

The device 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 (Calling Line Identification Presentation - a supplementary GSM service used to show the number of a caller) calls, in any GSM mobile phone network. In remote control operation devices can be directly connected to its relay outputs. Below specified are characteristic features and functions of Elmes GSM2 module:

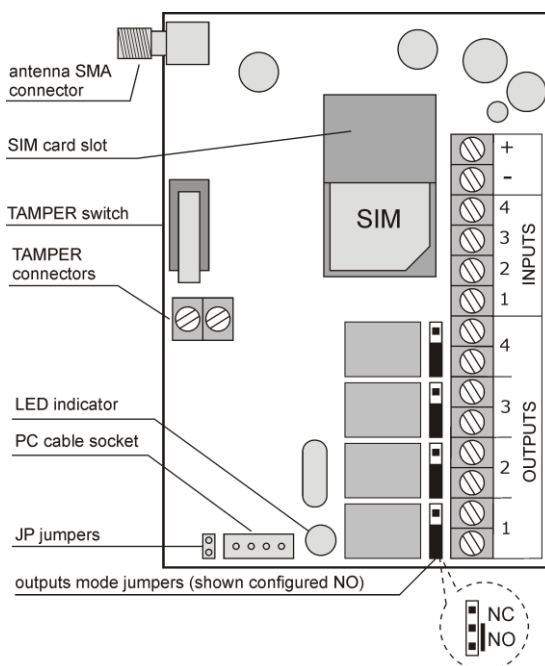
- Mobile phone integrated transceiver GSM (CE, FCC and SGS Certified).
- Four user programmable control inputs with trigger voltage levels set High (7-12V) or set Low (0-3V), as required.
- Four SMS controlled and galvanic isolated relay outputs with selectable NO or NC terminals.
- Relay outputs operation in Pulse Mode (programmable time-lapse), or On/Off Mode (bistable).
- Outputs controlled by SMS or CLIP from up to 255 phone numbers, or by control GSM2 module wired inputs set on/off.
- Alarm monitor SMS & CLIP notifications are send to up to six phone numbers.
- Periodic communication test by SMS or CLIP is send to one or two phone numbers, at specified time or time interval.
- User defined limited number of SMS notifications are send daily.
- Provided TAMPER switch is used for monitoring of module's 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 www.elmes.pl

Installation

IMPORTANT NOTE! Before module first use prepare SIM card with active PIN code card access protection and preset PIN **1234**. The required PIN code can be preset in any mobile phone operating in the same GSM network. In case of GSM2 module with firmware 2.11 or higher, PIN-less SIM card can be used, i.e. a card with access protection set off. The SIM card must have SMS memory cleared and voicemail set off. **The use of SIM card with different PIN code in module with firmware older then 2.11 may result by blocking the card.**

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 used and 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. Input-output wire connections should be made with cables put through dedicated cable hole in bottom cover, or through holes made in purpose. Active SIM card should be inserted. Connected power supply is signaled by fast flashing LED (at 0,8s rate). Slow LED flashes, once every three seconds, indicates the module is logged on to GSM network. Logging to network procedure takes 30 to 60 seconds. The LED fast flashing after that time means the module cannot log to network for any of the following reasons:

- Low GSM signal reception. That can be verified in Diagnostics menu of the GSM2 Configurator software; external directional antenna may be needed.
- SIM card problem. Positioning of the card should be checked and socket contacts should be alcohol solvent cleaned, if necessary. Required PIN 1234 should be verified.
- Insufficient power supply current rating may cause module reset on setting communication with cellular network base station. In that case higher current rating power supply must be used with the module.



Main components of the Elmes GSM2 module are shown on side diagram.

Specification

Integrated GSM module (CE declaration attached).
 Power supply: 12VDC (allowed voltage range: 10-20VDC), maximum rating 1A, standby 5mA.
 Four control inputs rating up to 12VDC maximum with reference to ground (-V power supply).
 Four control relay outputs NO/NC type, rated 0,5A/130VAC or 1A/30VDC.
 Remote control from up to 255 phones. Notification to up to 6 phone numbers.
 Indoor operation only. Temperature range: 0 +40°C. 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.

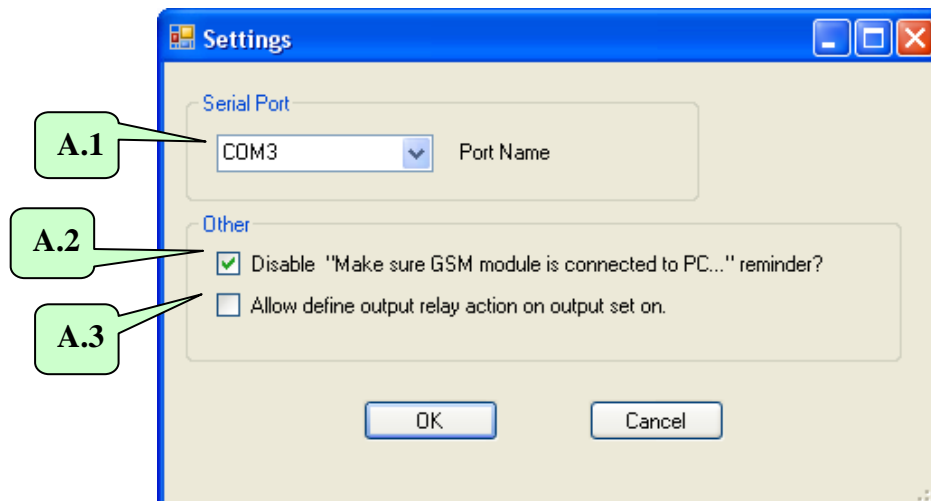
PROGRAMMING ELMES GSM2 MODULE

GSM2 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 made mini-USB 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. GSM2 Configurator software as well as mini-USB 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.

