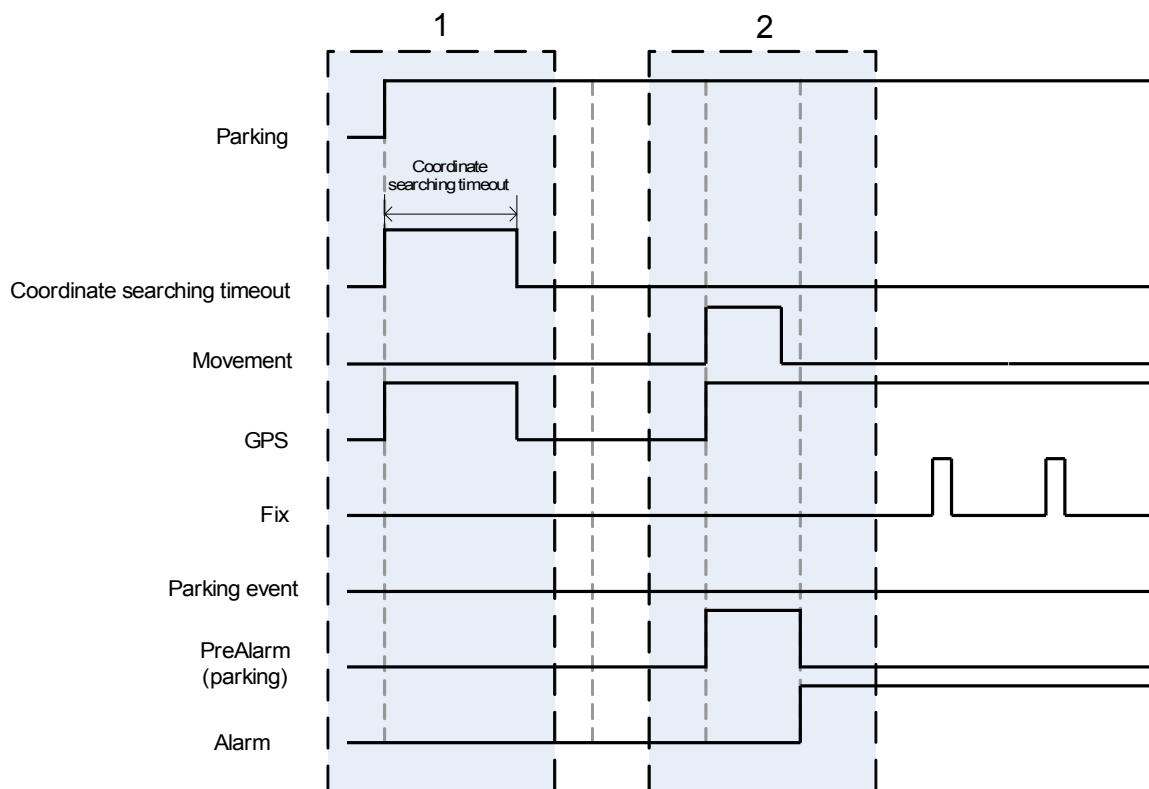
Monitors accelerometer data

NO_FIX 2: There is no GPS signal in the zone

Parking function is activated. There is no movement. GH3000 does not find new coordinate. Device goes to movement (accelerometer) monitoring mode. *PreAlarm* is activated when movement is recorded. *Alarm* is activated after *PreAlarm* time runs out.

Couple scenarios, when device is not able to get new coordinate, are displayed below.

1. a) There was no movement at first, coordinate is not found:



