



GSM car security system

User's guide

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Safety precautions

Read and follow the present user's guide before working with the module GTAUTO. Any operations involved in mounting of the module must be carried out only after unplugging the power supply.

Intended use

Individual security GSM communication module GTAUTO (hereinafter the module) is designed for transfer of GSM SMS messages to the mobile phone of the user. It is used for complex car security with car alarm system, which has central lock control. The module also has a wide range of application fields.

Additional information The module can be used as a tool for tracing and defining the state of the car, having the module built-in. More see: www.traceamobile.co.uk. Any issues concerning the present information consult with local operator of GSM communication.

Used definitions and terms

- *Installer* – the person who knows INST (installer) passwords.
- *User* – the person who knows USER (user) password.
- *Authorized user* – the person whose has mobile phone's number is entered into the GSM module. The module may have two authorized users in parallel.
- *Configuration* – it is programming of settings involved in the operation of the module. E.g. Users' telephone numbers, setting of periodicity and sending of test message, input names etc.
- *Event* – event about which the user is being informed.
- *ARM* – the module is in security mode.
- *DISARM* – the module is in idle running active only 24h inputs.
- *NO* – input type "Normal Open" – alarm will be sent when input will be connected with housing (-V).
- *NC* – input type "Normal Close" – alarm will be sent when circuit between connection and input, (-V).
- *Service messages*- on, off, test, system overload.
- *DIAL*- call of the system to the set number.

Short description of operation principles

The module via GSM communication channel transfers messages about car security system to the mobile phone of the user. Following the alarm of security system, the module generates the message, which is being sent the user and duplicated with a short call. It is possible to send the message and to call to two users. The sending order is being set when programming the module.

The module understands when the user cancels the call and no further calls will be made. When the phone is calling the user can not cancel the call at least 15 seconds. Otherwise the module will understand that the telephone number of user is busy and will try to call one more time. If the telephone number of the user is busy in fact the module will try to call for the number of times, set during programming the module. **Note:** the performance of the present function depends on interpretation of the operator's call control. In some cases the operator may interpret the call programming thus the module will repeat calling each 60sec. following the number of times set during programming (By default it is 3 times). In such case GSM operator may be changed or simply reduced DIAL repetition times.

Exploitation parameters of the module are being set by sending SMS message or via PC by using the configuration programme SERA, which may be downloaded on the website www.topkodas.lt.

In order to switch on the voice listening, it is necessary to call to the module from the mobile phone of the user. When performing the call the module will switch on voice listening, this will continue till the module will terminate the call or till the module will start performing other commands. Calls from other phones (not from authorized users) are being ignored.

The alarm system is being switched on/off only after sending appropriate signals from the central lock of the module to LOCK and UNLOCK inputs. If car ignition is on the alarm system from the central lock will not be activated.

The alarm system will be activated anyway after alarm of the bell of central security system (emergency activation).

Specifications

1. Table. Meanings of indication

Name	Indication	Meaning
Mountable outer LED „ARM“	Flashes, turns on for 50ms, and turns off for 300ms.	GSM module is in ARM (security) mode.
	Flashes, turns on for 50ms, and turns off 10ms.	GSM module is in DISARM (non – security) mode.
	Off	Programme error, processor out of operation, hardware trouble or no power supply.
Test (green) built-in LED	Flashes, remains lit for 50ms, turns off for 1000ms.	The module is functioning.
	Off	The module out of operation or voltage failure.
Ctrl (yellow) built-in LED	Lights constantly	Modem registered to the GSM network.
	Flashes, remains lit for 50ms, turns off for 300ms.	Modem performs registration to the GSM network.
	Off	Modem failed to register to the GSM network
Mod (red) built-in LED	Flashes	Modem power supply OK and the module connected to GSM network.
	Lights constantly	Modem power supply OK, but the module failed to connect to the GSM network.
	Off	No power supply or it is switched off.
Note:	All LEDs turns off for 15sec as the modem of GSM module is being restarted.	

Parameters of built-in GSM modem:

- GSM frequency Quad-band (850/900/1800/1900 MHz)
- SMS
- Audio

Test:

Test sending in SMS messages. Sending of communication control messages (tests) at the periods from 1 to 24 hours after pressing the RESET button or after entering ARM (security) mode. Discretion of settings is one hour.

Outputs:

- OUT1 max current (-V) 1500 mA.
- OUT2 max current (-V) 1500 mA.
- OUT3 max current (+V) 50 mA
- All outputs can be controlled with the help of SMS message e.g. for ignition locking etc.

- Parameters of output alarm may be programmed.

Inputs:

Input electrical schemes see Annex No 3

The module has eight external and one internal input for power supply voltage control.

Parameters can be programmable:

- SMS text;
- Input program enabling and disabling;
- Alarm from plus or minus.
- Input type
- Operation algorithm
- Reaction time
- Time of secondary alarm
- Additional calibration of temperature and thresholds of alarm responses.

IN1, IN2, IN3 parameters:

- Alarm signal time 200ms;
- Insensibility time to secondary alarm 10s;
- Alarm from minus (input type NO) by default;
- Recommendable use: door, luggage, capote

IN4, IN5 parameters:

- Alarm signal time 50ms;
- Insensibility time to secondary alarm 1min;
- Alarm from minus by default;
- Recommendable use: shock, microwave sensors.

