

Up-to-date (Add-On) vehicle alarm system with GSM-GPS SMS/DIAL Automatic Vehicle Location and Tracking

User's guide
Prog. Version GTGPS v1



APPLICATION

- The module may be applied for remote monitoring and control of vehicles, motorcycles, boats or other transport facilities as well as for their protection via GSM network.
- Vehicle GPS tracking by transferring info via GSM network in a form of SMS.
- Remote control of vehicles via GSM network.
- Temperature and voltage control.
- Remote voice listening.

FEATURES

- Built-in GPS module.
- GPS location request via SMS.
- GPS SMS message format including link to Google Maps. You only need to press the link in your smart phone and you will be able to see vehicle location on Google Maps.
- Geofence alarm
- Over speed alarm
- Up-to-date (Add-On) ARM/DISARM control of alarm system. Not necessary additional desk The module may turned ON/OFF by using manufacturer's central lock.
- 6 inputs. Fully programmable zones.
- 2 inputs for arm/disarm the security system. The module can be controlled using standard central lock of a vehicle or using other access control device.
- 4 programmable outputs for remote control or for fulfilment of selected function.
- 1 output for monitoring of system's state. LED indicator.
- 16 users who receive information about protected object. Reception of information in a form of SMS or via DIAL short call.
- 400 users being able to control gate or electromagnetic lock via free short call.
- ARM/DISARM of the system via free short call.
- ARM/DISARM of the system with the factory remote control central lock.
- Temperature measurement. For temperature control, tracking, alarm and control.
- Voltage measurement. Voltage monitoring and alarm.
- External microphone. Remote voice listening option via external microphone.
- Option to connect BELL for alarm indication.
- System state BUZZER. (Optional output type)
- FLASH feature may be used for direction indicators on arming or disarming or in the event of alarm. (Optional output type)
- Sending of periodical test including system parameters.
- SMS about state of each sensor, alarms, power supply voltage and GSM communication level.
- Built-in GSM module.
- Testing and diagnostic of the module via USB by using program SERA
- Remote set-up via SMS messages.
- Configuration of the module via USB.
- Free configuration program SERA.
- Very compact

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1. Safety requirements

Before applying the module in operation please read this user's guide. Any operations, related with mounting of the module and connecting of peripheral devices, should be performed only after unplugging the module from the mains.

2. Application of the device

GSM GPS Automatic Vehicle Location and Tracking module GTGPS (hereinafter the Module) is designed for sending of GSM SMS messages and GPS location to the mobile phone of a user. GTGPS module may be used for protection of all types of vehicles, for determining geographic location of a vehicle and for remote tracking via GSM network.

The module may be used for protection of a vehicle or in combination with the vehicle's security system, which has control lock control. In the event of burglary, the device, depending on programmed operation algorithm, is able to call or to send SMS to up to 16 users. A user is able to hear what is going on in his vehicle after answering a call or he may make a call by himself. A user is able to receive an SMS with detailed information about status of each protected zone and number of alarm events. The user is able to control the device via SMS messages only if he knows user's password. If a call is being performed from the telephone number not included in the system's data base, the call is rejected immediately.

The module has system voltage control. If power supply voltage drops below the defined value, a user automatically will be notified via SMS. The SMS message includes voltage of backup battery.

The module has external temperature sensor. A user receives information about temperature alarms and restores via SMS messages. The SMS on voltage of the module and ambient temperature is also available. Temperature may be measured in Celsius and Fahrenheit.

SMS periodical test ensures constant control of the module. The module is able to send periodical test. Test time is programmable. The test will include all essential information: GSM communication strength, system (car battery's) power supply voltage, temperature and IMEI of the module.

GTGPS module is deal for remote vehicle start. The module compares incoming number with programmed users' numbers and in a case of compliance activates an output or other action and interrupts the call automatically.

All parameters of the module should be configured via PC by using software SERA or in remote manner by sending appropriate SMS including password.

The module is used for automatic vehicle tracking and determining its geographic location. It is possible to see a location of a vehicle in Google Maps.

3. Used definitions and terms

- GPS - (Global Positioning System) global system for determining a geographic location .
- Installer – a person provided with INST (installer's) password.
- User – a person provided with USER (user's) password.
- Authorized user - a person whose mobile phone's number is entered in GSM module. Two authorized users with the same rights may be entered into the module.
- Configuration – programming of the settings, which will define the operation of the item. For example, user's telephone numbers, set-up of periodicity for sending SMS message, input names etc.
- Event – event a user receives the information about.
- ARM – status of the security system. The module is in ARM mode
- DISARM – status of the security system. The module is in standby mode; only 24h inputs are active.
- NO - input type (Normal Open) - this means that the alarm will be send when the input will be connected with ground (-V).
- NC input type (Normal Close) - this means that the alarm will be send when the circuit between input and ground (-V) will be broken.
- EOL - (end of line resistor) input type with resistor.
- Service messages – ARM/DISARM, test, resetting of the system.
- DIAL – the system makes a call to the number specified.
- Pull-up resistor - the pull-up resistor is that it weakly "pulls" the voltage of the wire it's connected to towards +V (or whatever voltage represents a logic "high").
- MIC - microphone
- COM – negative power supply terminal.
- +V - positive power supply terminal.
- SSR - Solid State Relay
- Caller ID - Caller's identification
- AVL - Automatic Vehicle Location
- Geofence - the territory in a selected radius around the set point. This function is to inform a user that the object crossed the defined zone.

4. Short description of the operation principle

The module has built-in GPS system to define a geographic location of the object and to transfer the said information to a user's mobile phone.

The module transfers messages about event of the security system to the mobile phone of a user via GSM communication channel.

Upon alarm response of the security system, the module will generate SMS message about alarmed sensors: door, capote, shock, fuel tank etc. SMS message is being sent to a user in-line with a short call. This is to reduce the probability that a user will not observe SMS message.

It is possible to send SMS and to call to 16 users. The algorithm of message sending is SMS1,SMS2...SMSn till all SMS messages will be send. After DIAL1,DIAL2....DIALn. All messages are being sent until all users will be notified about the event. Preferred messages and texts of these messages should be defined when programming the module.

The module understands when the call is rejected and will not repeat calling. When the module is calling to the user's phone, the user can not reject the call at least 15 seconds. Otherwise the module will understand that the user's number is busy and will try to repeat the call again. In a case the user's number is busy in fact, the module will make repetitive calls following the programmed number of calls. Efficiency of this function depends on interpretation of call control by the operator; in some cases the operator may wrongly interpret the call and thus the module will make repetitive calls each 60 seconds, following the programmed number of repetitions (by default 3 repetitions). In such case GSM operator may be changed or simply the amount of DIAL repetitions reduced.

Parameters of the module are set by sending SMS or via PC by using standard miniUSB cable and configuration software SERA, which is available to download at www.topkodas.lt.

In order to activate voice listening it is necessary to call from a user's telephone number. When calling, the module will immediately activate voice listening, which will last as long as the user will reject the call or when the module will start performing other commands. Calls from other telephone numbers (of non-authorized users) are ignored.

5. Package content

		
GT GPS module - 1 pcs	System cable - 1pcs	GSM antenna - 1 pcs
		
GPS active antenna - 1 pcs	2,2 kOhm resistors - 4 pcs	1 kOhm resistors - 6 pcs
		
System state indicator (LED), attached on the system cable - 1 pcs	External temperature sensor, attached on the system cable - 1 pcs	External microphone attached on the system cable - 1 pcs
		
Mini USB cable	Mini CD - 1 pcs: <ul style="list-style-type: none"> • User's guide in PDF • Program SERA • USB drivers 	Shipping Package

Note: Some package content may be optional. Please ask seller for more information.

6. Specifications

Parameters of built-in GSM module:

Quad-band (850/900/1800/1900 MHz)
Sending of SMS messages
Receiving of calls and dialling
Microphone

PGS parameters:

Chipset.....AR1511 Atheros GPS chip, 20 channel
Supports.....`AGPS, WAAS, EGNOS and MSAS
General FrequencyL1, 1575.42MHz
Accuracy Position2.5 meters CEP
Acquisition Rate:
.....Cold start 35 sec, typical
.....Warm start 33 sec, typical
.....Hot start 1.3 sec, typical
Sensitivity Tracking-160dBm
Navigation-157dBm
start.....-144dBm
Velocity515 meters /sec (1000 Knots) max.
ProtocolsNMEA, 3GPP,
5 Hz position update rate capability

Outputs:

OUT1 max current - (-V) 1500 mA.
OUT2 max current - (-V) 1500 mA.
OUT3 max current - (-V) 1500 mA.
OUT4 max current - (-V) 1500 mA.

All outputs can be controlled via short call DIAL or via SMS message. This feature may be used for gate opening, ignition locking etc.

Output alarm parameters may be programmed.

Programmable algorithms for outputs operation: CTRL/SMS/DIAL, SIREN, BUZER, ARM state, Zones OK, Light Flash,inverting ,pulse mode

INI-IN6 inputs:

SMS text for input alarm and restore
Programmable enabling or disabling of inputs;
Input type NC/NO/EOL
Algorithm for zones operation:: *delay, interior, instant, 24 hours, silent, fire*
Response time;
Time of additional response;
Commutation of selected out put

IN7 voltage control (internal power supply voltage input)

Alarm voltage (programmable);
Restore voltage (programmable);
Programming-based voltage calibration;
Power supply voltage range from 8.0 V to 16 V.
Measurement scale 0.01V;

IN8 (temperature control) parameters:

External temperature sensor;
Alarm temperature (programmable);
Restore temperature (programmable);
Programming-based calibration of temperature sensor;
Temperature measurement range from -40 °C to +80 °C
Measurement system Fahrenheit/Celsius
Measurement scale 0.1 °C / 0.18 °F

Module control:

ARM/DISARM of the security system via LOCK/UNLOCK outputs. 6 control algorithms:
via SMS message
via short call DIAL

Automatic periodical test:

Test sending in a form of SMS message. Sending communication control messages (tests) at time range from 1 to 24 hours after pressing RESET button or after entering into ARM (security) mode. Settings discreteness - one hour.

Power supply voltage:

Nominal power supply voltage - 12.6 V
Power supply voltage range 9 - 16 V

Consumption current:

In standby mode, GPS receiver is OFF.....less than 30 mA*.
In standby mode, GPS receiver is ON.....less than 45 mA*.
In dialling or SMS sending modeless than 300 mA.

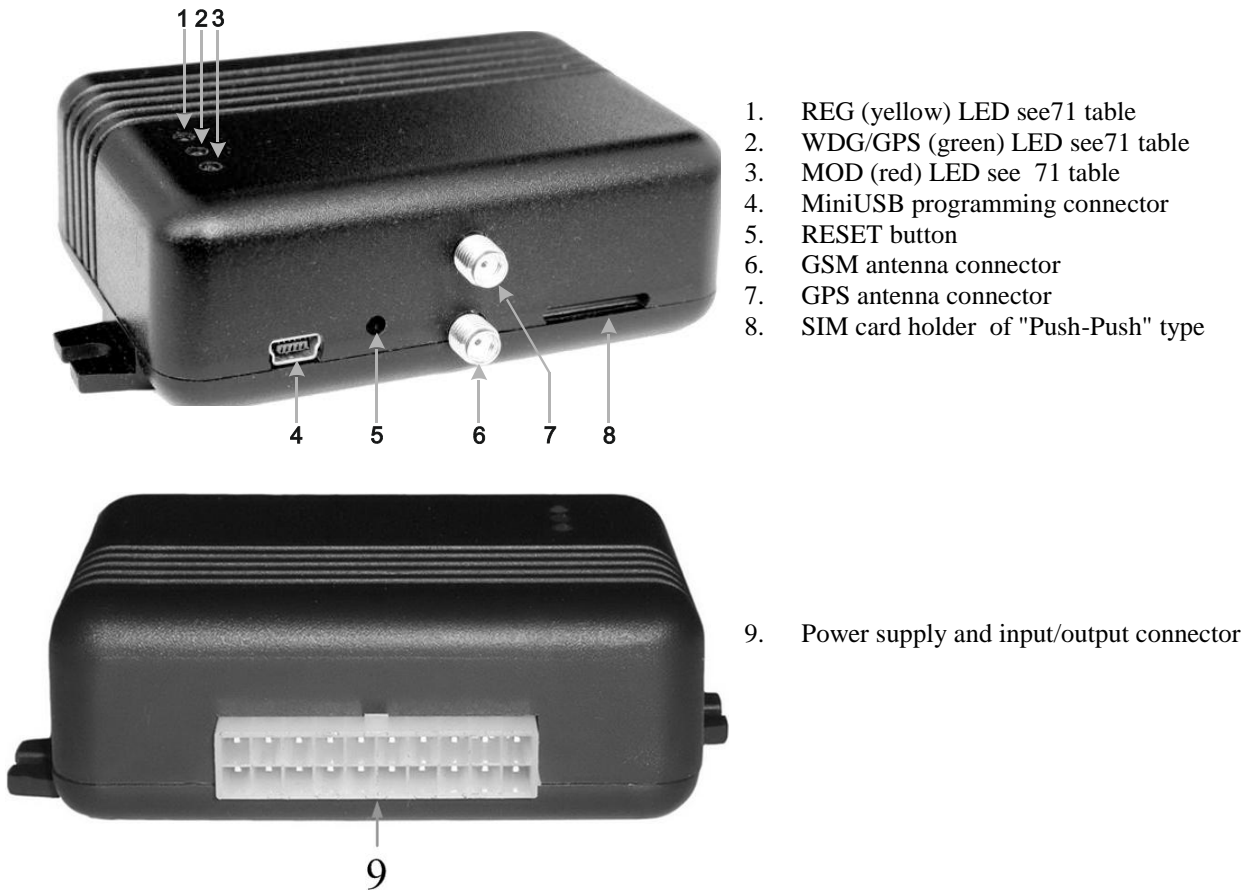
Environmental parameters:

Storage temperature range from -40 to +85 °C / -40 to 185 °F
Operational temperature range from -30 to +75 °C / -22 to 167 °F
Max relative humidity under +40 °C / 104 °F 95%

Package weight:.....430g
Module weight:112g
Overall dimensions of the module:90x63x32 mm

* Current consumption in idle running depends on inputs connection type, on output state and load.