Described below is procedure of mini-USB cable driver installation:

Plug in the USB cable to the PC. The PC should detect new device connected and display “USB serial Converter” notice followed by “Can Windows connect to Windows Update to search for software ?” . Select “No, not this time”. Further, select “Install software from list or specific location ” and define driver location. Now, an appropriate driver file folder should be input corresponding to the cable version. As for the mini-USB cable “..\\USB cable drivers\\VER 2A” should be given. After driver installation the system detects next device “USB Serial Port” and a new COM port appear (e.g. COM3, COM4 or higher). In order to check number of the new COM port assigned to GSM2 module, click “My Computer” with right mouse switch and select “Hardware” in folder “Properties”. Now, “Device Manager” should be selected and all hardware devices connected to the computer will be displayed. The new COM port number assigned to GSM2 will appear in subfolder “Ports (COM and LPT)”, e.g. “Elmes USB to UART bridge COM7”.

First step after launching “GSM2 Configurator” is selection of serial COM port for communication with the module – menu Options->Settings, field **A.1**. The same port should be selected as used for USB cable installation. The USB cable must be connected to the computer otherwise it will not appear in the selection list.



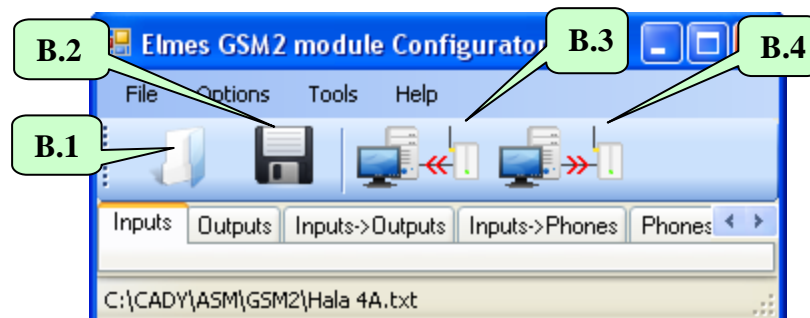
Other options in this menu:

Field **A.2** allows disabling reminder message appearing every time setting data is send to or received from the module. Meaning of option in field **A.3** is described in menu “Outputs” – pt. 2.

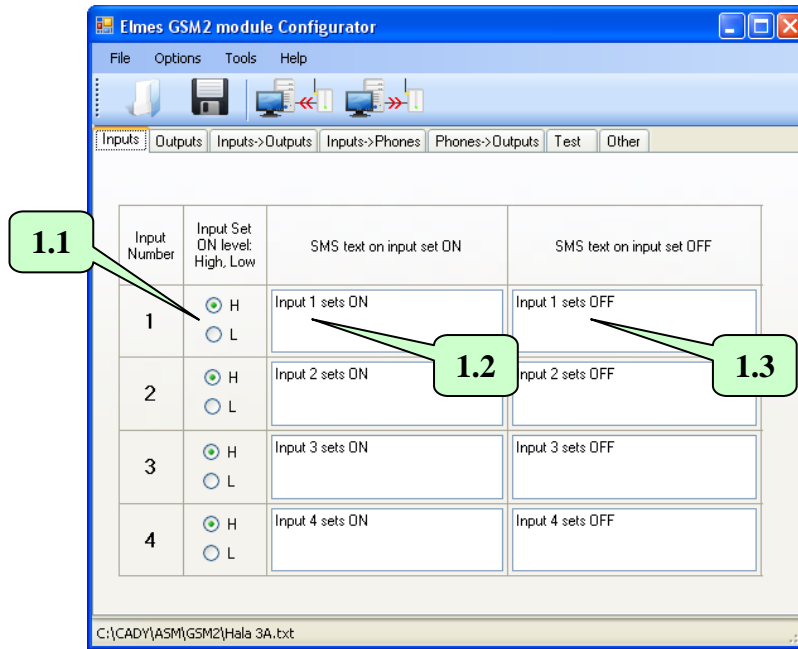
When connecting GSM2 to PC computer, the following steps should strictly be obeyed:

1. Make sure SIM card with PIN 1234 or without PIN code protection (requires firmware 2.11 or higher) is inserted in SIM socket of the GSM2.
 2. Connect power supply to the module (12VDC/1A).
 3. Connect USB cable to socket in the module and socket of PC
- When disconnecting the module follow steps in reverse.

Next step is to set all parameters and options of programmed module (pt. 1 to 7). After all options are set, it is suggested to save them to HDD by clicking **B.2** in main window menu. The data may be useful for future use or, when installing next module. Programming is effective when all set options are sent to the module by clicking **B.4** in main window menu. The programmed settings will remain the module memory even after power supply is off.



1. „Inputs”



Elmes GSM2 module features four control inputs with 12VDC(!) maximum allowable input voltage level measured with reference to module’s ground (minus power supply). Input control signals ranging 0-3V are regarded as Low (L) while signals ranging 7-15V as High (H).

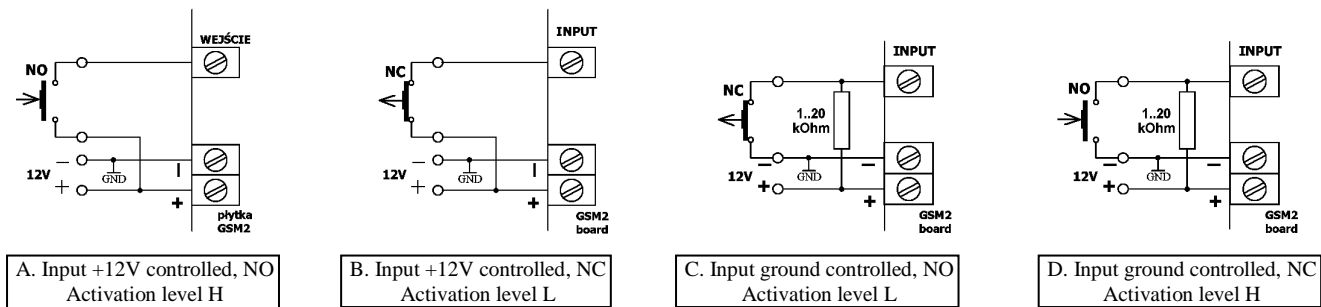
A set of parameters is defined for every input including:

1.1 - Selection field of input trigger voltage level – low (L), or high (H). Selection of H or L trigger level means that when the input voltage level rises from low to high (H) or drops from high to low (L), SMS notification predefined in field **1.2** is send and calls are made to predefined phone numbers. When input signal voltage drops from H to L (H selected) or rises from L to H (L selected), only SMS notification, defined in field **1.3**, is send (no calls are made). Phones to be notified and type of notification (SMS and/or CLIP) are defined in menu “Inputs->Phones”.

