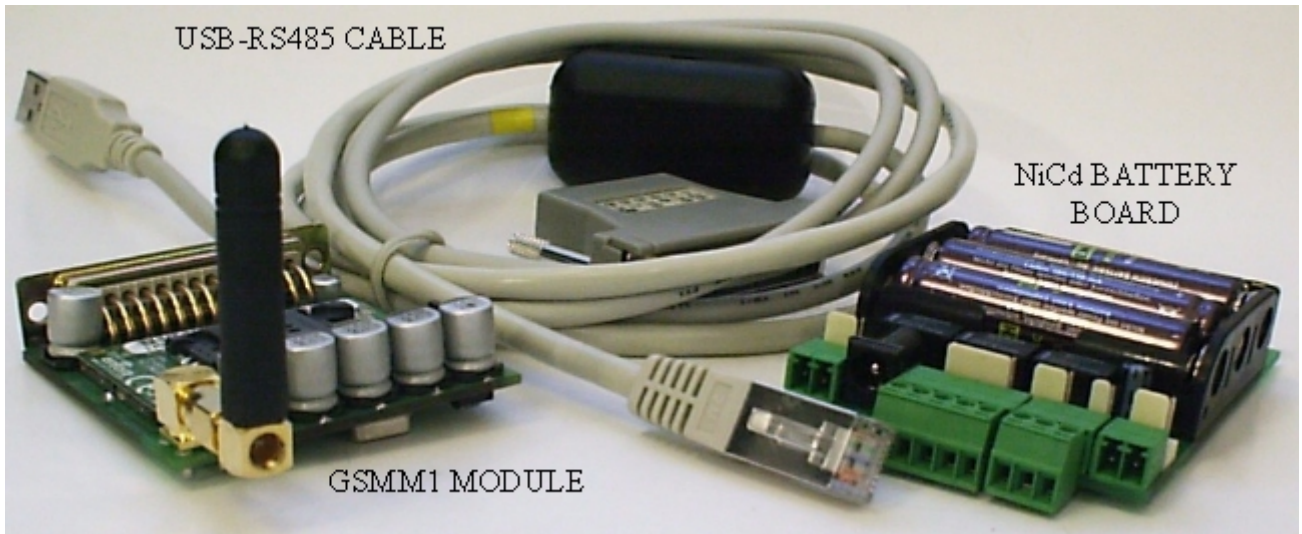


GSM-M1/2 MODULE
Configuration Program



Software was developed to program and configure multifunctional GSMM1/2 modules.



GSMM1/2 – 3x or 4x band GSM/GPRS devices, based on ENFORA ENABLER – II G module and ATMEGA128 microcontroller.

Inputs and outputs:

- 2 digital optic-isolated inputs with programmable trigger state and debounce function;
- 6 analog inputs with programmable lower/upper trigger thresholds;
- 4 open collector outputs;
- microphone input and 1W speaker output;
- RS485 interface;
- programmable timer with trigger period from 1 s to 24 hours.

Case alarm occurred, module executes one of ten build-in programs. Each program consists of one of ten commands and three consecutive GSM/GPRS actions.

Number of commands in the module is 10. Each command can set or unset or inverts inputs, enable or disable timer, turn on or off outputs, turn on or off microphone and speaker. Also outputs could be turned off automatically in a 1 ... 255 seconds.

Each of GSM/GPRS action could be programmed as:

- SMS message;
- E-mail via SMS; e-mail via GPRS (*);
- Call with sending DTMF message;
- Call with sending voice message (*);
- Empty call;
- GPRS message;
- Call with sending GSM Data (*).

Messages could be user-defined set of ASCII data, or module status report in various formats.

Commands could be received via GSM/GPRS as:

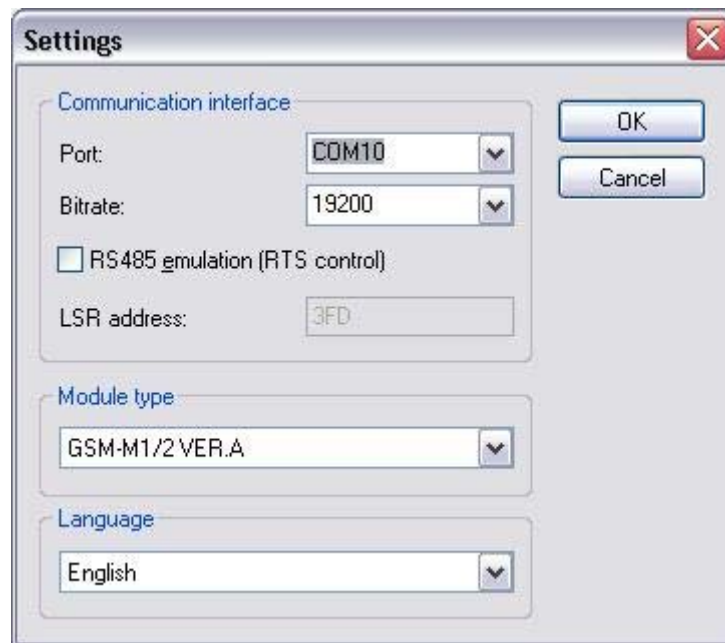
- SMS message;
- Free call (without answering);
- Voice call with DTMF message;
- GPRS message;
- GSM data call (*).

It is possible to process commands from all phone numbers or only from the list of allowed numbers (up to 5 numbers at a moment). For better safety, command could contain additional 8-sign secure word. After successful processing of command module can send the confirmation in the same way how command was received. Confirmation of successful processing command from free empty call is busy tone.

Module could be configured with this software product through special USB-RS485 adapter.

(*) – Not implemented yet.

Program settings – before you begin



First of all select serial port number and baud rate. Case of programming GSMM1/2 device select 19200, GSM/GPRS modems have 115200 by default.

If you use USB422/RS485 converter for programming, leave field "RS485 emulation" unchecked and LCR address empty, otherwise, using RS232-RS485 converter (direction of transmission selected with RTS signal), check it and type LSR address.

Select GSM-M1/2 VER.A "module type" for programming GSM-M1 or GSM-M2, VER.B is not implemented yet.

Select program language interface and press "OK" button to keep changes.

