



GPRS TRANSMITTER PX100N

Installation and programming manual

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1. INTRODUCTION

Transmitter GPRS type PX100N is an advanced microprocessor device, made with surface moulding technology and designed according to the latest trends. This transmitter is purposed for data transmitting from electronic security systems of facilities and other technical devices with the use of GSM mobile phone network. Data transmission follows via GPRS or SMS.

Due to many settings a transmitter may be applied with many systems of various requirements. The device is basically purposed for data transmission from security systems installed in detached houses and in small business facilities.

Communication with a monitoring station follows by GPRS/SMS mode. This device provides an opportunity to send text messages to private mobile phones.

An advanced encoding methods like a 256 bits encoding key and AES (Advanced Encryption Standard) provides for security of data transmission. As a result reception of this transmission is possible with OSM.2007 monitoring receiver system.

Furthermore there is possibility to transmit not coded messages that are to be comprehensible by reception solutions and also by GPRS Server software.

Programming of receiver is possible:

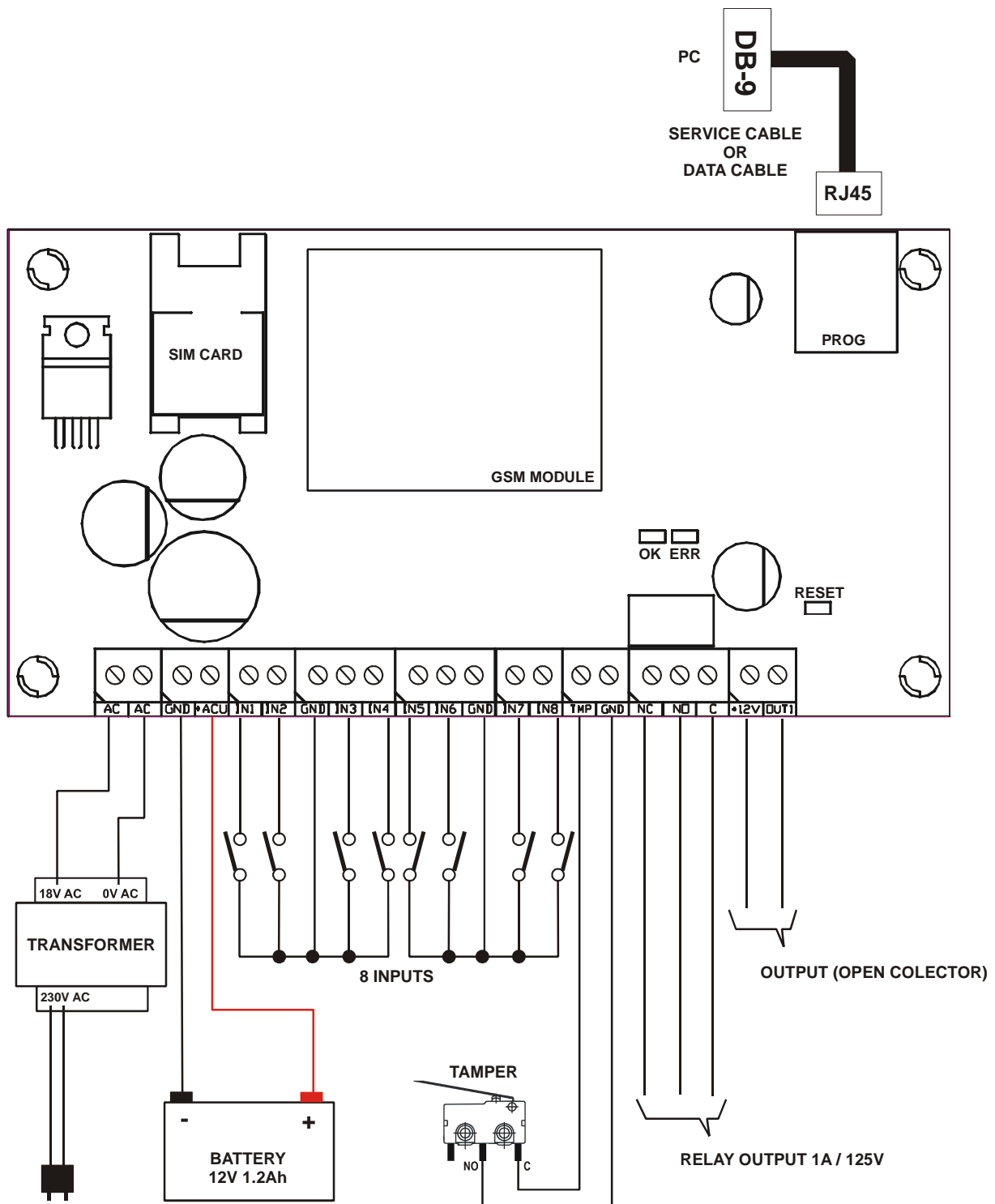
- Locally on computer and with recommended "GPRS Transmitters Configurator" software
- Remotely
 - via GPRS connection (or SMS).
 - via SMS commands
 - via transmission on CSD channel

2. FUNCTIONAL AND TECHNICAL PARAMETERS

Inputs: (NO/NC)	8	
	1 (sabotage input)	
Outputs:	Sabotage - 1 (NO/NC) Additional - 1 (OC)*	
Digital interface:	RS232 (RxD, TxD, RTS, CTS lines)	
Operation modes:	<ul style="list-style-type: none"> ➤ GPRS transmission only ➤ SMS transmission only ➤ GPRS and SMS transmission 	
Messages:	Sending of text messages for defined mobile phones	
Configuration:	Remote - via GPRS link Remote - SMS Remote - CSD Locally - from PC with the use of software and RS-232 link	
Security:	SMS/GPRS transmission - AES encoding	
Output current:	TMP	AUX
	Max. 1A	Max. 100mA
Voltage supply :	18VAC (16-20VAC)	
Current consumption average/max.:	100mA / 950mA @18VAC	
	70mA / 470mA @ 13VDC	
Dimension:	141mm x 73mm	
Charge current:	Max. 100mA	
Charge voltage:	13,8V	
Used batteries:	Acid-leaded 12V	
Battery failure voltage threshold:	11V	
+12V Output current	Max. 200mA	
Used GSM/GPRS modems:	Siemens MC55i, Siemens MC55, Siemens MC56, Wavecom Q2686, Simcom SIM300C, Simcom SIM340C	

* Device can be equipped in additional two OC type outputs (OUT2, OUT3)

3. ASSEMBLY AND WIRING



Connections of wires shall be made with due care to prevent any faults or dead shorts. Places of connections shall be protected against weather conditions. According to the above figure terminals of transmitter shall be connected to:

Terminal	Connection description
AC, AC	Two terminals for AC power supply (output from AC transformer)
+ACU	Positive terminal of battery
GND	Device ground, common for other input and output
TMP	Connection of monitoring sabotage switch (the second switch contact connected to GND terminal).
IN1 till IN8	Signal inputs. Possible connection of detectors contacts or alarm control panel outputs. GND terminal is common for all inputs.
NC, NO, C	Sabotage output indication relay. It may control external device. During activation disconnects C terminal from NC, and connects C to NO terminal
OUT1	Type OC additional output. It may control external device. Provides ground during activation.
+12V	Supply voltage output. Provides up to 200mA

NOTES :

OUT1 output can sink up to 100mA. Don't short this output to power supply because it can cause permanent damage of output.