1.2 - In this field input activation (set on) SMS text is defined.

1.3 - In this field input deactivation (set off) SMS text is defined.

Inputs control signal level (L) or (H) wiring examples.



NOTES!

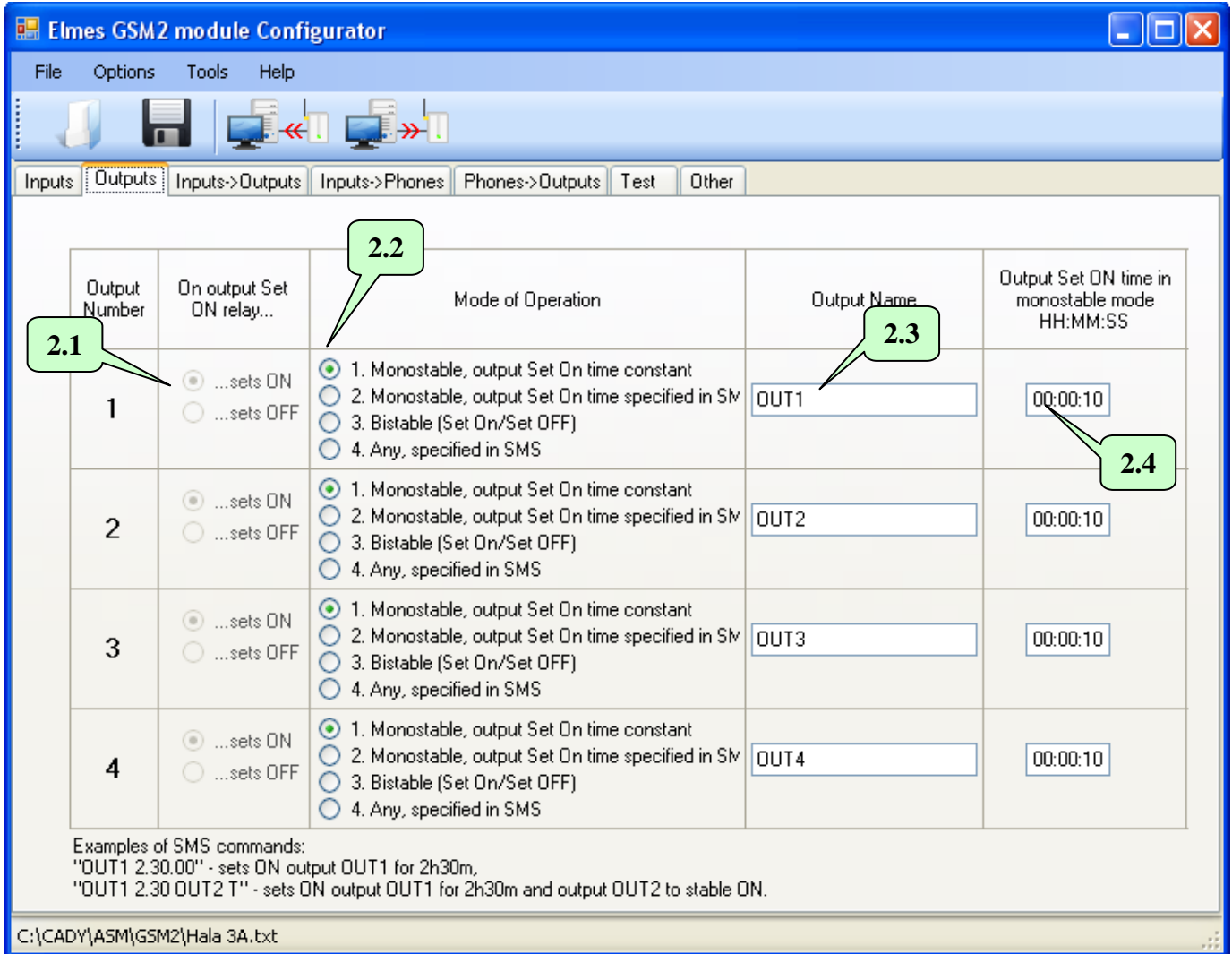
1. Grounds of external control device and GSM2 module must be short connected.
2. NC – normally closed state at standby. NO – normally opened state at standby.
3. Resistor in examples C and D in 1- 20kOhm range. Optimal value is 4.7 kOhm.

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

- call is rejected;
- call is received and ended by call recipient;
- call is received but ended by the module due to notification time passage (up to 99s), defined in window “Other” **7.9**;
- call is not received nor rejected but defined in window “Other” **7.9** notification time out has passed (up to 99s).

Contrary to earlier GSM2 models, starting from software ver. 2.10, if a call is either not rejected nor received but the defined notification time has passed (up to 99s), the module would not acknowledge the call as received and will attempt to redial three times.

2. „Outputs”.



Elmes GSM2 module features four relay control outputs. Each output has two installation terminals connected to relay output contacts and is jumper configured to operate in normally opened (NO), or normally closed (NC) mode (see pt. 8). Outputs can be operated in four control modes. This description covers only SMS control of outputs. Two other control modes: by CLIP (outputs controlled by calls made to module) and by input violation are described in windows “Phones->Outputs” and “Inputs->Outputs” respectively.

SMS text command format depends on selected operating mode of module’s outputs, as shown in field **2.2**:

Selected in 2.2 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 field 2.4
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 field 2.4
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 field 2.4 „OUT1 1:30:00” – Sets on output OUT1 for 1h30m „OUT1 Y” – Sets stable on output OUT1 „OUT1 N” – Sets off output OUT1

Remarks: command strings are space separated and quotation marks are not used!

- After applying name to an output, it 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, see **7.2**, confirmed by return SMS with “OK”. If a command contained any error, such as improper output name, incorrect password or content, the command is not executed and, if this option is selected, see **7.2**, “ERROR” SMS is returned. Typical error could be SMS command “OUT1 Y” sent 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).