GSM-M1/2 Programming

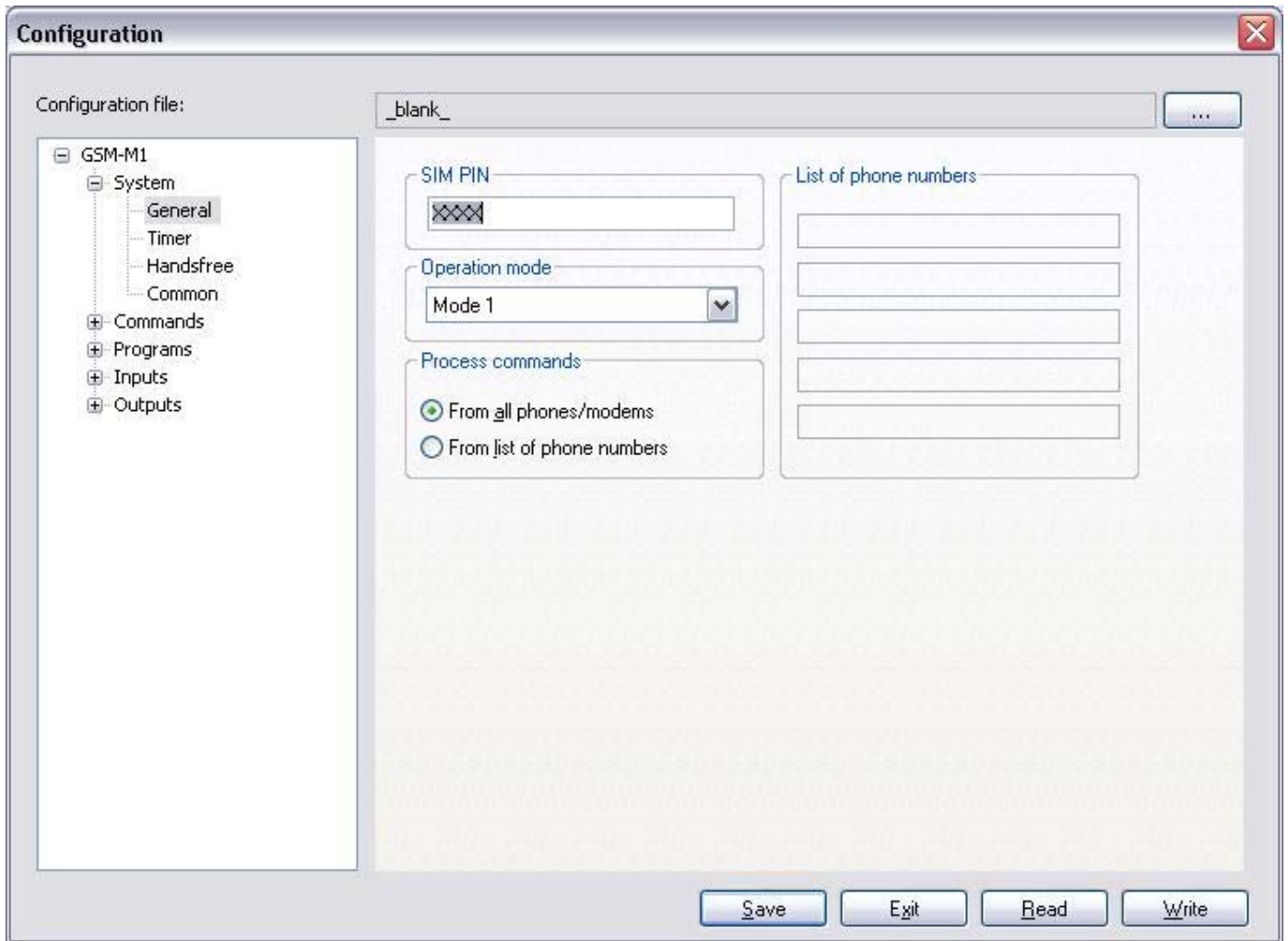
There are two ways of changing (programming) device:

1. *Configuration mode*
2. *Wizard mode*

When you are going to program module by the first time it is highly recommended to use *Wizard* (step-by-step configuration)

Module configuration is divided onto several logical topics with parts (pages): **System** (General, Timer, Handsfree, Common); **Commands** (Command 1, Command 2, ..., Command 10), **Programs** (Program 1, Program 2, ..., Program 10), **Inputs** (Input 0, Input 1, ..., Input 7), **Outputs** (Output 0, ..., Output 3)

Programming – Configuration mode – General Page



SIM PIN – enter 4-digit security code for your SIM card; if SIM PIN is not used, type any letter as the first digit and module will ignore this pin code.

Operation mode – always select “mode 1” for GSM-M1/2 modules at moment.

Process commands from all phones: tick this control if you want that module will execute commands received from any phones. **Note!** Module will not confirm command execution.

Process commands from list of phones: tick this control if you want that module process **SMS, Ring, DTMF, Call-GPRS, GSM Data** commands, received from phones, which numbers are in allowed list only (up to five 19-digit numbers).

Save – save all configuration pages as the file you selected

Read – read **only** current page from module memory

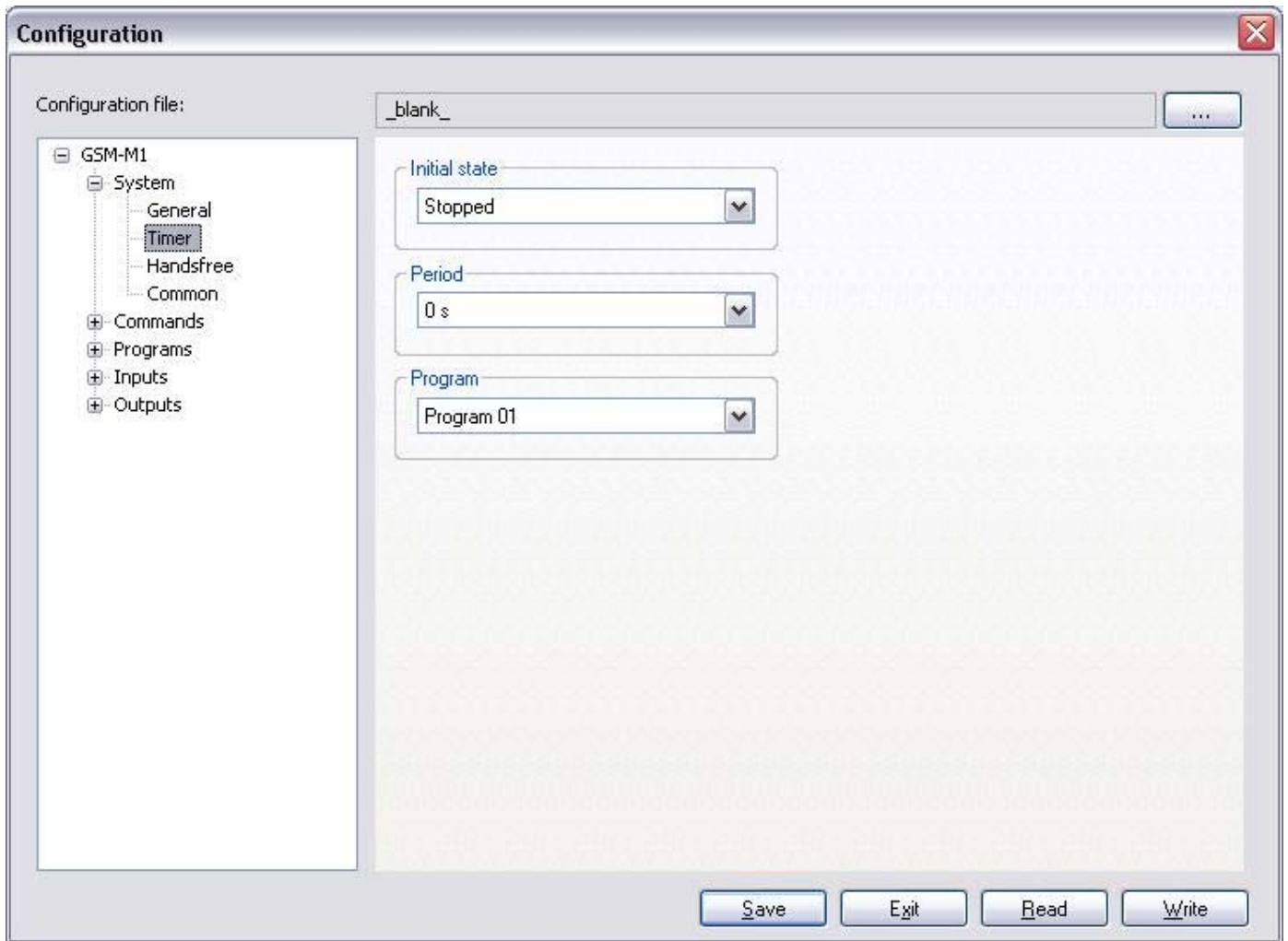
Write – write **only** current page to module memory

