me**tis** Micro

GSM ALARM TRANSMISSION AND CONTROL DEVICE

INSTALLATION AND USER MANUAL

V1.6

Global Safety & Security Solutions Oy
www.globalsafety.fi

1 – FEATURES AND TECHNICAL INFORMATION

1.1 Description of operation

metis Micro is a GSM-based alarm and remote control device. The device is designed to send information from alarm inputs via SMS and phone calls to predefined receivers. The receiver is typically either a mobile phone or an application server in a guarding center.

Many different kinds of detectors can be connected to metis Micro for alarm or measurement information (burglar alarm systems, IR-detectors, a temperature detector etc.). The device can also be remotely controlled to for example turn on or off heating or lighting.

1.1.1 Alarm information

- Alarm / alarm settled from inputs
- Armed / disarmed information
- Tamper switch alarm / alarm settled

1.1.2 Relay

Relay control via SMS:
- on/off
- 5 seconds pulse
- pulse for given time (1...999 min.)

Alarm relay
- pulse 20s – 9 min. during alarm

1.1.3 Queries

metis Micro can be queried for, for example, inputs' status and current temperature (see 7 – Control commands).

To prevent unreasonably big phone bills metis Micro has a lock-up feature that stops the device from sending messages after factory set limits. This is designed to prevent for example a broken detector causing unlimited number of alarms.

To avoid any problem situations, devices are not allowed to be set up to send messages to each other (e.g. relay controls). The standard messages generated by the devices can cause massive communications between devices that will not be noticed until receiving the next phone bill. User must make sure that he/she is able to monitor the communication from and to the device (e.g. with a mobile phone or an automated PC-software).

Warning! Under no circumstances connect 230VAC to the device.

230V mains voltage installations can only be done by an authorized installation company.

1.2 Technical specification

Type	**metis Micro**
Version	This manual applies to v.1.0
GSM	SimCom SIM300
	900/1800/1900 tri-band GSM
Connectors	2 digital inputs
	1 output relay
Enclosure	water-resistant 130 x 80 x 35mm
Antenna	dual-band 900/1800, SMA-connector
Data transfer	SMS, call
Input voltage	+8...+24VDC, 1A
Power consumption	approximately 30mA / 400mA (peak)
Temperature range	-20...+50°C
CE-marking	According to Standard SFS-EN50130-4
Delivery package	**metis Micro**
	GSM-antenna
	installation and user manual
Manufacturer	Global Safety & Security Solutions Oy
	www.globalsafety.fi
Restrictions	This product has not been designed, intended, inspected or approved to be used in any life support related use or any other critical application
	If the device is used as a transmitter of information in any burglar alarm system, rules and regulations of any authorities and insurance companies must be followed when designing and installing these type of systems.

1.3 Restrictions

All rights to this manual are reserved and owned solely by Global Safety & Security Solutions Oy (GSSS). All information furnished herein by GSSS is believed to be accurate and reliable. However no responsibility is assumed for the accuracy and use of this document, or any possible unintentionally made damages or unforeseen direct or indirect expenses or damages, loss of business profit, income or any other gain or assumed savings that are caused by the use of this device according to these instructions.

GSSS reserves the right to change the technical specifications or functions of its products without any written announcement.

This product has not been designed, intended, inspected or approved to be used in any life support related use or any other critical application!

GSSS will not bear any responsibilities of failures in the device if as a result of misuse of the instructions, incorrect or careless use of the device, or if the device is used to any other purpose or application than it is designed for, or if the device has been exposed to humidity, dust, extreme temperatures or environment conditions or fast change of these conditions, corrosion or oxidation, or the device has been under the influence of other chemical products, or any liquid or food has been pour onto the device, or if the device has been altered or connected to other devices, or opened or prepared with spare parts that are not approved by the manufacturer, or if the device has been installed incorrectly. Or if the failure has been caused because the device has been influenced by events out of the control of GSSS, including, but not limited to deficiencies in consumer goods that have limited operating time, such as batteries or damages of antennas.

NOTE! This device is not allowed to be used in any other purpose or application than it is designed for.

If the device is used as a transmitter of information in any burglar alarm system, rules and regulations of any authorities and insurance companies must be followed when designing and installing these type of systems.

This device utilizes the GSM-standard for cellular technology and it is under same rules and regulations than mobile phones. These devices send and receive radio frequency energy. RF energy may cause some malfunctioning in some electronic equipment. Please check the laws and regulations on the use of cellular devices in the area where you use this device and check that the device will not cause any harmful consequences to other electronic devices. Do not allow children to play with the device. Children could hurt themselves or others or make unnecessary calls that increase your phone bills.

GSSS will not bare any responsibilities of the functionality of the device, if by any changes done or to be done to mobile networks by a third party, not depended on GSSS, or by any changes to SIM card versions, the functionality of the device will change, becomes difficult and/or will cease, even within the guarantee period of the device.

If the device for some reason or other, can not achieve connection to GSM network, GSSS will not bare any possible direct or indirect expenses caused by this failure.