7. General view of the product and layout of control devices



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Name	Indication variations	Meaning
External LED on the system cable "ARM state"	Flashes, remains lit for 50ms, turns off for 300ms.	GSM module is in ARM (security) mode.
	Blinking, remains lit for 50ms, turns off for 10s.	GSM module is in DISARM (non-security) mode.

	Off	Program error, processor is out of order, hardware problem or power supply failure.
„WDG/GPS“ (green) LED	Blinking, remains lit for 50ms, turns off after 1000ms.	The module is functioning. GPS has not been detected
	Remains lit for 500ms, turns off for 1000ms	The module and GPS have been detected. GPS geographic location has been detection.
	Off	The module is out of order or no voltage.
“REG” (yellow) LED	Lights continuously	Modem has been registered to the network.
	Flashes, remains lit for 50ms, turns off for 300ms.	Modem is being registered to the GSM network.
	Off	Modem failed to register to the network.
“MOD” (red) LED	Flashes	Power supply OK and the module is registered to the GSM network.
	Lights continuously	Modem power supply is OK, but the module failed to register to the GSM network.
	Off	Modem power supply failure or it is switched off.
Note:	<i>All LEDs turn off for 15sec when resetting GSM modem of the module.</i>	

7.1. Input/output connector pinouts

Contact No	Name	Wire colour	Description
1	GND	Black	Negative supply voltage (GND)
11	+V	Red	Positive supply voltage Power supply voltage 8-16V
2	Input 1	Green/Yellow	1 zones/input, NC/NO/EOL
12	Input 2	Green	2 zones/input, NC/NO/EOL
3	Input 3	Yellow	3 zones/input, NC/NO/EOL
13	Input 4	Brown	4 zones/input, NC/NO/EOL
4	Input 5	Blue	5 zones/input, NC/NO/EOL
14	Input 6	Orange	6 zones/input, NC/NO/EOL
5	Lock	Black/White	Input for security ARMING
15	Unlock	Black	Input for security DISARMING
6	OUT1	Grey	First output 1500mA. Open Collector.
16	OUT2	Green/Yellow	Second output 1500mA. Open Collector.
7	OUT3	Green	First output 1500mA. Open Collector.
17	OUT4	White	Second output 1500mA. Open Collector.
8	LED(K)	Black/White	ARM/DISARM state LED cathode
18	LED(A)	Black	ARM/DISARM state LED anode
9	Temp+	Black/White	Temperature sensor input
19	Temp-	Black	Temperature sensor input
10	MICP	Black/White	Positive differential input of the microphone.
20	MICN	Black	Negative differential input of the microphone.

8. Users

8.1. Control and programming of the module via SMS messages

8.1.1. Installer

Installer is able to execute all (INST) commands available in the table [171](#). The installer is able to change parameters of the module only with INST password

8.1.2. User

User is able to execute only user's (USER) commands available in the table [172](#). A User may send SMS request any time and receive parameters of the security system: zones and inputs states, communication strength, temperature

etc. SMS messages may be used to control outputs (Out1, Out2, Out3, Out4) and to activate ARM/DISARM mode. A User is able to control the module only when using USER password.

8.2. Users to receive SMS/DIAL messages

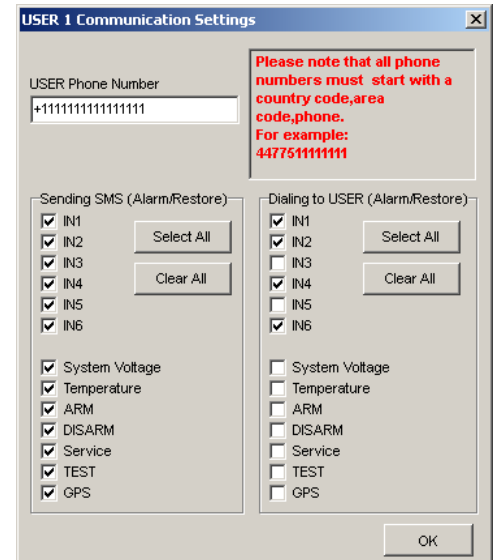
The number of users - up to 16 These users are able to receive messages or/and calls after alarm response of the security system or communication test or system state test messages, which are being generated after alarm response of the security system or following test messages schedule. The number of users - up to 16 See 81 on how to define types of messages to be sent to different users.

8.3. Remote control. Users who are able to control the module via short call.

The number of users - up to 400 These users are able to control outputs via short call, to activate voice listening and to activate ARM/DISARM mode of the system. Action of the user is free-to-select. The actions to be done by the module, after the telephone number having been recognized, might be assigned to every telephone number.

The following actions may be selected regarding telephone number of each user:

- To activate outputs OUT1,OUT2,OUT3,OUT4 optionally. This function might be used to lock a vehicle's ignition, to start a vehicle and for remote control of other equipment.
- ARM/DISARM security system
- Activate voice listening via external microphone MIC



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9. ARM/DISARM of the module

The module can work in ARM mode and DISARM mode. ARM/DISARM state of the module may be changed thus: via short call, via SMS message and by using Lock/Unlock inputs. All modes of ARM/DISARM may supplement each other. For example: The module may be activated via Lock/Unlock inputs, and deactivated via short call or SMS message.

9.1. ARM/DISARM via short call

It is possible for 400 users to activate/deactivate the module via short call. The module will recognize user's number and will automatically cancel the call. Not recognized numbers are being ignored. Information on how to program the user numbers is available in the description of SERA.

9.2. ARM/DISARM by sending SMS message

It is possible to ARM/DISARM of the module by sending SMS message and using USER or INST password. Example of SMS message:

- Deactivate the system USER 123456 59 0
- Activate the system USER 123456 59 1

More info see [17.2](#)

9.3. ARM/DISARM by using Lock and Unlock inputs

It is possible to ARM/DISARM the module by using Lock and Unlock inputs. These inputs may be used when it is necessary to control the module via any additional external access control device having NO or NC output:

- Vehicle's central lock signal;
- Access control device, e.g.: RFID, IBUTTON, keyboard;
- It is possible to use switch, button, reed switch etc. for generating of control signal.

Several Lock/Unlock modes are available:

- Mode 1 (V+ Pulse using Lock and Unlock inputs). Lock input sets ARM mode after pulsing or steady signal. Unlock sets DISARM mode. It is comfortable to use 1st or 2nd mode when connecting the module to the central lock of vehicle. Central lock mostly generates lock and unlock signals with two wires.
- 2nd mode 2 (V- Pulse using Lock and Unlock inputs) similar as 1 mode only inverted.
- 3rd mode 3 (V+ Level using Lock input) used only one Lock input. Unlock input is not used. These modes are comfortable to use when activating/deactivating the system by using switch or other access control device.

- 4th mode (V- Level using Lock and Unlock inputs) similar as 3rd mode is only inverted.
- 5th mode (V+ + >500ms Pulse Lock input) uses only one Lock input. Unlock input is not used. The ARM/DISARM state might be changed via voltage pulse longer than 500ms. The voltage pulse might be generated by using switch or other input control device.
- 6th mode (V+ >500ms Pulse Lock input) similar as 5th mode is only inverted.

1,2,3,4,5,6 see diagrams in annex 2.

Lock and Unlock inputs do not have built-in Pull-Up resistor. When there is no external signal, you need to connect external 2,2K pull-up resistor. The resistor should be connected between power supply positive terminal +V and input. Such event may occur when switch is connected between lock input and ground as shown in Fig. 91

Example of wiring diagram with two switches. One switch for ARM-ing, another - DISARM-ing. 1st or 2nd modes should be set by using two switches.

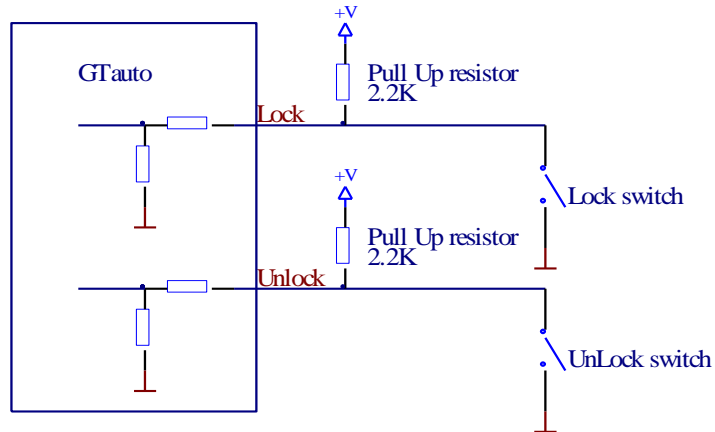


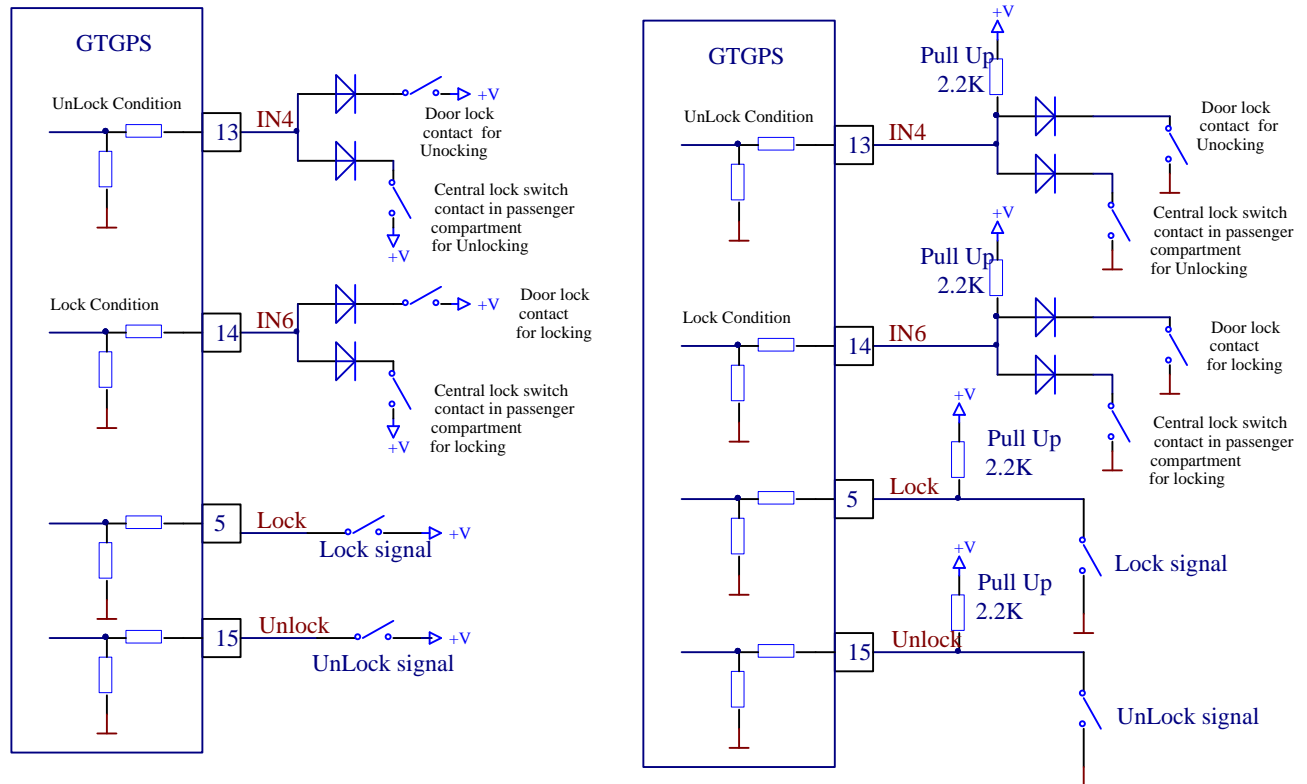
Fig. 91

Example of wiring diagram with central lock of vehicle, see annex 1

9.4. Using Lock/Unlock inputs with IN4, IN6 inputs with lock/unlock blocking condition

Lock/Unlock condition is used when a user does not want the security system to be activated/deactivated, by using door lock or central lock button. In such event the module will analyse signals from door and central lock and will not allow changing ARM/DISARM mode. This feature will protect a vehicle from disabling (DISARMing) the module via the lock or button, in the event of breaking window and pressing central lock button or lock spinning. For lock/unlock blocking condition it is necessary to use IN4 or/and IN6 module inputs. These inputs are configured like additional input function. The following conditions might be set:

- Unlock Blocking condition
- Lock Blocking condition
- Lock/Unlock Blocking condition



9.5. Automatic arming of the security system “Auto rearm”

If the function „Auto-reARM“ is on, the module will automatically return to ARM state, if during „Entry Delay“ none of zones was alarmed. This feature is active only if the module was deactivated via telephone DIAL or SMS. This protects from random disabling of the system via telephone.