Browse (...) – open configuration file

Note1! To read/write all pages in topic, select parent topic and press button **Read** or **Write**.

Note2! Buttons behavior is identical for all pages and topics.

Programming – Configuration mode – Timer

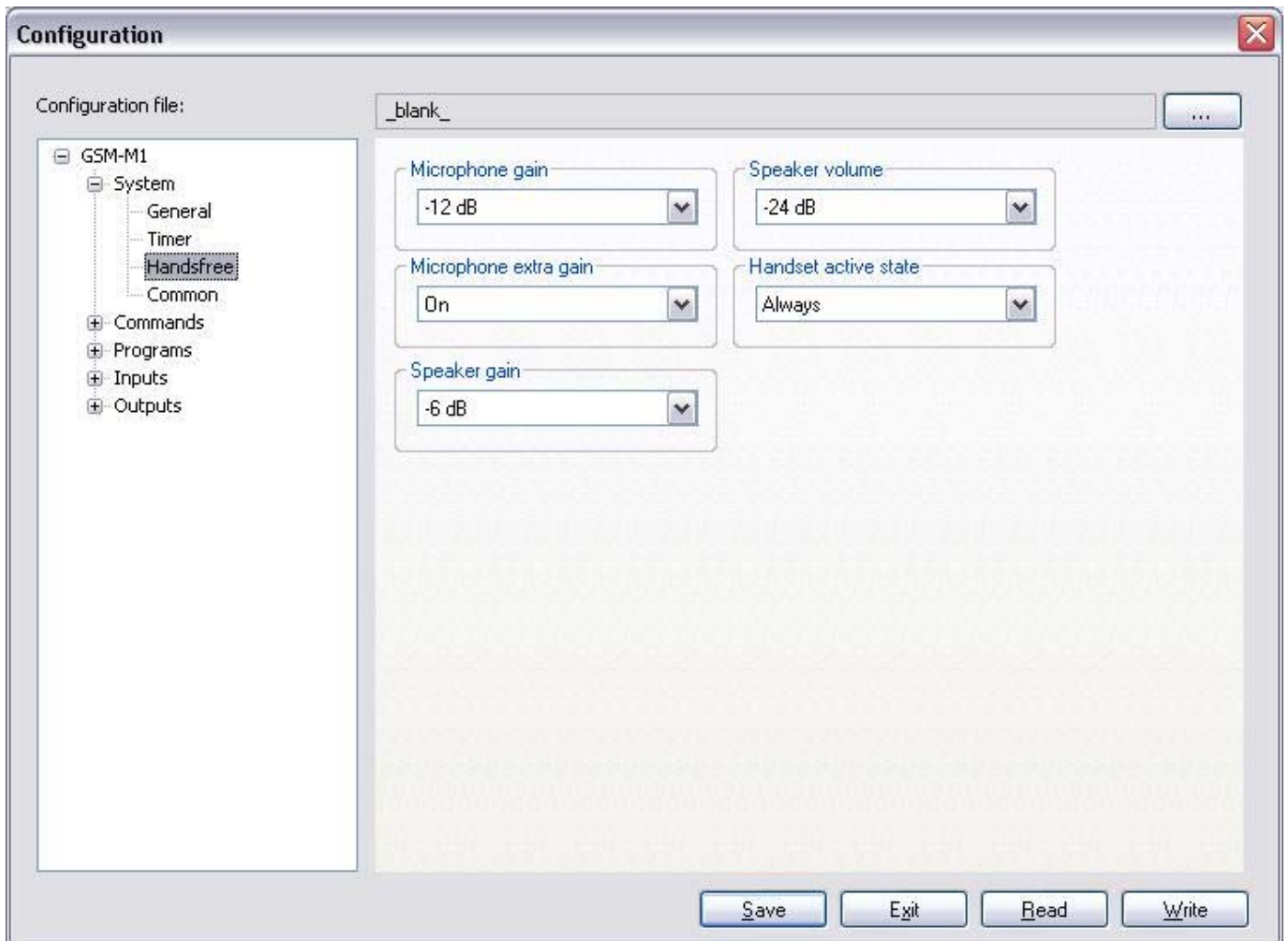


Initial state: initial timer state (after power reset), timer can be **Stopped** or **Started**.

Period: timer shooting interval (from 1 second to 24 hours), module executes selected program in a time represented the selected value in case of timer is enabled. **Note!** It is not recommended to use timer period less than 1 minute for long GSM operations.

Program: executable program.