The person installing the device must be properly educated and trained. If you are not certain about the installing of this device, contact a distributor or the manufacturer of the device. All devices must be thoroughly tested when doing implementation.

To avoid any problem situations, devices are not allowed to be set up to send messages to each other (e.g. relay controls). The standard messages generated by the devices can cause massive communications between devices that will not be noticed until receiving the next phone bill. User must make sure that he/she is able to monitor the communication from and to the device (e.g. with a mobile phone or an automated PC-software).

To avoid interfering with explosive operations turn the device OFF if a blasting area or other potentially explosive atmosphere occur.

To prevent unreasonably big phone bills metis Micro has a lock-up feature that stops the device from sending messages after factory set limits. This is designed to prevent for example a broken detector causing unlimited number of alarms.

Note! In no circumstances, the device is allowed to be connected to 230VAC voltage, because of any danger to life or danger of fire. Only authorized personnel can perform wiring to 230V electric networks.

Copying, altering and distribution of any part of this document are forbidden without written permission from the manufacturer.

1.4 Warranty and maintenance

There is a limited manufacturer's warranty and general service terms for these devices. These terms can be acquired from manufacturer.

2 – BEFORE INSTALLATION

Before installation and use of the device, check restrictions (1.3 – Restrictions)

2.1 SIM-card

metis Micro requires a SIM-card in order to function. Basically any service provider's SIM-card works, but there are certain limitations and recommendations:

REQUIREMENTS / RECOMMENDATIONS:
+ SMS and voice communication (minimum requirement)
+ secret number (prevents unnecessary calls to the device, optional)
+ prevention of advertisement SMS (prevents unnecessary SMS', optional)
+ GSM-data -feature* (enables quick support service, optional)
+ account limit (to prevent excessive messaging due to humane errors during installation)

FEATURES NOT RECOMMENDED:
- prepaid SIM-cards (limited operating time)
- call divertion or caller indication prevention

GSM-data feature is not the same as GPRS. GSM-data means traditional 9600bps data service (CSD). For more information, contact your service provider.

The SIM-card must be cleared from all numbers and messages. PIN-code query must also be turned off. Instructions to these procedures can be found from your mobile phone's manual. For more information contact your retailer.

RECOMMENDATIONS FOR GSM- TELEPHONE SUBSCRIPTIONS:
The user platforms for the subscriptions are mainly for functional telephones, and SIM cards might include pre-defined service settings or when connecting to the network first time, the phone operators can send several settings to SIM cards that are not compatible with other devices, except mobile phones.

Operators recommend to use specially designed subscriptions for control devices. These types of connections stay as neutral as possible to all the service changes in the network. These subscriptions are mainly called machine-to-machine –types.

We recommend our customers to follow operators' preferences to assure the best functionality of our devices.