9.6. Enabling of the security system via IN6 input. „Force ARMing“ function

This feature is comfortable to use when the module operates in parallel with other security system. For example, if default security system is used in a vehicle, thus bell signal may be used for IN6. If default security system will be alarmed for appropriate reasons and will activate the bell, thus GTGPS module will automatically turn into ARM state. And will send all information in relation to alarmed sensors. Thus the user gains additional protection from undesirable deactivation of GTGPS module. This IN6 feature may be disabled.

9.7. “Blocking ARM” IN5 additional feature

This is additional feature IN5, which enables to block activation of ARM State. This feature may be applied in vehicles by connecting IN5 input to ignition. If GTGPS module was disabled and afterwards ignition was turned on, thus while the ignition will remain on, the module would not be able to enter into ARM state. This feature may be disabled.

9.8. Bell confirmation signal by arming/disarming the security system

The siren will generate confirmation signal when arming/disarming the security system, if function „Siren signal on ARM/DISARM“ was selected in the software SERA. When the security system is to be turned in ARM mode, the bell will beep once, when in DISARM mode - the bell will beep twice.

10. Module inputs

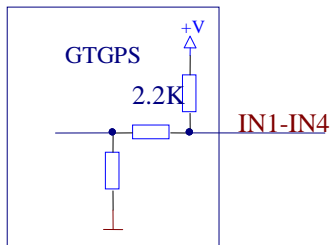
GT GPS module has:

- 6 programmable external inputs (zones).
- 1 temperature sensor input.
- Measuring of power supply voltage. Internal input is visible in programming table.
- 2 control inputs Lock and Unlock, see clause 9.3.

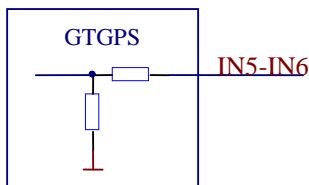
Each input may be linked with selected output, i.e. to switch selected output depending on output state. This feature enables to apply the module for premisses automation and temperature control. For example: For example, if temperature drops below the standard limit, the module is able to automatically activate heating system and also to inform a user about critical temperature by sending him an SMS.

10.1. Equivalent input diagrams

Equivalent 1-4 input diagram:



5-6 inputs are used when Pull-Up resistor is not necessary for the input. For example, when signal should be taken from vehicle's bell or ignition or from other device, for which extraneous signal cannot be applied. These inputs do not have internal Pull-Up resistor. Input resistance is 22kOhm. Equivalent diagram of 5-6 inputs:

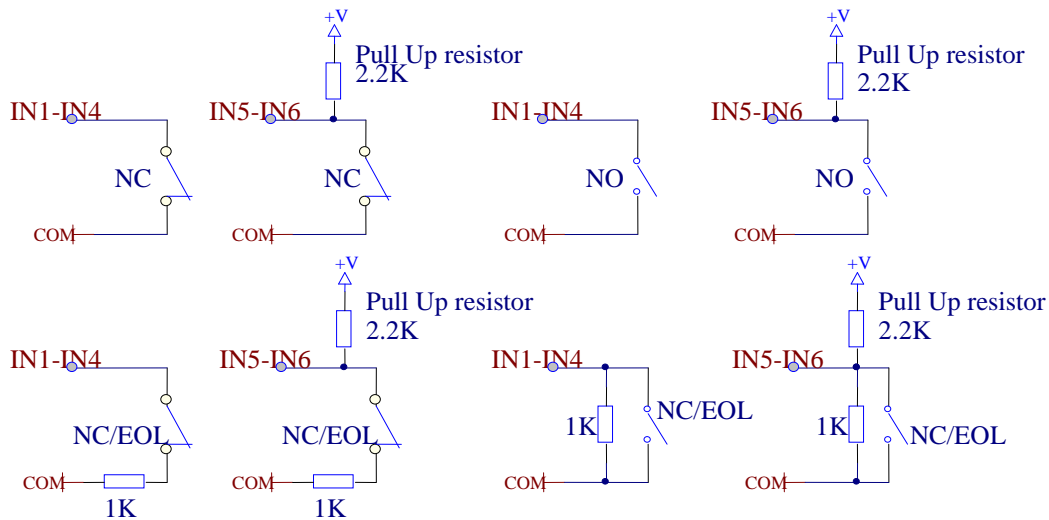


10.2. Sensor connection diagrams

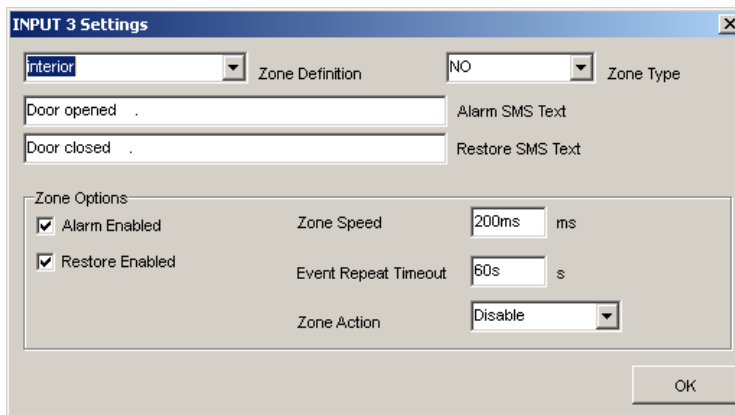
Sensors may be connected following 4 different connection diagrams:

- NC – normally closed contact;
- NO – normally open contact;
- NC/EOL – normally closed with end of line resistor, line resistor),
- NO/EOL – normally closed with end of line resistor, resistor),

NOTE. All resistors should be 1 kOm \pm 10%. The length of wires for connection of sensors can not exceed 300m and resistance of wire connected to sensor contacts can not exceed 300 Ohms. Resistors should be mounted as near the sensor as possible. Improper connection of resistors system will not work properly. Pull-Up resistors should be 2,2 KOhm.



10.3. Input configuration parameters



The following parameters may be set for all inputs:

- Text of SMS messages for alarms and restores. This text will be included when sending SMS message to a user about alarms and restores of zones.
- Input types: NC,NO,EOL. These parameters should be set depending on type of zone connection.
- Definitions of input application:
 - Delay – Entry/Exit zone. Set "Entry delay" and "Exit Delay" are applied for this zone. Such type zones are used for connection of door sensor.
 - Interior – disturbance of this type of the zone will not be responded if alarm of “Delay” type zone occurred and “Entry Delay” or “Exit Delay” time still have not run out. Such type zones may be used for connection of motion sensor in front of the door. The input will be activated immediately, if the door has not been opened before.
 - Instant – Instant zone. Upon disturbance of this zone, the system will immediately activate burglary alarm.
 - 24 hours - Upon disturbance of this zone, the system will activate burglary alarm not depending whether the security system is in ARM or in DISARM modes. The applications of this type zones are safes, storehouses, tampers of the sensors.
 - Silent - silent zone is always active not depending on whether the security system is ARM or DISARM. Upon disturbance of this zone, SMS messages are being generated but the siren will not be activated. These zones may be applied for voltage, temperature control, AC mains failure control and for alarm of silent panic.
 - Fire - this zone is always active not depending on whether the security system is ARM or DISARM. The zone generates a special siren signal with interruptions. The zone is applied for smoke sensors and for fire alarm.
- Enabling or disabling of zone alarm or restore.
- Input speed – time of the input reaction, this is the time period during which changed input state should remain stable in order to let the module to register alarm or restore input state.
- Repeat time – this is the time period, during which repeated event of the input will be ignored.
- Zone action – switching of selected output (OUT1, OUT2, OUT3, OUT4) in the event of alarm or restore. May be used for object automation. For example, for indoor temperature control. Upon dropping of temperature will critical limit, heater would be switched on automatically.

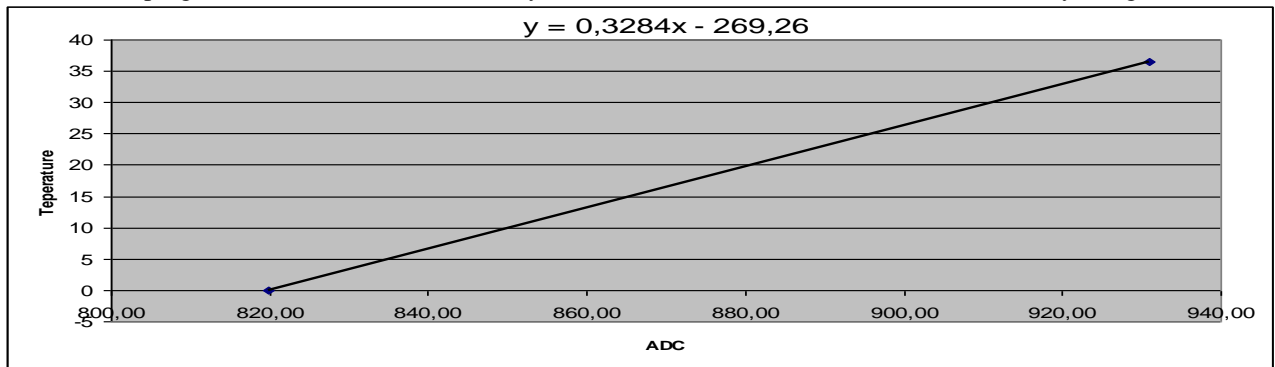
10.4. Voltage measuring IN7 (internal)

This input is visible only in configuration window of the SERA software of the module. IN7 input is intended for power supply voltage control. If the module is being applied for the security of vehicle, it is very comfortable to follow car battery voltage. A user will always be alerted that a car battery has been charged or discharged. This the car battery will be protected from full discharge or damage. Alarm and restore voltages are programmable. Voltage measurement may be calibrated additionally.

10.5. Temperature sensor input IN8

Temperature sensor is connected to the system wire contacts 9 Temp(+) and 19 Temp(-). Temperature input number in "Inputs" configuration table is IN8. Alarm and restore temperature may be changed. Upon temperature alarm, the module will send SMS message to a user. And if setting exist, the module will switch the selected output. It is comfortable to use this function for indoor heating management. In a case of accuracy shortage, temperature sensor may be calibrated additionally.

Following the equation $Temperature = X * ADC + Y$ and by selecting X and Y coefficients. Temperature calibration may be performed in software SERA in testing window. It is necessary to have accurate thermometer in order to measure temperature at least in two points. In testing window to read temperature ADC indications in these points. Following the equation " $Temperature = X * ADC + Y$ " to calculate X and Y coefficients. Calculated X and Y coefficients should be programmed in the module. It is easy to calculate X and Y coefficients in MC Excel by using trendline.



Temperature may be measured in Celsius and Fahrenheit.

10.6. Microphone and voice listening

The microphone may be connected to the system wire contacts 10 MICP and 20 MICN. In order to avoid noises, the microphone should be mounted as far as possible from GSM antenna. 400 users are allowed activating voice listening in the objects. In order to allow a user to activate voice listening, it is necessary in user table „GSM remote control“ to check the box „MIC“.