Programming – Configuration mode – Handsfree



Microphone gain: microphone amplifier gain; could be value from 0 to 24 (-12 dB to +12 dB)

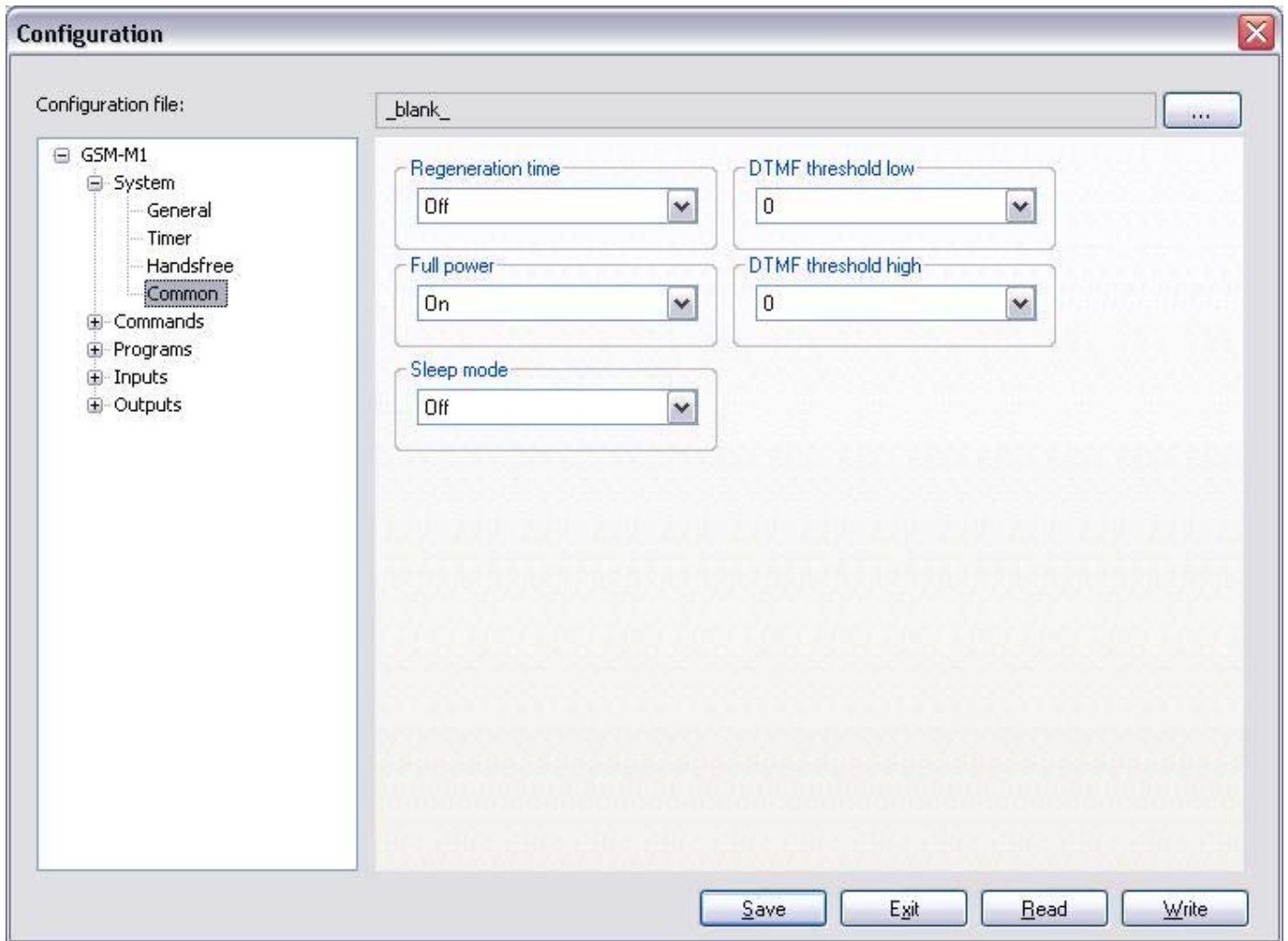
Microphone extra gain: turning on an additional (extra) amplification at least to 23 dB.

Speaker gain: speaker amplifier gain; could be value from 0 to 12 (-6 dB to + 6dB)

Speaker volume: 0 – mute, 1 - -24 dB,..., 5 - -6dB.

Handset is Active: time, value from (1 s to 24 h), due which module will be online after receiving command to turn handset on; module will go offline earlier if the caller drops conversation.

Programming – Configuration mode – Common



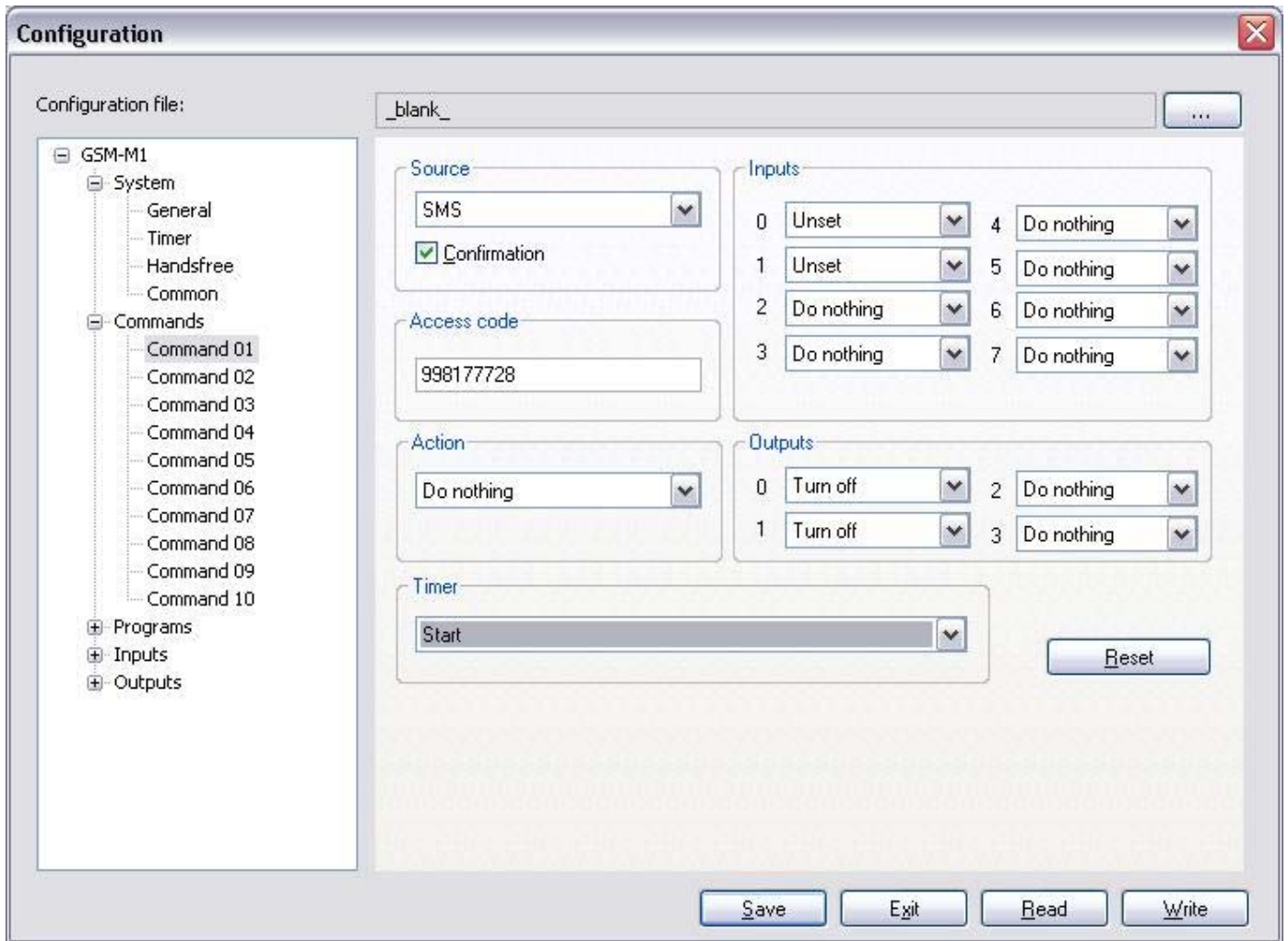
Regeneration time: after executing program module will be fall asleep for this time, no programs will be executed, even alarm occurs. **Note!** Do not select this value lower than 1 minute.