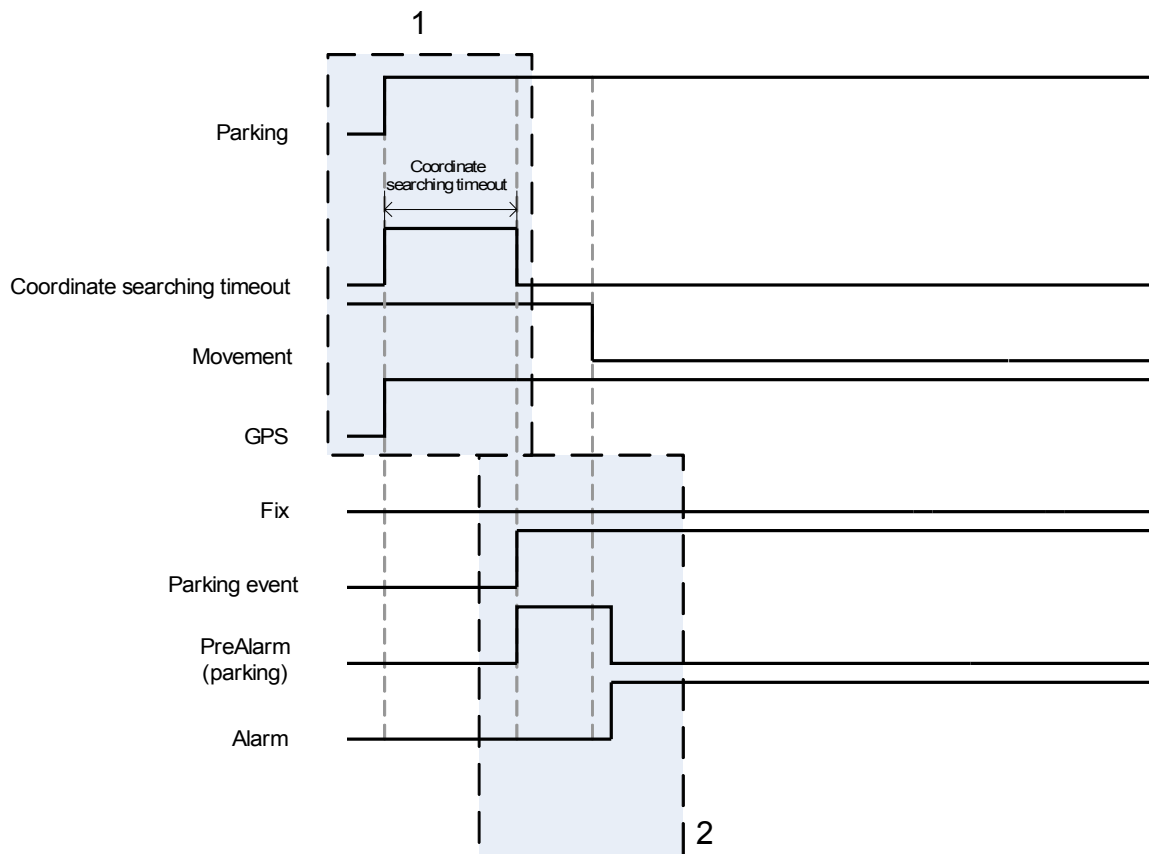
NO_FIX 3: Operation of parking function, when new coordinates are not found. There was no movement at

first

1 - Parking function is activated. There is no movement, so there is no cause to activate an alarm. Device goes to sleep mode.

2 – Movement is recorded and *PreAlarm* is activated. Device tries to get new FIX. *Alarm* is activated after *PreAlarm* time runs out (there was a movement and location is not found).

b) There was a movement at first, coordinate is not found:



NO_FIX 4: Operation of parking function, when new coordinates are not found. There was a movement at first

1 - Parking function is activated. There is a movement. New coordinates are not found during entire *Coordinate searching timeout* time.

2 - *PreAlarm* is activated after *Coordinate searching timeout* time runs out. *Alarm* is activated after *PreAlarm* time runs out (there was a movement and location is not found).

Notes:

- Parking function is activated again after Alarm ends. Device sets up new *Parking* zone and tries to get new coordinates. Movement monitoring mode (Sleep mode) is activated.

- **Attention!** When You are leaving parking zone, Parking function has to be switched off in order to avoid false Alarm activation.
- Parking function has its own *PreAlarm* signal. It mean that *Alarm* has another *PreAlarm* time. So sequence will be like this *PreAlarm (Parking)* → *PreAlarm (Alarm)* → *Alarm*

Detailed description:

Parameter	Description
Parking	Parking function activated/deactivated
Coordinate searching timeout	Time, for how long device will try to get new coordinate. <i>PreAlarm</i> will be activated after this time runs out.
Movement	Movement of GH3000 (yes/no)
GPS	GPS module turned on/off
Fix	New coordinate is found
Parking event	Parking function event. Device left the zone or movement is recorded if new coordinate is not found.
PreAlarm (parking)	Parking function's <i>PreAlarm</i>
Alarm	<i>Alarm</i> mode

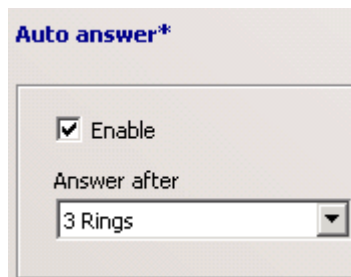
Auto answer function

This function allows to answer incoming calls automatically. So GH3000 will connect with the caller even if device owner will not be able to answer the call himself. Auto answer time can be changed.