IN6 (ignition control) parameters:

- Alarm signal time 1s;
- Insensibility time to secondary alarm 1min.;
- Alarm from plus (input type NC) by default;
- Recommendable purpose: ignition;
- When ignition is on LOCK input is being blocked.**

IN7 (Bell control) parameters:

- Alarm signal time 5s;
- Insensibility time to secondary alarm 1min.;
- Alarm from plus (input type NC) by default;
- After alarm of the bell, the module switched to ARM mode anyway.**
- Bell alarm time for switching to ARM mode 2s

IN8 (battery control) parameters:

- Internal voltage control (virtual input)
- Alarm signal time 60s;
- Insensibility time to secondary alarm 100min;
- Alarm from (programmable) 11.0V;
- Restore from (programmable) 12.6V;
- Measurements discretion 0.01 V;

IN9 (temperature control) parameters:

- External temperature sensor;
- Alarm impulse time 60s;
- Insensibility time to secondary alarm 100min;
- Alarm from (programmable) -15 °C / 5 °F;
- Restore from (programmable) -5 °C / 23 °F;
- Measurements discretion 0.1 °C / 0.18 °F;

Control of the module:

Security system is enabled/disabled from central lock or by using buttons via LOCK and UNLOCKS inputs.
Several control modes are available see Annex2.

Power supply voltage:

Nominal power supply voltage 12,6 V.

Drop in power supply voltage 9 – 16 V.

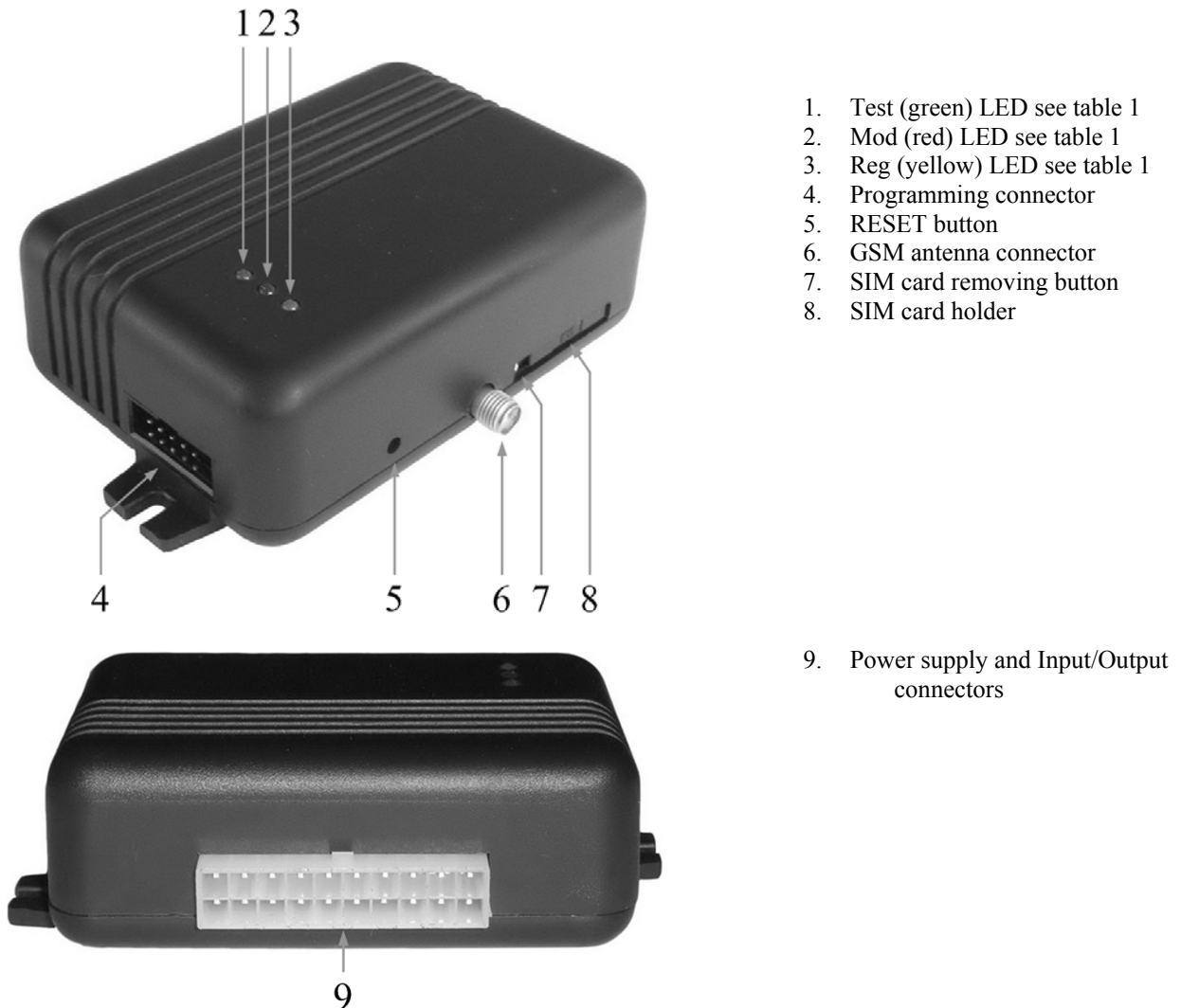
Current:

- In idle runningless than 50 mA.
- During calling and SMS sending.....less than 300 mA.