Don't connect power supply when GSM antenna isn't connected, because it can cause permanent damage of GSM/GPRS modem.

After careful connections examination a battery may be connected (to +AKU and GND terminals) and then power may be switched on for transformer and programming procedure of transmitter may begin (See chapter 6).

4. QUICK START PROCEDURE

NOTE :

Do not insert SIM card before the first programming of transmitter as it may block the card if PIN code is required for the card.

This chapter is purposed for users that possess experience regarding GPRS data transmission systems and who work with OSM.2007 server. Other users shall skip this chapter and go to chapter 5 of this Manual.

As many users possess protected facilities spread at vast locations, local programming of transmitter is not always available (with computer keyboard and programming cable).

Two phases comprise programming in this option:

- a) sending to transmitter of main parameters (with SMS) that enable connection to communication server (OSM.2007 system).
- b) full configuration of device with remote programming (GPRS transmitters configurator and OSM. 2007).

Quick start procedure:

- a) insert into device SIM card with PIN code 1111 or without PIN code.
- b) connect power supply for module,
- c) send to SIM card number with SMS parameters related to connection of device to communication server (OSM. 2007)
- d) waiting for moment, when device indicates connection to server

Note: Connection to server is possible if the device was registered into it. Registration procedure has been described in OSM.2007 Operation Manual.

- e) complete, remote programming with GPRS transmitters configurator.

SMS text message shall provide the following information:

<transmitter's service code> ■ *SERVER= <server address>* ■ *PORT= <server port>* ■
APN= <access point name> ■ *UN= <user ID number>* ■
PW= <user password>

Where:

■: space (every parameter shall be separated with space – blank character)

<transmitter's service code>: factory settings -**1111**

<server address>: address of communication server purposed for collection of transmitter signals e.g. 89.123.115.8 In case address is provided as domain e.g. block.autostrada.com, SMS message shall include DNS1 parameter (address of main DNS server)

<server port>: Number of port in server that receives messages from a device

<access point name>: defines access point name to GSM network.

If private network is used, SMS message shall provide the following parameters:
UN= <user ID number> and *PW= <user password>*.

Exemplary SMS is as follows (if we use public network and provide server address as IP):

**1111 SERVER=89.123.115.8 PORT=6780 APN=general.t-mobile.uk
UN= PW=**

Where:

: space character

5. OPERATION

A device maintains communication via GSM-GPRS network. If any problem follows a device automatically switch to SMS mode (if this mode has been programmed before-See chapter 7 "Programmable parameters"). As a result the transmitter may be used only at the territory covered with mobile phone operator network.

If status of inputs is the same as programmed one (NO or NC) a device stays in a rest. Change of status on any input results in immediate signal transmitting of this event by the device.

Note:

Each device input (from IN1 till IN8) may be individually defined as on open one (NO) or closed one (NC). It means that when in NO, input shorting will be an active state and, a non-shorting will be an active state in NC.

To avoid an excessive cost of use related in particular to false alarms a device possesses a programmable analysis of inputs.

All inputs respond only to states change which means that transmitting will follow only if an active state is on input and maintains during programmed minimum time. Maintenance of active state longer than a minimum time will result in single indicating. Another input activation (another transmitting) is possible only after input reached based state.

Number of messages sent in SMS mode is limited (limit includes also text messages or answers to orders sent by user). This function provides for cost reduction by limiting messages e.g. in case of damage of sensor connected to any input. After passage of programmed time new messages will be sent but only in a number determined by the user.

Text message on events sent to private phone numbers may be edited.

All programmable parameters are saved in memory and in case of voltage drop that are not lost. Supply of power starts the transmitter with saved settings.

6. CONFIGURATION PROGRAM

6.1. INITIAL REMARKS

GPRS transmitters configurator software may be downloaded at www.ebs.pl (login: pxn@ebs.pl, password: pxn).

To install program an installation wizard shall be started that performs installation in default place C:\Program Files\EBS\. During installation process shortcuts on screen and Windows menu are created.

If device is to be used for the first time it shall be programmed with the above program and after this procedure the SIM card may be inserted into the device. Otherwise SIM card may be blocked if wrong PIN code is entered. Alternatively SIM card may be used along with switched off PIN code.

In case of remote programming it is necessary to insert SIM card prior to sending configuration settings. In this situation SIM card with switched off PIN code shall be used or before card inserting, PIN code shall be changed with mobile phone.

6.2. COMPUTER – REQUIREMENTS

Minimum requirements for computer system where configuration software is to be installed :

Hardware:

- Processor Pentium II 400 Mhz,
- 64 MB RAM,
- 1 GB HD.
- CD-ROM,
- RS-232 serial port
- Colour monitor (minimum 15 inch , min. 800x600 resolution),
- Keyboard
- Mouse

Software:

- Operation system Windows 2000, Windows XP or Windows Vista
- NET Framework 2.0 (delivered along with installation wizard of configuration).

6.3. PROGRAM FUNCTIONS

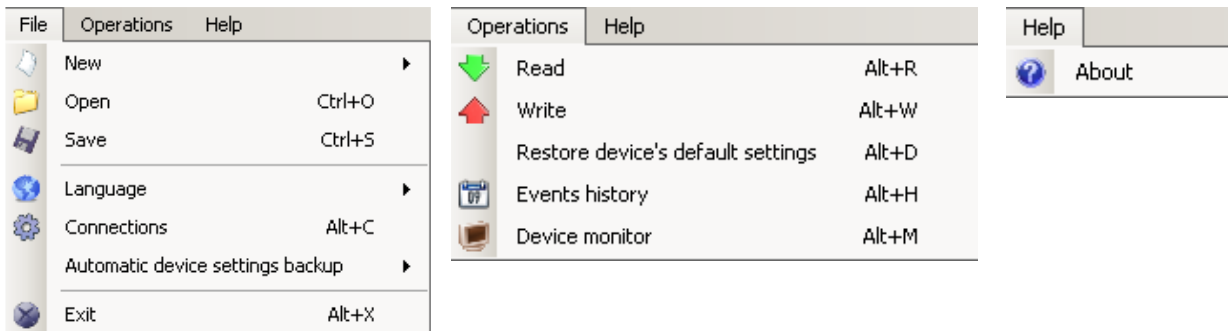
After installation and program starting a main view shall be displayed on screen. Thanks to this view an access to program or programmable parameters of device is possible.(See chapter 7).