2.2 SIM-card installation

1. Open the SIM-card reader by pushing the metal clamp gently according to the pictre and lifting the holder up.
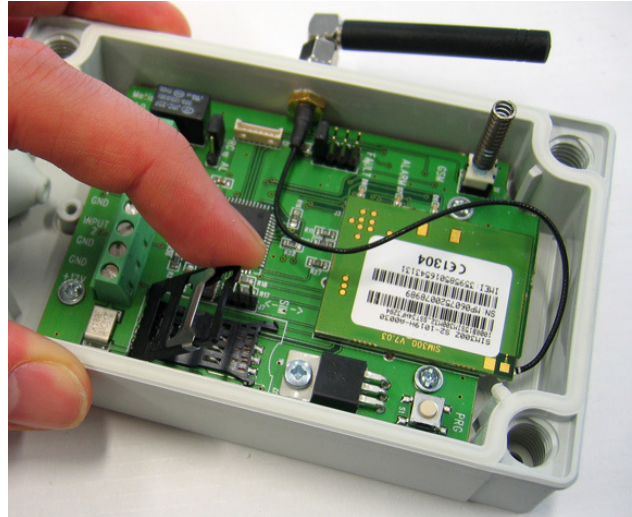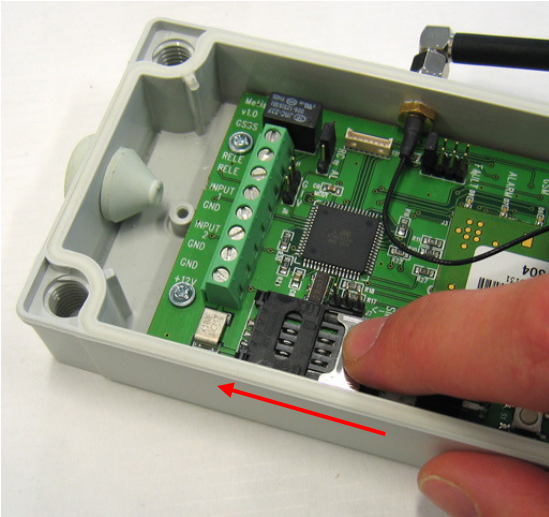
2. Place the SIM-card as presented in the picture. Close the holder by lowering it down and gently pushing the metal clamp. Make sure that the bevelled corner points outwards from the PCB.
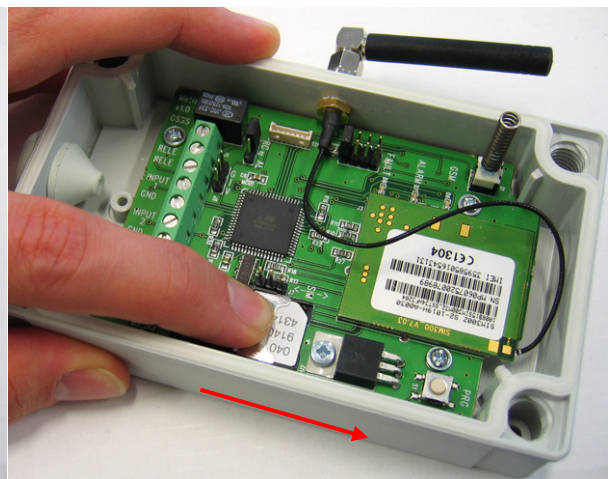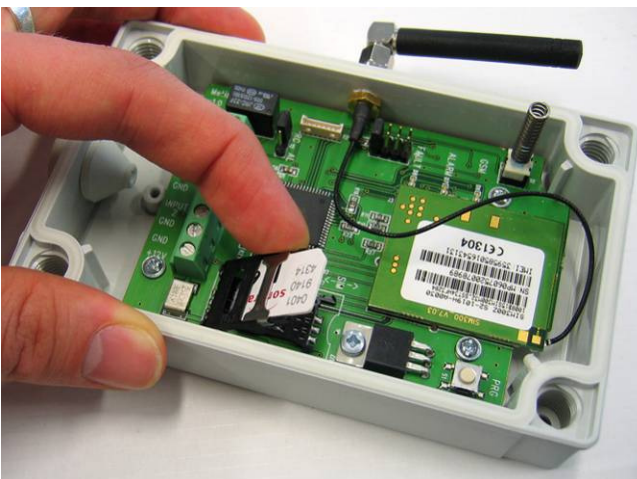
3. S Close the holder by lowering it down and gently pushing the metal clamp until it locks into position.

3 – QUICK START GUIDE

metis **Micro** has basic settings with which it is ready to be used in most applications straight away. Only small modifications are usually needed. This quick guide represents the minimum procedures to get the device up and running.

- Insert a SIM-card in to your own mobile phone and remove the PIN-code query.
- Remove all phone numbers from the SIM-card and also remove all SMS-messages.
- Insert the SIM-card into the **me**tis **USB**.
- Connect a power supply.
- Wait until the green "GSM" light is lit (this typically takes 30s to 1min.)
- Press the programming button until the green light starts to blink (approx. 10 seconds)
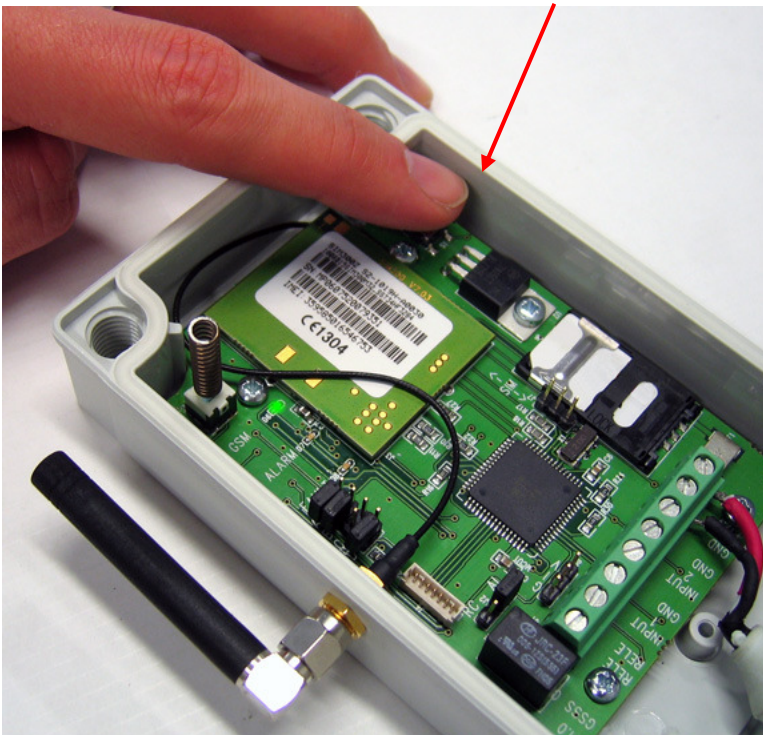
- Call **me**tis **Micro**´s phone number to store your number as the master number
- Press the programming button for a few seconds to end programming (the green light stops blinking)
- Test the functionalities

4 – INSTALLATION

4.1 Connecting a power supply

metis Micro is powered by an external power supply. The input voltage is **+12...+24VDC**. The device's normal power consumption is approximately 40mA and momentarily (during a SMS send) it can rise up to approximately 400mA.