Environmental parameters:

- Temperature range of the storage of the module.....-40 to +85 °C/-40 to 185 °F
- Operating temperature range-30 to +75 °C/-22 to 167 °F
- Max humidity near +40 °C/104 °F 95%

General view of the product and layout of control devices



Users

1.1 Installer

Installer may perform all (INST) commands available in the table 2.

1.2 User

User may perform (USER) commands only, presented in the table 3. *User* is allowed to request and to receive parameters of the security system as well as to control outputs (Out1, Out2, and Out3) with the help of SMS messages.

1.3 Authorized user

Only *authorized user* is allowed to receive messages or/and calls after alarm of security system as well as test messages and messages of communication and security, which are being generated after alarm of the security system or under set test sending time.

Preparatory work

Before installing the module or after its installation, it is necessary to set its parameters. **Parameters of SIM card may be set by using GSM phone.**

Follow the indications below:

- check and if not available insert SMS messages centre number (**only with GSM phone**);
- **set PIN code request off (only with GSM phone)**;
- programming of the phone numbers via which information is to be transferred*;
- set the numbers to whom send SMS and to call*;
- set active inputs, which will be used. E.g. if microwave sensor will not be used its input should be disabled*;
- set periodicity of communication test (if inserted "00" communication test will not be send);
- set inputs states OUT1, OUT2, OUT3 (if applicable)*;

After inserting SIM card or after changing parameters the module must be restarted by pressing **Reset** button.

*There are two ways of configuration of the module. The first: via SMS messages. The second: via PC by connecting the module to the PC using programming cable. The full change of the parameters of the module can be performed only via PC by using programming cable. If possible we recommend configuring the module via PC.

1.4 Configuration of GSM module via SMS

The module may be configured via SMS messages, but it is applied only to the main parameters of the module, indicated in the table 2.

In order to perform configuration via SMS messages, it is necessary to know installer's code.

The table 2 includes types of the module of configuration and control codes. Configuration of the module is being performed via SMS messages.

Structure of the command:

- Identifier:
INST – Install the present identifier is used for configuration of the parameters of the module.
USER – User the present identifier is used for control of the module.
- Installer's or user's password,
- Command code,
- Configuration kit.

One SMS message may contain the number of commands, comprised of 160 symbols (including spaces).

The sequence of the command in such case is as follows identifier, password without space after identifier, after them separated with space in pairs follows command code and parameter, command code and parameter etc...

The module performs commands as follows: firstly performs the first command, after half and hour performs the second command and further other commands from the left to the right.

Table 2. Installer's command codes

Beginni ng	Passwo rd	Command code	Command parameters Manufacturer's settings	Examples of command parameters	Explanation
INST	123456	01	0#	3701111111#	1 user's TEL. number (up to 16 symbols, the end symbol "#")
		02	0#	3702222222#	2 //2 user's TEL. Number (up to 16 symbols end symbol "#")
		03	1111	1010	What is being sent to the first user: input SMS, input DIAL, service SMS, service DIAL (1-on, 2 – off) in the event of example the first user will receive input SMS and service SMS .
		04	1111	1100	What is being sent to the second user: (the same as for the first). In the event of example the first user will receive input SMS and the call (input DIAL)
		05	1	4	Lock/Unlock modes: 0, 1,2,3,4 see. schemes Annex 3
		06	24	01	Periodicity of communication test (from 00 to 24), 00-not send In the event of example test will send hourly.
		07	1	0	Led Indication Test, Reg (1-on, 0-off).
		08	111111211	121111222	Input IN1,IN2,IN3,IN4,IN5,IN6, IN7, IN8, IN9 modes (1-Normal, 2-24h) As example IN1 acts as 1 – Normal; IN2 acts in 2 – 24h mode; IN3, IN4, IN5, IN6 acts as 1-Normal; IN7 IN8 IN9 acts in 2-24h mode.
		09	111112211	121111111	Inputs IN1,IN2,IN3,IN4,IN5,IN6, IN7 IN8, IN9 types (1-NO type, 2-NC type) As example IN1 acts as 1-NO; IN2 acts as 2-NC;IN3,IN4,IN5,IN6,IN7,IN8,IN9 acts as 1-NO.
		10	1111	0011	Service messages: Arm, Disarm, Reset, Test (1 – on, 0 – off) As examples the messages Reset ir Test will be sent.
		11	111111111	000001011	Input alarms: IN1,IN2,IN3,IN4,IN5,IN6, IN7,IN8, IN9* (1 – on, 0 – off) As example alarm of IN6 IN8 IN9 will be activated.
		12	111000011	101011011	Input restore: IN1,IN2,IN3,IN4,IN5,IN6, IN7,IN8, IN9* (1 – on, 0 – off) As example restore of IN1, IN3, IN5, IN6, IN8, IN9 will be activated.
		21	Alarm Luggage #	Atidare bagazine#	IN1 input name change up to 16 symbols, the end symbol „#“
		22	Alarm Bonnet#	Atidare kapota#	IN2 input name change up to 16 symbols, the end symbol „#“
		23	Alarm Door#	Atidare duris#	IN3 input name change up to 16 symbols, the end symbol „#“
		24	Alarm Microwave#	Suv. mikr.#	IN4 input name change up to 16 symbols, the end symbol „#“