Note: If a user number is enabled for ARM/DISARM and MIC thus after making a call to the module, the state ARM or DISARM will be changed and also microphone will be activated.

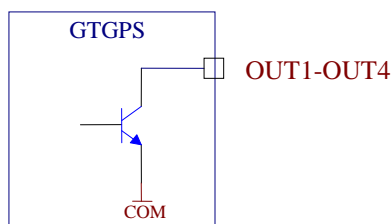
11. Programmable outputs

The module GTGPS has 4 programmable outputs. Outputs of the module may be used to switch relay, LEDs, siren or other sound device. Current for OUT1 - OUT4 is 1500mA. All outputs are protected from short-circuit, over-voltage and overheating.

11.1. Equivalent output diagrams

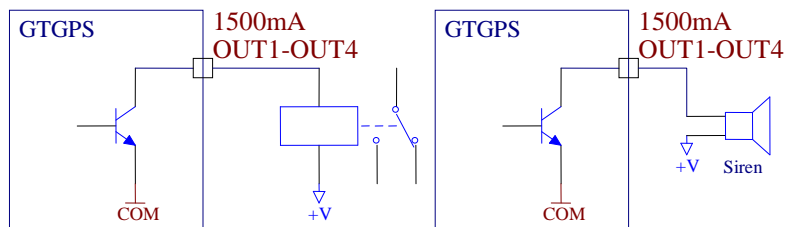
OUT1 - OUT4 outputs is open collector in terms of grounding -V.

OUT1 - OUT4 equivalent diagram:



11.2. Output connection diagrams

Examples of output connection diagrams see below:



11.3. Operational output parameters

The following parameters may be set for each output:

- SMS text for ON output state
- SMS text for OFF output state
- Output operation algorithm „OUT def“:
 - CTRL/SMS/DIAL – output used for remote control via short call or SMS. E.g. for ignition blocking, for gate control or for remote vehicle starting etc.
 - SIREN – output used for connection of siren. “Siren time” can be changed.
 - BUZER – sound signalling device. In the event of zone alarm - beeps continuously. When security system starts calculating exit delay, the user is able to hear short, repetitive sound signals. When 10 seconds are left till the beginning of activation, signals are being repeated each 0.5 seconds. If after expiry of the delay time, all zones remain unalarmed, the system turns into ARM state along with beep sound to confirm the action.
 - ARM state – state of alarm system: ARM/DISARM. May be used for light indication. When the output is set to operate in pulse mode, this feature may be used to close car windows or sunroof on arming. Impulse time should be set 20-30 seconds. On arming the output will generate signal to close windows.
 - Inputs OK- if any of zones is disturbed, the output will be alarmed. This feature is usually used for indication whether all zones are in order.
 - Light Flash – used for connection of light signal. Upon alarm of the security system the light starts blinking. Lights will also blink when arming/disarming the security system. This feature may be applied to connect vehicle direction signals.
- Output inversion;
- Output type level or impulse;
- Output impulse duration. 1-65535 seconds.

12. Timers of the security system

Entry Delay – time period, during which the user after passing Delay zone should manage to disarm the security system.

Exit Delay – time period, during which the user should manage to leave the object and pass Delay zone.

Siren time – Siren switch on time in the event of alarm.

Test time – time of automatic periodical test.

13. Automatic periodical test sending

Periodical test may be used for communication control of the module. Test sending time is programmable [Test Time]. Asynchronous periodical test may be programmed. This means that after each activation of the system, test time is being calculated from the beginning „Reset test counter ARMing“. Test sending may be disabled by setting time 00.

Periodical test may be used for SIM card's account control. The following parameters of the module are available in a test message: GSM communication strength, power supply voltage, temperature, IMEI number of the module, software version.

14. GPS User's guide

Having installed GTGPS module, you will be able to determine the geographic location of your vehicle. The module will send you SMS message including GPS location:

- If an authorized user makes a call to the module and the right to request GPS geographic location is granted to the said user. More info see in Users.
- Against SMS with request. More info see in the chapters [17.2](#) and [14.1](#).
- If Geofence alarm is triggered. This function is to inform a user that the object crossed the defined zone. The zone covers the area in a defined radius around the set point.
- If the function of periodical GPS location sending is assigned to preferred users.

14.1. GPS SMS commands, requests and management

The list of SMS commands and parameters see in the tables: 171 and 172

Sleep mode of GPS received, energy saving mode:

USER123456 70 0

- 123456 - user code; more info see 8.1.2;
- space character
- 70 – command; see table 172
- space character
- 0 – disable GPS receiver;

To activate GPS receiver:

USER123456 70 1

To send GPS location with Google maps link:

USER123456 70 2

Example of received SMS : <http://maps.google.com/maps?q=54.933573,23.904220>

To send all parameters of GPS receiver:

USER123456 70 3

Example of received SMS:

Long=54.933590

Lat=23.904348

Altitude=107m

Speed=1.1km/h

PDOP=1.80

Sat in Use=9

Sat in View=12

Geofence=2.505km

UTC GPS Time:

09/26/2010 18:16:38

Automatic object tracking according to SMS request:

USER123456 71 3#500#

- 123456 - user code; more info see [8.1.2](#);
- space character
- 71 – command; see table 172
- space character
- 3 - to send GPS location every 3 minutes
- # - figure end character
- 500 - to send 500 SMS with geographic location
- # - figure end character

According to this example the amount of 500 SMS including geographical coordinates will be sent every 3 minutes to the telephone number the command was sent from.

To activate Geofence security according to current object state:

USER123456 72 0

- 123456 - user code; more info see [8.1.2](#);
- space character
- 72 – command; see table 172
- space character
- 5800 - Geofence circle radius
- # - figure end character

According to this example the command will be assigned to the module to set its GPS geographical coordinates according to which Geofence centre and radius will be defined. The same may be done with configuration program see chapter [14.4](#) .

14.2. GPS location request via short call

GPS geographical coordinates may be acquired when making a call to the module, if your telephone number is entered and the setting to acquire GPS information is checked.

When dialling, the module will automatically hang up a call and will send a message with geographic coordinates to the phone, the call was made from.

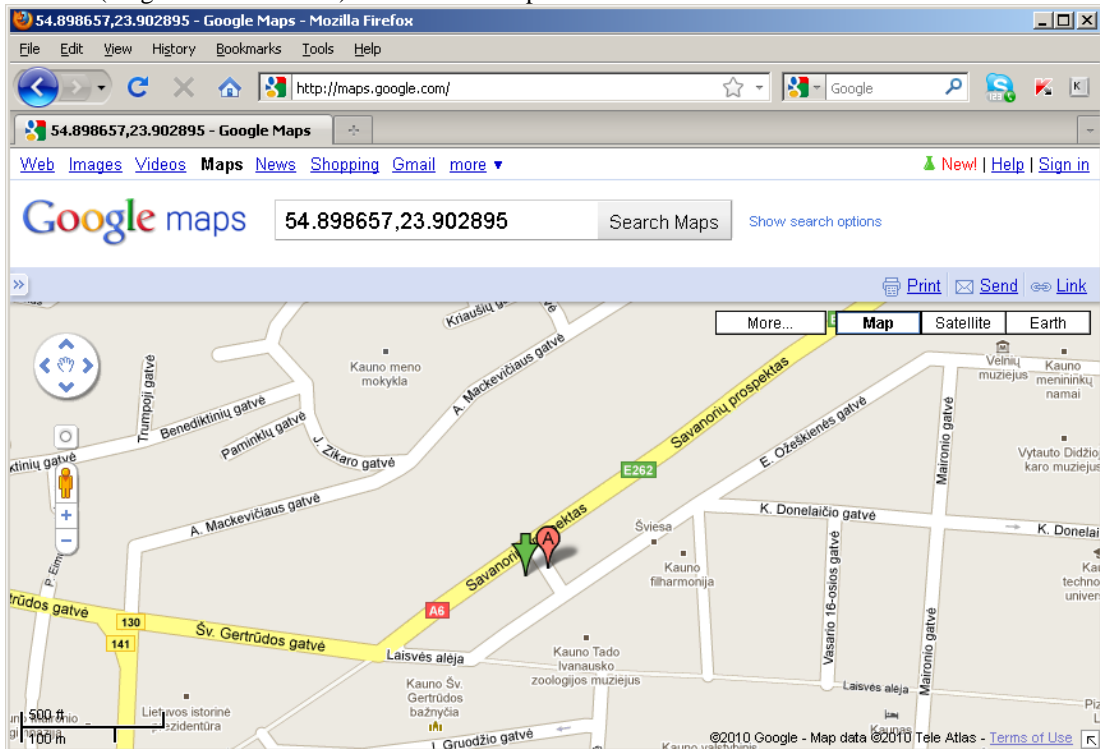
The format to send GPS coordinates might be set in SERA program.

Note: If this function is active, a user will not be able to enable a microphone, because the call will be automatically terminated.

14.3. Vehicle tracking and determining of geographic location by using Google Maps or Google

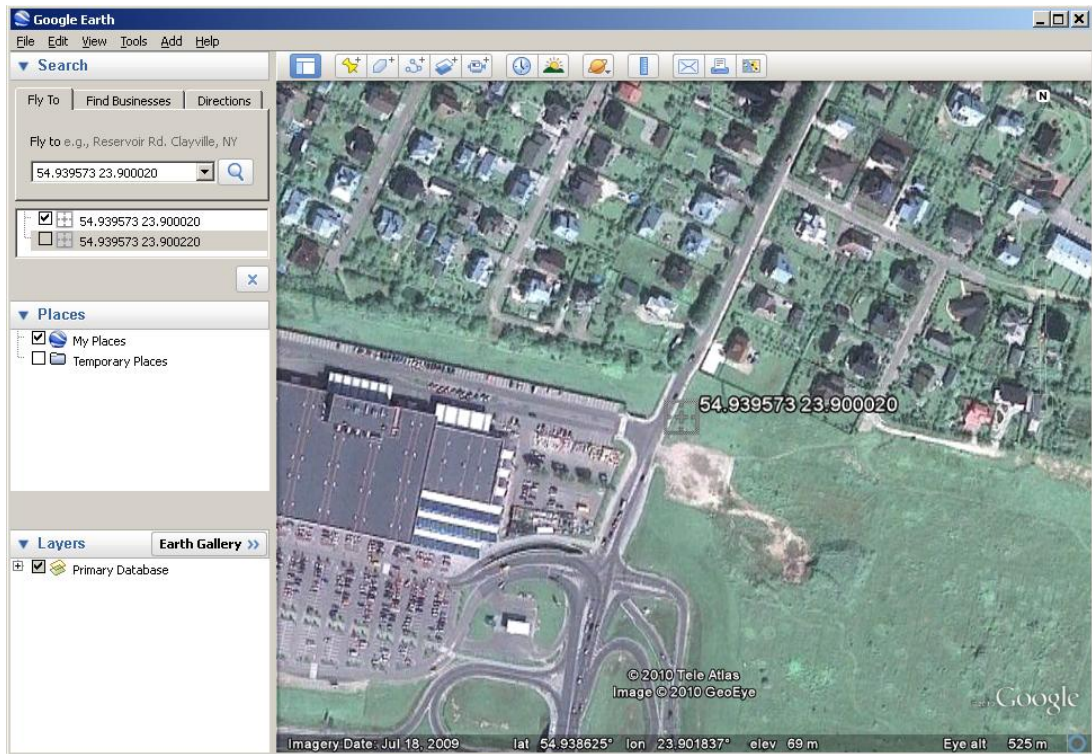
The object location on a map may be set by using PC or smart phone.

- In both cases firstly one should order vehicle's geographic location via SMS or short call.
- To open internet browser,
- To open <http://maps.google.com/> website
- To open SMS message in a phone and to type geographical coordinates in Google Maps search field (longitude and latitude) as shown in the picture.



How to use Google Earth map?

- Download Google Earth program from the internet <http://earth.google.com/>
- Install the application.
- Launch GoogleEarth and enter set coordinates (longitude and latitude).



Location might be determined in a smart phone. The phone should be provided with the option to connect to internet via GPRS. Some phones have the option to open internet directly from the message field. In a message field you will need to click on the generated Google Map link and the phone will show you the object location on the map.
Note: Internet connection will be charged following the rates of the service provider.

14.4. Geofence function

This function is to inform a user that the object crossed the defined zone.

