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ALARM NOTIFICATION & REMOTE CONTROL GSM MODULE: GSM2000 (EN)
Expanded instruction manual inclusive of "GSM2 Configurator" software use is available for download at: www.elmes.pl

The module allows monitoring of events occurring in alarm and security systems as well as operation in remote control systems by means of SMS notifications and CLIP calls, in any GSM mobile phone network 900/1800 MHz. In remote control operation, devices can be directly connected to its relay outputs and controlled also by means of SMS & CLIP (Calling Line Identification Presentation – a GSM service used to show the number of a caller). Specified below are some features of GSM2000 module:

- Mobile phone integrated GSM transceiver chipset module (CE, FCC and SGS certified).
- 4 control inputs, each with programmable switching levels in the range of 0.2 - 14,5V and programmed hysteresis in the range of 0.1 - 5V.
- Four SMS controlled and isolated relay outputs with NO (Normally Opened), or NC (Normally Closed) terminals – see Fig.1 below.
- Relay outputs operation in pulse mode (programmable time-lapse), or on/off mode (bistable).
- Outputs are set on by means of SMS or CLIP from up to 2048 phone numbers.
- Alarm monitor SMS & CLIP notifications sent to up to six preregistered phone numbers.
- The ability to remotely add and delete phone numbers supported by the module.
- Periodical communication test by SMS or CLIP sent to one or two phone numbers, at user's specified time of day or time interval.
- SMS information of all inputs and outputs status.
- The ability to remotely execute AT commands.
- User set limited number of SMS notifications sent daily with option to set the limitation off.
- TAMPER switch monitoring of module's box cover opening.
- Module configuration, firmware upgrade and user preference parameters are set in "GSM2 Configurator" software made for Windows® based PC (Personal Computer). The software is available for download at manufacturer's web site: www.elmes.pl

Control Inputs. GSM2000 module features four control inputs with 15VDC(!) maximum allowable input voltage level, as measured with reference to module's ground (minus power supply). "GSM2 Configurator" software specifies the following parameters for each input of the module separately:

- The level of input switching voltage in the range of 0.2 - 14,5V, and the voltage hysteresis in the range of 0.1 - 5V, set for each input individually.
- Input set on (activation) voltage level – high (H) or low (L).
- Input sensitivity, that defines minimum duration of an input violation. It can be set between 0,2 and 65536 seconds with step of 0,1 second. E.g. if input sensitivity is set at 5 seconds, the module will send SMS or CLIP only if input has been violated for a time longer than 5 seconds. Input violation of less than 5 seconds will be regarded as invalid and the module will not send SMS or CLIP.
- Input freezing time after violation in the range from 0 to 255 seconds with 1 second step. After input is violated and CLIP or SMS notification is sent, the input is freezed for preset time period, in which any other violation of the input will not activate CLIP or SMS notification. It allows avoidance of situation when many notifications are sent due to series of short input violations, e.g. from PIR detector.
- Phone numbers to which SMS notifications are sent on input set on (change from inactive to active).
- Phone numbers to which SMS notifications are sent on input set off (change from active to inactive).
- SMS notification text contents on input set on and off (up to 63 characters each).
- Phone numbers CLIP calls are made to on input set on.

When CLIP call is made to phone number engaged or unavailable, the call is redialed twice. First however, the module attempts to call remaining phones in predefined list and then returns to redial the unmade call. Calls are considered made when:

- call is rejected;
- call is received and ended by call recipient;
- call is received and ended by the module due to predefined notification time passage (up to 99 seconds);

If a call is neither rejected nor received, but the defined notification time has passed, the module would not acknowledge the call as received and will attempt to redial two times. This function can be deactivated - then the module calls only once.
There is a possibility to break the CLIP notification queue after first succeeded notification (if any recipient already rejected the call, the module will not send notifications to other phone numbers).

Control Outputs. GSM2000 module features four control relay outputs. Each output has two installation terminals jumper configured to operate in normally opened (NO), or normally closed (NC) mode (see figure 1). Outputs feature the following "GSM2 Configurator" software set parameters:

- output name (up to 16 characters max.);
- one of four possible operating modes;
- selection whether output's relay sets ON or OFF on output activation.

Outputs can be controlled by SMS command sent to the module. The user sets the following parameters:

- whether SMS command is protected by preceding password;
- whether SMS command can be sent from any, or module listed only phone numbers;
- whether SMS command letters case (lower or upper) has meaning;
- whether the module confirms command execution by return SMS or, in case of an error, confirms command rejection.

Fig.1 Output diagram

The GSM2000 outputs can be also remotely controlled by calling (ringing) to module's number from any phone registered on its list of up to 2048 phones. Each of these phone numbers may have predefined one or many control outputs assigned for simultaneous operation. This mode allows programmed time pulse control of outputs only (bistable "on/off" operation is not available). The third and last available control mode of GSM2000 allows predefined output/s control by violation of inputs. In this mode an output can work in monostable mode (modes 1 and 2) or bistable (modes 3 and 4), as listed in the table below.