25	Alarm Shock.#	Suv. smug.#	IN5 input name change up to 16 symbols, the end symbol „#“
26	Ignition On#	Ijunge degima#	IN6 input name change up to 16 symbols, the end symbol „#“
27	Siren on#	Suv Siren#	IN7 input name change up to 16 symbols, the end symbol „#“
28	Low Battery#	Low Battery#	IN8 input name change up to 16 symbols, the end symbol „#“
29	Low Temperature#	Low Temp#	IN9 change of temperature alarm name up to 16 symbols, the end symbol „#“
31	Rest. Luggage #	Atidare bagazine#	IN1 input restore name change up to 16 symbols, the end symbol “#”
32	Rest. Bonnet#	Atidare kapota#	IN2 input restore name change up to 16 symbols, the end symbol “#”
33	Rest. Door#	Atidare duris#	IN3 input restore name change up to 16 symbols, the end symbol “#”
34	Rest. Microwave#	Suveike mikr.#	IN4 input restore name change up to 16 symbols, the end symbol “#”
35	Rest. Shock.#	Suveike smug.#	IN5 input restore name change up to 16 symbols, the end symbol “#”
36	Ignition Off#	Isjunge degima#	IN6 input restore name change up to 16 symbols, the end symbol “#”
37	Siren Off#	Siren off#	IN7 input restore name change up to 16 symbols, the end symbol “#”
38	Battery Restore#	Battery Restore#	IN8 input restore name change up to 16 symbols, the end symbol “#”
39	Temp Restore#	Temperature Res#	IN9 change of temperature restore name up to 16 symbols, the end symbol “#”
40	Out1 ON#	Degimas on#	Out1 output test activation change up to 16 symbols, the end symbol #.
41	Out2 ON#	Blokavimas on#	Out2 output test activation change up to 16 symbols, the end symbol “#”
42	Out3 ON #	Kondic.on#	Out3 output test activation change up to 16 symbols, the end symbol “#”
43	Out1 OFF#	Degimas off#	Out1 output test activation change up to 16 symbols, the end symbol “#”
44	Out2 OFF#	Blokavimas off#	Out2 output test activation change up to 16 symbols, the end symbol “#”
45	Out3 OFF #	Kondic. off#	Out3 output test activation change up to 16 symbols, the end symbol “#”
46	000	111	Outputs OUT1 OUT2 OUT3 states: 1 – on, 0 – off after reset of the module. In the event of example OUT1 OUT2 OUT3 outputs are switched on.
47	000	102	Description of output operation Out1, Out2, Out3 (0-On/Off, 1-Pulse ON, 2- Pulse OFF) In the event of example OUT1 will operate as Pulse ON; OUT2 – as On/Off; OUT3 will operate as Pulse OFF.
51	Not applicable	nėra	Change OUT1 state
52	Not applicable	nėra	Change OUT2 state
53	Not applicable	nėra	Change OUT3 state
80	Not applicable	1	Send a part of information in the form of SMS about configurations of the module: 1. send command code 01...12 parameters; 2. send command code 21...28 parameters; 3. send command code 31...38 parameters; 4. send command code 40...49 parameters; 5. request about(Out1 – Out3) states; 6. Test request. 7. System state request. Input/Output states will be sent.
90	123456	654321	To change installer's (INST) code (recommended before working with GSM module).
91	123456	948921	To change user's (USER) code (recommended before working with GSM module).

Example: “INST123456 01 3701111111# 03 1110 (telephone No of 1st user +3701111111 is being entered with commands SMS and DIAL to the telephone of the 1 user, when alarms are active and sent service SMS, not including service DIAL).

Examples of typical programming messages:

1. Programming of the telephone numbers of users.
INST123456 01 3701111111# 02 3702222222# 03 1111 04 1111 80 1
Herein:

- 123456 – installer's code;
- 01 – command code;
- Number of the first user without (+) comprised of state code, operator code and user's number. The end symbol #;
- 02 – command code;
- Number of the second user without (+) comprised of state code, operator code and user's number. The end symbol #;
- 03 – command code;
- 1111 to send all SMS and DIAL to the first number;
- 04 – command code;
- 1100 to send input SMS and DIAL, not including service messages and DIAL to the second number;
- 80 – command (see table);
- 1 - sends SMS back to the sender command code 01-12 parameters. Thus is the control whether GSM security module is reprogrammed correctly or not.

2. Input programming

INST123456 11 000001111 12 011011111 80 1

- 123456 – installer's code;
- 11 – command (see table);
- 000001111 – Used inputs are calculated from the left to the right. IN1, IN2, IN3, IN4, IN5 alarms are disabled, IN6, IN7, IN8, IN9 alarms are enabled;
- 12 – command (see table);
- 011011111 – IN1, IN4 restores are disabled, IN2, IN3, IN5, IN6, IN7, IN8, IN9 restores are enabled;
- 80 – command (see table);
- 1 - sends SMS back to the sender command code 01-12 parameters.