NOTE! The upper limit of the supply voltage (+24VDC) is the absolute maximum value. Make sure that this limit is not exceeded. In systems that utilize 24V batteries have a typical charging voltage of 27-28VDC.

4.2 Start-up

Connect the power supply. **metis Micro** automatically connects to the GSM-network. This takes approximately a minute during which the red "wait/fault" led is constantly lit. When the device is ready and fully operational the green led is constantly lit.

If the device has any phone numbers stored, the device sends information about the start-up to these numbers (including any possible alarms).

The red "alarm" light indicates an alarm. When testing the device remember that the inputs may have delays and response times set – meaning that the alarms may not be sent immediately.

4.3 Inputs

Connect sensors/detectors to the inputs according to the instructions (see 8 – Connectors). Factory setting for inputs is armed. All sensors using entry/exit delays must be connected to input 1.

Arm/disarm –control is possible to do by phone call only if the setting has been activated (see 6.9 General settings)

Input 1 can be configured with an entry / exit delay. This represents the time user has to disarm the system after entering the premises under surveillance and exit after arming the system (see 6.4 –Input settings).

Input 2 can be configured with a response time. Response time means the time the input has to in alarming state until the alarm is registered (see 6.4 –Input settings).

In addition to normal inputs, the device has a built-in tamper switch that alerts when the enclosure is opened. The tamper switch can be disabled with a jumper (see 8 – connections)

4.4 Output

metis Micro has a small relay that can be used to control external devices. Maximum load for the relay is 24VDC/1A. Jumper 2 selects whether the relay acts as a local alarm indicator or remotely controllable (see 8 – Connections).

When the alarm relay function is selected the relay gives a pulse (20s – 9min.) during an alarm that can be used to control a siren for example.

When the remote control function is selected the relay can be controlled either via a phone call or an SMS (the control commands are described in 7.1- relay control commands)

For higher loads please use external relays. It is also recommended to use a diode over the coil of the external relay to prevent harmful transients..

Note! Under any circumstances do not connect 230VAC voltage to the device.

4.5 Input arming and disarming

Selected inputs can be armed / disarmed with a phone call (see. 6.9 – General settings / 6.5 – Arming and disarming).

Arming/disarming the device and relay controlling via phone call cannot be both used at the same time. Please review settings to prevent the double function.

metis Micro can be armed / disarmed by calling the device from a number that is stored in the device's phonebook (see 5 – Phone numbers). During the call no voice channel is opened, only the number is recognized. It is recommended to activate the armed/disarmed state reporting to receive an SMS every time the state is changed (see 6.9 – General settings).

5 – OPERATION

5.1 Phone numbers

metis Micro *has a 15 number phonebook. First number in the list is the master number. From this phone it is possible to perform all configuration, queries and commands listed in this manual. All other numbers (2-15) in the SIM-card can receive alarms and it is possible to make status inquiries and relay commands but they are not entitled to change any settings.*

The phone numbers can be stored in the phonebook with SMS or with a phone call.

5.2 Alarms

When an alarm is detected **metis Micro** *sends an alarm message according to the input's number. The alarm text can be set freely (see 6.2 – Alarm messages).*

The direction of operation (N.O / N.C) of each input can be set individually (see 6.4 –Input settings). It is also possible to specify whether it is reported when the input's return to normal state after an alarm (see 6.9 – General settings).

5.3 Entry / exit delay and response times

Input 1 can have an entry / exit delay set. If **metis Micro** *is disarmed during the delay time-window no alarm messages are delivered. The same applies when the device is armed it activates after the exit delay. The delay is equally long to both directions.*

Input 2 can have a response time set. This means that the inputs must be in alarming state the set time before the alarm is delivered.

5.4 Backup call

metis **Micro** can be configured to make a phone call after sending SMS. The device makes the phone call consecutively to all number in the phonebook. The call routine is performed 3 times. The backup call must be answered or else the device moves on to calling the next number on the list.

In addition to answering the call, a call back to the device must be performed, or the device will continue to call all numbers defined, even if the phone call is answered. **me**tis **Micro** waits for 30 seconds after each call to receive a call back to end the call routine.

The backup call feature is input sensitive and can be activated as described in 6.4 – Input Settings.

The calling sound from the device is 4-times-short-peep -sound.

5.5 Lock-up

If **me**tis **Micro** detects over 20 alarm events in one hour the device locks up to prevent unnecessary message sending. When the device is locked-up the red light (wait/fault) is on.

Also if more than 60 messages of any type (interval sendings, alarms, status info) are sent in one hour, the device locks-up.

The lock-up can be dismantled either by calling the **me**tis **Micro's** phone number from any authorized (listed in the phonebook) phone number or by waiting for 6 hours for the automatic dismantling.