Main window of program is divided into some fields.

Main menu: at upper part of window, contains control and configuration options.



Main menu contents:

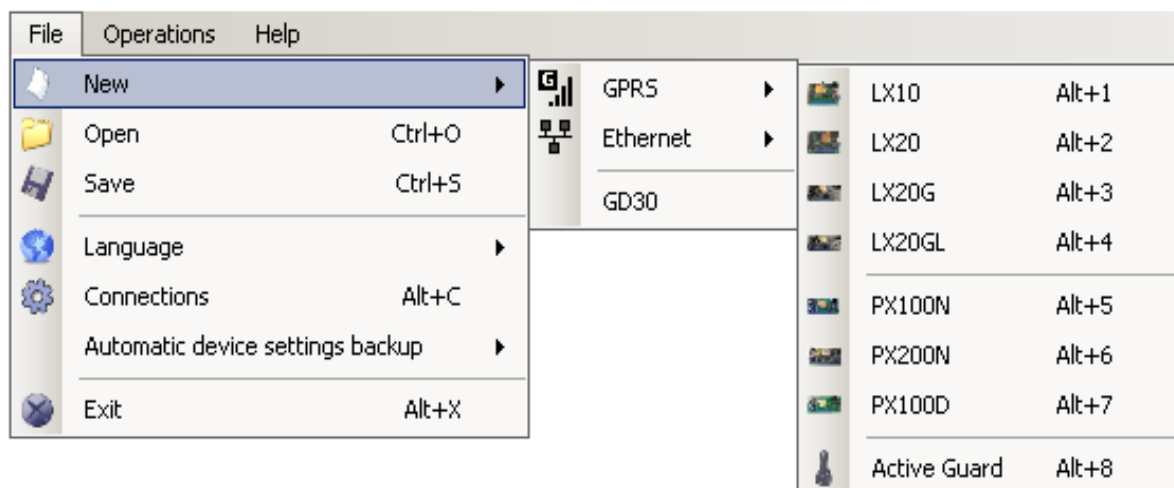


Main menu is available as icons on fast access bar:



6.3.1. File -> New

Opens new set of parameters. Editing of configuration parameters is possible.



Select type of device – PX100N.

6.3.2. File -> Open

If file contains saved settings, they may be used to program next device. Firstly a catalogue where file has been saved shall be chosen and then name of file shall be provided. Obtained data collection may be modified by the user. Any amendments are effective if send to device.

6.3.3. File -> Save

During programming many devices in different configurations, it is not necessary to have in mind each one as it may be saved on hard disc or floppy disk under any name and it may be loaded later on. This function save on disc any information from configuration wizard window. After activation of function a dialog window appears with request to provide file name. Default data is saved with CMI extension (Configuration Memory Image).

6.3.4. File -> Language

Allows for selection of any available languages (determined in attached exterior language files).

6.3.5. File -> Connections

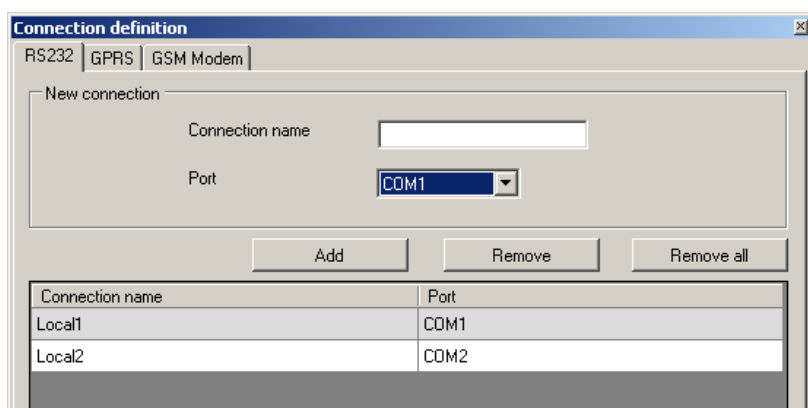
Before programming of devices, a connection type shall be defined. It is possible to do it with two methods:


- locally
- remotely.

6.3.5.1. Local connection

Local connection means that configuration software (namely computer on which is installed) is directly connected to proper terminal of transmitter. Connection is possible owing to special wire and through RS-232 serial port.

To program device or make any other operations (e.g. reading of device settings, firmware amendments, etc.) it is necessary firstly to define connection parameters.



It is possible to do so with the above window that is available after activation of connection from Main Menu and selection Configuration tab or after clicking on  icon on fast access bar and clicking on RS-232 tab.

Define:

Name of connection e.g. Locally

Choose serial port e.g. COM 4

Click on [Add] button to confirm settings. Connections shall be saved (and inserted in table). From this time on program shall enable wires connection with device and reading, and saving of parameters in PX100N memory will be possible.

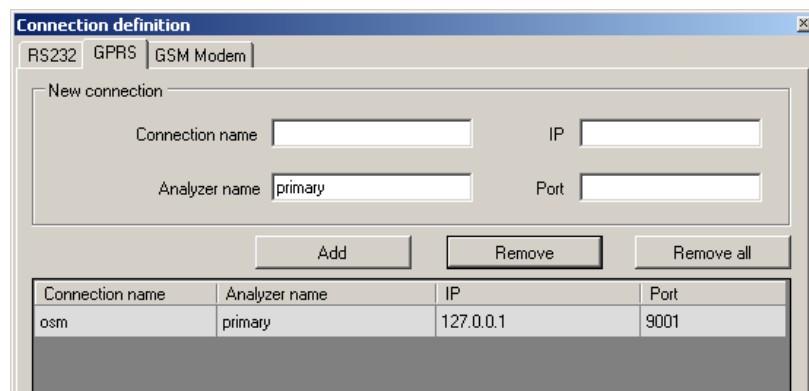
6.3.5.2. Remote connection

As provided above the device and software makes for complete configuration with GPRS link or CSD channel. This programming mode requires definition of linking parameters.

GPRS linking

Activate file in Main menu and select Connection function (or after clicking on icon on fast access bar) and click on GPRS tab to carry out configuration of this mode.