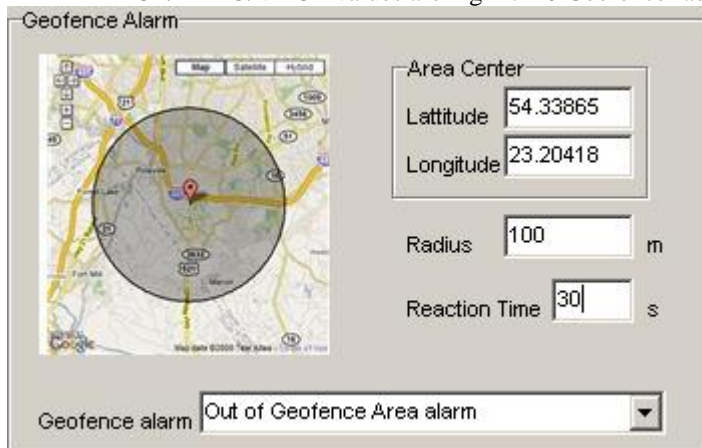
Geofence might be applied for:

- vehicle protection.
- vehicle control when coming in or out of the defined zone or to inform a user that object has reached the zone of defined point or left the said zone.

The above mentioned options perfectly suit for logistic management and protection. A user will be notified via SMS that cargo has reached its destination etc. The function will be executed in real time and the module will itself perform the data analysis. Having read the coordinates, the module checks whether they are at the range of defined zone and if they are or if they are not - sends messages with the text defined in advance.

To activate Geofence, please set the following parameters:

- Select Geofence operation mode.
- Set zone centre coordinates.
- Set zone radius. We do not recommend to use a small radius, because in the event of low GPS signal, Geofence area might become even smaller than GPS accuracy can be provided. When PDOP/HDPO/VDOP values are high 7-10 Geofence radius should be more than >100m.



14.5. Automatic-dynamic Geofence activation together with ARM (Geofence On ARM)

This feature is comfortable, because it is not necessary to every time set Geofence coordinates, because the module each time when ARMING will set its coordinates and will automatically activates Geofence security with a set radius.

Such security will inform a user in the event if a vehicle will cross a security zone. In the event of burglary, if a vehicle will be towed out of protected zone, the module will sent Geofence alarm. This feature is comfortable, because it is not necessary to each time set Geofence coordinates. The module will each time, when ARMING, set its coordinates and automatically activate Geofence security.

14.6. GPS receiver testing and preparation to operate

When installing the module, GPS antenna can not be covered by metal construction. For normal operation of the module, sufficient communication quality is necessary, which is characterized by: PDOP [Position dilution of precision] – a definition, which describes satellites layout and precision in real time. This is a coefficient, which is visible in SERA diagnostics window or in GPS report SMS messages thus by providing information on precision of works being carried out. If the coefficient is low, work conditions are perfect and measurement bias is minimal, if the coefficient is high - it is recommended to relocate the antenna. If SERA diagnostics window will register PDOP/HDOP/VDOP too high, the module will simply not to allow to carry out an appropriate works. When measuring under PDOP/HDPO/VDOP values 1-3, measuring bias will be minimal. For normal operation of the module PDOP/HDPO/VDOP values should not exceed 7-10.

15. Messages sending

Messages are being sent in the event of alarm, after ARM/DISARM of the security system (if specified in the configuration), upon test sending time (if specified in the configuration), after changing the module configuration (if specified in the configuration), upon sending request about parameters (command code 80).

SMS about alarm of the security system is doubled with a short telephone call (if specified in configuration).

16. Remote control of the module via SMS messages or via short call

With the help of SMS messages it is possible to control devices connected to outputs Out1, Out2, Out3, Out4. It is possible to ARM/DISARM the security system. Control command for user (USER) are available in the table No 2. The amount of users when controlling via SMS is unlimited.

Example of control command when changes the states of all three outputs and inquiry is made to send information via SMS about output states after changing of output states:

```
USER123456 51 52#500#
```

- 123456 – user code;
- 51- changing of the first output state
- 52 – changing of the second output state
- 53 – changing of the third output state
- 80 – information request command (see table No 3)
- 5 – to send information via SMS about output states.

More examples of controlling via SMS message see the chapter [Configuration of GSM communication module via SMS modules](#)

All outputs may be controlled via short call (the module will automatically ignore the call). Up to 400 users may control the module. All users optionally may control outputs Out1, Out2, Out3, OUT4, ARM/DISARM the security system and activate voice listening (MIC).

It is possible to assign to each user that he is able to control. This is comfortable to use a single module for controlling of few gates when several masters are.

17. Preparation to operate

Before or after installation of the module it is necessary to configure its parameters.

SIM card settings may be configured by using only GSM phone.

How to prepare the module to operate:

- Connect system connector, GSM and GPS antennas.
- Connect power supply source: 10-15V battery or stabilized 10-15V/1A power supply source.
- Check and if necessary enter SMS message centre number (using GSM phones). Mostly SIM card already has SMS centre number inserted, please skip this step.

- Remove PIN code request of the SIM card (using GSM phones).
- Install SERA configuration program.
- Connect USB cable to the PC and to the module.
- Launch SERA program. Guidelines on how to use SERA program is available in SERA description.
- GSM communication strength, IMEI and SMS centre number are available in Test window (see SERA description).
- Configure telephone numbers to which information should be transferred*;
- Set the numbers to send SMS and to make a call*;
- Set active inputs, which will be used; For example, if the input will not be used, it should be disabled*;
- Set periodicity of communication test (if 00 is entered, the test will not be send);
- Set input parameters.
- Set output OUT1, OUT2, OUT3, OUT4 states (if applied)*;

After inserting SIM card or upon changing parameters of the module, it is necessary to press RESET button.

There are two types to configure the module. The first – via SMS messages. The second – via PC, by connecting the module to PC via programming cable. Full change of parameters is possible only via PC by connecting programming cable. If possible we recommend to configure the module via PC.

17.1. SIM card

GTGPS module is not locked with a particular GSM network. This means that a user may use SIM card of any GSM service provider with a possibility to send SMS and to call.

In order to control the module via a short call, SIM card should be have Caller ID option. Usually SIM cards have such option. If your card can not identify a caller, please contact GSM service provide or use another SIM card.

Locate SIM card into a holder. Card's circuitry should look downward and card's key (cut angle) should look upwards. The card holder is of "Push-Push" type. This means that after pushing the card once, it is fixed and after pushing it again - it is released.



Locate SIM card into a holder. Gently push it Fix SIM card.

Note: do not locate SIM card with force, because you may damage SIM card holder.

17.2. Configuration and control of GSM communication module via SMS messages

Only basic parameters of the module, shown in the table 171, may be configured via SMS messages. All parameters of the module may be changed via USB by using configuration software SERA.

Configuration of the module via SMS messages may be performed only with installer's password.

171

Command structure:

- Verifier:
 - INST – Install. This verifier is used for configuration of parameters of the module.
 - USER – User. This verifier is used for module control.
- Installer's or user's password.
- Command code.
- Configuration kit

One SMS message may include as many commands as one SMS message may cover, i.e. 160 symbols (including spaces).

In such case firstly verifier should be sent, password should be written without space after the verifier and further come command code, parameter, command code, parameters etc. separated with space „_“.

The module executes the commands as follows: the first command next after the password and further go all other commands from the left to the right.

171 Table of Installer command codes.

Inst	Pass	Word	Command code	Command parameters default settings	Examples of command parameters examples	Clarifications
INST	123456		01	none	TelNo#01	Telephone number of users to whom send SMS and to whom make a call (DIAL) up to 16 symbols, the end symbol "#"; after the symbol "#" user priority number 01-16 should be entered.
			02	none	01	Delete selected user's telephone number according to priority number. User ID from 01 to 16

03	none		Delete telephone numbers of all users
05	1	4	Several Lock/Unlock modes are available: 0,1,2,3,4,5,6 see diagrams in the annex No3: In the example test to users will be send each hour.
06	24	01	Periodicity of communication test (from 00 am to 00 pm), 00 – no test In the example test to users will be send each hour.
07	1	0	LED indication Test, Reg (1-on, 0-off)
08	11111121	02111133	Input IN1,IN2,IN3,IN4,IN5,IN6, IN7, IN8 modes (0-'delay',1-'interior',2-'instant',3-'24h',4-'silent',5-'fire')
09	11111221	02111111	Input IN1,IN2,IN3,IN4,IN5,IN6, IN7, IN8 types (0-NO type, 1-NC type, 2-EOL)
10	1111	0011	Service messages: Arm, Disarm, Reset, Test (1-ON, 0-OFF) In the example service messages Reset and Test will be sent.
11	11111111	00000101	Input triggering: IN1,IN2,IN3,IN4,IN5,IN6, IN7,IN8 (1-ON, 0-OFF) The example demonstrates triggering of IN6 IN8 IN9 inputs.
12	11100001	10101101	Input restores: IN1,IN2,IN3,IN4,IN5,IN6, IN7,IN8 (1-ON, 0-OFF) In the example, inputs IN1, IN3, IN5, IN6, IN8, IN9 will be restored.
21	Alarm Luggage #	Luggage #	IN1 input name changing up to 16 symbols, the end symbol “#”
22	Alarm Bonnet#	Bonnet #	IN2 input name changing up to 16 symbols, the end symbol “#”
23	Alarm Door#	Door #	IN3 input name changing up to 16 symbols, the end symbol “#”
24	Alarm Microwave#	Microwave# Microwave#	IN4 input name changing up to 16 symbols, the end symbol “#”
25	Ignition On#	Ignition#	IN5 input name changing up to 16 symbols, the end symbol “#”
26	Siren on#	Siren#	IN6 input name changing up to 16 symbols, the end symbol “#”
27	Low Battery#	Battery#	IN7 input name changing up to 16 symbols, the end symbol “#”
28	Low Temperature#	Low Temp#	IN8 temperature alarm name changing up to 16 symbols, the end symbol “#”
31	Rest. Luggage #	Closed Luggage #	IN1 input restore name changing up to 16 symbols, the end symbol “#”
32	Rest. Bonnet#	Closed Bonnet #	IN2 input restore name changing up to 16 symbols, the end symbol “#”
33	Rest. Door#	Closed Bonnet #	IN3 input restore name changing up to 16 symbols, the end symbol “#”
34	Rest. Microwave#	Rest. micr#	IN4 input restore name changing up to 16 symbols, the end symbol “#”
35	Ignition Off#	Ignition#	IN5 input restore name changing up to 16 symbols, the end symbol “#”
36	Siren Off#	Siren off#	IN6 input restore name changing up to 16 symbols, the end symbol “#”
37	Battery Restore#	Battery Restore#	IN7 input restore name changing up to 16 symbols, the end symbol “#”
38	Temp Restore#	Temperature Res#	IN8 temperature restore name changing up to 16 symbols, the end symbol “#”
40	Out1 ON#	Ignition on#	Out1 output activation text changing up to 16 symbols, the end symbol “#”
41	Out2 ON#	Locking on#	Out2 output activation text changing up to 16 symbols, the end symbol “#”
42	Out3 ON #	Kondic.on#	Out3 output activation text changing up to 16 symbols, the end symbol “#”
43	Out4 ON #	IMMO#	Out4 output activation text changing up to 16 symbols, the end symbol “#”
44	Out1 OFF#	Ignition off#	Out1 output deactivation text changing up to 16 symbols, the end symbol “#”
45	Out2 OFF#	Locking off#	Out2 output deactivation text changing up to 16 symbols, the end symbol “#”
46	Out3 OFF #	Kondic. off#	Out3 output deactivation text changing up to 16 symbols, the end symbol “#”
47	Out4 OFF #	IMMO off#	Out4 output deactivation text changing up to 16 symbols, the end symbol “#”
48	0000	1111	OUT1, OUT2, OUT3, OUT4 output states: 1-Inverted, 0-Normal Example outputs OUT1 OUT2 OUT3 OUT4 are inverted.
49	0000	1024	Description of output Out1, Out2, Out3,Out4 operation algorithm 0-CTRL,1-SIREN,2-BUZZER,3-ARM state,4-Zones OK,5-Flash In the above example OUT1 will operate in siren mode; OUT2 – for remote control; OUT3 – to connect buzzer (BUZZER).OUT4- Zones OK
50	none	1	1-OUT1, 2-OUT2, 3- OUT3, 4- OUT4. Change state of selected OUT output. Output state: changes every time after sending command code. Explanation see below the table.
51	none	0 or 1	Activates or deactivates OUT1 output. 0 – deactivates, 1 - activates
52	none	0 or 1	Activates or deactivates OUT2 output. 0 – deactivates, 1 - activates
53	none	0 or 1	Activates or deactivates OUT3 output. 0 – deactivates, 1 - activates
54	none	0 or 1	Activates or deactivates OUT4 output. 0 – deactivates, 1 - activates
59	none	0 or 1	ARM/DISARM command. 0 – DISARM the security system, 1 - ARM the security system
60	none	TelNo#001#000100	Command to enter new user for remote control via short call. Command parameters: User telephone number, end symbol #, user ID number from 001 to 400, #, dial mode 0 – off or 1 - on, sequence OUT1,OUT2,OUT3,ARM/DISARM,MIC
61	none	001	Delete selected user's telephone number according to ID number. User ID from 001 to 400
62	none		Delete all telephone numbers of remote control users from 001 to 400
80	none	1	Send via SMS a part of information regarding configurations of the module: 1. 05...12 command code parameters will be sent; 2. 21...28 command code parameters will be sent; 3. 31...38 command code parameters will be sent; 4. 40...49 command code parameters will be sent; 5. make the request about output states (Out 1 – Out 4); 6. test request; 7. system state request. input/output states will be sent along with current state of the system (ARM/DISARM).
90	123456	654321	To change installer's (INST) code (recommended to change before applying the module in operation)
91	123456	948921	To change user's (USER) code (recommended before applying the module in operation)
92	none	none	The module reset (Reset) by using SMS message

Examples of typical programming messages:

1. Programming of users telephone numbers to send SMS and to make a call:

INST123456 01 37011111111#01

- 123456 – installer's code;
- 01- command code (programming of users' numbers);
- user's telephone number without (+) comprised of country code, operator's code and user's telephone number. the end symbol #;
- 01- user ID number 01-16 In this example the telephone number of 1st user is entered.