Configuration

Use *Track Assistant* software in order to activate and configure Auto answer function :

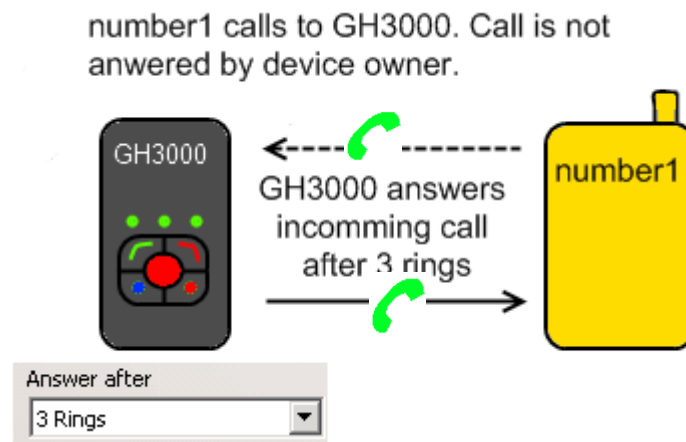
1. *Device configuration* → *GSM* tab choose *Auto answer* section.
2. Tick *Enable*.
3. Select *Answer after* value.



Configuration of Auto answer function

Operation

Auto answer is set up to answer automatically after 3 rings. *Number1* calls to GH3000. Device owner does not answer himself so GH3000 automatically answers incoming call after 3 rings.



Operation of Auto answer function

Spy call function

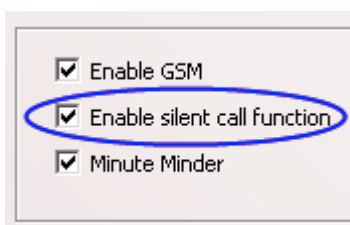
This function allows You to connect to GH3000 device using voice call method and nobody will be able to notice that (even device holder). There is no indication when Spy Call function is active at all. So GH3000 can be used as spy device which has unlimited range, because information is transmitted through GSM.

Configuration

Use *Track Assistant* software in order to configure this function :

1. *Device configuration* → *GSM*.
2. Tick *Enable silent call function*.

Spy call function can be activated using *Action On Call* method. Detailed description of each method is displayed



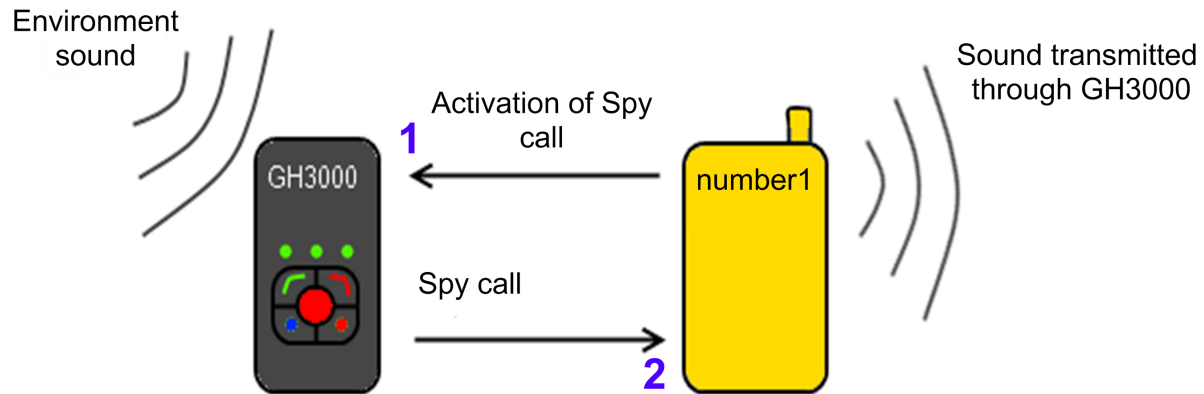
Configuration of Spy call function

Method	Description
SMS request	Function is activated when GH3000 receives this type of request : "psw<password> SPY" Exp.: psw:0000;SPY If there is no password: SPY
Action On Call	Function is activated when GH3000 receives a call from number, which is in <i>Action On Call</i> contact list and is configured to activate Spy Call function (for more detailed information see <i>Action On Call</i> chapter).