On screen the following window shall appear:



Connection name	Analyzer name	IP	Port
osm	primary	127.0.0.1	9001

Define:

- Name of connection e.g.: **Remote**
- Select name of analyzer e.g.: **Primary**
- Enter analyzer address e.g.: **87.128.125.8**
- Enter port on which analyzer operates e.g. **7000**

Click on [Add] button to confirm settings. Connections shall be saved (and inserted in table). From this time on program shall enable remote connection to device and reading and saving of parameters in PX100N memory shall be possible.

Notice: The following parameters: analyzer name, analyze address, port relate to settings of OSM.2007 receiver of monitoring system. Remote programming is available only if above mentioned device (or software) is used.

CSD connection

Activate file in Main Menu and select Connection function (or after clicking on icon on fast access bar) and click on GSM Modem tab to carry out configuration of this mode.

On screen the window shall appear where it is possible to define:

- Name of connection e.g. Remote CSD
- Serial port where GSM modem is connected (e.g. Wavecom Fastrack)
- PIN code of SIM card installed in GSM modem e.g. 1111
- Serial port parameters: amount of bytes/sec. (e.g. 115200), data bytes (8), parity (none), stop bytes (1)

Conn. name	Port	PIN	Baud rate	Data bits	Parity	Stop bits	Phone No
Remote C...	COM30	1111	115200	8	None	One	

Click [Add] button to confirm settings and save connection (settings are inserted into table). Since that time a remote connection to device, reading and saving of parameters in PX100N memory is possible.

Note : Remote configuration with CSD canal is possible if option of CSD data sending has been activated both for SIM card inserted into a device and SIM card installed in GSM modem. In addition, the transmitter must have turned on permission to receive CSD data calls, see clause 7.5.2 *GSM modems authorized phones*.

Programming with CSD is also possible if OSM.2007 system has been installed, and minimum one GSM modem is connected. If device has been entered onto server list (factory number and SIM card telephone number –See OSM.2007 Operation Manual) it is possible to use link via OSM. It is possible if device is not connected to the OSM.2007 via GPRS. During programming procedure (with GPRS link- See above) a question will be displayed if user want to use a modem connected to the server. After confirmation procedure will follow as in case of other programming channels.

6.3.6. File-> Automatic device settings backup

All configuration settings including reread from devices and saved on devices are to be automatically saved on hard disc. If during installation on configuring tool settings have not been changed, files will be saved as follows:

C:\Program Files\EBS\KonfiguratorLX\configs\PX100N_20000

Catalog PX100N_20000 contains all files in respect of PX100N with factory number of 20000 programming. The name contains date and time of operation and its type (saving/ reading). Files have **cmi** extension.

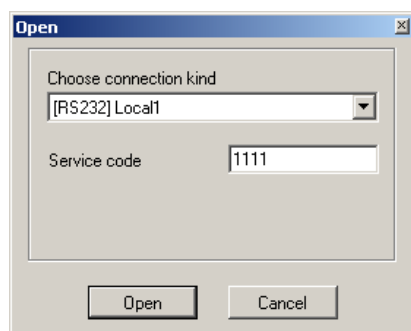
6.3.7. File -> Exit

Finishes program operation.

6.3.8. Operations -> Read

Function reads data saved in memory of GPRS module. Exchange of data follows on port selected in section "Select Connection Type" (See below description of option "Configuration"). Correct reading is confirmed with message on a screen. Data downloaded from device may be saved on file (see clause 6.3.3) and use for other devices.

To use this function it is necessary to define type and parameters of connection. E.g. for local connection the following view is displayed:



where:

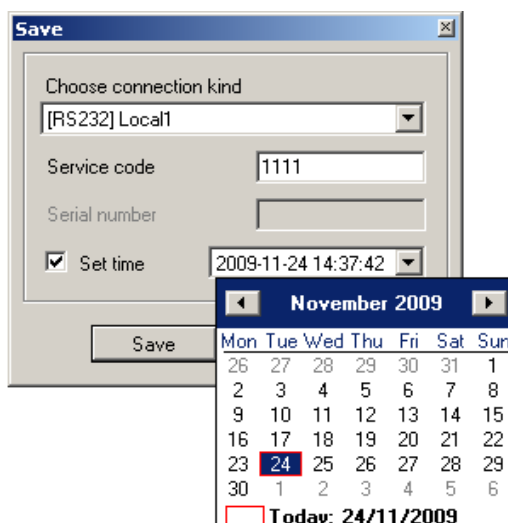
Connection kind - serial port to which module is connected

Access code- service code of transmitter

Detailed description of connections configuration is included in clause 6.3.5.

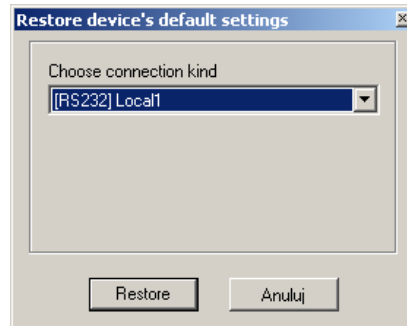
6.3.9. Operations -> Send

This function is analogical to the above one, at the same time it enables data saving into EEPROM module. Correct saving is confirmed with message on a screen.



6.3.10. Operation -> Restore default settings

If operation "Read" finishes with error message (e.g. if access code is unknown) it is possible to come back to default settings by selecting "Restore default settings". e "Do you want to overwrite current configuration with default values?". After confirming the following window shall appear :



This operation is possible only with local connection. After operation completing device parameters shall come back to default settings.

6.3.11. Operations -> System events history

„Events history” provides information about last events stored in PX100N device memory. See chapter 7.11 *Events history*.

6.3.12. Device monitor

“Device Monitor” provides real-time information on PX100N device state. See chapter 7.10. *Device Monitor*.

6.3.13. Help -> About program

Select this information to view additional information about program.

7. PROGRAMMABLE PARAMETERS

Parameters available in configuration program are divided into groups: Access, Transmission, Inputs/Outputs, Monitoring, Restrictions, SMS Notifications, Link control, RS-232 and Firmware. Every from these groups will be described in detail in next part of this manual.