When **me**tis **Micro** is in the lock-up state, the device neither sends nor receives any SMS commands. All commands and queries received during the lock-up are ignored and erased.

6 – SETTINGS

me**tis** **Micro** can be configured by sending special configuration commands to it. The device accepts settings only from the master phone number.

The actual command is sent inside parenthesis. Any text outside the parenthesis is ignored. Only one command/setting can be given in one SMS.

For example the following message is correctly formatted and can be stored in the user's mobile phone for conveniency: "Activate heating (11)". This way the user can easily see what the command means.

When a command is recognized and accepted, **me****tis** **Micro** sends a confirmation message back stating "OK". If the setting or command sent to **me****tis** **Micro** is not recognized (missing parenthesis, invalid format etc.) the device sends back a message "ERROR!". These acknowledgement messages are sent only to authorized numbers (numbers that are stored in the phonebook).

6.1 Language setting

me**tis** **Micro** has a few non-configurable (standard) messages that can can be sent in different languages. The standard messages include for example the arm/disarm – information, power-up notification and response to temperature query.

Message format::
(00=a)
a = language selection, **0**=Finnish, **1**=English, **2**=Swedish, **3**=Norwegian, **4**=Danish, **5**=Estonian

Example: **(00=5)**

6.2 Alarm messages

Alarm messages are input specific.

Setting format:
(81=nnn...) ;alarm text input 1
(82=nnn...) ;alarm text input 2
(84=nnn...) ;alarm text tamper switch

nnn... = free text (max 32 characters!)
Example: **(82=Fire detector alarm!)**

6.3 Phone numbers

6.3.1 Storing numbers with a phone call

Press the programming button until the green light starts to blink (approx. 10 seconds). The device is now in programming mode. Every caller is stored in the phonebook in the same order that the calls are made. The first caller is stored as a master user.

When making the calls, **metis Micro** doesn't answer but quickly hangs up and stores the caller's number to the phonebook.

Press the programming button for a few seconds to end programming (the green light stops blinking).

When in programming mode, any call erases all previous stored numbers. If no calls are made for a few minutes **metis Micro** automatically returns to normal working state.

Make sure that the GSM subscription doesn't have the caller number visibility blocked. **metis Micro** cannot store the number if the number is not visible.

6.3.2 Storing and editing phone numbers with SMS

Message format:
(91=+358xxxxxxxx) ;user 1 (master user)
(92=+358xxxxxxxx) ;user 2
(93=+358xxxxxxxx) ;user 3
...
(915=+358xxxxxxxx) ;user 15

+358xxxxxxxx = phone number in international format*.

Example: **(98=+35850123123)**
The number 050 123123 is stored into the phonebook's slot 8.

A single phone number can be removed the list by sending only **+358** instead of the number.

Example: **(911=+358)**
Erases the number stored into slot 11.

In international format the first number after the land code is left out. If the number to be saved is 0401231234 the international format is +358401231234 (+358 is Finland's land code).

6.4 Input settings

Several input affecting settings such as delays, backup-call and direction of operation can be set input-specificly.

Input 1
Message format::
(01=aa,b,c)
aa = entry / exit delay, 0-99 seconds
b = backup call, 0=no 1=yes
c = direction of operation, 0=N.C 1=N.O

Input 2
Message format::
(02=aa,b,c) ;settings for input 2
aa = response time, 0-99 seconds
b = backup call, 0=no 1=yes
c = direction of operation, 0=N.C 1=N.O

Example: **(02=05,1,1)**
Input 2 is set with a 5 second response time (the alarm is registered after the input has been 5 seconds consecutively in alarming state), the backup call feature is activated and the direction of operation is set to N.O (normally open).

6.5 Inputs that follow arm/disarm event

If the arm/disarm function by phone call is set (see 6.9 General settings), this parameter determines the inputs that are affected by the arm / disarm event.

Message format:
(09=a,b)
a,b = controlled inputs

Example: **(09=2)**
Input 2 is set to follow the arm / disarm state. Input 1 is in this case always armed.

6.6 Grouping

All alarms are sent input-specificly to selected numbers. The phone numbers are defined inside the parenthesis, separated by commas. In order to use grouping, one must know which number is stored in which slot in the phonebook.

Setting format:
(61=a,b,c,...) ;input 1 grouping
(62=a,b,c,...) ;input 2 grouping

a,b,c,... = memory slot in the phonebook

Example: **(62=4,5,6)**
Alarms from input 2 are sent only to numbers 4,5 and 6 in the phonebook.

6.7 Restoring factory settings

The factory defaults of **metis Micro** can be restored with a jumper block (see 9 – Connectors)). When the device is started with the jumper block in place, the factory settings are restored.

6.8 Alarm output

Alarm (siren) output is active for 20 seconds during an alarm as a default. This setting determines the inputs that activate the siren output and also gives the possibility to change the output active time.