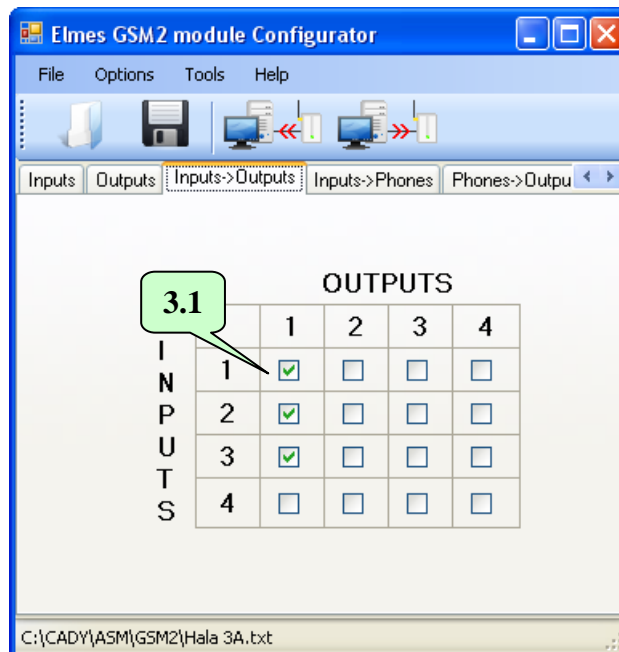
Below listed, are all SMS control commands parameters that are set in various menus of the configuration software. These include:

- whether SMS command must begin with password - field **7.1** and the password - field **7.4** in window “Other”;
- whether SMS command letters case (lower or upper) has meaning - field **7.3** in window “Other”;
- whether the module confirms command execution by return SMS or, in case of error, confirms command rejection – field **7.2** in window “Other”;
- whether SMS command can be send from any- see field **5.5**, or numbers from the list only - see fields **5.3** & **5.4** in menu „Phones->Outputs”.

Every output may have its relay output set ON or set OFF on output activation, selected in field **2.1**. This does not mean that in activation relay output contacts should close or open – that function is NO-NC jumper set manually. It is whether the relay’s coil should be unpowered at standby and powered at set on or, alternatively, powered at standby and unpowered at set on. That second case is rarely used but has meaning in sensing and alarming of power supply cut off.

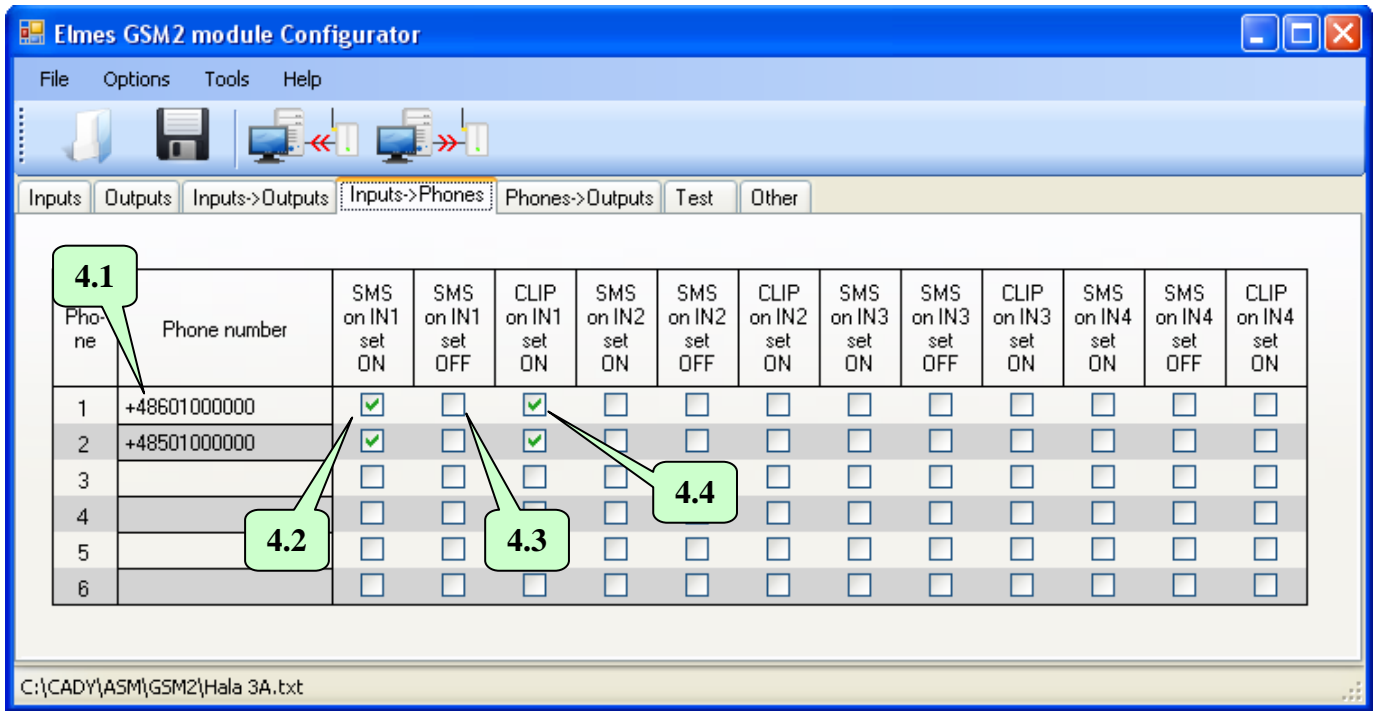
The GSM2 outputs can be also controlled by calling to module’s phone number from one of its 255 listed phones. Each of these phone numbers may have predefined one or many assigned for simultaneous control outputs. This mode allows programmed time pulse control of outputs only (bistable “on/off” operation is not permitted). The third and last available control mode of GSM2 allows predefined output/s control by assigned to it input violation. This control mode does not allow bistable “on/off” operation either. Therefore, the function is set off as standard. To activate it select option **B.3** in menu „Options”.

3. „Inputs->Outputs”.