Operation

Number1 sends „**SPY**“ SMS request. GH3000 receives message and activates SPY call without any indication. Also sensitivity of microphone is increased too. Number1 can hear what is happening around the device.

Action On call function works exactly the same.



1 – SPY call is activated by *SMS* message or *Action On Call* method.

2 – GH3000 calls to number1 and increases sensitivity of microphone, so Number1 can hear what is happening around the device.

Note:

- Spy call function can be deactivated just by terminating the call (like terminating ordinary conversation)

Function activation by call (Action on call)

This function allows to activate various function just by calling to the GH3000 device. So there is no need to send SMS. Incoming call is terminated instantly so You will not be charged for the call.

Number, which will be able to control device, must be entered in order to use Action on call function. This entered number will be able to activate only one, previously configured function. Couple different numbers can control the same function. 5 different numbers and actions can be used.

Configuration

Use Track Assistant software in order to configure this function:

1. *Track Assistant* → *GSM* tab choose *Action On Call*.
2. Press *Create new action*.
3. Enter parameters (see table below).

Parameter	Description
Activation number	This number will activate the function
Function	This function will be activated when device will receive a call from activation number. New field asking to enter SMS message format will appear If SMS function is chosen. Formant can be edited just by pressing <i>Edit SMS templates</i> .
Phone number	Device will send SMS or call to this number if SMS or CALL function is chosen.

Press *Delete this function* in order to delete selected action on call . Press *Delete all actions* in order to delete all actions.

Example:

Action on call*

[Create new action](#)
[Delete all actions](#)

Activation number
+37012345678
Add contact

Function
Parking On
Delete this action

Phone number

Activation number
+37011122222
Add contact

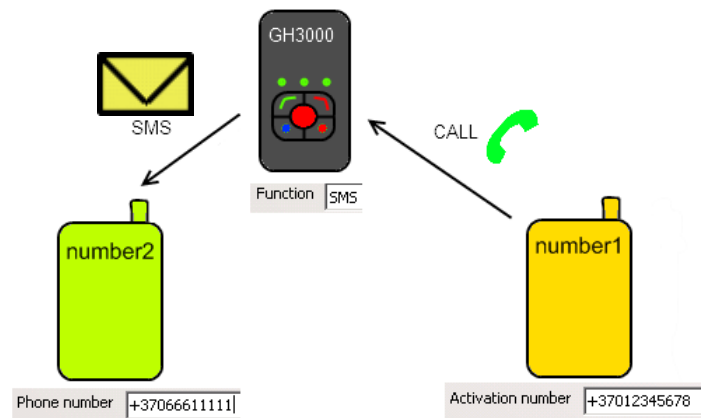
Function
SMS
INF! Name:%s;
Edit SMS templates
Delete this action

Phone number
+37066611111
Add contact

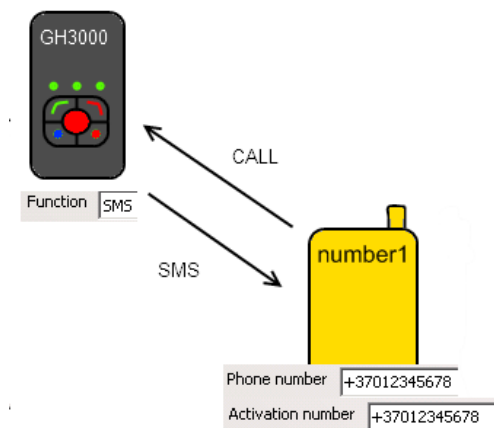
Operation

number1 is used as activation number. Number1 calls to GH3000. GH3000 records an incoming call and compares it to numbers entered in *Action On call* list. Finds that number1 is in a list. Now GH3000 terminates an incoming call and activates function.