7.1. ACCESS

7.1.1. Parameters

7.1.1.1. Device mode

The screenshot shows the 'GPRS transmitters configurator' window. On the left is a sidebar with a list of configuration categories: 1. Access (selected), 2. Transmission, 3. Inputs/Outputs, 4. Monitoring, 5. Restrictions, 6. SMS Notifications, 7. Link control, 8. RS232, and 9. Firmware. The main area is divided into several sections: 'Parameters' with fields for Device mode (set to 'GPRS & SMS'), GPRS test time (60s), SMS mode after unsuccessful attempts (1), SMS test time (checked, 10min), Server phone number (+48600000123), and a checkbox for 'Send events via SMS immediately'; 'Primary server parameters' with fields for Server address (all01.ebstrade.com), Server port (6831), Interval between subsequent connection attempts (70s), Number of connection attempts before switching to backup server (3), and a checked checkbox 'Always try to connect to primary server at first'; 'APN parameters' with a dropdown menu, an empty text field, and buttons for '+' and '-'; 'Backup server parameters' with fields for Server address (62.123.28.9), Server port (8001), Interval between subsequent connection attempts (70s), Number of connection attempts before switching to primary server (3), and a checked checkbox 'Disconnect after' (300s); and 'Access' with fields for Service code (1234567), Restricted user's service code (7654321), and SIM card PIN (1111). At the bottom, a status bar displays 'Type: PX100N', 'SN:', 'Firmware version: /', and the time '11:56:08'.

Depending of user preferences, a device may operate in 1 out 4 modes (available from scrolled list) :

- GPRS & SMS: GPRS standard transmission (TCP/IP Protocol), and if any problems follow with this link it automatically SMS mode will follow.
- SMS: Transmission only in SMS mode, without trial to establish GPRS link
- GPRS: GPRS standard transmission (TCP/IP Protocol), and in case of any problems with this link no transmission will follow.
- *Serverless*: no transmission to the server with is possible, remote communication possible only via SMS notifications to the user

7.1.1.2. GPRS test time

The device sends signal "Test" with determined interval that informs monitoring station that the device is in operation mode. In this field you can determine how often this message will be sent (in seconds) .

7.1.1.3. SMS mode after unsuccessful attempts

Define number of reconnections to server. If during all reconnections fail the device will go into SMS mode. In this mode PX100N will try to make connection with server, according to interval defined in clause 7.1.3.3.

7.1.1.4. SMS test time

This function is analogical to GPRS. It is activated when problems with GPRS transmission follow when the device automatically goes into SMS mode (it relates to operation mode in SMS). Usually it is undesirable to send text as SMS so often as with GPRS transmission. Parameter this allow for significant extension of distance between tests (time in minutes) or completely interlocking of this option.

7.1.1.5. Server phone number

If GSM modem is connected to server application (e.g. OSM.2007) enter in this field its number. Any SMS will be sent to this number if transmitter has got problems with GPRS transmission.

If this field is left blank or 0 was entered, the transmitter will be operating exclusively in GPRS mode.

Note : This field will be inactive if device is to operate in GPRS mode.

7.1.1.6. Send events via SMS immediately

In case of GPRS connection lost device will send SMS reports immediately, even if the device isn't in SMS mode yet.

7.1.2. APN Parameters

7.1.2.1. APN

Parameter depending on GSM network operator that supplies GPRS (SMS) services. It provides GSM network access point name. It possible to obtain a private access point. In this case a name will be provided by GSM network operator.

7.1.2.2. User ID

When using public APN , user ID is mostly not required. For private APN this parameter shall be obtained from operator (it is impossible to be granted access to GPRS network without it).

7.1.2.3. User password

When using public APN , user ID is mostly not required. For private APN this parameter shall be obtained from operator (it is impossible to be granted access to GPRS network without it).

Note : Private APN provides very high security of the system.

7.1.2.4. DNS1 and DNS2

It determines address of main and backup DNS server (Domain Name System).
If IP server address has been entered in form of domain it is required to provide minimum one DNS address.

7.1.3. Main Server Parameters

7.1.3.1. Server IP Address

It is address of receiver of monitoring system (OSM.2007) or computer where "Communication Server" software has been installed , e.g. 89.123.115.8. This address may be provided in domain name of server, e.g. modul.gprs.com. In this case it is required to provide minimum one address of DNS server.

7.1.3.2. Server port

It determines server port that was selected in server for collection of data from transmitter.

7.1.3.3. Interval between subsequent connection attempts

Programmable and equipped with SIM card device will try to make automatic connection with server. In this field you define interval (in seconds) after which next connection will follow if the previous connection failed.

7.1.3.4. Number of connection attempts

In this field you determine how many times device will try to make connection to server. If connections fail, PX100N after execution of some connection will start

procedure of connection to back up server. This option is active only if we define parameters of backup server.

7.1.3.5. Order of connection to servers

Mark this check box means, that the device will try in first order to connect to primary server, without regard on definition of parameters for backup server (in peculiarity of number of connection attempts).

7.1.4. Backup server parameters

7.1.4.1. IP server address

It is IP address of second (backup) receiver of monitoring system (OSM.2007) or computer where "Communication Server" software has been installed , e.g. 89.130.125.82. This address may be provided in domain name of server, e.g. monitor.gprs.com. In this case it is required to provide minimum one address of DNS server.

7.1.4.2. Server port

It determines server port that was selected in server for collection of data from transmitter.

7.1.4.3. Interval between subsequent connection

If device can not connect to primary server defined this after exhaustion for him number of attempts, it will begin realizing the procedure of connecting to backup server. We in this place define space of time (in seconds), after which test will connecting renewed if previous finished with failure.

7.1.4.4. Number of connection attempts

In this field you determine how often device will try to make connection to backup server. If connections fail, PX100N after execution of some connection will back to procedure of connection to primary server.

7.1.4.5. Disconnect after time limit

If you mark this choice field the device will disconnect from back up server after passage of set time. Further operation depends on defined parameter Order of connection (See clause 7.1.3.5). If this option is active the device reconnects to the primary server. If this option is not active the device firstly completes connection to backup server procedure and if this fails, the device will try to connect to the primary server.

7.1.5. Access

7.1.5.1. Service code

It provides security against unauthorized access. It is being used during programming of device and during remote controlling (in TCP/IP or SMS mode). Factory setting is **1111**. During the first starting of device (programming) it shall be changed. Code may consist of up to seven alpha numerical characters.

7.1.5.2. Restricted user's service code

Allows restricted access to the parameters of device. When restricted user's service code is used following groups of parameters are unavailable: Access, Transmission, Restrictions, SMS notifications, Link control and RS232. Choosing unauthorized groups of parameters in "GPRS transmitters configurator" causes error notification. Default restricted user's service code: **2222**

7.1.5.3. PIN of SIM card

As a device operates via GSM network, SIM card is indispensable and it may be received from phone operator. Before the first use PIN code of SIM card shall be programmed for operation in given transmitter. PIN code is indispensable for automatic system launching. In case of card without PIN code, it is possible to enter any value e.g. 0000.