After the telephone number has been entered all events of the security system will be sent to a user. Optional events to be send may be selected only when configuring via USB.

2. It is possible to delete telephone numbers one by one according order of priority or all 16 numbers at once:
INST123456 02 15 Delete user's telephone number whose ID number is 15. It is possible to select from 01 to 16.

INST123456 03 Delete all 16 users' telephone numbers.

3. To enter user's telephone number for remote control via short call:

INST123456 60 3701111111#001#000100

- 123456 – installer's code;
- 60 – command code (programming of users' telephone numbers for remote control via short call);
- 370111111# - user's telephone number without (+) comprised of country code, operator's code and user's telephone number. the end symbol #;
- 001- user ID number; from 001 to 400; In this example the telephone number of 1st user is entered;
- 000100 – What actions should be done after making call to a user. Sequence from the left to the right: OUT1,OUT2,OUT3,OUT4 ARM/DISARM,MIC 0 - active functions, 1- non-active function. In the example, the function ARM/DISARM is selected.

4. Delete user's for remote control via short call telephone number according to ID number or all numbers at once:
INST123456 61 001 Delete user's telephone number whose ID number is 001. It is possible to select from 001 to 400.

INST123456 62 ; Delete all numbers of remote control users from 001 to 400.

5. Inputs programming

INST123456 11 00000111 12 01101111 80 1

- 123456 – installer's code;
- 11 – command (see table)
- 00000111 – used inputs are calculated from the left to the right. IN1, IN2, IN3, IN4, IN5 alarms are disabled and IN6,IN7, IN8 alarms are enabled.
- 12 – command (see table)
- 01101111 - IN1, IN4 restores are enabled, IN2, IN3, IN5, IN6, IN7,IN8, IN9 restores are enabled.
- 80 – command (see table)
- 1 will send command code 05-12 parameters back to SMS sender.
More input parameters may be changed via USB.

6. Programming of input names:

INST123456 21 Alarmluggage# 22 Alarmbonnet# 23 Alarmdoor# 80 2

7. Output names programming

INST123456 40 3701111111#01 43 ignition off.# 80 4

- 123456 – installer's code;
- 40 – command (see table)
- „ignition on.#“ name of output state when ignition is on.
- 43 – command (see table)
- „ignition off#“ – name of output state when ignition is off.
- 80 – command (see table)
- 4 – will send 40-49 parameters of command codes.

8. Programming of output parameters:

INST123456 48 1010 49 1053 80 4

- 48 – command – outputs inversion (see table)

- 1010 – OUT1 inverted, OUT2 normal, OUT3 inverted., OUT4 normal.
- 49 – command - description of operation output algorithm (see table)
- 1053 – OUT1 siren, OUT2 – remote control, OUT3 light signalling device (FLASH), OUT4 ARM state.
- 80 – command (see table)
- 4 – will send 40-49 parameters of command codes.

9. Module control modes (ARM/DISARM) see diagrams in the annex 2:

INST123456 05 1

- 123456 – installer’s code;
- 05 – command (see table)
- 1- lock/unlock modes of the module, see diagrams in the annex 2

172 Table of users codes

Beginning	Password	Command code.	Command parameters default settings	Possible commands	Clarifications
USER	123456	50	none	1.2 3.4	1-OUT1, 2-OUT2, 3- OUT3, 4- OUT4. Change state of selected OUT output. Output state: changes every time after sending command code. Explanation see below the table.
		51	none	0 or 1	Activates or deactivates OUT1 output. 0 – deactivates, 1 - activates
		52	none	0 or 1	Activates or deactivates OUT2 output. 0 – deactivates, 1 - activates
		53	none	0 or 1	Activates or deactivates OUT3 output. 0 – deactivates, 1 - activates
		54	none	0 or 1	Activates or deactivates OUT4 output. 0 – deactivates, 1 - activates
		58	none	1.2 3.4 # Time in seconds #	1,2,3,4 - selectable output number #- delimiter Time #- delimiter
		59	none	0 or 1	ARM/DISARM command. 0 – DISARM the security system, 1 - ARM the security system
		70	none	0.1 2	GPS Module control: 0- To turn of GPS receiver: 1- To turn on GPS receiver: 2- To request GPS location with Google maps link: 3- To request GPS parameters 4- To request "Geofence On ARM" state
71	none	P1#P2#	Periodical GPS coordinates sending: P1 - time interval to send the coordinates 1-9999min #- delimiter P2 - Number 1-9999 how many SMS GPS coordinates will be sent to a user #- delimiter		
80	none	1,2,3,4,5,6,7	Send via SMS a part of information regarding configurations of the module: 1. 01...12 command code parameters will be sent; 2. 21...28 command code parameters will be sent; 3. 31...38 command code parameters will be sent; 4. 40...49 command code parameters will be sent; 5. to make a request about output states (Out 1 – Out 4); 6. test request 7. System state request. will send information on input/output states and system state (ARM/DISARM).		

Outputs control via SMS messages:

Output states of the module may also be controlled via SMS messages. Let’s assume that vehicle ignition should be blocked, thus the first output should be connected to ignition blocking relay. For outputs control the following commands are used: 50,51,52,53, 54,58

Command "50" changes (inverts) state of selected output. When this command is being sent, output state is being changed, i.e. if output has been deactivated, it is activated and vice versa.

51, 52, 53,54 commands sets preferred output state: if 0 is being sent, the output is being deactivated; if 1 – the output is being activated.

50 and 51, 52, 53,54 commands performs the same action, i.e. changes output states. The user may use command, which are the more convenient for him.

58 command changes the state of selected output for set time limit.

If you wish to change (invert) OUT1- OUT4 states and to receive information about output states, the following message should be sent:

USER123456 50 1 50 3

- 123456 – user code
- 50 – to change state of selected output;

- 1 – to change state of first output OUT1;
- 50 – to change state of selected output;
- 3 – to change state of third output OUT3;

If you wish to activate OUT1 and to deactivate OUT2:

USER123456 51 1 52 0

- 123456 – user code
- 51- set OUT1 state;
- 1 – deactivated output;
- 52- set OUT2 state;
- 0 – deactivated output;

Output control by selecting triggering time interval:

USER123456 58 1#48# (enable OUT1 for 48 seconds)

USER123456 58 2#5# (enable OUT2 for 5 seconds)

- 123456 – user code
- 58 – command (see table)
- 1 enable OUT1 output (1-OUT1, 2-OUT2, 3-OUT3, 4-OUT4);
- #
- 48 Output triggering time limit set for 48 seconds. After time limit of 48 seconds OUT1 will be disabled automatically;
- #

ARM/DISARM of the security system via SMS message:

To DISARM the security system: USER123456 59 0 or to ARM the security system: USER123456 59 1

It is possible to receive test of the module on the basis if request command:

USER123456 80 6

- 123456 – user code
- 80- information request command (see table No 3)
- 6 – command (test request)

Upon sending command SMS (USER123456 80 6) test message will be sent to the number, from which SMS message has been sent.

Below see the example of received test SMS message:

```
--Test--
Signal strength:
17
System voltage:
13.16V
Temperature Res#
+26.1 C
IMEI:
356895030001799
HW:GTGPS
SW:GTGPS v1 100801
```

Clarifications:

Signal strength: Numerical values of communication signal level. Corresponds the following meanings (according GSM telephone):

- 0- very weak signal (communication loss limit);
- 1...5 - very weak signal (correspond to one bar on the monitor of a mobile phone);
- 6...9 - satisfied signal (correspond to two bars on the monitor of a mobile phone);
- 10...14 - good signal (correspond to three bars on the monitor of a mobile phone);
- 15 and more - excellent signal (corresponds to four bars on the monitor of a mobile).

Voltage: Voltage of car battery or other power supply source the module is connected to.

Temperature Res# temperature sensor's showings (C or F).

IMEI: IMEI number of GSM modem.

HW: hardware version

SW: software version.

System state request according to the command:

USER123456 80 7

- 123456 – user code;
- 80 - command (see table No 3)
- 7 – command (system state request)

The module will sent two part message to the number the SMS was sent from.

Below you will see the example of received SMS message following request command (USER123456 80 7):

The first of two SMS:

System voltage:

State:ARM (clarification: system state)

Inputs:

In0:Luggage closed .

(Clarification: state of the first input)

In1:Bonnet closed .

(Clarification: state of the second input)

In2:Door closed .

(Clarification: state of the third input)

In3:MicrowaveRestore

(Clarification: state of the forth input)

In4:Shock restore .

(Clarification: state of the filth input)

The second of two SMS:

Inputs:

In5:Ignition OFF .

(Clarification: state of the sixth input)

In6:Siren OFF .

(Clarification: state of the seventh input)

In7:Batery restore .

(Clarification: state of the eighth input)

In8:Temp restore .

(Clarification: state of the ninth input)

Output states

Out1 OFF#

(Clarification: state of the first controlled output)

Out2 OFF .

(Clarification: state of the second controlled output)

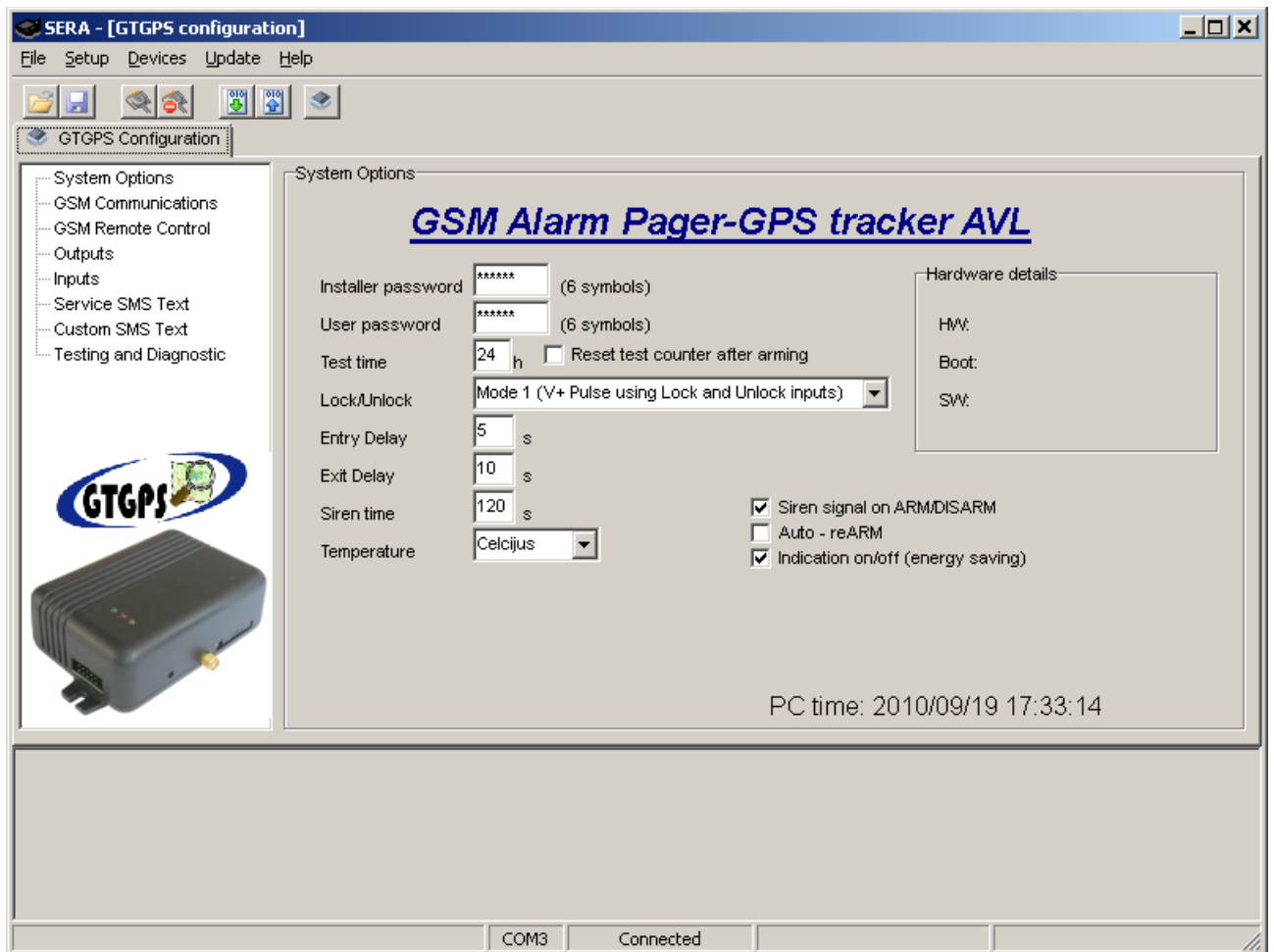
Out3 OFF .