Operation:



Operation of *Action On Call* SMS function 1. Function – send SMS to number2



Operation of *Action On Call* SMS function 2. Function – call to number1 (same number)

Notes:

- 1) It will be not possible to make a voice call to device from number which is in *Action On Call* list.

- 2) Only last entered function will be activated if one number is configured to activate couple of different functions.
- 3) Action On Call function will work even if authorized number list is enabled and activation number is not in that list.

Configuration through terminal

Device configuration can be changed through terminal (software which communicates with device through command line). Detailed description is described in *General Protocol Configuration* document. Terminal software can be downloaded from here:

http://92.61.34.5/Downloads/GH3000/Software/Terminal/Terminal_Setup_1.0.0.710.zip

Main configuration steps:

- 1) Connect device to computer.
- 2) Choose COM port, to which device is connected to.
- 3) Press *Open* in order to connect device with computer.
- 4) Send command with device configuration password : #GH+PSW=0000
- 5) Read device parameters : #GET:CFG1
- 6) Send command with new parameters. Commands and parameters will be found in *General Protocol Configuration* document.
- 7) Save changed configuration : #SAVE:CFG1
- 8) Reset GH3000 : #RST. Device can be reset by pressing reset button too. Device has to be disconnected and connected again to computer via USB port in order to use terminal after reset.

Note: device will respond *OK* to correctly sent commands.

Firmware Update

Installation

Firmware update is performed using *Track Assistant* software.

First of all switch GH3000 to Firmware installation mode. To do this follow these steps :

- a) Press and hold 1 (green) and 5 (red *Alarm*) buttons and shortly press *reset* button (please use paperclip for this). Make sure GH3000 is in Firmware update mode. Battery's (1) and GSM's (2) LED s should light up green.

1.



Press and hold

2.



press reset

3. Indication



- b) Turn off GH3000. Press and hold 1 (green) and 5 (red *Alarm*) buttons and now connect GH3000 to computer via USB cable. Make sure GH3000 is in Firmware update mode. Battery's (1) and GSM's (2) LED s should light up green.

1.