If you enter wrong PIN number after inserting card and switching on transmitter, the system will not launch and you may be able to use card after entering PUK card only (with use of any GSM mobile phone).

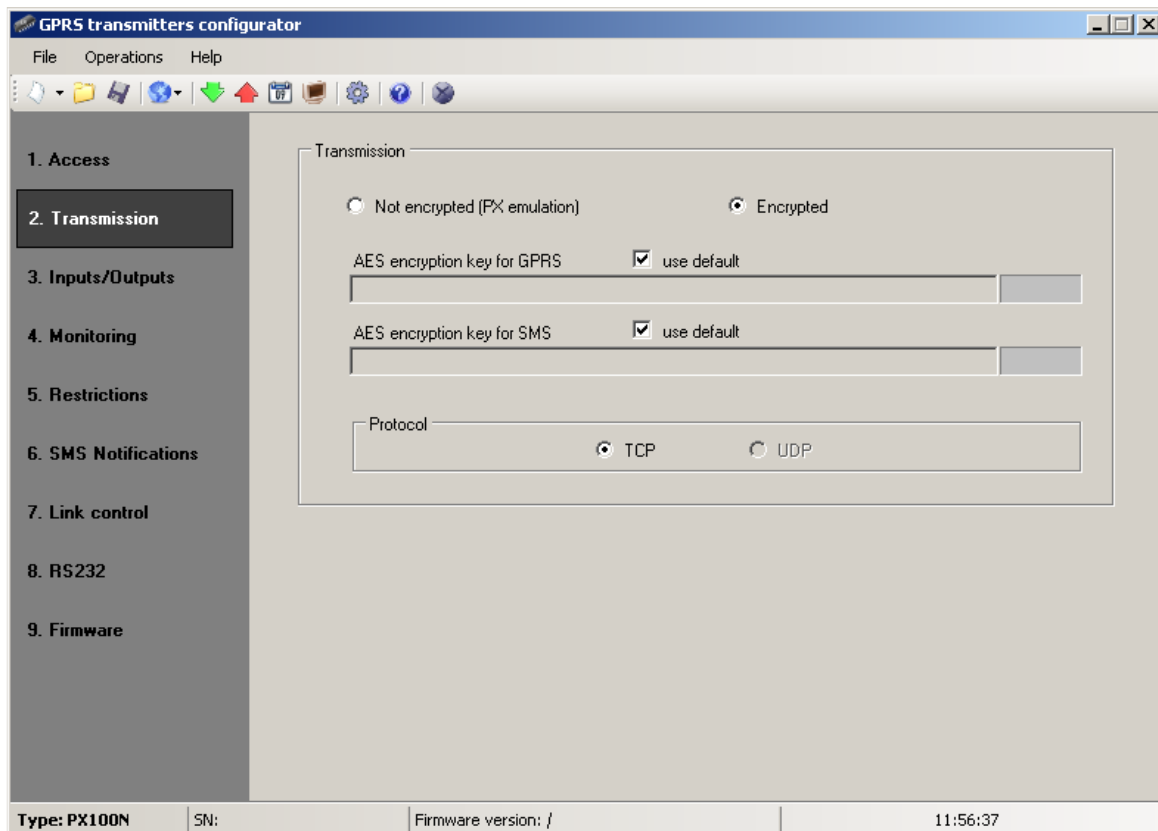
Factory setting of PIN in PX100N transmitter is **1111**.

7.2. TRANSMISSION

For the purpose of maximum security of transmission, data is encrypted with AES key. This option may be used for GPRS and SMS transmission.

After selection of encrypted transmission you may use your own code (256 bytes – signs 0-9 and A-F) or use default settings.

Selection of not coded transmission means device operation similar to PX transmitters.



7.3. INPUTS/OUTPUTS

Transmitter has got 8 signal inputs and additional input for sabotage signal switch-key connection. Module is equipped with two outputs: indicating sabotage and an additional one. In/Out option enable programmable configuration so that transmitter operates pursuant to requirements of the user.

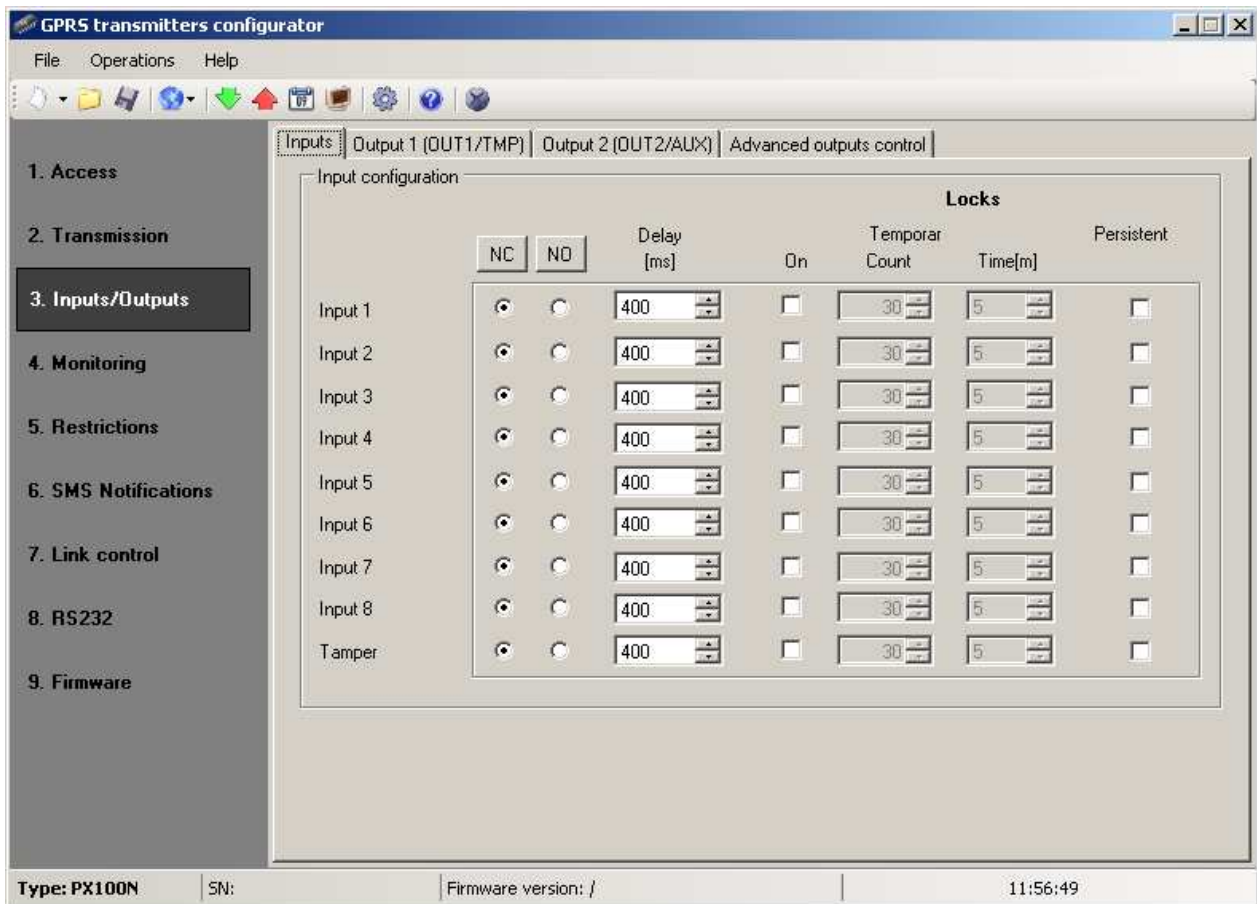
All inputs of the device are 24 hour alarm inputs.