Example:
(89=a,b,...)
a = siren active time (0=20 seconds, 1-9=active time in minutes)
b = activating inputs (1-2)

Example: **(89=5,2)**
The siren output is active for 5 minutes during an alarm, but only the alarm of input 2. Input 1 in this case won't activate the output.

6.9 General settings

Setting format:
(06=abcde)
a = arm / disarm with a phone call, 0=no 1=yes
b = SMS notification from arm/disarm event, 0=no 1=yes
c = relay control method (when remote control feature selected), 0=text message 1=phone call (5 second pulse)
d = input restored notification, 0=no 1=yes
e = standard value 0

Example: **(06=11000)**
Arm / disarm state is controlled with a phone call. Every time the device changes its state it is reported with an SMS to the users. The relay is controlled with SMS. Inputs report only alarms (no "alarm settled" notification).

6.10 Factory settings

<u>Language setting</u>
(00=0) Finnish

<u>Input settings</u>
(01=00,0,0) input 1, no entry/exit delay, only SMS, N.C
(02=00,0,0) input 2, immediate response, only SMS, N.C

<u>General settings</u>
(06=00100) Arming/disarming with a phone call deactivated, arm/disarm event
notification with SMS deactivated, no input restored notifications.

<u>Arm / disarm</u>
(09=empty) Arming/disarming affects both inputs. Factory setting is empty, because the function of arming/disarming the inputs by phone call is off (see 6.5 Inputs that follow arm/disarm event)

<u>Grouping</u>
(61=1,2,3,4,5,6,7,8,9,10,11,12,13,14,15)
(62=1,2,3,4,5,6,7,8,9,10,11,12,13,14,15)
All inputs send alarm to all numbers in the phonebook.

<u>Input alarm messages</u>
(81=Silmukka 1)
(82=Silmukka 2)
(84=Kansi avattu!)

<u>Siren output</u>
(89=0,1,2)
Siren active time 20 s, both inputs activate the siren output during alarm.

<u>Phonebook</u>
(91=+358...) number 1
(92=+358...) number 2
—
(915=+358...) number 15
No numbers stored.

7 – CONTROL COMMANDS AND QUERIES

7.1 Relay commands

Relay on	**(11)**
Relay off	**(10)**
Relay on, 5s pulse	**(31)**
Relay on, adjustable pulse	**(31=a)** a=time in minutes (1-999)

Example: **(31=60)**
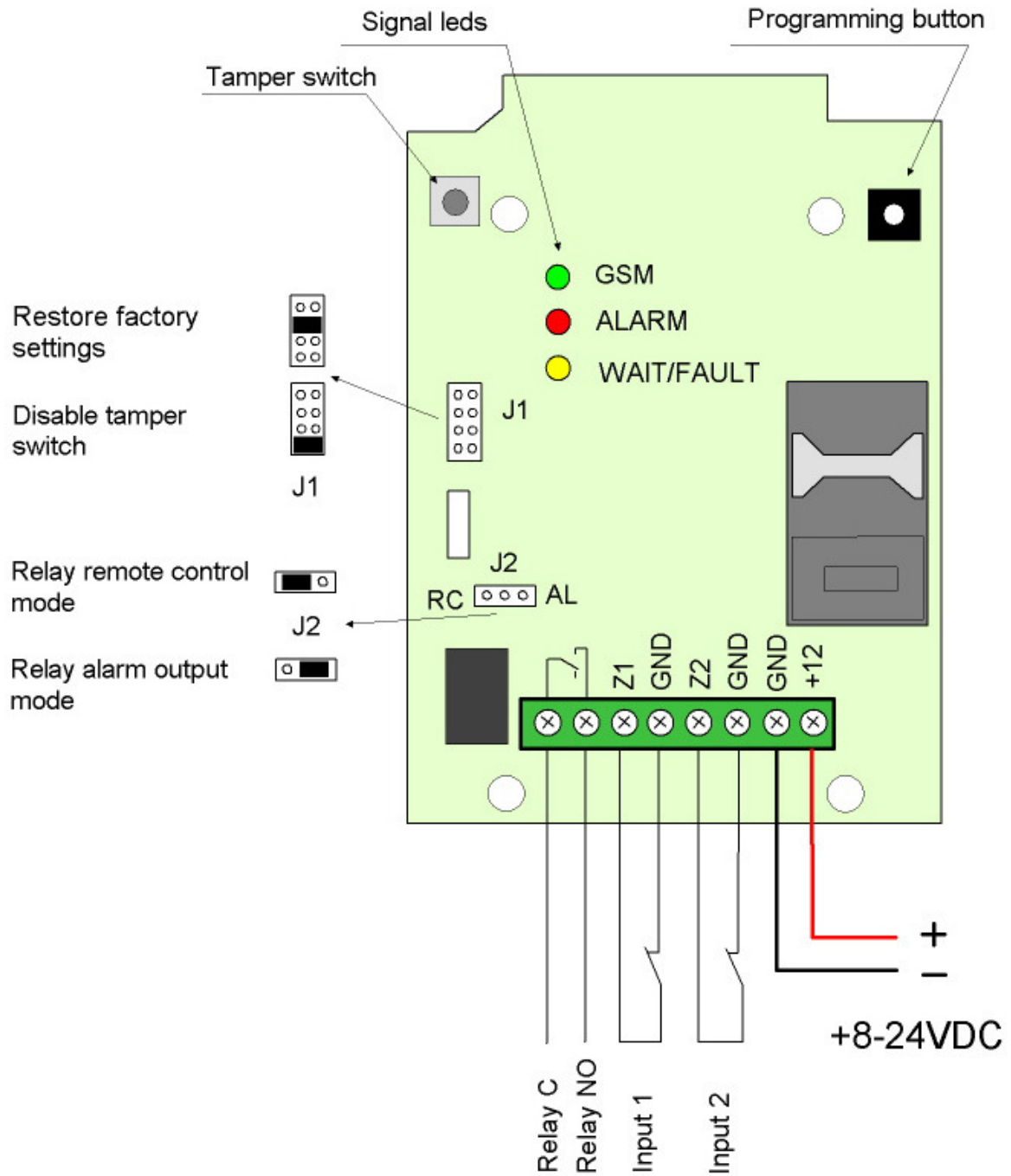Relay is activated for 60 minutes.

