

GsmAlarm-420 (V1.05)



GSM Alarm and Remote control System



FEATURES

- Integrated GSM module.
- 4 inputs for door, motion, fire sensor connection.
- 3 programmable outputs for remote control.
- Option to switch the protection mode on/off by short free call.
- 5 users are informed on the protected unit.
- 250 users able to control the gate or electromagnetic lock by short free call.
- Info-carrying SMS on the state of each sensor, number of triggers, system mains voltage, GSM signal strength.
- Option to connect siren.
- Option to connect external mic.
- Remote programming.
- Cheap maintenance.








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1. GENERAL INFORMATION

1.1. SAFETY INSTRUCTION

Important! Read and strictly follow all safety and operational instructions written in this user manual, before using GsmAlarm-420 in order to guarantee safety and prevent possible injuries from possible thermal and electric device failures for you and surrounding people. Retain all safety and operational instructions for future reference during the whole operation lifetime of device.

	<p>Device has two power supplies: main and reserve.</p> <p>For premises protection: Main: power transformer: I: 230V 50/60 Hz; II: (16–24)V ~ 1,2 A 50/60Hz; Reserve: 12 V 1,2 Ah battery.</p> <p>For car protection: Main: 12 V car battery; Reserve: 6 V 1,2 Ah battery.</p>
	<p>Device GsmAlarm-420 certifies required safety level of LST EN 60950-1:2003 standard.</p> <p><u>All power supplies described above and connected to device must satisfy the safety requirements of LST EN 60950 –1 standard!</u></p>
	<p>External power supply can be connected to AC mains only inside installation room with automatic 2-pole circuit breaker capable of disconnecting circuit in the event of short circuit or over-current.</p> <p>Open circuit breaker must have a gap between connections of more than 3mm and the disconnection current 5A.</p>
	<p>Only a qualified specialist possessing strong knowledge about general safety requirements and technology of device can perform system installation works and technical support.</p> <p>In case of any device performance disorder only qualified specialist can repair it.</p> <p>There are no parts you can change at place in the device.</p>
	<p>ATTENTION!</p> <p>EXPLOSION POSSIBLE USING WRONG KIND BATTERIES - NOT RECOMMENDED BY MANUFACTURER.</p> <p>DO NOT SWITCH POLES OF BATTERY BY ACCIDENT.</p> <p>DO NOT SHORT CIRCUIT BATTERY POLES.</p>
	<p>MAINTENANCE PERSONNEL WARNING!</p> <p>TWO POLES OF AC ELECTRIC POWER SUPPLY.</p> <p>POWER TRANSFORMER CUT-OUT IN NEUTRAL CABLE!</p>
	<p>Disconnect device from AC power and reserve battery before performing any installation or maintenance work.</p> <p>It is forbidden to perform any device installation or maintenance work during lightning!</p>

Remote control and monitoring device GsmAlarm-420 has built-in radio transmitter operating on GSM900 and GSM1800 networks.

Do not use the device where it can cause interferences and danger.

Do not arrange the device close to medical equipment and appliances.

Do not use the device in explosive environment.

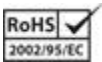
Device is not resistant to moisture, chemical materials or mechanical damage.

Don't attempt to personally repair the system.

System label is on the bottom side of the device.



This symbol on the product or on its packaging means that your electrical and electronic equipment should be disposed at the end of life separately from your household wastes. There are separate collection systems for recycling in EU. For more information, please contact the local authority or the dealer where you purchased the product.



The device compliance to RoHS Directive.

1.2. PACKAGE CONTENT

GsmAlarm-420 main board	Qty	1
GSM antenna	Qty	1
Microphone with 1,5 m lead cable	Qty	1
Load resistors 2,2 k Ω \pm 5%	Qty	6
Colours marking: red, red, red.		
Clamping cable for accumulator connection	Qty	1
User's manual	Qty	1

1.3. GENERAL DESCRIPTION

Four zone control and monitoring device GsmAlarm-420 can be used for protection of cars, boats, houses, apartments, garages, and cottages. In the case of a breach of the protected zone and depending on the programmed system operation algorithm, GsmAlarm-420 switches on the siren, calls and sends SMS messages to five users. After answering the call, a user can remotely control the system by means of his phone keypad (DTMF tones) (e.g., stop a car engine), can listen to what is going on in the room, request an SMS with detailed information on the state and the number of activations of each controlled zone.

GsmAlarm-420 has 2 (3, if a siren is not used) programmable outputs, intended for remote control of different devices. A user can turn on/off heating, ventilation or lighting systems, etc., via a mobile phone just by typing a relevant code or sending SMS to the control device.

For user's convenience, the system can indicate entrance/exit with an audio signal, if the miniature sound signalization element is connected to system.

A user will receive an SMS message, if GSM connection was lost for over 30 seconds. The message is sent only when the protection mode is turned on.

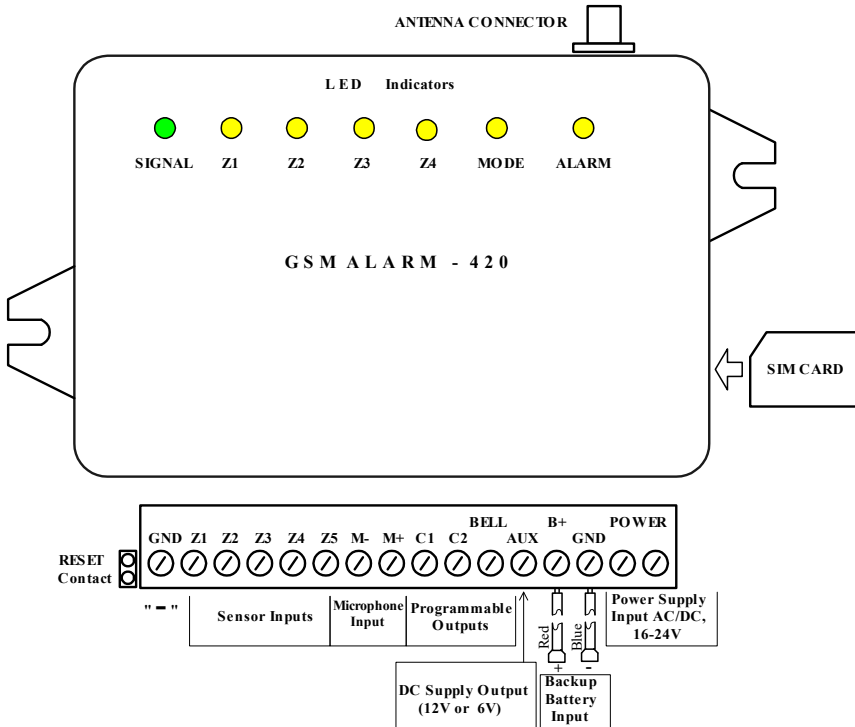
The device suites perfectly for remote control of automated gates, fences and electromagnetic door locks. In order to open a gate, a user calls the number of GsmAlarm-420. Then GsmAlarm-420 verifies that the caller's number is in the list of the programmed user numbers and in case of positive confirmation switches on the gate control device and automatically terminates the call. Up to 250 users can control a gate.