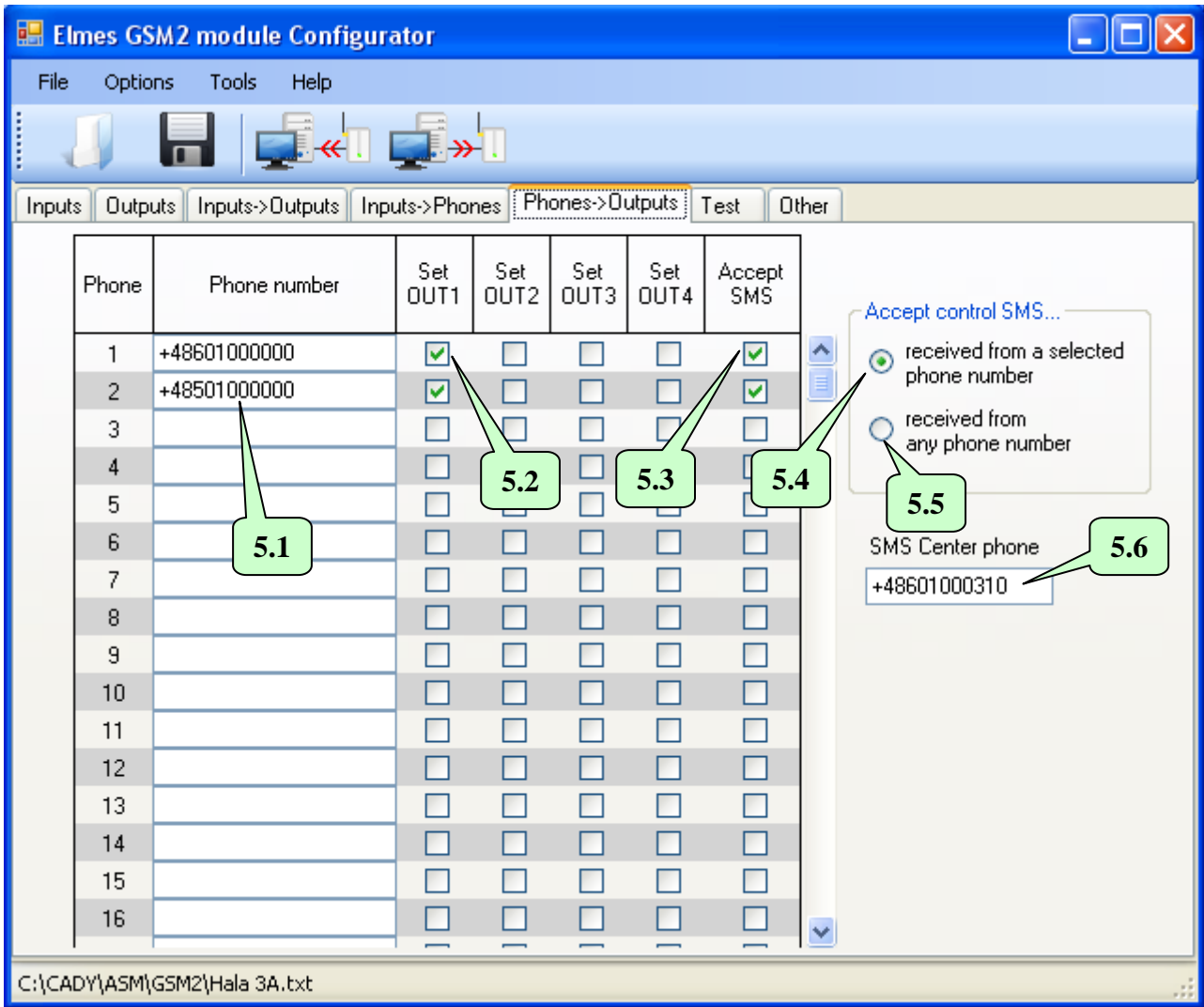
This menu allows selection of outputs activation by violation of inputs. By checking any selection box **3.1** violation of selected input would activate one or many outputs for programmed time (bistable (on/off) mode is unavailable), even it is defined so in window “Outputs”. At the above example, inputs 1, 2 or 3 set on activates output 1.

4. „Inputs->Phones”.



This window is for defining types of notifications that would be send to first six phones on input set ON - field **4.2**, and set OFF - field **4.3**. Also, which of phones would be called to (CLIP notification) on input activation - field **4.4**. Shown phones - field **4.1** are for example purposes only. Phone numbers are input in window “Phones->Outputs”.

5. „Phones->Outputs”.