(Clarification: state of the third controlled output)

The module is considered to be installed properly and communication is reliable, if all messages and calls are received properly and all user command are being executed properly.

17.3. Configuration of the module via PC

The module may be configured and tested via PA by using standard miniUSB cable. This configuration is being performed by using the software “SERA”, which you may download at www.topkodas.lt More info about the module configuration by using SERA program see SERA description.



17.4. Installation of the product and connection diagram

The module should be installed in a location, ensuring GSM and GPS communication. It is necessary to properly select a location for GSM antenna. GSM antenna can not be hidden deeply in metal constructions to prevent GSM communication screening. GSM antenna should be mounted as far as possible from electronic sensors, shock, microwave, microphone, temperature sensors etc., because GSM electromagnetic field may disturb operation of sensors or other electronic devices.

We are not liable for disturbances related with your GSM communication service provider.

Connection diagram is available in the annex, however other connections versions are also possible. Fuses are necessary.

In order to check operation of the module it is necessary to activate used sensors, door, shock sensor etc. and to observe their operation. The user should receive messages about alarmed zones (depending on programming). If SMS messages have not been received, please check GSM communication and whether the module is configured properly by sending 80 command with 1,2,3,4,5,6,7 parameters. We recommend to check configurations of the module and test with the software SERA.

The module is considered to be equipped properly and communications is reliable, if all sent SMS and calls are properly received as well as all user commands are being performed.

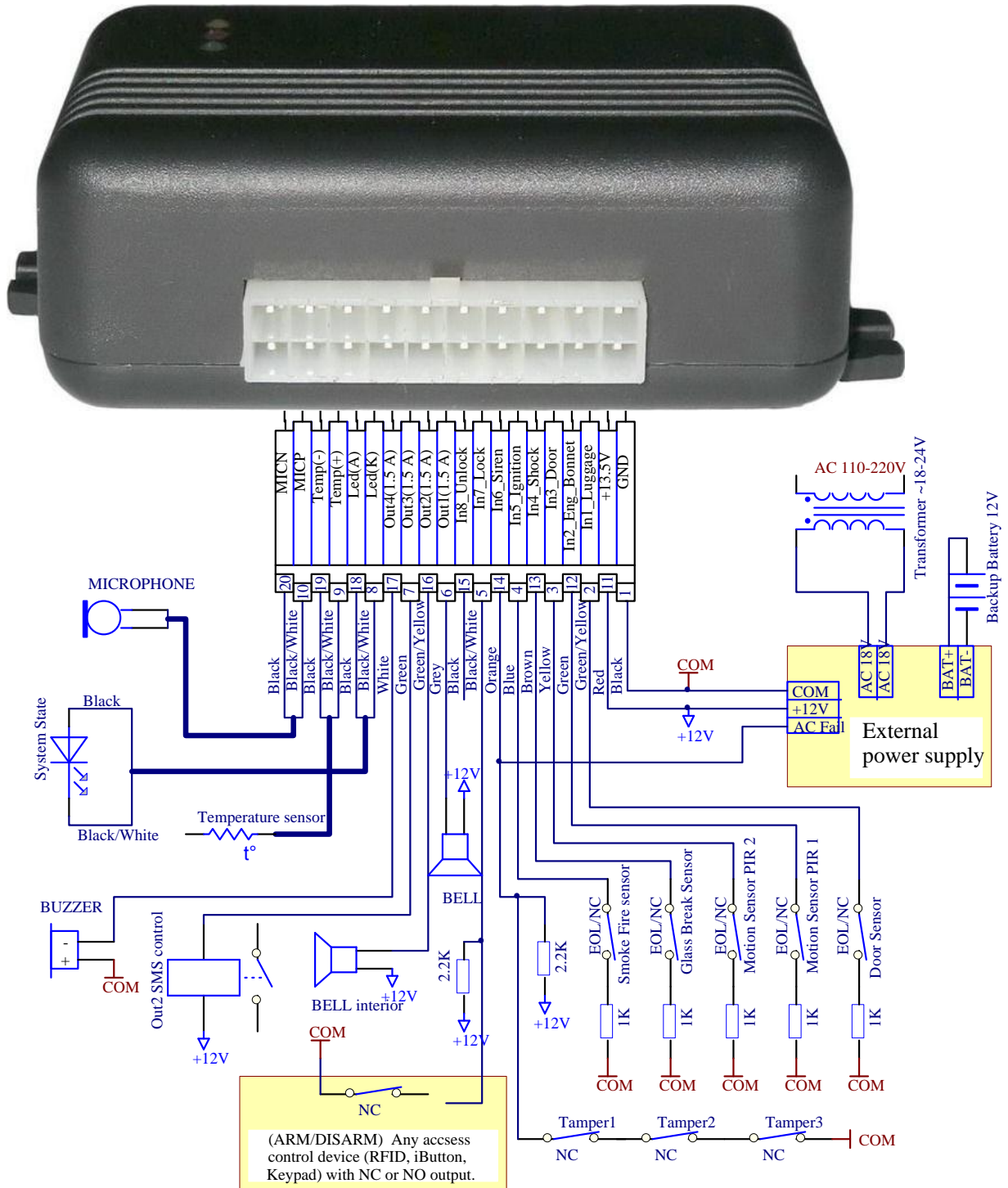
17.5. Installation instruction and connection diagram of security system for house, mini-mobile cottages, boats

It is recommended to use standard motion, fire, glass breaking sensors. For powering of sensors we recommend to use standard 6-8 cores single core cable for, designed for installation of security system. For voice signalling we recommend to use siren DC12V up to 1500mA. It is recommended to connect the siren to the system by using 2x0,75 sq. mm double insulation cable.

It is possible to supply the security system from stabilized power supply source 10-15V and not less than 1,5A. It is necessary to calculate max current of power supply. The current of the alarm system is the current used by sensors, relays, siren and other devices. It is most convenient to use power supply source applied for power supply of security systems with the option to connect backup lead battery. It is recommended to mount remote control relays into sockets. Sockets may be easily fixed in metal box. It is necessary to select relays according to preferred voltage and current.

Auxiliary BUZZER is recommended to be installed inside the premises not far from the entrance. Buzzer operates together with the main siren also when the system starts calculating the time to leave the premises and the time

till alarm response of the security system after entering the premises (see clause 7.1). It is possible to use buzzer of Hitpoint PB12N23P12Q or similar modified piezoelectric 12V DC, 150mA max sound signalizer.



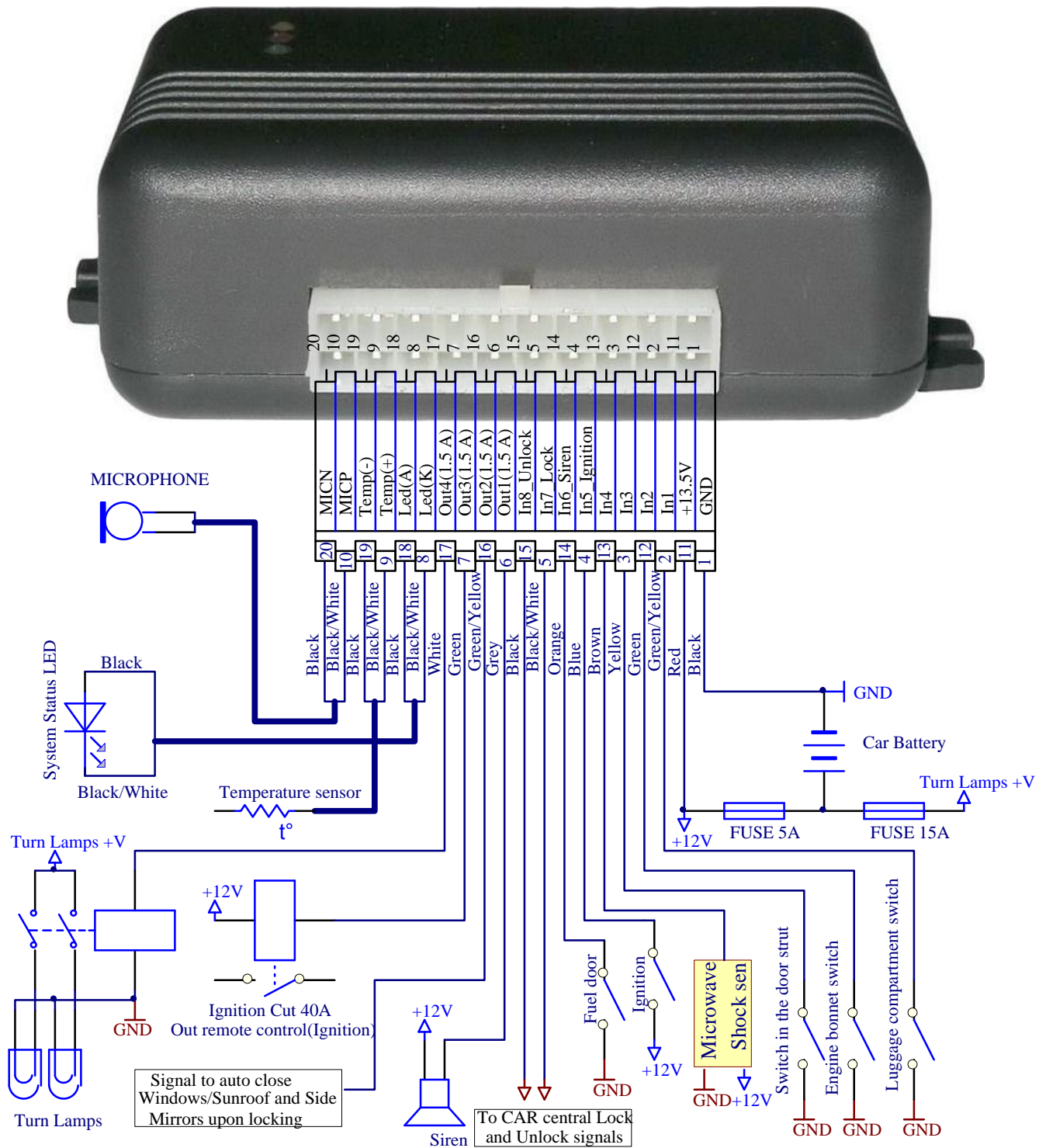
Module configuration blank sample for this diagram you will find after installing configuration program SERA, located in the directory „ConfigTemplates“. File name: *GTGPS_v1_Boat_MobileCamper.tcfg*

17.6. Vehicle's GSM-GPS messages system Installation manual and connection diagram

The module may be installed in all vehicles with petrol and diesel engines and 12V batteries negative pole of which is connected to car body. The system should be installed in a saloon of vehicle following installation manual of the manufacturer.

The module may be installed in line with already available security system such as GSM SMS pager or as independent separate system for car protection.