7.2 Queries

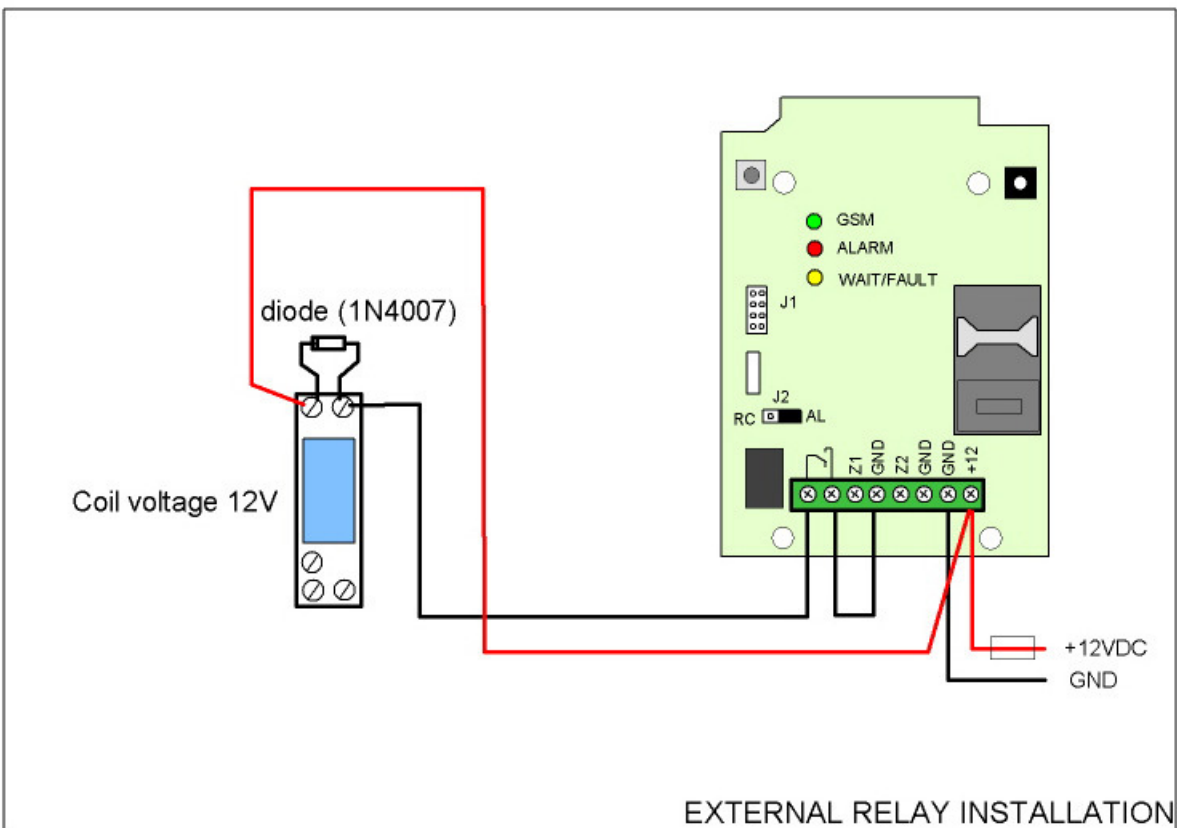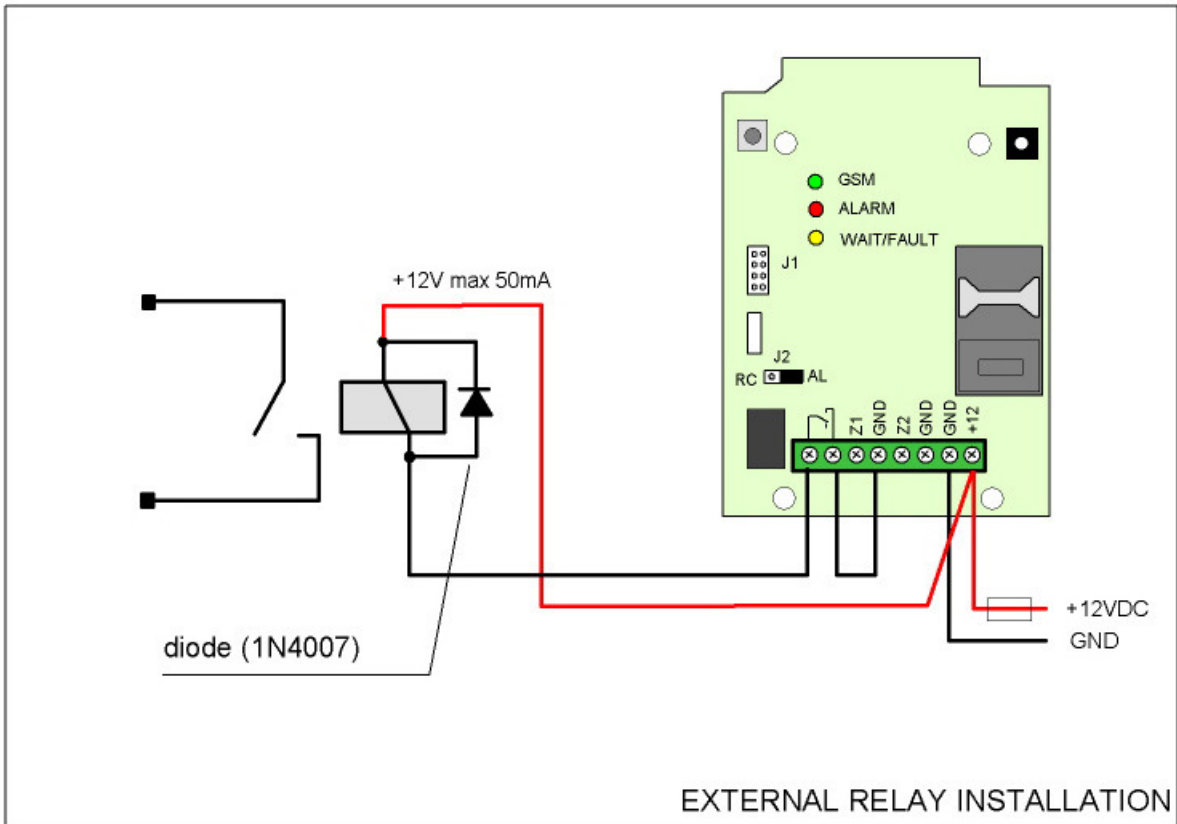Input state query   **(42)**
Returns the state of each input (alarm / normal)

