

The modules allow 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 4G/LTE and 2G mobile phone networks. In remote control operation, module can be directly connected to its relay outputs and also controlled by means of SMS & CLIP (Calling Line Identification Presentation – a feature showing phone number of caller) commands. Additionally, GSM2000TX module is equipped with 434 MHz radio transmitter wirelessly controlling Elmes Electronic receivers, as equivalent to the use of hand held remotes with capacity of up to 8 remotes and 8 remote buttons each, a total of 64 wireless control commands.

Significant features of GSM2000 and GSM2000TX modules are listed below:

- 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).
- Setting on outputs by SMS or CLIP from up to 2048 phone numbers.
- Setting on outputs by inputs state violation.
- CLIP or SMS memory up to 1790 events.
- alarm SMS & CLIP notifications sent to up to six preregistered phone numbers.
- Wireless control of 434 MHz band Elmes Electronic receivers by SMS commands sent to module (model GSM2000LTE-TX only).
- Remote (via SMS) add and delete phone numbers to the list with separated phone numbers list of administrators and common users.
- 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 info with status of all inputs and outputs state.
- Remote execution of AT commands ability.
- User set limited number of SMS notifications sent daily with option to set the limitation off.
- TAMPER switch for notification of the module's box unauthorised opening.
- Module configuration, firmware upgrade and user preference parameters are set in "GSM2 Configurator" software made for Windows® based PC (Personal Computer). The software may be downloaded from 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 frozen 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:

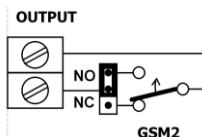
- call is rejected;
- call is received and ended by call recipient;
- call is received and ended by the module due to predefined notification time passage (up to 99 seconds);

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.

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).

Wireless control of 434 MHz band receivers (model GSM2000LTE-TX only).

GSM2000LTE-TX module is equipped with 434 MHz radio transmitter wirelessly controlling Elmes Electronic receivers, equivalent to the use of hand held remotes. The control is made by sending SMS message to the module from any phone with text command format of "Pmn", where m=1...8 is a hand remote number and "n" stands for 1...8th number of hand remote button. Example: SMS command "P72" would simulate the use of second button of seventh hand remote transmitter. Short form command "Pm" is also allowed and as an example "P8" would mean the use of the first button of eighth hand transmitter. Single SMS message may consist of up to 15 control commands that will be performed sequentially each with one-second-duration time.

IMPORTANT! To control a receiver by SMS commands the GSM2000TX transmitter requires teaching its unique control codes to that receiver, as in the case of any remote. To do so, receiver must be set to remotes learning procedure (see receiver's manual for details) followed by sending SMS message from phone to the GSM2000TX module containing two consecutive "button pressed" commands. Example SMS message with command to 8-channel receiver with 8th channel selected in learning procedure may contain: "P28 P28" (commands space separated and quotation marks omitted) meaning the receiver learns all eight buttons of the second transmitter. When the end of the procedure is confirmed by the receiver, all eight receiver's outputs will be controlled by SMS P21... P28 commands.

Communication Test

GSM2000 module features periodical communication test by making CLIP call or sending SMS to one or two predefined phone numbers. User defines the SMS text containing up to 31 characters. 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, module'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 adding and deleting phone numbers.

List of supported phone numbers may be remotely edited, i.e. phones may be added or removed. Up to 99 phones can be allowed. List phones is divided into two sections: phones 1...n (where n may be set to 0...99 range) are administrative while remaining are common user's phones. SMS command adding a phone number to the list should appear as "ADD +48123456789", where +48123456789 is sample phone number. To add administrative phone number "ADD-ADM" command should be used. To remove any phone number from the list "DEL +48123456789" command should be used. Phone numbers in the SMS commands must include country prefix code number, e.g. +48.. for Poland. **NOTE:** SMS command can only add/delete phone to/from the list, but not select which output can be controlled, or whether the module can accept incoming SMS from this number. These options must be earlier set up by "GSM2 Configurator".

Event memory.

The module features memory of up to 1790 events with their date and type. The events may consists of output control commands (by SMS or CLIP) as well as SMS adding or deleting phones or setting date and time only.

To operate properly the event memory requires correct time and date which can be set with the use of "GSM2 configurator" software or remotely by SMS command "DATE". For example, command "abcd DATE 30.06.24" sets the module date to 30th June 2024, where "abcd" is the set password. Correct time setting is described in Communication Test section.