The system answers only to calls from the pre-programmed numbers. If the system receives a call from an alien number, the call is immediately terminated and an SMS is sent the user, indicating the caller's phone number. SMS messages are also sent to users in case of loss and restoration of power.

Operation of the alarm can be check by a short call to the GsmAlarm-420 number. If GsmAlarm-420 is operative, the caller will get a short confirmation call.

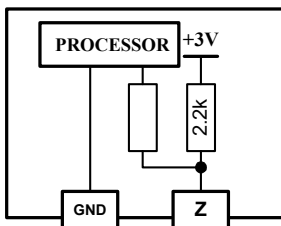
All GsmAlarm-420 parameters are programmable remotely by means of SMS messages with respective content and the password.

2. CONNECTORS AND LEDs



GsmAlarm-420 connection contacts and LED indicators

2.1. INPUTS Z1-Z5



Equivalent diagram of input

Inputs Z1-Z5 are used to connect sensors of protected zones. The inputs can operate in a "loaded input" mode or in a "zero-one" mode (see Ch. 5.3.1.2). The "loaded input" mode is recommended to be used for protection of premises. In this case all the inputs have to be loaded with 2,2kΩ resistors. The system becomes triggered both when the monitored input circuit is broken as well as when it is short-circuited.

In the second case the system is triggered after breaking or short-circuiting of the monitored input circuit (depending on the programmed "active" level).

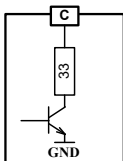
Input Z5 is used to arm/disarm the system. System can be armed by applying active level to Z5. After the delay time passes, the system starts checking the monitored inputs; in the case of alarm it activates the siren, calls and sends SMSs. After Z5 level is changed, the system is disarmed and responds to no zone changes (except when the monitored zone is operative 24 hours per day).

2.2. MICROPHONE CONNECTION CONTACTS M- M+

Contacts **M-** and **M+** are used to connect external microphone. Connect black/ white wire to contact **M+**, black to **M-**. Try to install microphone as far as possible from GSM antenna. If wire of the microphone is long (over 2 m), it is recommended to use shielded twisted pair cable. Connect shield to GND contact.

Microphone is switched on by DTMF instruction **66*** in the conversation mode (see Ch. 7.3).

2.3. OUTPUTS C1 & C2

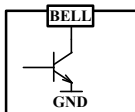


Programmable outputs C1 and C2 are used to connect remotely controlled devices. Relays with 12V operation voltage and current not exceeding 150 mA max, are recommended for device control.

Output operation modes are described in Ch. 5.3.2.1

C1-C4 equivalent diagram

2.4. OUTPUT BELL



The BELL output is used to connect audio siren or extra-commutated device (see Ch. 4.1 and 4.2).

Commutated current may reach 0.6 A max.

Equivalent diagram of BELL OUTPUT

2.5. OUTPUT AUX

AUX output is used to supply power external devices (fire, motion sensors) and is short-circuit-protected. This output has voltage +13.7 V or +6.8V (depending on the system parameter U, see Ch. 5.3.2 and 6.2). Load current is 1 A max.

2.6. CONTACT B+

“+” terminal of reserve battery is connected to contact **B+**. Max capacity of the battery is 1.2 Ah. 12 V battery is used in the premises protection mode.

It is recommended to use 6 V battery for car protection. In this case switch GsmAlarm-420 to 6 V mode (see par. 5.3.2 and 6.2).

2.7. CONTACTS POWER

Input **POWER** is used to connect secondary winding of power supply transformer with voltage between 16V and 24V (or 12V DC in car protection mode).

2.8. CONTACTS RESET

RESET contacts are used to restore factory default parameters (see. Ch. 6).

3. LED INDICATORS

Light indicators facilitate quick adjustment and troubleshooting of the system during installation.

3.1. **SIGNAL:** INDICATOR OF SIGNAL STRENGTH AND GSM MODULE OPERATION MODE

Indicator state	Explanation
Out.	GSM module is not in use. No power supply or system failure.
Continuously On.	There is no GSM operator network registration. Possible causes: SIM card PIN code request is not deactivated, antenna not connected or poor network connection quality.
Blinking more frequently than once a second.	GSM module is in use: outgoing call or SMS is being sent.
Blinks 5 times, short break after.	Very good signal.
Blinks 4 times, short break after.	Good signal.
Blinks 3 times, short break after.	Satisfactory connection.
Blinks 2 times, short break after.	Weak connection.
Blinks once, short break after.	Poor connection.

3.2. **Z1-Z4:** INPUT STATUS INDICATOR

Indicator state	Explanation
Out.	Input is not triggered
Continuously On.	Input is triggered

3.3. **MODE:** SYSTEM OPERATION MODE INDICATOR

Indicator state	Explanation
Out.	No power supply or system failure.
Continuously On.	System is operative, disarmed, no zone sensors have been triggered.
On with short breaks.	System is operative, disarmed, but one or more zone sensors have been triggered.
Blinking with low frequency (once in 2-3 sec.).	System is operating in armed mode.
Blinking more frequently than once a second.	System is in alarm state, siren is active, call or SMS is sent. If SMS is sent, indicator blinks a little bit slower (about twice a second).
Blinking very rapidly for 2-3 sec.	SMS instruction or DTMF command receipt confirmation.