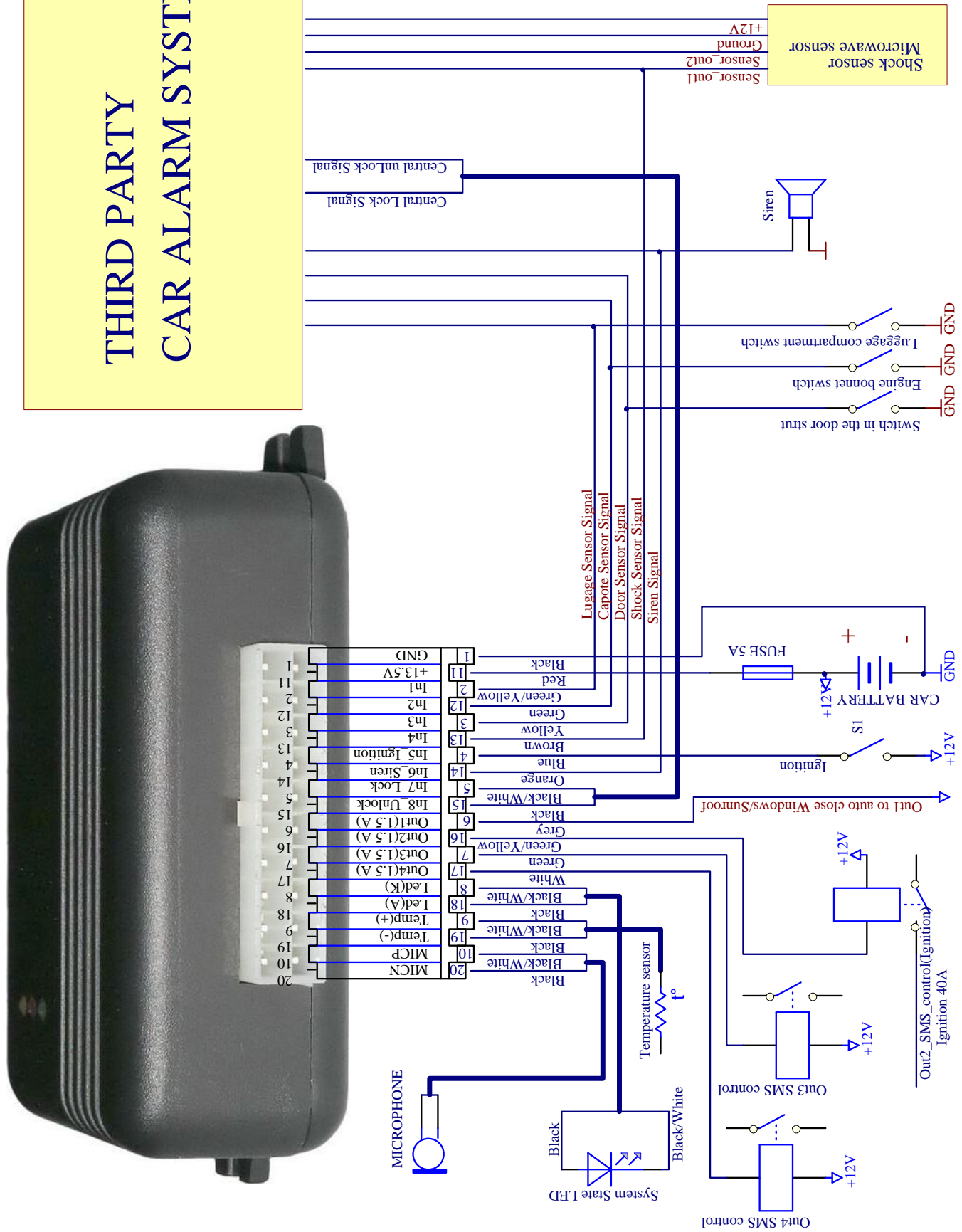
Connection diagram of the module as independent protection system is see below:



The module configuration blank sample for this diagram you will find after installing configuration program SERA, located in the directory „ConfigTemplates“. File name: *GTGPS_v1_VehicleAlarm.tcfg*

The connection diagram of the module is in parallel with already available security system

THIRD PARTY CAR ALARM SYSTEM



In the saloon of the vehicle the module should be placed in hard-to-reach place. The device should be mounted in a place protected from impact of humidity or other materials causing corrosion as far as possible from heating elements of

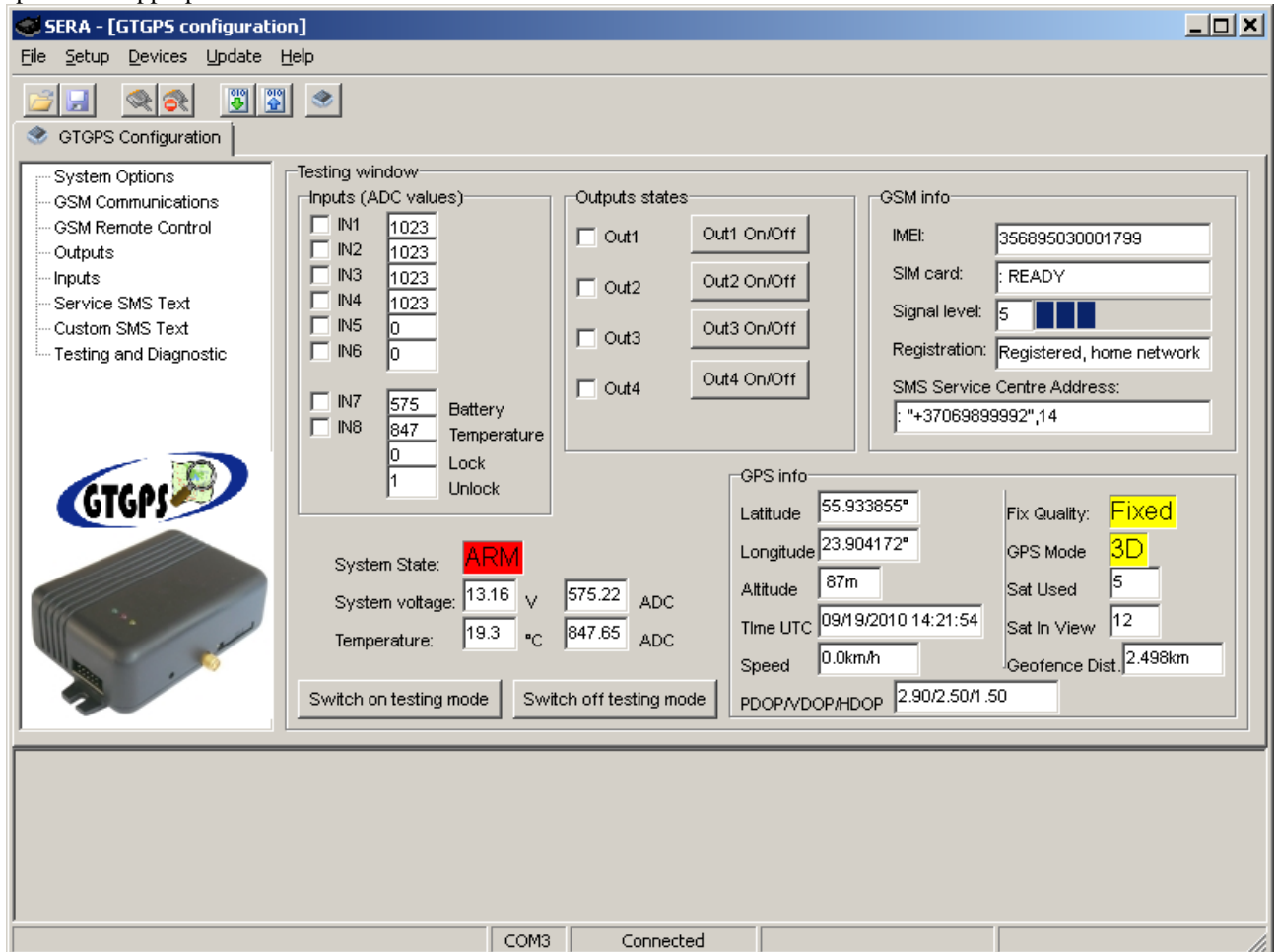
passengers' saloon and sources of electromagnetic disturbances (auto computer, air conditioning system, relay units). Do not mount the unit directly to metal parts of the vehicle in order to avoid accumulation of condensate within system block. The module should be mounted thus connectors of wires to be at the bottom side. Wires of the security system can not be laid near moving or hot parts of a vehicle.

For fastening use screws or plastic fastening straps. The battery should be installed in a place protected from impact of humidity or other materials causing corrosion as far as possible from heating elements of passengers saloon.

It is necessary to install fuses mentioned in the diagram. Fuse seat should be installed as near as possible to the car battery.

17.7. Testing and diagnostics

Diagnostics and testing of the module may be performed via USB port with software SERA. The software will show system input, output, GPS, GSM states in real time. Thus it would be easier to evaluate whether the module operates as appropriate.



18. Software updating

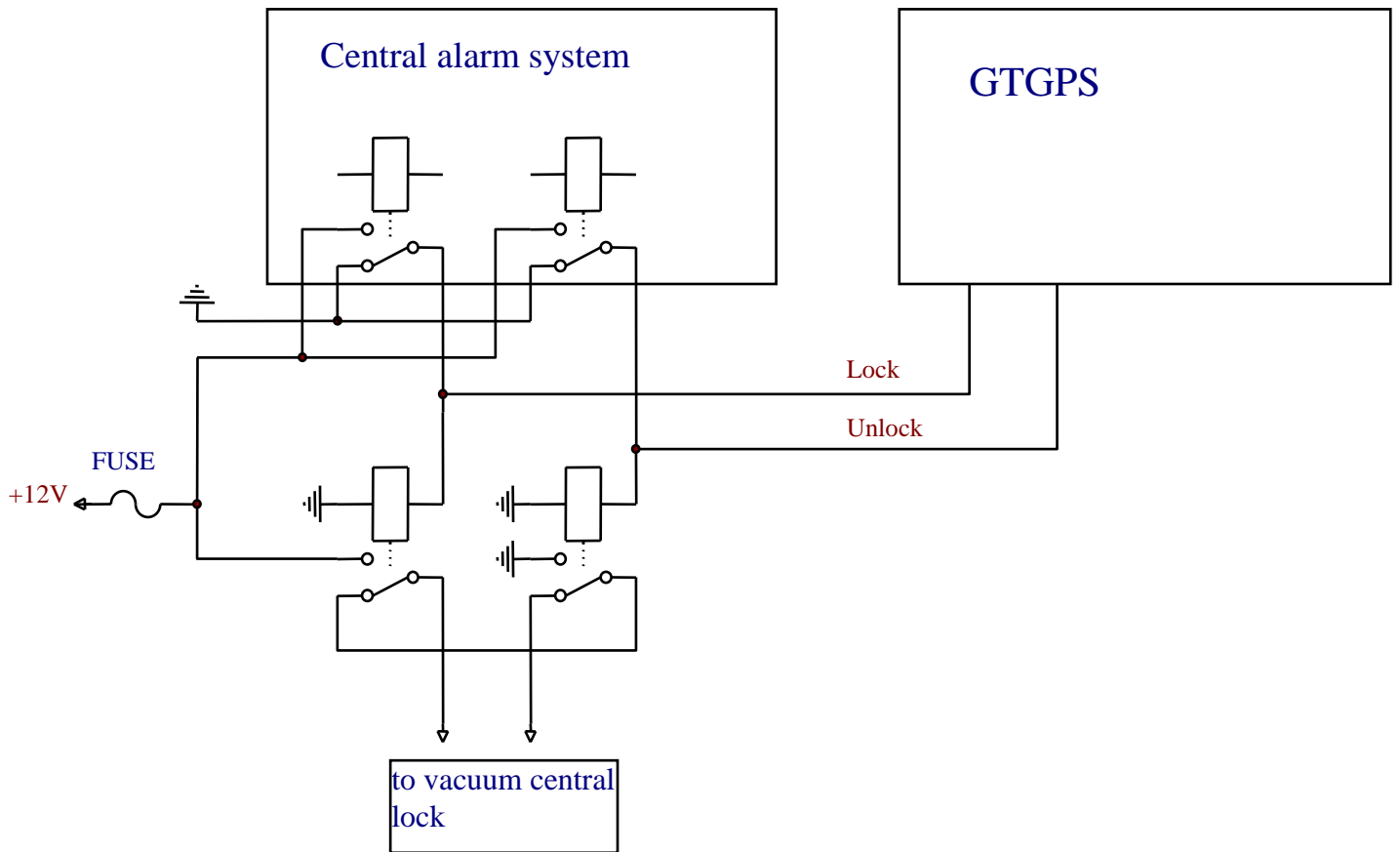
Updating of firmware version should be performed via PC. The following is necessary:

- mini-USB configuration cable,
- configuration software “SERA”,
- the new software version, which may downloaded at www.topkodas.lt

More about software updating process see user manual of the software „SERA“.

Annexes

1. Annex.



2. Annex