3. Input name programming:

INST123456 21 Alarmbagazi# 22 Alarmkap# 23 Alarmdurys# 80 2

4. Input programming:

INST123456 40 ignition on.# 43 ignition off.# 46 101 47 000 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.
- 46 – command (see table)
- 101 initial output states after RESET pressing (Out1 on, Out2 off, Out3 on)
- 47 – command (see table)
- 000 – description of output operations (Out1, Out2, Out3 active On/Off mode)
- 80 – command (see table)
- 4 – Sent input settings 40-49 sections.

5. Modes of the module control (ARM/DISARM) see schemes in Annex 3:

INST123456 05 1

- 123456 – installer's code;
- 05 – command (see table)
- 1 - LOCK/UNLOCK mode of the module, see schemes in Annex3.

Table 3. Table of user's codes

Beginning	Password	Command code	Command parameters Default settings	Command parameters (example)	Clarifications
USER	123456	51	No	No	To change OUT1 state. Output OUT1 state: changes each time after sending of command code. See clarification below.
		52	No	No	To change OUT2 state. Output OUT2 state: changes each time after sending of command code. See clarification below.
		53	No	No	To change OUT3 state. Output OUT3 state: changes each time after sending of command code. See clarification below.
		80	No	1	Send a part of information in the form of SMS about configurations of the module: 1. send command code 01...12 parameters; 2. send command code 21...28 parameters; 3. send command code 31...38 parameters; 4. send command code 40...49 parameters; 5. request about(Out1 – Out3) states; 6. Test request; 7. System state request. Input/output states will be sent (ARM/DISARM).

Output control using SMS messages:

Output states of the module can be controlled by using SMS message. For example in order to lock ignition the first output must be connected to the ignition locking relay. Commands 51, 52, 53 are used for output control. After sending the command, output state is being changed, i.e. if output was off it is switched on and vice versa. In order to change states of the first and third outputs, the SMS below must be sent:

USER123456 51 53 80 5

- 123456 – user's code.
- 51 – Change of the state of the first output.
- 53 – Change of the state of the third output.

- 80 – Command of information request.
- 5 – Send information on output states in the form of SMS after changing.

According to request command test of the module may be downloaded.

USER123456 80 6

- 123456 – user's code;
- 80 – information request command (see table 3);
- 6 – command (test request);

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

Example of received test (SMS) message is displayed below:

Events:
--Test--
Signal strength:
 17
Sistem voltage:
 12.60 V
Temperature:
 +23.3 C
IMEI:
 353358010231707
HW:Gtauto2
SW:Gtauto v2 071124

Clarifications:

Signal strength: Numerical values of the signal level correspond to the following values:

0- very low signal (limit of communication loss);

1...5- low signal (equal to one bar of four on the screen of the mobile phone);

6...9- satisfactory signal (equal to two bars of four on the screen of the mobile phone);

10...14 – good signal (equal to three bars of four on the screen of the mobile phone);

15 and more – excellent signal (equal to four bars of four on the screen of the mobile phone).

System voltage: voltage of accumulator of the car or other power source, the module is connected to.

Temperature: indications of temperature indicator in Celsius or Fahrenheit.

IMEI: IMEI number of GSM modem.

HW: hardware version of the module.

SW: software version of the module.

Request of system state and input/output state according to the command:

USER123456 80 7

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

SMS message of two parts will be sent to the number, from which message has been sent.

See the example below of the SMS according to request command (USER123456 80 7):

First part of SMS:

System info:

State: ARM

(Explanation: system state)

Inputs:

In0:Luggage closed .

(Explanation: first input state)

In1:Bonnet closed .

(Explanation: second input state)

In2:Door closed .

(Explanation: third input state)

In3:MicrowaveRestore

(Explanation: fourth input state)

In4:Shock restore .

(Explanation: fifth input state)

Second part of SMS:

Inputs:

In5:Ignition OFF .

(Explanation: sixth input state)

In6:Siren OFF .

(Explanation: seven input state)

In7:Battery restore .

(Explanation: eight input state)

In8:Temp restore .

(Explanation: ninth input state)

Output states

Out1 OFF .

(Explanation: state of first controlled output)

Out2 OFF .

(Explanation: state of second controlled output)