3.4. **ALARM:** ALARM MODE INDICATOR

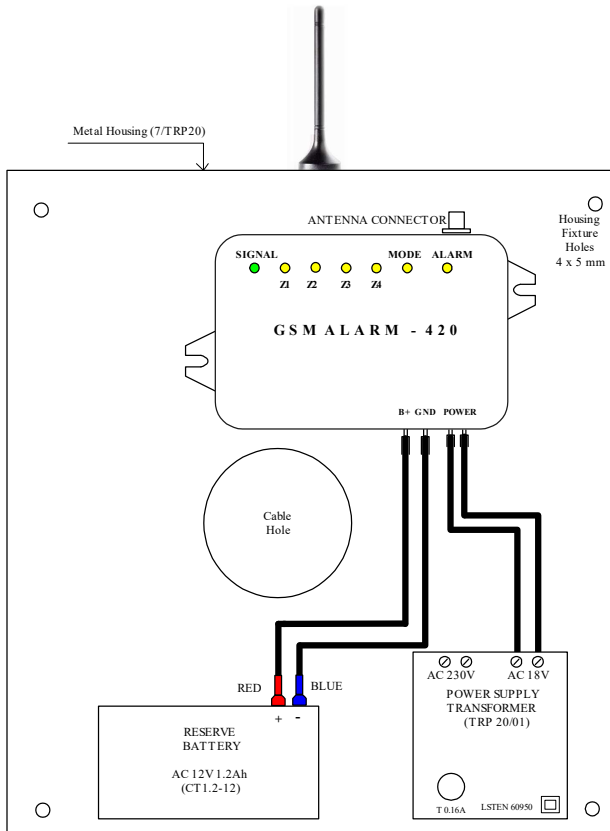
Indicator state	Explanation
Blinks at a permanent rate.	System is in alarm state, call is made or SMS sent.
Blinks twice every 2-3 seconds.	ALNRN1 number has not been programmed. In order GsmAlarm-420 could make calls, this number need to be programmed!

4. INSTALLATION

According to manufacturer recommendations, hire qualified security system specialist (or company) to perform system installation works. Self-dependent installation of the system can be performed only if person possess basic knowledge in electricity and electronics, otherwise device might be irrecoverably damaged.

4.1. INSTRUCTION FOR PREMISES PROTECTION INSTALLATION

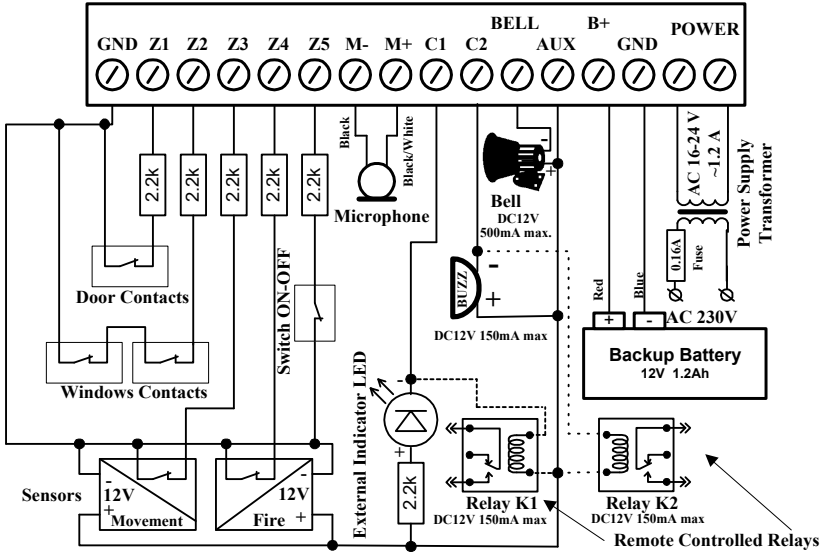
System should be assembled in metal housing 7TRP20 as recommended. Antenna is fixed on the top of outer side of metal housing.



Layout of system elements in 7TRP20 type housing

Use double isolated cable 3x0,75 mm² for 230V power supply. Circuit breaker or other surge protection device should be installed in the 230V power line.

It is recommended to use standard motion (e.g., SRP-300) and fire (e.g., EA318-4) sensors in protected zones, use standard 6-8 wired single core cable designed for installation of security systems. Siren DC12V 500mA (e.g., Odyssey 1E) is recommended for sound alarm, use double isolated cable 2x0,75 mm² to connect it to the system. Reserve battery must be PB-acid (e.g., CT1,2-12).



Wiring diagram for premise protection

In armed mode inputs Z1-Z5 must be loaded with 2,2kΩ resistors. It is recommended to install resistors in the most distant point of the line, close to sensor. This will guarantee alarm activation in case of short circuiting or breaking of sensor circuit. If external LED *MODE* is not in use, remote control relay can be connected to contact C1.

LED must be installed withindoors in a prominent place. *LED* state indicates system operation mode status, if all protected zones are closed before switching on armed mode.

User can arm/ disarm system with short call from user mobile phone (parameter F should be F51 or F41, see Ch. 5.3.2.3). Please note, if trying to call the system in alarm state, deactivation is not possible, therefore it is recommended to use switch *ON-OFF* designed for activation/ deactivation of armed mode. The switch can be connected to any zone instead of sensor contacts. Zone, designated for sensor connection must operate in *ON/OFF* mode (A33, see Ch. 5.3.1.2). Armed mode is activated if there is open circuit in switch contacts. Armed mode is deactivated by closing circuit in switch contacts.

It is recommended to install remote control relays into sockets (e.g., F95913) which can be easily fixed to metal housing. Operating current of relay coil can not exceed 150mA max. (e.g., F4031-12). Relays are selected depending on desirable commutative voltage and current.

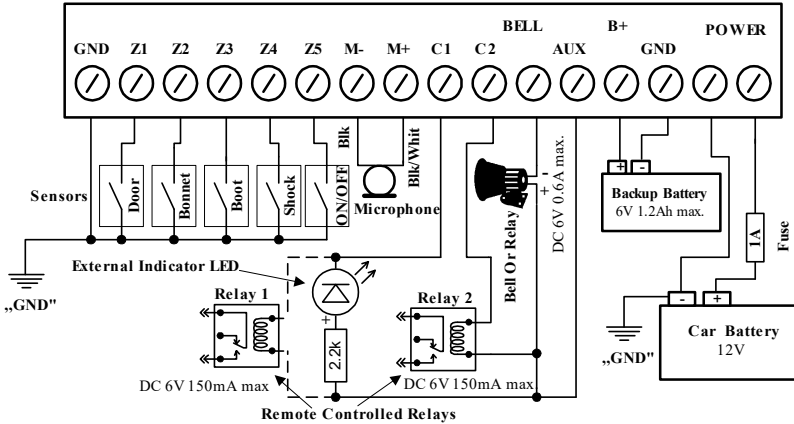
The *LED* indicator is optional, but it helps to determine the operating mode of the system and confirm closure of all protected zones before activation of the protection mode, etc. *LED* indicator should be installed in a prominent location inside the premises.

When the system operates the gate control mode, the power supply transformer and the backup battery are connected according to the wiring diagram of premise protection. The remote control Relay 1 is connected to the terminals C1 and AUX. The gate control system is connected to the relay

switch terminals. The outputs C2 and BELL can also be used for gating control. Programming of the gate control mode of the device is described in Chapter 5.5.