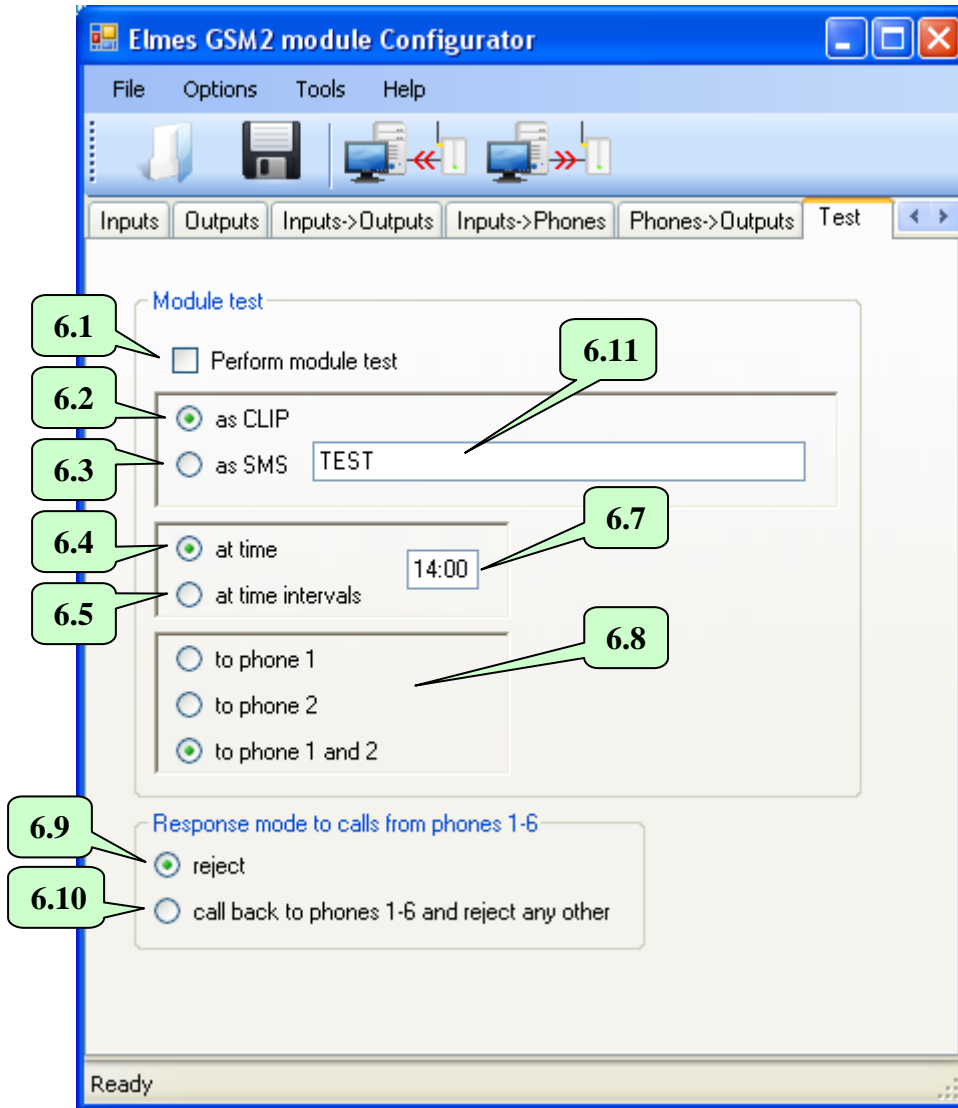


This window is designed to input phone numbers **5.1** that would operate with Elmes GSM2. The list may contain up to 255 phones however, only the first 6 phones are entitled full functionality: can receive SMS and CLIP notifications on input violation (monitoring function) as well as can control module's outputs with SMS and CLIP commands. The remaining phones (7...255) can only be used to control module outputs. Fields **5.2** (4 for each phone) define which outputs are activated on call from respective phone number. Outputs are activated for programmed time only (bistable (on/off) mode is unavailable), even it is defined so in window "Outputs"

If outputs are to be activated by SMS commands from any phone, field **5.5** should be checked. If outputs are to be activated by phones listed in the module only, field **5.4** should be checked. Fields **5.3** are used for selecting phone numbers from which SMS commands are accepted.

The **5.6** field is for input of the network operator SMS center number. This number can be obtained from the respective GSM network operator of which SIM card is used in the module.

6. „Test”.



Periodical module's communication test will be performed if field **6.1** is checked. The test will be made with CLIP calls if field **6.2** is checked or, with SMS specified in field **6.11**, if field **6.3** is checked. The test will be made to the first, to the second or, to both phones simultaneously – see field **6.8**.

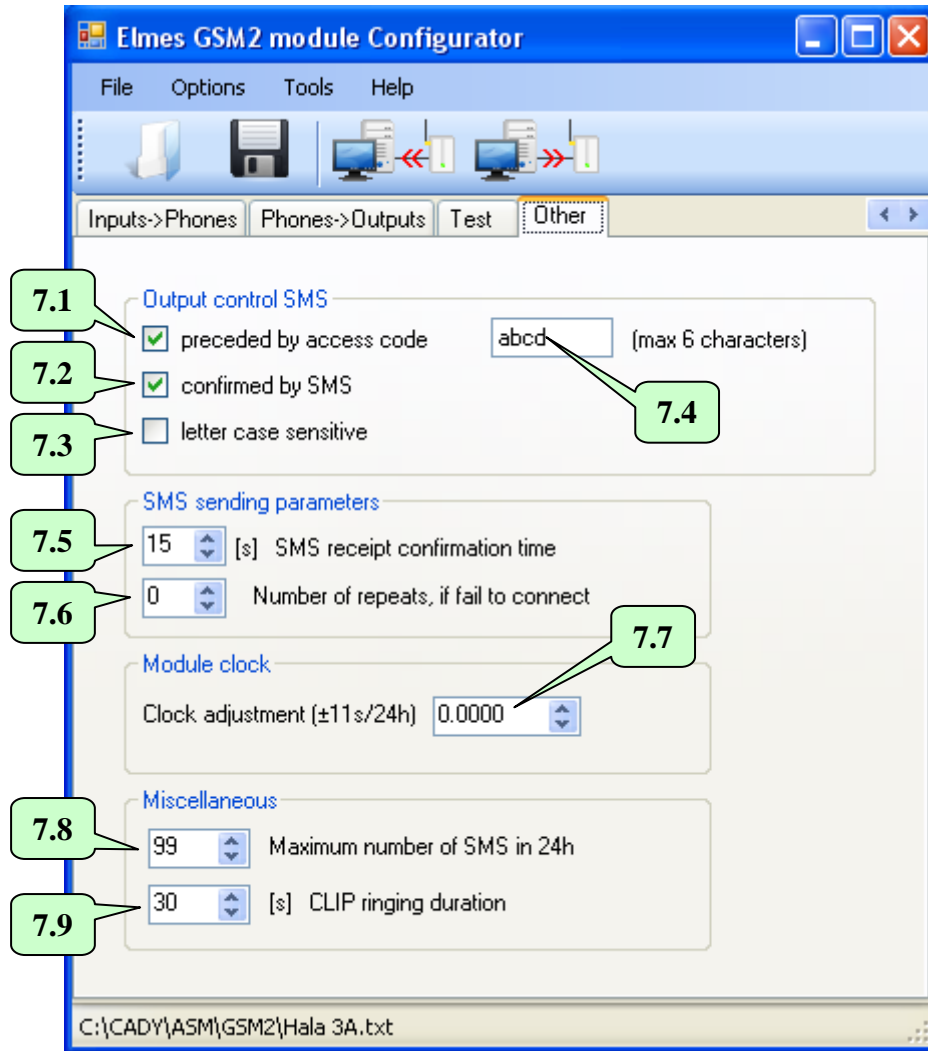
By checking field **6.4** the test would be performed once daily, at time specified in field **6.7**. In that case, module's real time clock should be set first either in Configurator software by clicking field **8.6** in window "Tools->Diagnostics", or remotely by sending SMS with text "password TIME HH:MM:SS" or, "password TIME HH:MM". Example: "abcd TIME 12:30" sets the real time clock to 12:30, where "abcd" stands for password in the example. Time setting SMS must include a valid password.