Table 1: SMS text command pattern depends on selected operating mode of module's outputs, as below:

Output's Operating Mode	Examples of SMS commands content and their meaning
1. Pulse Mode with preset set on time.	„OUT1" – Sets on output OUT1 for time preset in GSM2 Configurator
2. Pulse Mode with set on time defined in SMS text.	„OUT1 1:30" – Sets on output OUT1 for 1m30s „OUT1" – Sets on output OUT1 for time preset in GSM2 Configurator
3. Bistable Mode – on/off.	„OUT1 Y" or „OUT1" – Sets stable on output OUT1 „OUT1 N" – sets off output OUT1
4. Any mode defined in SMS command	„OUT1" – Sets ON output OUT1 for time preset in GSM2 Configurator „OUT1 1:30:00" – Sets on output OUT1 for 1h30m „OUT1 Y" – Sets on output OUT1 stable until set off command is received „OUT1 N" – Sets off output OUT1

Remarks: SMS text commands should be separated by a space and quotation marks should not be used!

- After applying name to output, the name should be then used in SMS commands, e.g. „STOVE 1:30:00" (switch on stove for 1h30m).
- In output bistable operation mode, letters T, Y, t, y can be used to mark set on while N, n to mark set off.
- In monostable (pulse) operation mode, output set on time can be specified as: HH:MM:SS, MM:SS or SS where ":" can be substituted by . / \ e.g. „OUT1 1.40.00" (one hour and 40 minutes); „OUT1 5/20" (5 minutes 20 seconds); „OUT1 6" (6 seconds).
- Single SMS command can control any number of outputs, e.g. „OUT1 OUT2 5 OUT3 T OUT4 12.00".

Correct SMS command is executed immediately after its receipt and, if this option is selected, confirmed by return SMS with "OK" or information on all inputs and outputs status. If SMS command contains any error, such as improper output name, incorrect password or content, the command is not executed and, if this option is selected, "ERROR" SMS is returned. Typical error could be SMS command "OUT1 Y" send to output that operates in monostable mode (1 & 2) or, execution of SMS command "OUT1 5:00" when the output is defined to operate in mode 1 (Pulse Mode with predefined set on time).

Communication Test
GSM2000 module features periodical communication test by making CLIP call or sending SMS to one or two predefined phone numbers. The SMS text containing up to 31 characters is defined by user. In addition, the contents of the SMS can include the state of the inputs and outputs. In "GSM2 Configurator" it is possible to define whether the test is performed once daily at specified time, or at specified time interval, e.g. every 8 hours. In the first case, mod-

ule's real time clock should be set first either in Configurator software, or by SMS with password followed by text "TIME HH:MM:SS" or "TIME HH:MM". Example: "TIME 12:30" sets the real time clock to 12:30. Then set start time of communication test. IMPORTANT! SMS must start with valid password. Periodical test can be forced to perform at any time by resetting test time counter, e.g. by sending SMS with "RESTART". Within a minute the test will be performed and next test will be made after preset time interval, e.g. after 8 hours. IMPORTANT! SMS must start with valid password.
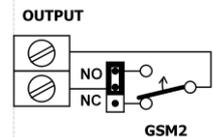
Communication test can also be done at any time by calling to the module from any of its listed phones. The call would be rejected and, if the option is set on, a return call will be made confirming proper communication status.

Module Status

The module status is an SMS describing the state of its inputs and outputs. It is send in response to an SMS with the text "STATUS" or SMS which controls outputs. It can also be sent periodically during the test module. The status may be presented in a simplified form, eg .: "IN1..4 = 1000, OUT1..4 = 0100", or expanded. In this case, when the zone is triggered, the contents of the SMS will be according to full description of inputs and outputs defined in the software "GSM2 Configurator".

Remote edition of phone number list

It is possible to add and delete phones from the list by SMS, but only by one phone number with appropriate authorization. Example SMS which adds/deletes number to/from the list should be of the following pattern respectively: "ADD +44123…" or "DEL +44123…". The phone number must be in the international syntax, e.g. in England must begin with: +44 .... NOTE: SMS can only add/delete phone to/from the list, but not select which output can be controled, or whether the module can accept incoming SMS from this number. Therefore, these options must be earlier set up by "GSM2 Configurator".

Remote AT commands (recommended for experienced users only)

Any AT commands can be executed at the start of the module. These special commands are send directly to the GSM radio module used in the device and allow for additional functionality. An example is to force the module to log on to GSM network other than the default GSM provider. For more information, please see extended user's manual of GSM2000 module ready for download from manufacturer's internet site.

IMPORTANT! Before the first use of GSM2000 module prepare an active SIM card. The card must be SMS and contact book memory cleared as well as voice mail function set OFF. A card with PIN code set on or off may be used. If PIN code is set on it must be set to **1234**. If the original code is different, it can be set to required 1234 code in any mobile phone operating in the same GSM network. The use of SIM card with PIN code **other than 1234 is not allowed** and may result by the card being blocked.

Programming the Module

NOTE: Before programming the module should be powered on and connected to a PC computer.