4.2. INSTRUCTION FOR CAR ALARM INSTALLATION

GsmAlarm-420 can be installed in all types of vehicles with petrol or diesel engines, 12V negative earth batteries (negative pole connected to vehicle frame). System must be installed in the passenger compartment of vehicle according to the given instructions of installation.



Wiring diagram for vehicle protection

GsmAlarm-420 must be installed inside the vehicle passenger compartment in difficult access area. Mount the device in place free from penetration of moisture and other corrosion - causing materials, as far away as possible from heating elements in the passenger compartment and sources of electromagnetic interference (vehicle computer, conditioner, block of relays). Avoid mounting system unit directly onto metal parts of vehicle to prevent accumulation of condensate in the system unit. Mount "GsmAlarm-420" in a way wire connectors are going from the bottom side of the unit. Avoid placing wires adjacent to moving or hot parts of vehicle. Reserve 6V battery must be accurately fixed close to "GsmAlarm-420" device. Use plastic fixing belts for fastening. Mount the battery in place free from penetration of moisture and other corrosion - causing materials, as far away as possible from heating elements in the passenger compartment. Operating voltage of battery must be 6 V, system must operate in 6 V mode. Instructions for system reprogramming to vehicle mode described in chapter 6.2.

Main power to GsmAlarm-420 is supplied (clamp „POWER“) from car battery through 1A standard 5x20 mm fuse, mounted in isolated block PTF/80A. Fuse must be mounted as close as possible to car battery. Use heat (to +150 °C) and cold (to -60 °C) resistant isolated 0,56 mm² diameter red wire (SPEC 55) to connect „+“ to system power supply. Other system power supply clamp must be connected to car frame "earth" in nearest most convenient point.

Connect inputs Z1-Z4 to relevant car contactors; input Z5 is used for system arming/disarming. All outputs in the car mode are working in a zero-one mode; therefore no 2,2kΩ resistor loads are needed.

6V battery supplies power to relay and siren (contact AUX).

4.3. SYSTEM OPERATION SET UP

SIM card is needed for GsmAlarm-420 operation, you may acquire it from any GSM service provider.

Before inserting SIM card into GsmAlarm-420 SIM card holder set PIN code request off. It can be performed simply inserting SIM card into any standard mobile phone and following certain phone user manual instructions.

After system circuit is connected according diagrams showed in chapter 4.1 or 4.2, place SIM card into GsmAlarm-420 SIM card holder, turn system power on, then wait till indicator *SIGNAL* will start to blink periodically and indicator *MODE* will be constantly alight. In case *SIGNAL* is constantly alight, check if SIM card's PIN code request is off and GSM antenna is connected. GSM signal quality can be evaluated according the blinking frequency of *SIGNAL* indicator. Connection is very good if it blinks 4 or 5 times with 2 seconds breaks after. *SIGNAL* indicator blinking fewer times, indicates weaker connection. Position of GSM antenna might be changed in order to improve signal quality.

Perform system programming when armed mode is disabled (ON/OFF contacts are closed). Protected zones must be closed (indicators *Z1 – Z4* are off, *MODE* and *LED* constantly alight).

5. PROGRAMMING

GsmAlarm-420 parameters can be divided into two groups. First group – user phone numbers which are stored in SIM card memory. User phone numbers can be programmed by using standard mobile phone of any type (see Ch. 5.2.1) or remotely, sending SMS message with the phone numbers of users to GsmAlarm-420 (see Ch. 5.2.2).

Second group – parameters, defining system operation algorithms, names of protected zones and programmable outputs. These parameters are stored in the memory block of GsmAlarm-420 device. The parameters of the system can be programmed by sending SMS message (see Ch. 5.3). It is recommended to change the SMS password at the end of programming (see Ch. 5.4)

If GsmAlarm-420 is used for protection, five user numbers can be programmed: *ALNR1*, *ALNR2*, *ALNR3*, *ALNR4* and *ALNR5*. These users can arm/ disarm the system, calls will be directed and SMS messages will be sent to these users. If only one user exists, he must be programmed under *ALNR1*. GsmAlarm-420 will send SMS messages to this specific user in case of main power supply loss or if an unknown number calls the system. If armed mode is turned on or off by turning the switch ON/OFF GsmAlarm-420 dials and SMS messages are also directed to the first user. Other four user numbers are not obligatory.

In case GsmAlarm-420 is used only for gate control it is not necessary to program *ALNR1*-*ALNR5*. Up to 250 user numbers, with the possibility to control the outputs *C1*, *C2*, and *BELL* with a short call, can be programmed in this case. Any name can be ascribed to user. Output operation mode has to be *M04* or *M05* (see Ch. 5.3.2.1).

After programming of user numbers - programmed system parameters, names of inputs and outputs (see Ch. 5.3).

5.1. USER NUMBER PROGRAMMING WITH STANDARD MOBILE PHONE

Insert SIM card into a standard mobile phone. Enter user name into SIM card number book using capital letters e.g. *ALNR1* and corresponding phone number. We recommend enter the number with international code. (E.g. +370....)

If GsmAlarm-420 is used for gate control, number of extra user numbers can be as large as fits into the SIM card (up to 250). Any name can be ascribed to user.

Important:

It's important to note that while programming SIM card memory should be active (not phone memory!). Otherwise the user number will be recorded in the mobile phone memory used for programming and the SIM card will remain empty.

After having programmed all user numbers, it is recommended to check whether SMS service centre number is programmed. Simplest way to check: send any SMS from the phone used for programming. If it is sent successfully we can be sure that SMS centre number has been programmed correctly. Otherwise, program SMS centre number following the mobile phone's user manual. SMS centre number can be learnt from GSM service provider.

After completion of programming and checking whether SIM card PIN code request is switched off, take the SIM card off from the mobile phone.

5.2. USER NUMBER PROGRAMMING WITH SMS

Switch on the system power source and wait for periodical blinking of *SIGNAL* indicator and *MODE* constantly On.

In order to program the main user numbers, send the following SMS from any mobile phone into GsmAlarm-420:

A	A	A	A	A	A	A	A	A	L	R	N	R	1	:	+	3	7	0	6	1	2	3	4	5	6	7	8	9		A	L	R	N	R	2	:	
+	3	7	0	6	1	2	3	4	5	6	7	8	9		A	L	R	N	R	3	:	+	3	7	0	6	1	2	3	4	5	6	7	8	9		
A	L	R	N	R	4	:	+	3	7	0	6	1	2	3	4	5	6	7	8	9		A	L	R	N	R	5	:	+	3	7	0	6	1	2	3	4
5	6	7	8	9																																	

AAAAAAA: eight digit alphanumeric SMS password, which is obligatory in the beginning of each SMS. Manufacturer-programmed password is AAAAAAAA. User can change the password on his own desire (see Ch.5.4).