By checking field **6.5** the test would be performed periodically, after passing preset in field **6.7** time interval, e.g. 12 hours. In that case, time to next test should be set in field **8.4** and button **8.6** clicked in window "Tools-Diagnostics". Periodical test can be forced to perform at any time by resetting test time counter, e.g. by sending SMS with "password RESET" where password is defined in field **7.4**. Within a minute the test will be performed and next test will be made after preset time interval, e.g. after 12 hours.

NOTICE! Disconnecting or switching off power supply results in module's clock and time to next test counter reset. In that case, SMS text message should be send to the module setting the clock and SMS with test time command, if function **6.4** is checked or, send SMS resetting time to next test counter, if function **6.5** is checked.

Communication test can also be done at any time by calling module from any of its listed phones. The call would be rejected and, if option **6.10** is checked, a return call will be made proving proper communication status. If option **6.9** is checked, then the module would reject the call without making a return call, similarly as in the case of all other phones.

7. „Other”.



Check fields **7.1**, **7.2**, **7.3**, **7.4** are designed to control the way module's outputs are operated by means of SMS commands and are described in detail in window "Outputs" (pt. 2).

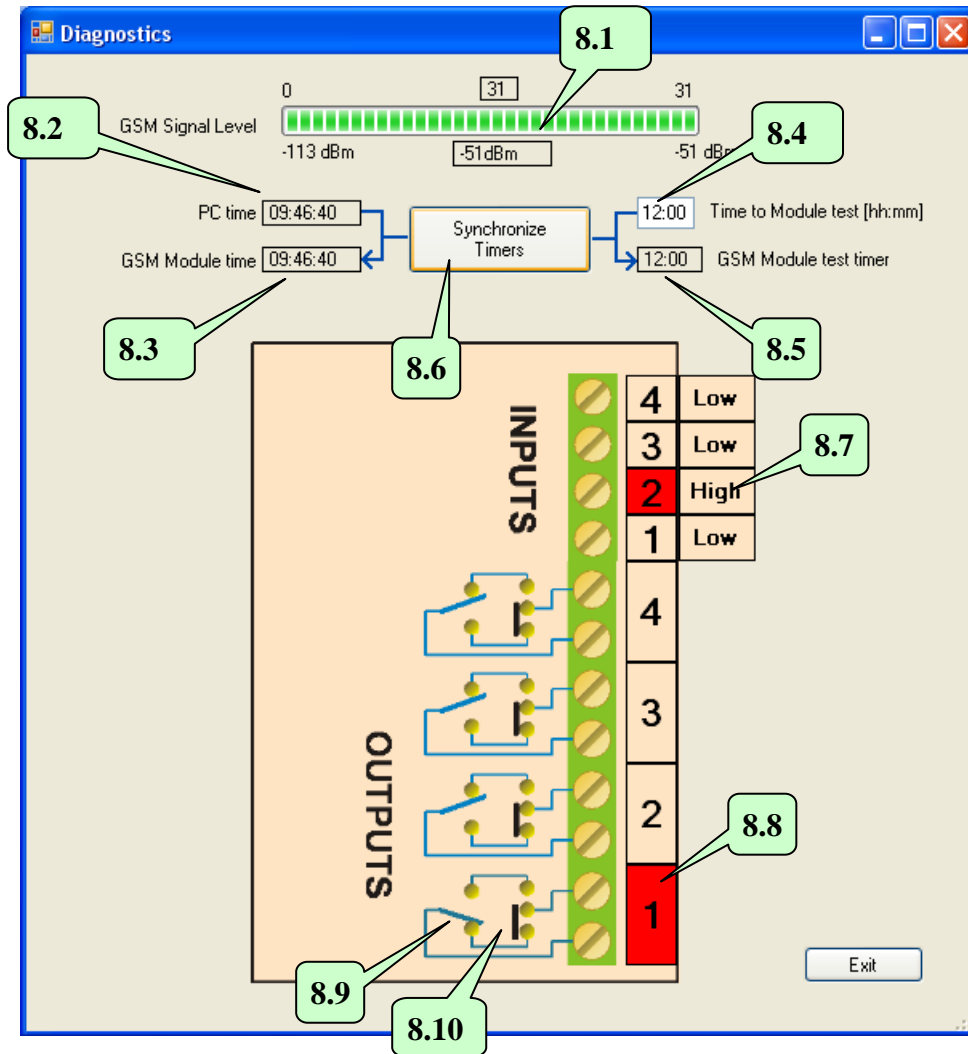
Time parameter in field **7.5** is set to 15s as standard and in most cases there is no need to change it. If two SMS notifications are sent instead of one, which may occur when SMS receipt confirmation time is too long (>15s), then the time value can be increased by few seconds and test made again.

Field **7.7** allows correction of real time clock in the module. If the clock is fast then the value in the field should be decreased. If the clock is slow the value should be increased. The adjustment allows -11 up to +11 seconds correction per day.

Field **7.8** allows sent SMS notifications limitation to within 10 and 200 a day. This function secures against high SMS cost in case of device failure.

Final field **7.9** defines how long the module would execute CLIP calls on input violation. After the preset time has passed calls cease.

8. „Diagnostics”.



Window “Diagnostics” is available in menu “Tools”. Before entering the window it should be made sure that the module is USB cable connected to computer.

GSM signal bar line **8.1** displays quality level of communication of the module with GSM base station in physical units (from -113 up to -51dBm, where -51dBm represent very good level while -113dBm very poor level. Displayed number of bars (0-31) is symbolic representation of signal level only.

Fields from **8.2** to **8.6** are used in module time and test synchronization and were described in window “Test” – pt. 6. Just to remind that clicking button **8.6** clock time of the module is synchronized with clock of computer and time to next test from field **8.4** is send to module’s counter.

Whether test would be performed at specified time daily or, after specified time interval and its set timing, it is defined in window “Test”.

It should be noted that field **8.5** shows time to next test counter in the module and decreases every minute if **6.5** is checked. Field **8.3** displays current clock time in the module.