7.3.1. Inputs configuration

For every input the following settings shall be determined respectively.

7.3.1.1. NO/NC

This parameter allows us to determine the steady state of the input. Change of this state results in sending information on alarm. Allowable NC and NO input. NC input shall be shorted to ground. Actuation follows after decay. NO input remains open. At this moment of shortening to ground activation follows.



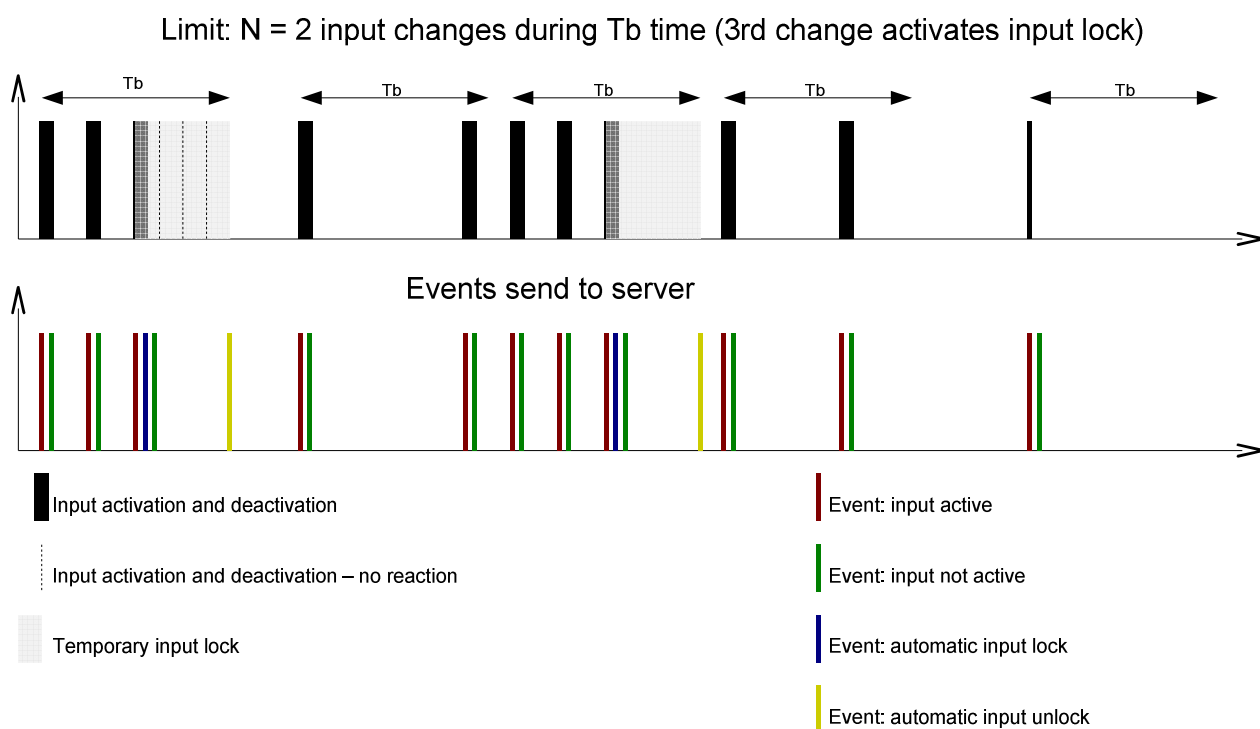
7.3.1.2. Delay [ms]

This parameter means minimum time for change maintenance at input so that it would be detected by transmitter. Factory setting is 400ms.

7.3.1.3. Lock

With this option you can lock any input of module, and as a result condition changes on this input will be ignored and will not be reported to monitoring station. Lock may be persistent or temporary.

In case of temporary lock – user can set lock time and number of input state changes after which lock occurs. Lock time is counted from first input state change. Both types of lock can be deactivated by SMS command (see RLIMIT command described in chapter 9).