ALRNR1 ... ALRNR5: user numbers.

Important:

- No characters/spaces can be used before the password;
- No spaces are allowed before and after the colon;
- Spaces must follow the password and each phone number;
- It is recommended to enter user numbers with international code (e.g. +123...).

It is not necessarily to send all user numbers. E.g., in order to programme only the first user number, send the following SMS:

A	A	A	A	A	A	A	A	A	A	L	R	N	R	1	:	+	3	7	0	6	1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Receipt and decrypting of the SMS by GsmAlarm-420 is confirmed by blink of indicator *MODE*. The phone, which has sent the programming SMS, immediately receives a confirming SMS with programmed numbers.

In order to delete unnecessary number, send the following SMS:

A	A	A	A	A	A	A	A	A	L	R	N	R	2	:	N
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Number ALRNR2 is deleted, user receives SMS with programmed numbers. In order to replace one number with another, no separate instruction for deletion needs to be sent.

In order to receive SMS with programmed numbers ALRNR1 ... ALRNR5, send GsmAlarm-420 the following SMS:

A	A	A	A	A	A	A	A	A	N	R	I	N	F	O
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Extra user numbers (only for gate control) are programmed by sending the following SMS:

A	A	A	A	A	A	A	A	A	D	D	N	R	:	+	3	7	0	1	2	3	4	5	6	7	8	9	1		A	D	D	N	R	:	+	3	7
0	7	0	1	2	3	4	5	6	7	8	9	2																									

ADDNR: – new number entering instruction.
+3701234567891 – new user number.

Up to 8 user numbers might be programmed with one SMS message.

If number was programmed successfully, the user, who sent the message, receives SMS with newly programmed number. In this case the confirmation message will be:

USER1:+3701234567891	USER2:+3701234567892	USER3:+3701234567893
----------------------	----------------------	----------------------

USR1 – name, assigned to the new number.

In order to delete the extra user number, send to GsmAlarm-420 the following message:

A	A	A	A	A	A	A	A	D	E	L	N	R	:	+	3	7	0	1	2	3	4	5	6	7	8	9	1	D	E	L	N	R	:
+	3	7	0	1	2	3	4	5	6	7	8	9	2	D	E	L	N	R	:	+	3	7	0	1	2	3	4	5	6	7	8	9	3

Specified numbers will be deleted and user receives the confirming SMS:

DELET:+3701234567891	DELET:+3701234567892	DELET:+3701234567893
----------------------	----------------------	----------------------

Up to 8 user numbers might be deleted with one SMS message.

In order to receive SMS message indicating all programmed numbers, following message must be sent to GsmAlarm-420:

A	A	A	A	A	A	A	A	N	R	L	I	S	T
---	---	---	---	---	---	---	---	---	---	---	---	---	---

User receives one or more SMS messages with all programmed numbers listed.

Note! Up to 8 user numbers can be sent in one SMS message. If 250 numbers are programmed GsmAlarm-420 will send 32 SMS messages!

5.3. SYSTEM PARAMETER PROGRAMMING WITH SMS

All GsmAlarm-420 input and output operation modes, delay times and names can be programmed with the help of SMS. First of all, it is recommended to receive SMS with programmed parameters and then to send the same SMS with corrected parameters back to GsmAlarm-420.

5.3.1. PROTECTED ZONES Z1-Z5 PARAMETER PROGRAMMING

In order to receive SMS with input Z1 – Z5 parameters, send GsmAlarm-420 the following SMS:

A	A	A	A	A	A	A	Z	P	A	R	A	M
---	---	---	---	---	---	---	---	---	---	---	---	---

SMS can be sent from any GSM phone, not necessarily the user's. GsmAlarm-420 confirms receiving the message with frequent blinking of MODE indicator and sends SMS message including input parameters Z1- Z5. Received message will look as follows:

AAAAAAA Z1:M70T20A20 Door, Z2:M70T00A20 Windows,
Z3:M70T00A20 Movement, Z4:M71T00A20 Fire, Z5:M02T00A20 OFF,

AAAAAAA: password.

Z1: protected zone input number.

M70: parameter defines system response to the violation of protected zone and which users are informed if certain zone sensors are triggered (see Ch. 5.3.1.1).

T20: delay time after triggering (in seconds), if system is in armed mode. After relevant input is triggered, the system switches siren on and sends SMS only after expiration of the given delay time.
Possible values: 0...99 seconds.

A20: input operation mode, parameter A (see Ch. 5.3.1.2).

Door, Windows, Movement, Fire, ON-OFF: input names, which are seen in the SMS after alarm triggering. User can change the name of zone under his own discretion. Maximum number of name characters: 11.

5.3.1.1. PARAMETER M

Alarm state after input triggering	MXY		Input operation mode
	X	Y	
All functions, described below, are deactivated.	0	0	Input with programmable delay time. *
Siren is operating.	1	1	24 hour input. **
Calling.	2	2	Fire sensor connection input ***
Siren is operating and calling.	3	3	ON/OFF zone. ****
Sending SMS message.	4	-	Follow zone. *****
Siren is operating and sending SMS message.	5	-	-
Calling and sending SMS message.	6	-	-
Siren is operating, calling and sending SMS message.	7	-	-

* *Input with programmable delay time.* After relevant zone is being triggered, the system will switch alarm on only if armed mode is active, after expiration of the given delay time T.

** *24 hour input.* After relevant zone is being triggered, the system switches alarm on with no respect to armed mode (ON/OFF), siren operates constantly, delay time is ignored.

*** *Fire zone mode.* 24 hour input, siren is operating with interruptions.

**** *Zone ON/OFF.* Mode designated to turn armed mode on/off.

***** *Follow zone.* After violation of this zone alarm goes on immediately, if other zone with delay isn't violated. If firstly zone with delay is violated (for example, doors are opened), "follow" zone receives delay time of earlier violated zone. It is recommended to apply this mode to motion sensor zone, if sensor is installed before the entry doors to the room.

5.3.1.2. PARAMETER A

Input triggering conditions	AXY		Users, getting information about zone violation
	X	Y	
Zero-one mode, active level: low (GND).	0	0	All (ALRNR1-ALRNR5).
Zero-one mode, active level: high (+12V or open contact).	1	1	Only user ALRNR1.
Loaded input mode, 2,2kΩ load required.	2	2	Only user ALRNR2.
-	-	3	Only user ALRNR3.
-	-	4	Only user ALRNR4.
-	-	5	Only user ALRNR5.
-	-	6	Users ALRNR1 and ALRNR2.
-	-	7	Users ALRNR1, ALRNR2 and ALRNR3.
-	-	8	Users ALRNR1, ALRNR2, ALRNR3 and ALRNR4.