Window diagram shows selected activation signal level of inputs (High or Low) and whether inputs are currently activated (colored red) – as seen in field **8.7**.

The diagram present also outputs state of the module. For example, **8.9** shows relay contacts state of output 1. The output is currently activated as shown by red color in field **8.8**. Whether output should be opened (NO) or closed (NC) at standby is jumper selected **8.10** on module’s board.

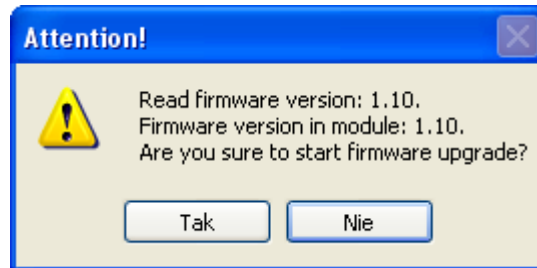
NOTICE! Diagram shows jumper state as delivered by manufactured – not their actual state.

9. Firmware update.

Firmware update is done in "Tools-Firmware Update" window.

First step is to download new firmware file from the manufacturer's web site - www.elmes.pl and save it to PC disk.

Next, the Configurator software prompts to start update process and shows up firmware version downloaded and version in the module. If downloaded version is older or the same as installed in the module, the update process is not necessary and can be discontinued.



By clicking "Yes" the firmware update process is started. When it ends power supply should be switched off.

NOTICE! If, while in the firmware updating procedure, power supply gets cut off, module LED would light steady on power return. The entire firmware update procedure should then be repeated. Firmware procedure can also be force initiated by switching on power supply with jumper JP on.

10. FAQ – what to do if.. ?

1. The Module does not send SMS?

Answer: the GSM network operator SMS service center phone number is either missing or has been input improperly (see fig. 5 above).

2. The Module hangs on if +V of power supply is connected to any of its IN1..4 control inputs?

Answer: the reason for that is voltage higher than +12V. It happens when the module is powered by not stabilized power supply and the supply +V is used to control the module's inputs. If so, at module's standby (the GSM2 module average current draw is 5 mA) the power supply voltage can be as high as 20V(!) while maximum allowable control voltage is 12VDC. The use of stabilized 12VDC power supply solves the problem. Alternatively, high voltage level at module's inputs may be reduced to 10..12V by the use of individually selected resistors in range of 4k7...27kOhm.

This problem refers to modules with mini-USB socket manufactured between 12.2010 – 02.2011 only.

3. The Module does not initialize (LED flashes fast in 1s rate then sets off for few seconds and starts flashing cycle again)?

Answer 1: check for proper SIM card contacting in the SIM socket. If necessary, clean all contacts with spirit cleaner.

Answer 2: SIM card PIN code is other than required 1234 or, PIN-less SIM card is used in module with firmware version earlier than 2.11.

Answer 3: power supply unit has insufficient current draw rating. Though average current draw of the module at outputs set off is less than 5 mA, it can be as high as 1 Amperes in short transmission pulses leading to the module's reset if insufficient current rating power supply is used.

4. On attempt of sending to or receiving data from the module while in communication mode with PC „Out of Time” message appears?

Answer 1: improper COM port is selected in Options->Settings menu. The COM number should match that what appears when USB cable is plugged to PC and what disappears when unplugged.

Answer 2: the USB interface drivers are either not installed at all or installation is faulty. Drivers are available for download at www.elmes.pl. After installation a new COM port should appear. Incorrect driver folder name given at installation is a frequent mistake. Proper driver folder name for modules with mini-USB socket currently manufactured is „VER 2A”.

If driver installation has failed, it should be uninstalled with the cable still plugged, then unplug the cable, plug to PC again and follow cable installation steps described at top of this manual.

Answer 3: check module's connections with PC and power supply unit.

Answer 4: if none of the above solves the problem, follow steps as below:

- unplug and then plug USB cable to the PC or,
- switch off module's power supply and unplug USB cable from the PC, then switch on module's power supply and plug the USB cable to the PC.

5. The „GSM2 Configurator” software does not start up?

Answer: missing Windows® component: „Microsoft.NET Framework 2.0”. It can be downloaded from Microsoft® web site and installed on PC.

6. *On attempt of sending or receiving data from GSM2 module „Access to port COM-x is denied „message appears?*
 Answer: this error may be due to other software application using this port. For example, “Sony Ericsson PC Suite” periodically tests COM ports for a phone presence and, in consequence, block the port access. To solve the problem the following steps should be tried:
- wait few seconds and try data exchange again,
 - disable software application blocking the port.
7. *On attempt of sending or receiving data from GSM2 module “The port COM3 does not exist” notice appears?*
 Answer: after selecting proper COM port in menu Options, the USB cable was PC unplugged.
8. *The Module sends SMS but does not make a call – no CLIP call is made?*
 Answer: the reason for this is that the calling phone number is listed in contacts book contained in the SIM card used in the module. To solve the problem remove the card from the GSM module and delete the number in the SIM contacts book using any mobile phone operating in the same network as the SIM card.
9. *After sending SMS command to GSM2 module, the module responds with “OK” but the outputs are not set?*
 Answer 1: the reason for this is that the password is the same as name of one of the outputs. Even if the function “SMS command must begin with password” is set off, any output name cannot be the same as password.
 Answer 2: SMS sent was 16 data bits coded, not 7 bits. To eliminate the problem, SMS coding mode should be changed in phone from which the SMS commands were sent or, firmware in the GSM2 module should be upgraded to latest version.
10. *On attempt of sending or receiving data from PC to the GSM2 module „Incorrect Parameter” message appears?*
 Answer: the reason may be not up to date Window XP system. The problem may occur only with RS-USB converter with MCP2200 chip and pcb initials “GSM2T-USB”. To solve the problem two Windows XP update patches (KB918365 and KB935892) should be downloaded from Microsoft© Windows site and installed in the PC. Alternatively, installing “Service Pack 3” for Windows XP would also clear the matter as it includes both update patches.

IF problem is of other nature from what is described above please read description of module’s subsequent firmware updates and install latest firmware version, if necessary. If that does not solve the problem please contact Elmes Electronic Service at: service@elmes.pl