Press and hold

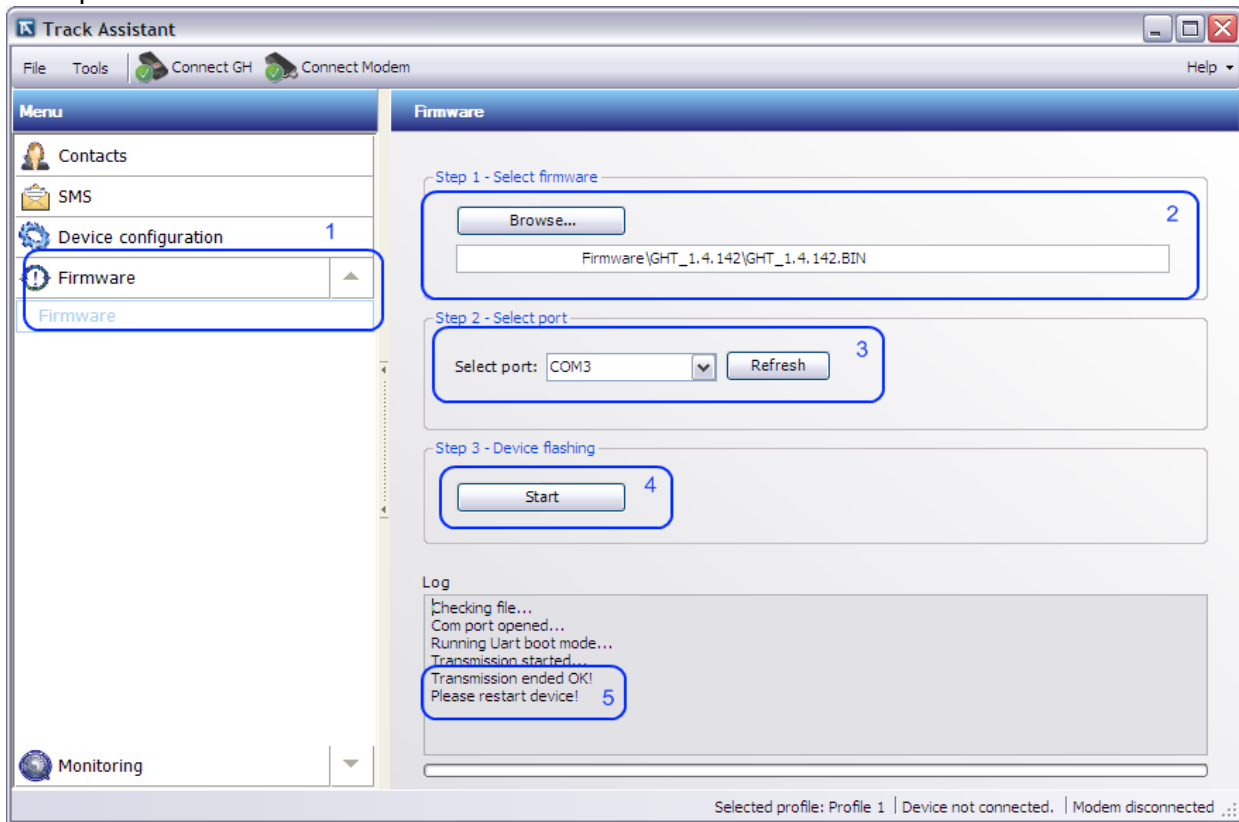
2. PC



3. Indication

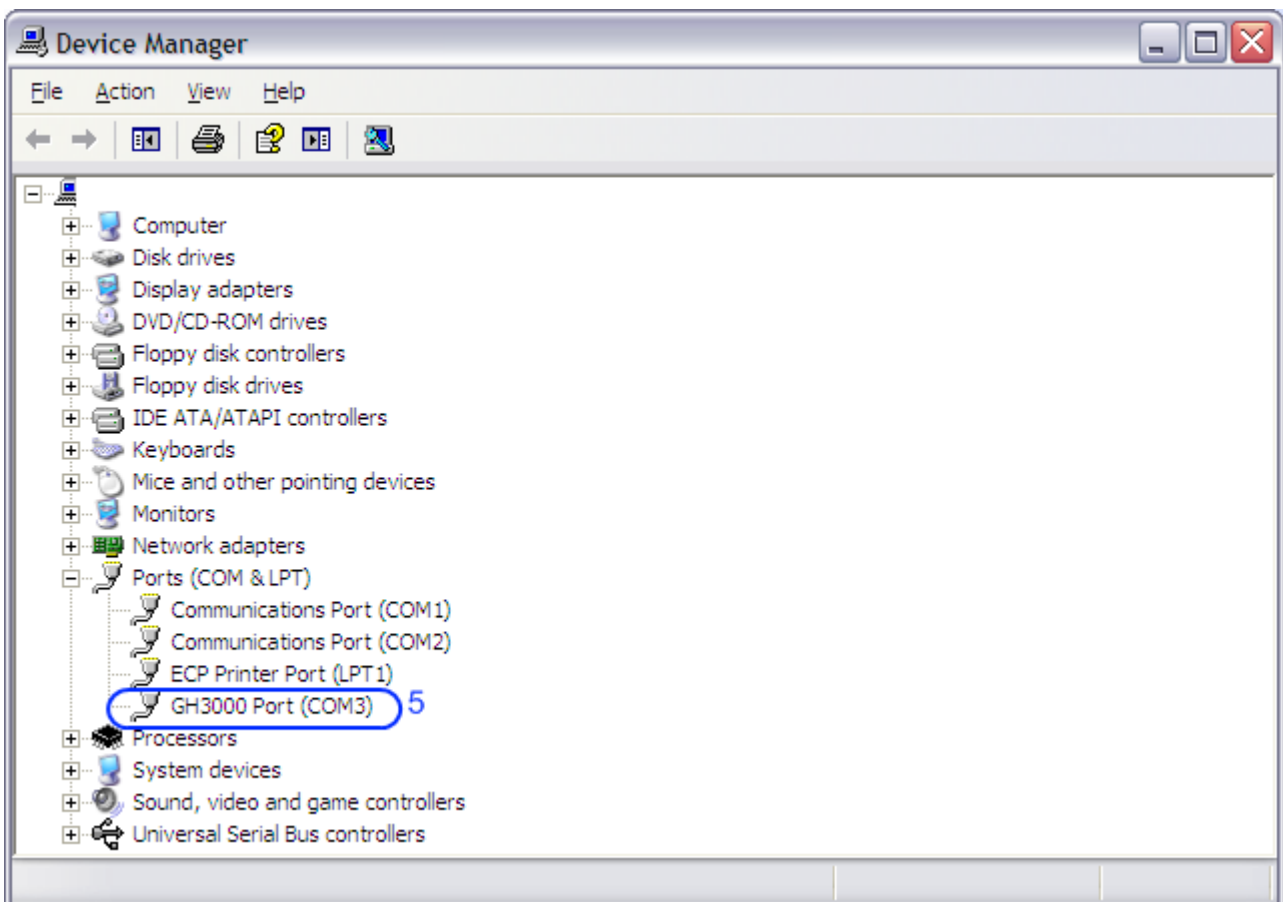
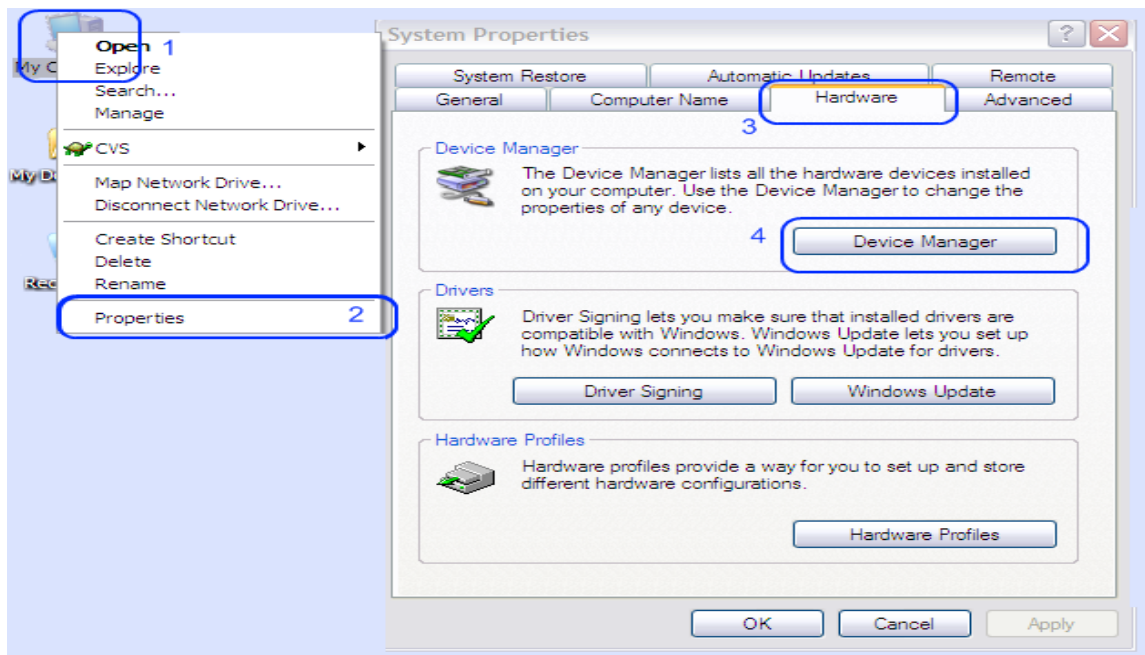


1. Open *Track Assistant* software and choose *Firmware* tab.



2. Choose newest *.BIN* format file needed for firmware update.
3. Choose port number to which GH3000 is connected to. Picture below explains how to find out port number when using Windows XP operating system :

1. Right click on *My Computer*.
2. Select *Properties*.
3. Select *Hardware*.
4. Select *Device Manager*.
5. Locate GH3000 port name in *Ports* tab. Port number will be displayed in the brackets.



4. Press *Start* in order to start firmware update.

5. „*Transmission ended OK! Please restart device!*” should appear in the last lines in Log section. GH3000 battery's LED should light up green and GSM's and GPS's LEDS should blink green light. Reset GH3000.



Indication of successful update

6. Now You need to format device memory. Please use terminal software. Connect GH3000 to terminal and type these commands :

- 1) #GH+PSW=0000
- 2) #FORMAT
- 3) #DEFAULT
- 4) #RST
- 5) Program should respond 'OK' to all the commands.

Notes:

Please be aware that it will take more time to get first coordinate after firmware is updated.

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