5.3.2. PROGRAMMING OF PARAMETERS FOR OUTPUTS C1, C2, BELL AND COMMON SYSTEM PARAMETERS E, F, T, U

In order to receive an SMS message with parameters of outputs *C1*, *C2* and *BELL* and the common system parameters, send the following message to GsmAlarm-420:

A	A	A	A	A	A	A	C	P	A	R	A	M
---	---	---	---	---	---	---	---	---	---	---	---	---

Reception of the message is confirmed by blinking of the GsmAlarm-420 indicator *MODE*. The system will send an SMS with the current system and output parameters to the user:

AAAAAAA C1:M02T05 OutC1, C2:M05T05 OutC2, C3:M06T02 Siren, PR:E24F11L01T20U12,

C1: number of a programmable output. *C3* corresponds to the siren output *BELL*.

M02: output operation mode (see Ch. 5.3.2.1).

T05: output operation time. For outputs *C1*, *C2*: in seconds, for the output *C3 (BELL)*: in minutes.

OutC1, OutC2 and Siren: programmable output names. A user can change the name under his own discretion. Maximum number of name characters: 10.

PR:E24F11L01T20U12

PR: command for programming the common system parameters.

E24: the method to inform the user about activation/deactivation of the armed mode. The user can be informed by a short call or an SMS message (see Ch. 5.3.2.2).

F11: system response to incoming calls, user information of communication breakdown, and the number of calls in the alarm state (see Ch. 5.3.2.3).

L01 - this parameter allows turning off light indicators on the housing of GsmAlarm-420 (SIGNAL, Z1, Z2, Z3, Z4, MODE, ALARM). Possible values:
 L01 - LED indicators are activated;
 L00 - LED indicators are deactivated.

T20: delay time after armed mode activation. Possible values: 00 – 99 seconds.

U12: reserve battery voltage. (see Ch. 5.3.2.4) Possible two values.
U12: system is operating in 12V (premise protection) mode, output AUX and battery charging voltage is 13.7V.
U06: system is operating in 6V (automobile) mode, output AUX and battery charging voltage is 6.8V.

5.3.2.1. OUTPUT C1, C2 AND BELL OPERATION MODE

Output mode	Explanation of operation
M00	Not in use.
M01	Output controlled by DTMF or SMS instructions. If zero operation time is programmed (T00), output is activated/deactivated and remains in the same state after receiving DTMF or SMS instruction. If not zero operation time is programmed, after receiving DTMF or SMS instruction, output is activated, it deactivates automatically after expiration of the programmed time.
M02	LED mode. Output is in operation together with MODE indicator.
M03	Output is activated, when system is armed. Open contact, when system is disarmed.
M04	Control by short call without number recognition function. Output is activated with a call from any number. If zero operation time is programmed (T00), output state changes after a call and remains unchanged till the next short call. If not zero operation time is programmed, after receiving short call instruction output is activated, it deactivates automatically after expiration of the programmed period.
M05	Control by short call with number recognition function (gate control mode). This mode operates analogue to M04, thus it is activated only if short call number coincides with programmed numbers.
M06	Siren mode. Valid only for output <i>BELL (C3)</i> .
M07	Siren mode with audible confirmation. After arming, one short audible sound is heard. After disarming, two short audible sounds are heard. Valid only for output <i>BELL (C3)</i> .
M08	Miniature siren (buzzer) mode (see Ch. 7.1).
M09	Output is activated if GSM connection is absent for over 30 seconds in the protection mode. After connection is re-established or protection mode deactivated, the output is also deactivated. When the connection is normal, the output operates in the same way as in mode M01.

Outputs are controllable in armed and disarmed modes.

5.3.2.2. *PARAMETER E* : INFORMING USER ABOUT ARMING AND DISARMING

System response to switching the armed mode ON	EXY		System response to switching the armed mode OFF
	X	Y	
All functions below are deactivated.	0	0	All functions below are deactivated.
User is informed by SMS.	1	1	User is informed by SMS.
User is informed with a short call.	2	2	User is informed with a short call.
-	-	4	If during the period of one minute after disarming by call no change in the input state is found, system automatically returns to "armed" mode.

Note! If several functions have to be operative, sum of the numbers is used. E.g.: for all three *Y* functions to be active, *Y* value must be 7 (1+2+4=7).

5.3.2.3. **PARAMETER F : SYSTEM RESPONSE TO INCOMING CALLS AND NUMBER OF CALLS IN ALARM MODE**

System response to incoming call	EXY		Number of the calls in alarm mode
	X	Y	
All functions below are deactivated.	0	0	-
If a call is received from unknown caller, user ALNRN1 will receive a SMS with caller's number.	1	1	After alarm triggering, users will be called once.
If calling from user's number, after 3-4 calls the system will pick up, armed mode will remain on.	2	2	After alarm triggering, users will be called twice.
The user ALNRN1 receives an SMS message, if GSM connection was lost for more than 30 seconds. The message is sent only when in armed mode.	4	4	If call received not from ALNRN1-ALNRN5, thus the calling number is in SIM card (gate control mode), system answers the call after 3-4 signals, and user can control the system with DTMF instructions. Call automatically cancelled after 1 minute passes.

Note! If several functions have to be operative, sum of the numbers is used. E.g.: for all three *X* functions to be active, *X* value must be 7 (1+2+4=7).

5.3.2.4. **PARAMETER U : RESERVE BATTETY VOLTAGE**

In the case of use of GsmAlarm-420 for car protection, it is recommended to use not 12V, but 6V reserve battery. This will assure reliable charge of reserve battery, independently of the car battery voltage.

U12: system operates in 12V (premise protection) mode, reserve battery voltage 12V

U06: system operates in 6V (car protection) mode, reserve battery voltage is 6V.

5.4. SMS PASSWORD CHANGE

In order to change manufacturer-programmed SMS password, send GsmAlarm420 the following message:

A A A A A A A A P A S S W : A B C D e f g h

AAAAA – old SMS password.

PASSW – password changing instruction.

ABCDefgh – new SMS password. Password must be 8 characters long!

Note! No characters/spaces can be used before password, space must follow the password.

If programming instruction is executed successfully, user gets a confirming SMS message with the new SMS password.

5.5. PROGRAMMING OF GATE CONTROL MODE

Connect the system after the wiring diagram presented in Chapter 4.1. To program GsmAlarm-420 to operate in the gate protection mode connect it to a power supply and send it the message with the command AAAAAAAA CPARAM (see Ch 5.3.2). When output C1 is used for gate control, change the output parameter M02 to M05 in the received message and send it back to the device with the modified parameter. Operation mode of the outputs is described in Chapter 5.3.2.1 (M05 or M04). Output response time is determined by the value of parameter T. When another output is used for gate control, it is programmed in the same fashion.