Full Power: full transmitter power in active mode could be **On** or **Off**. "On" is recommended.

Sleep Mode: power-saving in passive mode, could be **On**, **Off** or **Deep** (extra economical mode). Note! In Deep mode module turns interface off, so, even after returning to normal mode, some first received bytes could be lost. Recommended selection is "On".

DTMF: currently, field values do not matter.

Programming – Configuration mode – Command



Commands are used for setting/unsetting inputs, turning outputs on or off, starting or stopping timer and handsfree, resetting module. Command's action order is following: reset, timer operation, operation with inputs, operation with outputs, operation with microphone and speaker.

Source: field, representing the source of command that module received:

Internal – command could not be activated through GSM/GPRS, only changes in inputs state may execute it;

SMS – command will be activated through receiving a SMS. Module will determinate phone number of caller (sender), and if occurs that detected number is out from the list of allowed numbers, command will be ignored. See *General Page*.

Call – command will be activated through receiving a ring. The module doesn't answer. If it accepts the command, it makes "hook", if not – doesn't respond the ring.

DTMF (Call) – command will be activated through receiving a DTMF sequence. Module is answers the call with a short tone. Then it waits for a command. Allowable symbols are of digits from 0 to 9. The last sign must be "#". Module analyzes received digits from the end to start and ignores the first digits if it has already found the right command string. So if you make mistake during command entering, please start again. The total number of digits must not exceed 15. If module accepts the command it generates short tone and executes command. If not accept – disconnects.

GPRS – command will be executed if module received it from server through GPRS connection. In this mode, module connects time by time to internet and checks for new command from guard server

Call + GPRS – the same as previous, except for one detail: module connects to internet only after receiving voice call.

Access code: security code (up to 9 letters) for confirming the legality of command source. If source is DTMF (Call), this field could contain only 0-9, A, B, C, D,*, #; if this field is empty, module execute command immediately after call was received. Note! Do not use analogous codes, especially if one of

code is part of another. For instance: in case of combination of three commands **SET**, **RESET**, **UNSET**, following one after another, first one will be detected and activated instead of others!

Confirmation: tick in this control means that module will send confirmation about successful processing of command in the same way how command was received. If source is Ring, module confirms successful command execution breaking the connection. If source is DTMF (Call), module confirms successful command generating the short tone.

Action: module reset or operation with handsfree. Reset function could be used in any command, firstly module restarts (it takes about 1 minute), then executes all other operations. Timer operation could be activated only by command "Call+DTMF". If one of handsfree functions is active, module executes all other parts of the command, then switches on hands free input-output, amplifier and holds connection until it detects break or time is over.

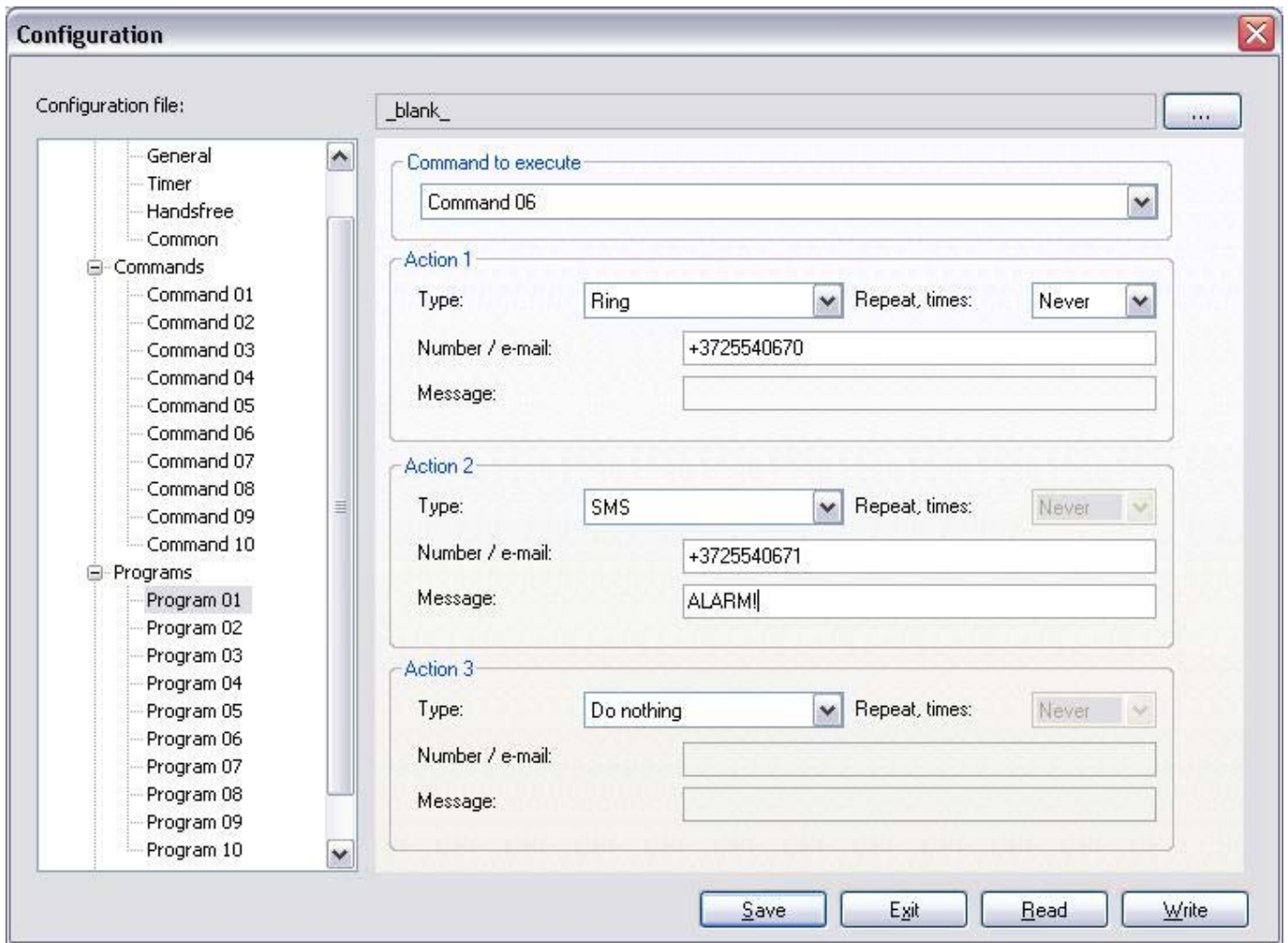
Timer: operation with timer, available choice is "Do nothing", that means no changes with timer work will happened, "Start", "Stop", "Execute timer program", and "Execute timer program and reset". See Timer page.