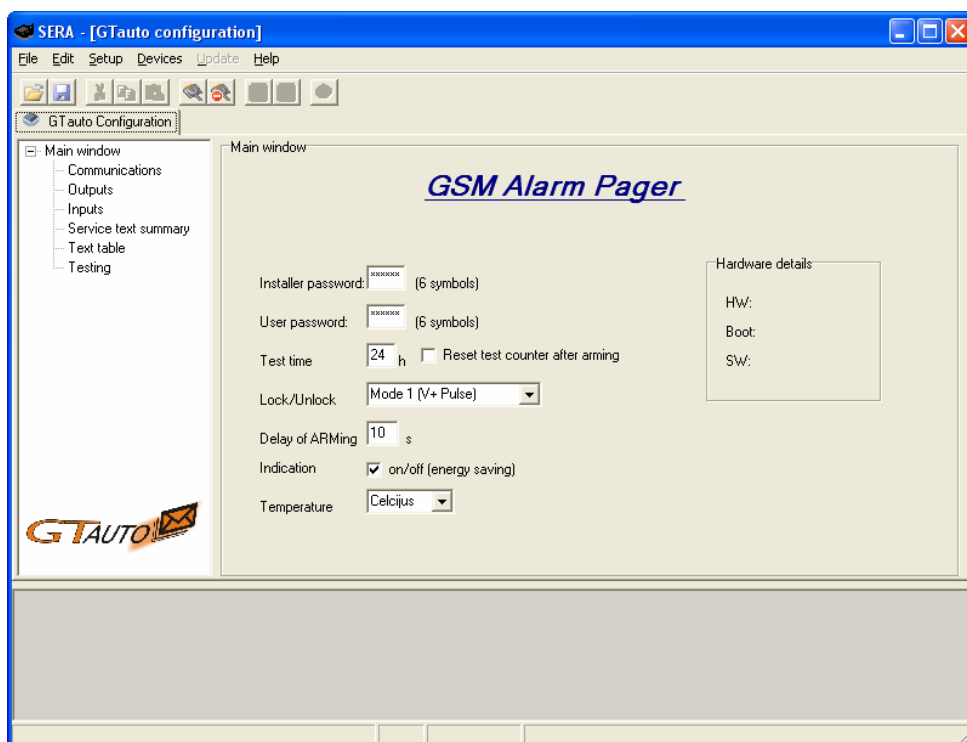
Out3 OFF .

(Explanation: state of third controlled output)

The module is considered to be equipped properly and communication is reliable if all sent messages and calls are received as well as users' command executed.

1.5 Programming of the module via PC

The programming is performed by using the programme "SERA", which may be downloaded from the website www.topkodas.lt.



1.6 Installation of the module and its connection scheme

The module is installed in such manner that GSM communication would be ensured. It is necessary to select proper location of GSM antenna. The phone can not be hidden deeply in metal constrictions, because failure of GSM communication may occur. **GSM antenna must be situated further from the module and electronic sensors: shock, microwave, microphone, temperature etc.**

The manufacturer is not liable for operation of the mobile phone and GSM communication failures.

Connection scheme is presented in annex; however other connection variations are possible. It is necessary to equip fuses.

To ensure operation of the module the used inputs should be activated i.e. door, sock sensor, etc. and observe their operation. The user must receive messages from alarm zones (depending on programming). If messaging fails check GSM communication and correct programming of the module by sending SMS of command 80 with 1, 2, 3,4,5,6,7 parameters. Configuration of module may be checked and tested by using the programme SERA.

The module is considered to be equipped properly if all sent messages and calls are received and user commands are executed.

Messages sending

Messages are being sent after alarm response of the security system, after alarm of bell or after the security system is disabled (if include in configuration), at the moment of test message sending (if included in configuration), after configuration of the module is being changed (if include in configuration), after sending request on parameters to find out (command code 80).

SMS Information about alarm response of the security system is being duplicated with a short call (if set during configuration).

Remote control

Devices connected to the outputs Out1, Out2 and Out3 can be controlled with the help of SMS messages. Control commands for the user (USER) are presented in the 3rd table.

Example of control command, when states of all three outputs are changed in line with request to send information in a form of SMS about output states after changing:

USER123456 51 52 53 80 5

- 123456 – user code;
- 51 – changing of state of first output
- 52 - changing of state of second output
- 53 - changing of state of third output
- 80 – information request command (See table 3)
- 5 – send information in a form of SMS about input states.

Output states, which appear immediately after reset may be changed (see table 2; command 46).