Send the following SMS from any mobile phone to GsmAlarm-420: AAAAAAAA ZPARAM (see Ch. 5.3.1.).

Change parameter A values of all zones to 00 and send the message with the modified parameters back to GsmAlarm-420 device.

Setup of user telephone numbers is described in Ch 5, 5.1, 5.2, and 7.3 (ADDNR: DELNR: NRLIST:)

Important! Two identical telephone numbers cannot be programmed under different names!

The command *NRLIST* is used for review of the numbers (see Ch. 5.2).

6. RESETTING SYSTEM PARAMETERS TO FACTORY DEFAULTS

In order to return all system parameters back to default settings, connect contacts RESET with the help of flat screwdriver and wait till LEDs Z1-Z4, MODE and ALARM are on (5-6 seconds). During such connection system has to be powered. System parameters are set to values denoted in chapter 6.1.

Only the parameters stored in the internal memory module system can be reprogrammed using this method. User numbers stored in SIM card will not be erased.

6.1. PREMISES PROTECTION MODE FACTORY DEFAULTS

Input parameters					
Input	Name	Parameter <i>M</i>	Delay time T	Parameter <i>A</i>	
<i>Z1</i>	<i>Door</i>	<i>M70</i>	<i>T20 (sec.)</i>	<i>A20</i>	
<i>Z2</i>	<i>Windows</i>	<i>M70</i>	<i>T00 (sec.)</i>	<i>A20</i>	
<i>Z3</i>	<i>Movement</i>	<i>M70</i>	<i>T00 (sec.)</i>	<i>A20</i>	
<i>Z4</i>	<i>Fire</i>	<i>M72</i>	<i>T00 (sec.)</i>	<i>A20</i>	
<i>Z5</i>	<i>ON/OFF</i>	<i>M03</i>	<i>T00 (sec.)</i>	<i>A20</i>	
Output parameters					
Output	Name	Parameter <i>M</i>	Operation time T		
<i>C1</i>	<i>OutC1</i>	<i>M02</i>	<i>T05 (sec.)</i>		
<i>C2</i>	<i>OutC2</i>	<i>M08</i>	<i>T05 (sec.)</i>		
<i>C3 (BELL)</i>	<i>Sirena</i>	<i>M06</i>	<i>T02 (min.)</i>		
Common system parameters					
SMS Password	Parameter <i>E</i>	Parameter <i>F</i>	Parameter <i>L</i>	Delay time T	Parameter <i>U</i>
<i>AAAAAAA</i>	<i>E24</i>	<i>F11</i>	<i>L01</i>	<i>T20 (sec.)</i>	<i>U12</i>

6.2. CAR PROTECTION MODE FACTORY DEFAULTS

In order to program car mode parameters:

- a) return to default settings as already described (connect RESET contacts);
- b) send GsmAlarm-420 message **AAAAAAA CPARAM** and receive SMS with programmed parameters;
- c) change parameter **U12** into **U06** and send the same SMS to GsmAlarm-420.

Input parameters					
Input	Name	Parameter <i>M</i>	Delay time T		Parameter <i>A</i>
<i>Z1</i>	<i>Door</i>	<i>M70</i>	<i>T00 (sec.)</i>		<i>A00</i>
<i>Z2</i>	<i>Bonnet</i>	<i>M70</i>	<i>T00 (sec.)</i>		<i>A00</i>
<i>Z3</i>	<i>Boot</i>	<i>M70</i>	<i>T00 (sec.)</i>		<i>A00</i>
<i>Z4</i>	<i>Shock</i>	<i>M70</i>	<i>T00 (sec.)</i>		<i>A00</i>
<i>Z5</i>	<i>ON/OFF</i>	<i>M03</i>	<i>T00 (sec.)</i>		<i>A00</i>
Output parameters					
Output	Name	Parameter <i>M</i>	Operation time T		
<i>C1</i>	<i>OutC1</i>	<i>M02</i>	<i>T05 (sec.)</i>		
<i>C2</i>	<i>OutC2</i>	<i>M05</i>	<i>T05 (sec.)</i>		
<i>C3 (BELL)</i>	<i>Siren</i>	<i>M06</i>	<i>T02 (min.)</i>		
Common system parameters					
SMS Password	Parameter <i>E</i>	Parameter <i>F</i>	Parameter <i>L</i>	Delay time T	Parameter <i>U</i>
<i>AAAAAAA</i>	<i>E24</i>	<i>F11</i>	<i>L01</i>	<i>T06 (sec.)</i>	<i>U06</i>

7. SYSTEM CONTROL

Five users can fully control GsmAlarm-420: *ALNRN1* - *ALNRN5*. In the case of violation of any area, these users are called in a row. If neither responds, all users are sent SMS with triggered area name and number of triggers. The word YES near area name means that the area during SMS sending was triggered. Number in the parenthesis shows number of area triggers.

User who picks up, according to the audible sound sequence, can learn which area has been triggered, E.g., if one short tone is heard every second, Z1 area has been triggered, if 1 short and after a 1 s sequence of three short signals are heard, Z1 and Z3 areas have been triggered. By entering relevant code on mobile phone keyboard, user can control the system remotely: switch the commutated devices on/off, switch microphone on and listen what is going on in the premises, ask for SMS with parameters of protected areas and commutated devices etc. If at least one user picks up, GsmAlarm-420 stops calling and sending SMS to the rest users.

User *ALNRN1* receives SMS, in the case of power failure, when switch *ON/OFF* is used to arm or disarm alarm system, or when GsmAlarm-420 is called from unrecognized number.

Other users (not *ALNRN1* ... *ALNRN5*), whose numbers are programmed in the SIM card, can control outputs *C1*, *C2* and *BELL* (open the gates, doors with electromagnetic lock etc.) with brief calls. Output operation mode has to be *M04* or *M05* (see Ch. 5.3.2.1) In this case the system automatically cancels the call and in the case number is accepted, switches the controlled device on or off.

GsmAlarm-420 responds to area violations only in armed mode (except the case when the input operates in 24-hour mode). Armed mode can be switched on only if all the areas are untriggered (MODE LED is permanently on). If MODE is on with short breaks, some of the areas is active (open window, doors, etc.).

Armed mode can be switched on and off in two ways: with the *ON/OFF* switch or remotely, from user's mobile phone.