Inputs: input could be "Set", "Unset", or "Toggle" active / passive state. Last one makes possible running the program, if state of input was changed in both ways. If selected value is "Do nothing" – no changes in zone state will happened. See Inputs page.

Outputs: output could be "Turned On", "Turned Off", or "Toggle" active / passive state. If selected value is "Do nothing" – no changes in output state will happened. See Outputs page.

Free: This will reset selected command to inactive state.

Programming – Configuration mode – Program



Each program consists of three independent GSM actions; and may execute one of 10 commands.

Action 1, 2, 3:

Type: type (kind) of action:

Do nothing - no GSM/GPRS action will be done

SMS - module will send SMS

SMS e-mail – module will send e-mail message through SMS service

GPRS e-mail –module will send e-mail message through Internet (*)

Voice Call – module will call and play voice message (*)

DTMF – module will call on modem/phone with DTMF decoder and send DTMF sequence (*)

GPRS – module will connect to the guard center through Internet and send TCP/IP data. IP address of guard center could be defined in SIM-card and modem settings.

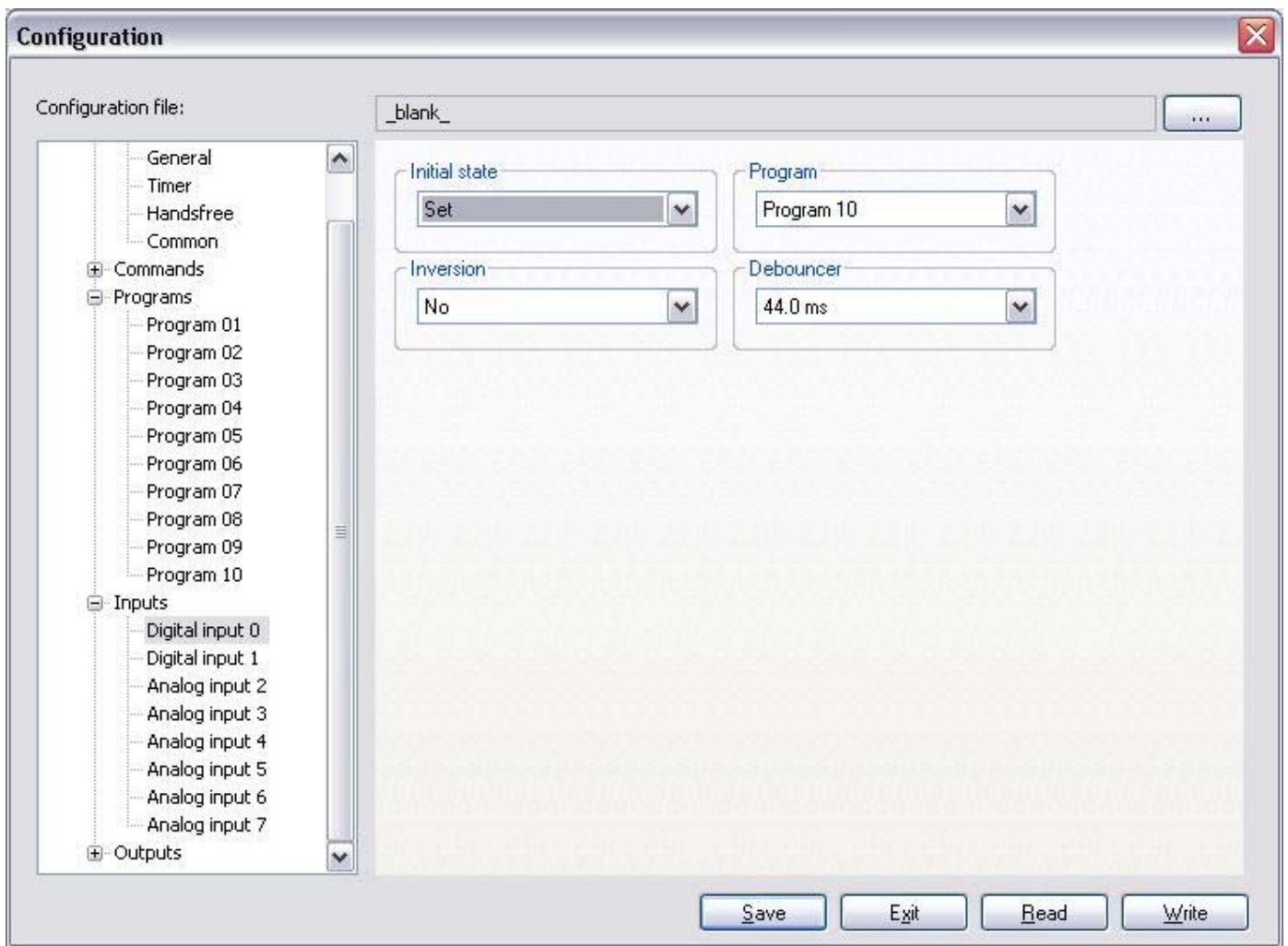
GSM DATA - module will call and send data message (*).

Repeat, times: from 1 to 16 times, this value represents how many times voice message will be repeated due call; Selected value **Never** means that module will make empty call if selected mode is Voice call.

Message: message body (up to 63 letters) or macro command; Macro command begins with "?", what kind of information will be sent and its format define module customer. For example: macros "?1" - module will send information about outputs state; macros "?2" – resistance values of analog inputs; etc. See appendix 1 for details.

Number / E-mail: phone number or e-mail address of recipient, to whom information will be delivered according to selected type of action.

Programming – Configuration mode – Digital inputs



Initial state: initial output state after module was reset; could be **Set**, or **Unset**.