GSM2000 module can be programmed and tested with „GSM2 Configurator" PC software before, or after installation. The latter allows GSM diagnostics, e.g. GSM signal reception test in place of module installation. To connect the module to PC a dedicated Elmes Electronic made mini USB-RS cable (sold separately) is needed. The cable can be optionally ordered from Elmes Electronic or its distributors. To use the cable a dedicated software driver must be installed on the PC. The GSM2 Configurator software as well as mini USB-RS cable driver can be downloaded from the manufacturer web site: www.elmes.pl. The user should make sure that GSM2 Configurator software current version is installed on the PC. If not, then it should be uninstalled by means of Windows® Control Panel Add/Remove Programs steps and latest version installed.

(!) Below listed steps order should strictly be followed when connecting GSM2000 to a PC:
1. Make sure SIM card with PIN 1234 is inserted in SIM socket.
2. Connect power supply to the module (12VDC/1A).
3. Connect mini USB cable plug to socket in the module.
4. Connect USB cable plug to USB socket in PC.
When disconnecting, reverse steps should be followed.

JP Jumper Use

The jumper is used only if module's firmware upgrade process has not succeeded properly, e.g. power supply set off while in upgrading. In that case, the jumper should be set ON followed by power supply switched on. The module starts firmware upgrade now.

Installation

The module can be installed indoor only, in dry place. Poor GSM signal reception places should be avoided. To improve reception a dedicated external GSM antenna can connected to SMA socket, in place of the supplied antenna. With the supplied screws bottom part of the module's plastic case should be installed to wall observing upwards direction of module's antenna. SIM card should be inserted, antenna screwed in and input-output wire connections should be made with cables put through dedicated cable hole in the bottom cover, or through holes made in purpose. Connection of power supply is signalled by fast flashing LED. Slow flashing LED, ca every three seconds, indicates module registration in GSM network. Registration procedure may take 30 up to 60 seconds.

NOTES!

1. Grounds (- V of power supply) of external control device and GSM2000 module must be shorted.
2. NC – normally connected state at standby. NO – normally opened state at standby. Change of state activates GSM2000 module.
3. Resistor in examples C and D is in 1kOhm..20kOhm range. Optimal value 4.7 kOhm. Note that internal input resistance is 38 kOhm to ground.
4. GSM2000 inputs activation level (H – high, or L – low) is selected with „GSM2 Configurator" software.

Specification

Integrated GSM transceiver chipset (CE declaration and module CE certificate attached).
Power Supply**: 10- 20VDC, current rating 1A minimum !**, standby current 6mA.
Four control inputs rating 0..15VDC maximum with reference to ground (-V power supply).
Four control relay outputs NO/NC type rated 0,5A/130VAC or 1A/30VDC.
Mobile phone remote control from up to 2048 phones numbers. Notification to up to 6 phone numbers.
Operation ambient temperature range: -20 to + 70ºC. Dimensions: (L/W/D) 96/63/28mm, without antenna.

Manufacturer: ELMES ELECTRONIC, 54-611 Wroclaw - PL, ul. Avicenny 2, tel. (071) 784-59-61, fax (071) 784-59-63

Manufacturer's Limited Warranty

Elmes Electronic alarm, security and remote control products carry two years manufacturer's warranty as from the date of purchase. The warranty is limited to the replacement of faulty original parts or repair defects of improper manufacture. Damage, faulty use or improper handling by the user or installer as well as any changes in product's hardware or software caused by the user violets the warranty and all due repair costs will be charged. Elmes Electronic shall not be responsible for any human or material damage caused by its products failure to operate correctly.
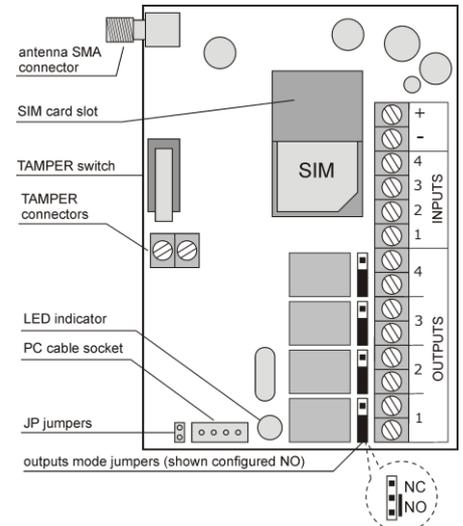
Input Control Wiring Examples
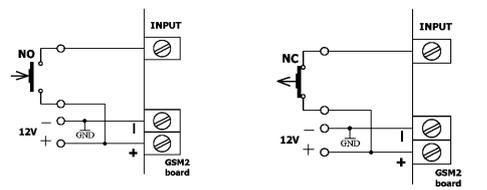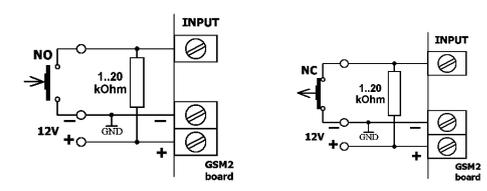
A. Input +12V controlled, NO activation level H	B. Input +12V controlled, NC activation level L
C. Input ground controlled, NO activation level L	D. Input ground controlled, NC activation level H