7.1. ARMING/ DISARMING WITH *ON/OFF* SWITCH

Turning of *ON/OFF* switch to “active” position (breaking contact circuit) initiates count-down of the delay time. When a miniature siren is deployed, the user hears short audible signals, repeating every second. When 10 seconds are left until activation, audio signals are repeated every 0.5 seconds. If all zones are in inactivated state after delay time is up, the system goes into protection mode, and the miniature siren emits a continuous, one second long signal. User *ALNRN1* receives a short confirmation call or SMS. Termination of the confirmation call is not required as it is cancelled automatically.

Protection mode can be turned off by closing contacts of the switch. Count-down of the entry delay time is started after entry to the premises. If a miniature siren is used, short repeating signals are heard every 0.3 seconds. If protection mode isn't switched off after expiration of the delay period, system goes to the “alarm” mode. The miniature siren operates together with the main siren.

Switch the armed mode off by connecting switch contacts. If the system is inactive and 24-hour zone is triggered, switch the siren off and cancel calling by putting the *ON/OFF* switch into open contacts position and, after 2-3 seconds, returning to closed contacts position.

7.2. ARMING/ DISARMING REMOTELY

Armed mode can be activated by short, free call. In order to switch the armed mode on, user calls GsmAlarm-420 number and, hearing the first signal, cancels the call. In this case no switch-on delay time is countdown. After the armed mode is on, user receives a short confirmation call or SMS. Don't cancel the confirmation call because it is cancelled automatically.

Switch the armed mode off by calling GsmAlarm-420 number and waiting for the system cancels the call (3-4 call signals).

Check whether the alarm is operating by short call to GsmAlarm-420 number. If GsmAlarm-420 is in operation, user receives a short confirmation call.

7.3. CONTROL USING DTMF AND SMS INSTRUCTIONS

In the speech mode user can control the system, after having entered relevant code from his phone keyboard. Instruction consists of two digits, it is entered by pressing asterisk key. If the instruction is completed, user hears three tone confirmation signals. If given instruction has already been executed earlier (e.g. you want to switch on the commutator, that is already ON), user hears one tone confirming signal.

Speech mode can be activated in two ways: user answers when GsmAlarm-420 calls, or user calls and waits for GsmAlarm-420 to answer (3-4 call signals). In this case relevant parameter *F* has to be programmed (see Ch. 5.3.2.3), otherwise, after 3-4 calling signals, the arming mode will be switched off and the call will be cancelled.

The control instructions may be given by SMS. Insert password in the beginning, then type the instruction. E.g., in order to switch on commutator *C1*, to switch off commutator *C2*, to switch on *BELL* and to receive a SMS with information on the status of the protected site, send the following SMS:

A	A	A	A	A	A	A	A	1	1	*	2	0	*	3	3	*	9	9	*
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

DTMF command	Result
00*	System disarming
11*	Activates output C1
10*	Deactivates output C1
22*	Activates output C2
20*	Deactivates output C2
33*	Activates output BELL
30*	Deactivates output BELL
55*	System arming
66*	Activates external microphone
60*	Deactivates external microphone
88*	Request to send SMS with information about GSM signal strength and power supply voltage.
99*	Request to send SMS about state of the system and protected zones.

SMS and DTMF control instructions

SMS instruction	Result
<i>ZPARAM</i>	Request to send SMS message with input Z1-Z5 parameters.
<i>CPARAM</i>	Request to send SMS message with output C1, C2 and BELL parameters.
<i>NRINFO</i>	Request to send SMS message with user numbers of security system ALRNR1 – ALRNR5.
<i>PASSW:</i>	SMS password change instruction.
<i>ALRNR1:</i> <i>ALRNR2:</i> <i>ALRNR3:</i> <i>ALRNR4:</i> <i>ALRNR5:</i>	System users number programming instructions.
<i>ADDNR:</i>	Gate control mode users number programming instructions.
<i>DELNR:</i>	Gate control mode users number erasing instructions.
<i>NRLIST</i>	Request to send SMS message (messages) with all numbers stored in SIM card.

SMS instructions, for system programming and diagnostics

8. WARRANTY

MANUFACTURER AND DISTRIBUTOR is not responsible for possible theft from GsmAlarm-420 protected premises or vehicle. GSM service operators are not associated to company “UAB Elektroninės Technologijos”, therefore, company takes no responsibility for GSM network services, coverage and functioning.

GsmAlarm-420 system PROVIDED with 36 month warranty. Warranty period starts with purchase date. If there are no purchasing documents, period counted starting from system manufacturing date (dated on security system identification label). Warranty is not valid if system: is reconstructed; wrongly assembled; used not on purpose; mechanical, chemical, electric damage and in other cases that are not related with GsmAlarm-420 manufacturing defects are seen.

If security system is not operating properly or breaks down, for guarantee or post-guarantee service, please contact company that performed assembling and installation of the system. Practice shows that main system operation failure reason is incorrectly performed system assembling.



Company “Elektroninės technologijos“ declares, that product “GsmAlarm-420” satisfies all essential requirements of standard EN 60950–1:2003 following European Union directive 2006/95EC.

The declaration of conformity may be consulted at www.eltech.lt

9. TECHNICAL CHARACTERISTICS

GSM MODULE	
Operation frequency	EGSM-900 MHz DCS-1800 MHz
MAIN POWER SUPPLY (connected to terminal “AC “)	
Power supply voltage in premises protection mode	AC 16-24V
Frequency	50/60Hz
AC Power supply voltage in car protection mode	DC 12V
Maximum current in premises protection mode	~1.2A max
Maximum current in car protection mode	--- 1.2A max
RESERVE BATTERY (connected to terminals “B+ “ and “GND“)	
Voltage in premises protection mode	DC 12V
Voltage in car protection mode	DC 6V
Reserve battery type	PB - acid
Reserve battery capacity	1.2 Ah max
OUTPUT“AUX “ (FOR EXTERNAL DEVICES)	
Output voltage in premises protection mode	DC 12V
Output voltage in car protection mode	DC 6V
Maximum current	--- 1 A max
Short circuit protection triggering current	--- 2 A max
SIREN OUTPUT “BELL” (C3)	
Maximum current	0.6 A max
Output active (siren is on)	Connected to GND
Output non-active (siren is off)	Open contact
PROGRAMMABLE OUTPUTS C1, C2	
Maximum current	150 mA max
Output active	Connected to GND
Output non-active	Open contact
INPUTS Z1 – Z5	
Load resistance (“loaded input” mode only)	2,2 kΩ, ±10 %
POWER CONSUMPTION (without external sensors and keypad)	
Non-activated state	40 mA max
Call, sending SMS or speech mode	300 mA max
OPERATING TEMPERATURE	
DIMENSIONS	-20°C...+55°C
	135x85x35 mm

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