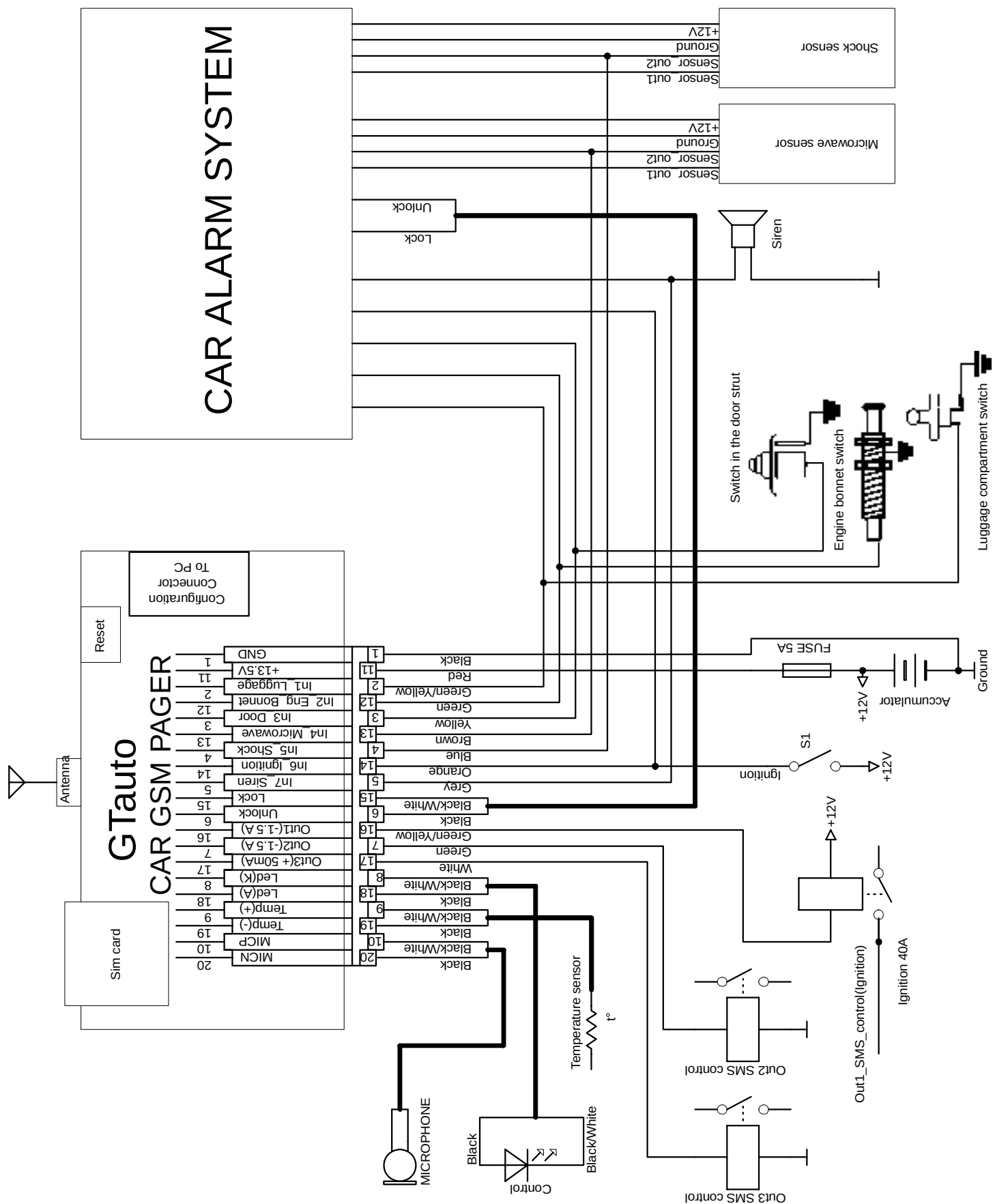
More examples of control commands you may find in the chapter „8.1 configuration of GSM communication module via SMS“.