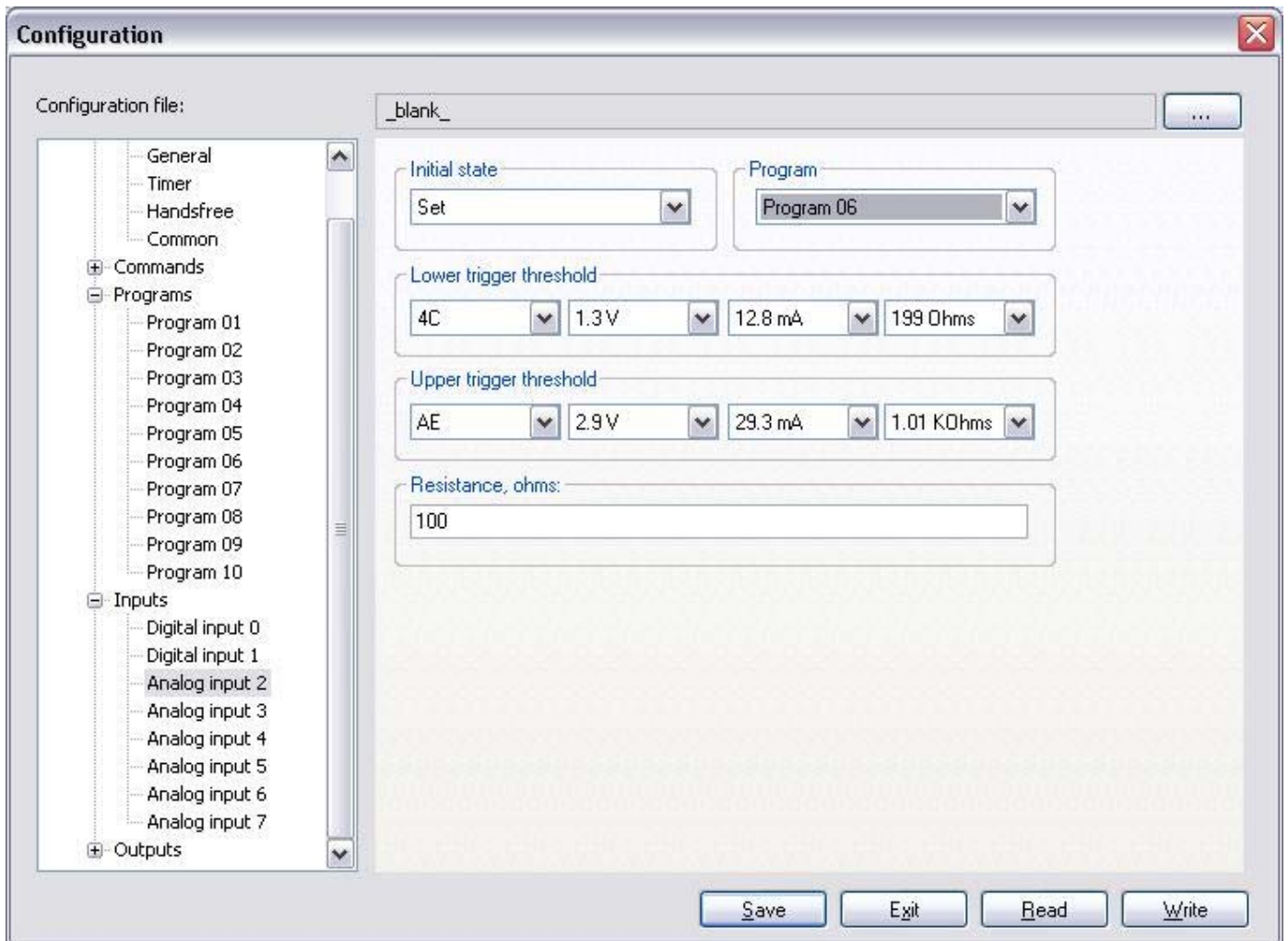
Program: executable program (one of 10) in case of input alarm.

Inversion: input inversion: **Yes** or **No**.

Debouncer: value from 0 to 1.122 s.

Note! Digital input DI0 has the highest priority; otherwise, analog input AI7 has the lowest one. Module will execute program for input with the *highest priority* in case when more than one of inputs is disturbed.

Programming – Configuration mode – Analog inputs



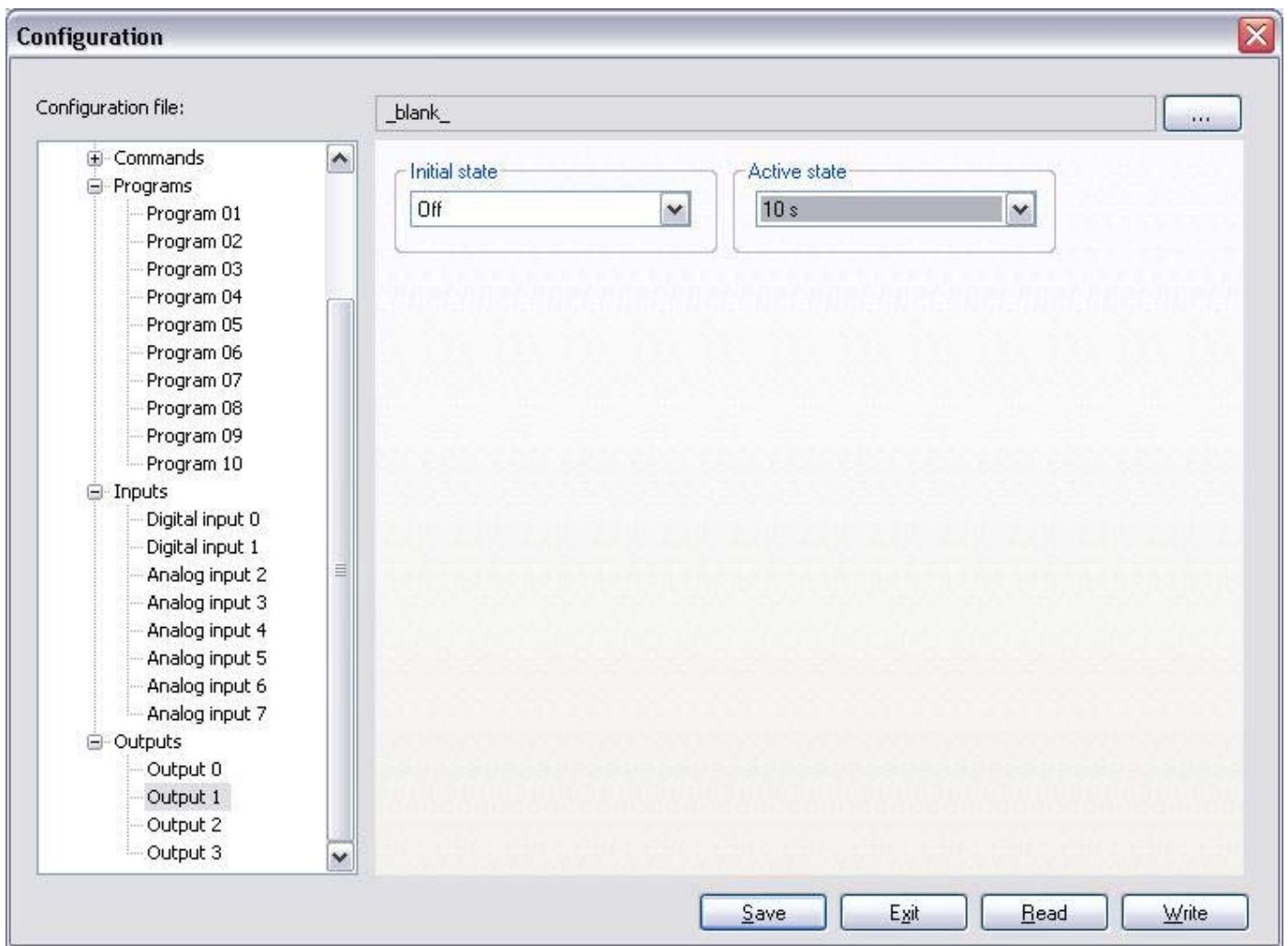
Initial state: initial output state after module was reset; could be **Set**, or **Unset**.