AT commands (recommended for experienced users only)

The module allows any AT commands to be executed at start. These special commands are send directly to the module's GSM radio and allow additional functionality. An example may be to force the module to log on to GSM network other than the default GSM provider, or log on to 2G network only. For more information on the topic see the extended user's manual of the GSM2000LTE module at the manufacturer's site www.elmes.pl.

Programming the Module

Before programming connect the module to PC computer and power supply.

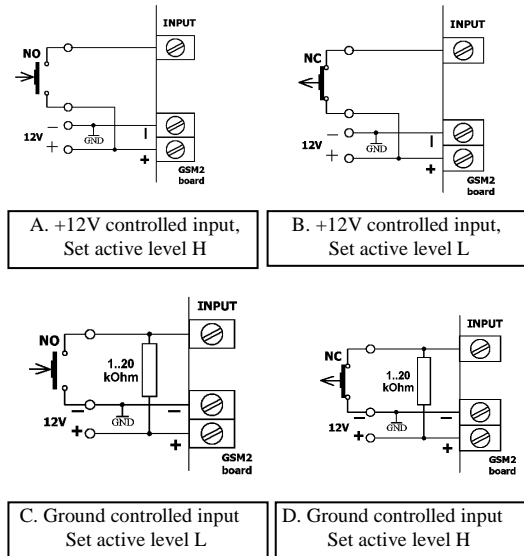
GSM2000 module can be programmed and tested with „GSM2 Configurator” software while connected to PC computer with mini-USB cable (not included with the module). At first, operating system of the PC should automatically search for and install drivers for the module. If not, drivers should be downloaded from the manufacturer's site www.elmes.pl. The operator should make sure the latest version of the "GSM2 Configurator" is installed on the PC. If not, the older version should be uninstalled at the PC control panel level: "control panel>add/remove programs>Elmes GSM2 Configurator>remove".

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. The use of SIM card with PIN code **other than 1234 is not allowed** and may result by the card being blocked.

Installation

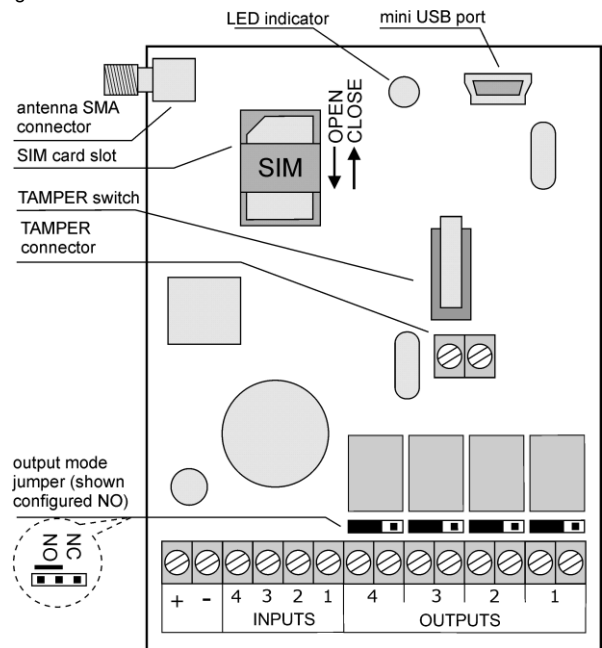
The module can be installed indoor only, in dry place. Poor GSM signal reception places should be avoided. To improve reception a dedicated external GSM antenna can be connected to SMA socket, in place of the supplied antenna. With the supplied screws bottom part of the module's plastic case should be 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, every 2.5 seconds, indicates that the module is logged to GSM network. Logging to network may take up to 60 seconds.

Examples of module's inputs control wiring



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 input.
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 4G and 2G GSM communication transceiver chipset.
- Power supply: 10- 30 VDC or 12..25 VAC with current rating 1A minimum, standby current 3mA.
- Dimensions: (L/W/D) 96/63/28mm, without antenna.
- 4 control inputs rating 0..24 VDC with reference to ground (-V power supply).
- Notification to up to 6 phone numbers.
- 4 control relay outputs NO/NC type, rated 0,5A/130VAC or 1A/30VDC.
- Module's outputs control from up to 2048 phones numbers.
- Operation ambient temperature range: -20 to + 70°C.

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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 voids 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.