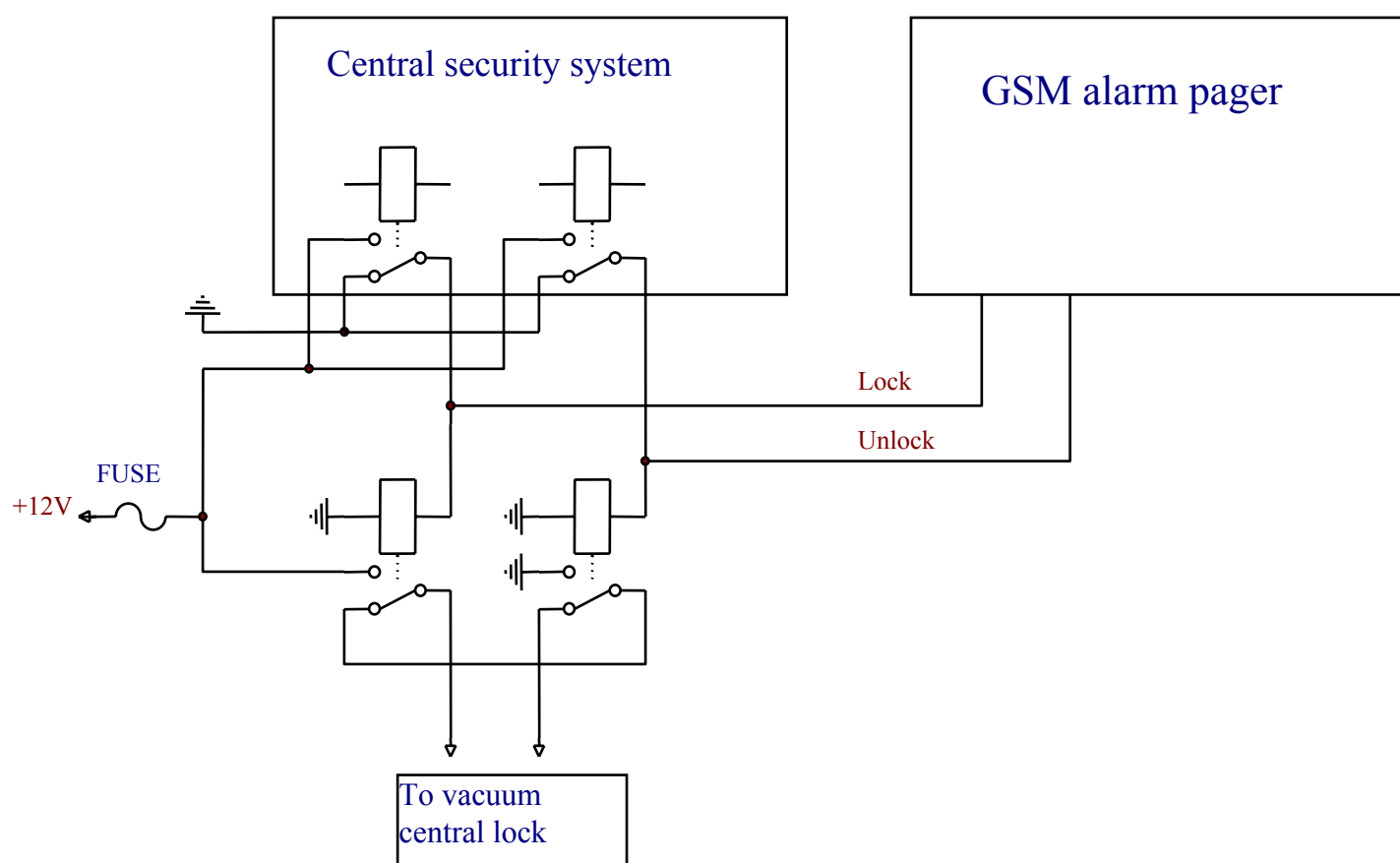
Updating of programme version

Updating of programme version (firmware) is being performed via PC, by using:

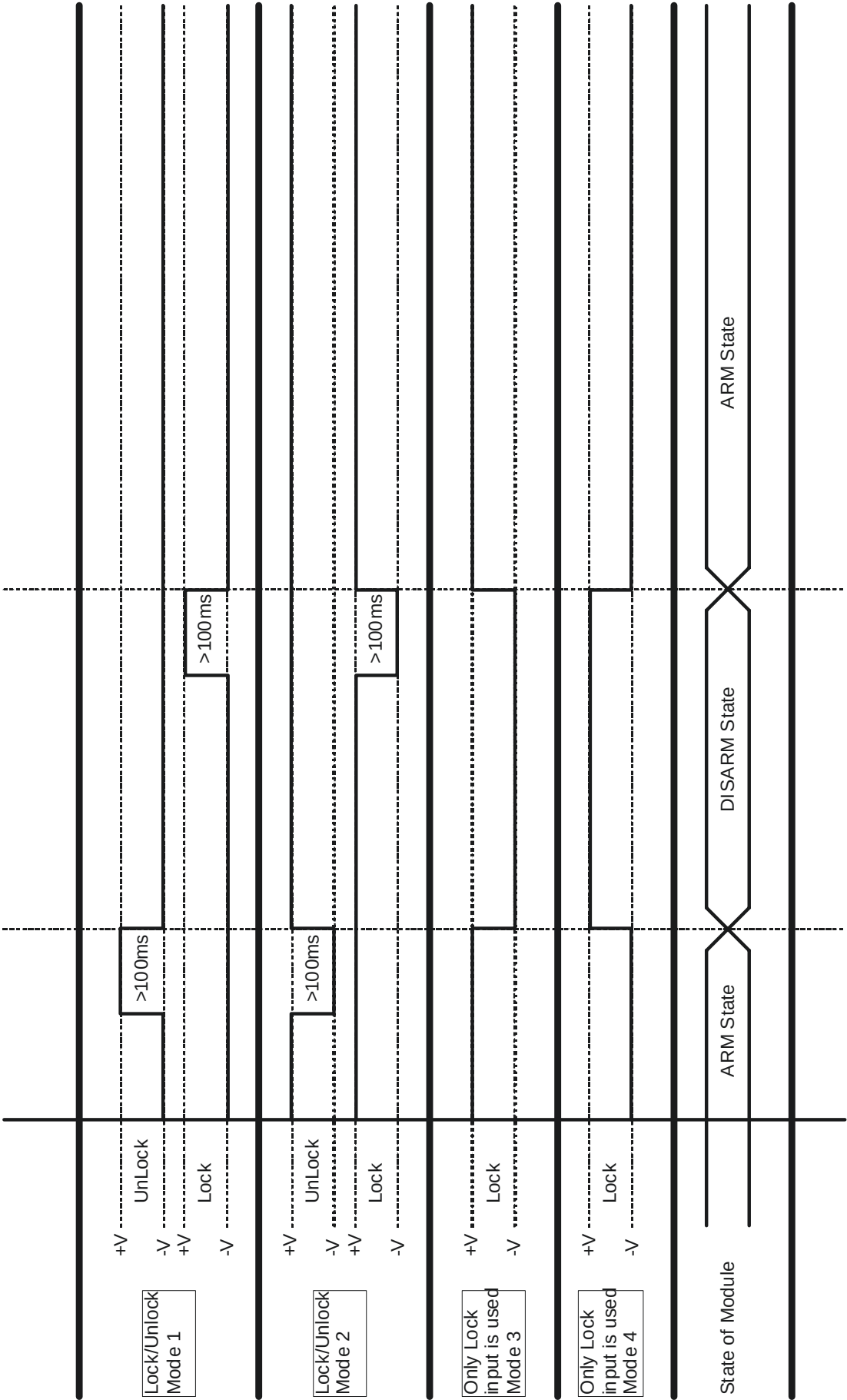
- configuration cable,
- configuration programme “SERA”,
- new version of the programme, which may be downloaded from the website www.topkodas.lt.

More info on the process of updating programme version see in manual of the programme SERA.





3 Annex



4 Annex