Relay state query   **(43)**
Returns the state of the output relay (on / off)

8 - CONNECTORS

9 – CONNECTION EXAMPLES

+12V max 50mA

GSM
ALARM
WAIT/FAULT

J1

J2
RC ▭ AL

Z1 GND Z2 GND GND +12

diode (1N4007)

+12VDC
GND

EXTERNAL RELAY INSTALLATION

diode (1N4007)

Coil voltage 12V

GSM
ALARM
WAIT/FAULT

J1

J2
RC ▭ AL

Z1 GND Z2 GND GND +12

+12VDC
GND

EXTERNAL RELAY INSTALLATION

10 – DECLARATION OF CONFORMITY

DECLARATION of CONFORMITY

In Accordance with
2004/108/EC Directive
of European Parliament and of the Council of 15 December 2004 on radio equipment and
telecommunications terminal equipment and the mutual recognition of their conformity.

Manufacturer: Global Safety & Security Solutions Oy
Address: Tarttilantie 266
                       FI-03400 VIHTI
                       FINLAND

Product type: **metis Micro**
Trade marks: **metis Micro**
Product description: GSM alarm controller
Technical Construction File: **metis Micro**

We, the manufacturer of the above mentioned products, hereby declare that these
products conform to the essential requirements of the European Union directive
2004/108/EC. This Declaration of Conformity is based on using the Harmonized European
Standards and relevant Articles of the RTTE-directive:

Article 3.1a : Protection of the health and Safety (EN60950-1:2001)
Test report   : CE05-RTE8216S of 2005-07-25
Article 3.1b : EMC (EN301489-1: v1.4.1 and EN301489-7 v1.2.1)
Test report   : CE05-RTE8205E of 2005-07-25
Article 3.2   : Effective use of Radio Spectrum (EN301511: v9.0.2)
Test report   : SH_SIMCO_0503_G_a of 2005-08-03

Standard EN50130-4:1995, EMC Test Report number 05010FIN/PJ, Jyväskylä
Polytechnic/EMC laboratory

Nummela on the 1st of March 2008

Harri Paananen
President & CEO
Global Safety & Security Solutions Oy