Program: executable program (one of 10) in case of input alarm.

Lower (Upper) trigger threshold: lower and upper threshold code in hex values; windows to the right of this codes shows the corresponding values in ohms (if input measures resistance), in volts (if input measures voltage) or in milliamperes (if input measures current on resistor, which nominal could be entered).

Note! Digital input DI0 has the highest priority; otherwise, analog input AI7 has the lowest one. Module will execute program for input with the *highest priority* in case when more than one of inputs is disturbed.

Programming – Configuration mode – outputs



Initial state: initial output state after module was reset; could be turned on (**On**), or turned off (**Off**).

Active state duration: active state of output (from 1 to 255 s). Selected value (**Always**) means that output can be turned off only by receiving another command.

Programming – Wizard mode – first step



There are three possibilities to start programming wizard: starting blank (default) device configuration, opening configuration file or reading configuration from device memory. Make your choice and press "Next" button.

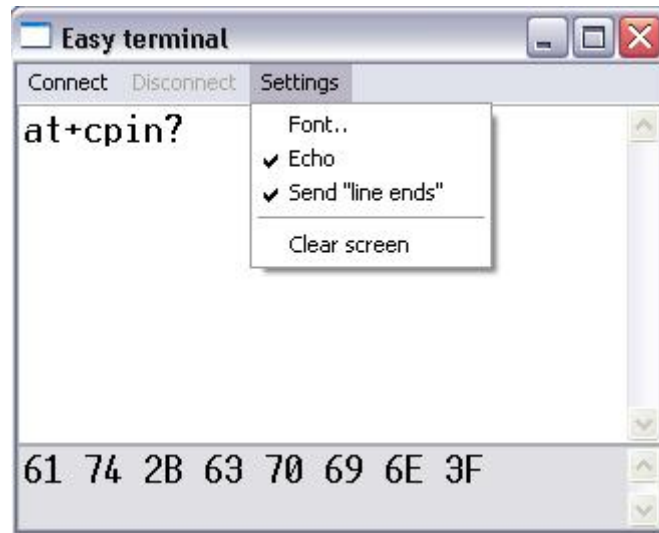
Then Wizard will bring you step-by-step through device configuration. The order of pages is the same as in Configuration mode: General, Timer, Handsfree, Common, Command 1, Command 2, ..., Command 10, Program 1, Program 2, ..., Program 10, Digital input 0, Digital input 1, Analog input 2, ..., Analog input 8, Output 0, ..., Output 3. You can use buttons "Next" and "Back" for navigation across these pages. Use button "To end" to jump to the last configuration page. Press "Exit" to quit the Wizard.

Programming – Wizard mode – last step



Select what you want to do with edited device configuration and press "Finish" button.

Monitoring tools – Easy terminal



You could use this tool for monitoring device work, or to send/receive AT commands.

Monitoring tools – Input monitoring

Input	Set/unset	State	HEX	Voltage	Current	Resistance
Digital 0	Set	Normal				
Digital 1	Set	Normal				
Analog 2	Set	Normal	F8	4.2 V	41.8 mA	16.7 KOhms
Analog 3	Set	Normal	FF	4.3 V	43.0 mA	
Analog 4	Set	Normal	FF	4.3 V	43.0 mA	
Analog 5	Set	Normal	FF	4.3 V	43.0 mA	
Analog 6	Set	Normal	FF	4.3 V	43.0 mA	
Analog 7	Set	Normal	FF	4.3 V	43.0 mA	

Signal quality:

Resistance:

This window is used for real-time input monitoring: **Alarm state** (Set or Unset), **State** (Normal or Alarm) and **Value** of input state (only for analog inputs). Values could be shown in different units (hex, volts, amperes or ohms)

SIM Card and Modem settings



The image shows a Windows-style dialog box titled "SIM card and modem" with a close button (X) in the top right corner. The dialog is divided into three sections:

- PIN code:** A section containing a checked checkbox labeled "PIN request is enabled";, a "Disable PIN" button, and a "Change PIN code" button.
- GPRS settings:** A section containing a "Provider APN:" label and a text box with "internet.t-mobile.cz", a "Guard server IP address and port:" label, and two text boxes containing "80 . 235 . 117 . 154" and "10001".
- SMS center phone number:** A section containing a text box with "+3725509911".

At the bottom right of the dialog are two buttons: "Save" and "Exit".

In this window user can change SIM PIN code, enable or disable SIM PIN request after module restart.

APN: Access Point Name of GSM/GPRS provider

Guard Center IP: IP address and socket port of Guard Center or SMTP server.

SMS Service center: phone number of provider SMS service center.

Save: save settings to module

Cancel: exit without changing settings

**Appendix 1.
Module status request.**

Status request: ?1,...,?6.

Type of message: ASCII.

First byte: ":".

Second byte: type of message from 1 to 6. The message body of next type will be added to the body of previous.

Type of request	Bytes / Total	Description
?1	2 / 4	Alarm state before executing the command included to the alarm program. Each bit is one input. Alarm is 1, Normal is 0.
?2	4 / 8	Alarm state after executing the command included to the alarm program. Each bit is one input. Alarm is 1, Normal is 0. State byte after executing the command included to the alarm program. Each bit is one input. Set is 1, Unset is 0.
?3	4 / 12	4 last IMEI digits.
?4	12 / 24	ADC values for each of 6 analog inputs.
?5	2 / 26	Radio signal quality.
?6	12 / 38	12 first IMEI digits.

Example: **Spaces are added specially for information blocks delimitation. Real message does not include any spaces.**

:6 02 0003 9030 ADADADADADAD 15 035326700003

Type of request: 6.

Alarm state: 02 – Alarm for input D1.

Alarm state: 00 – No alarm after executing command.

State: 01 – D0 input is set, others are unset

IMEI last digits: 9030

ADC values: ADADADADADAD

Signal quality: 15

IMEI first digits: 035326700003