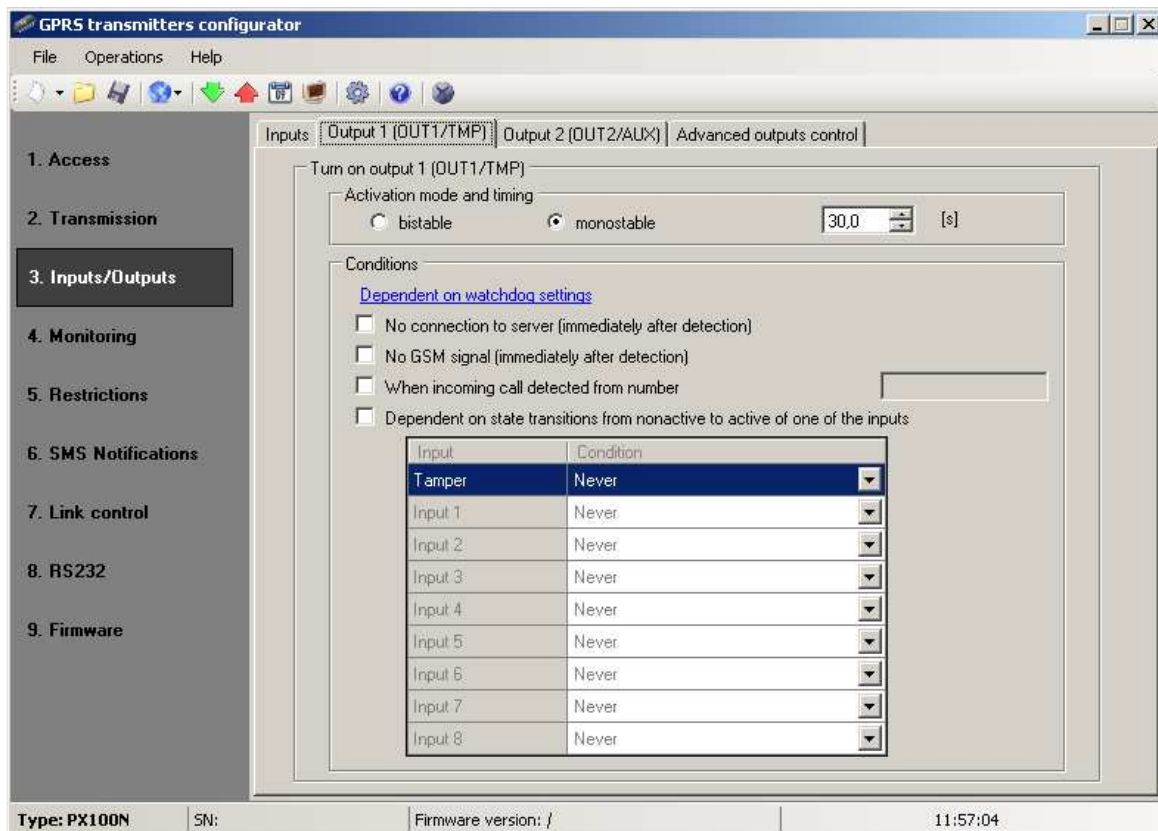


- N and T_b parameters may be set per input

- Locally there can be $2 \times N - 1$ input activations. In summary average number of activations during defined period of time will be preserved.

7.3.2. Outputs configuration

Tab „Output 1 (OUT1)“ and „Output 2 (OUT2)“ specify conditions of switch outputs. Settings for all outputs are identical so they will be described in one chapter.



7.3.2.1. Activation mode and timing

Thanks to this option you may choose output operation mode. There are two operation modes available:

- *Bistable* - connection follows for indefinite time- up to the moment of disconnection of power for module or remote command which switches output off,
- *Monostable* - connection follows for time defined by user - every 100ms.

7.3.2.2. Conditions

Defines conditions for activating both of outputs. User can set following conditions:

- No GSM signal (immediately after detection);
- Detection of incoming call from defined telephone number;
- Dependent on state transitions from non-active to active of one of the inputs. Outputs can be also activated by internal watchdog, which can be configured in "Link control" group.

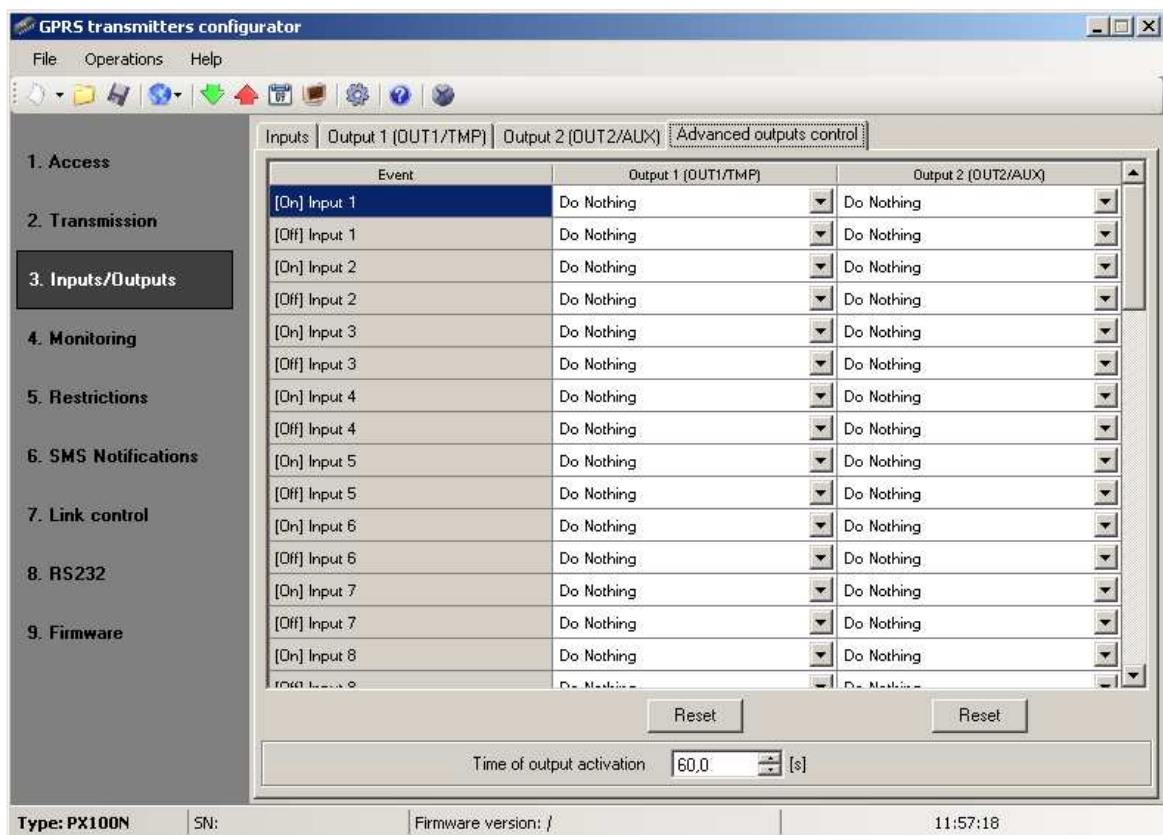
7.3.3. Advanced outputs control

The user is able to determine an alternative course of action to go over basic outputs configuration function described in 7.3.2 *Outputs configuration*. In the "Advanced outputs control" you may define separately the behavior of each of the outputs, depending on events taking place. "Advanced outputs control" differs from the existing basic "Outputs configuration" by:

- it is possible not only to turn on but also to turn off the output
- output can be activated temporarily for specified amount of time

- there is a complete list of events for which you can define the behavior of the output

Note: where possible, use either the basic configuration of outputs (7.3.2 Outputs configuration) or with an “Advanced outputs control”! In particular, the basic configuration of existing options: “No GSM signal (immediately after detection)” and “Dependent on state transitions from non-active to active of one of the inputs” should not be used with their replacements “[Off] GSM” and “[On] Input x”.



7.3.3.1. Output 1/Output 2

These columns define which signals are to influence the status of a specific output. Possible choices are:

- *Do Nothing* – output status will be not changed (default action)
- *Turn on output* – output will be permanently turned on
- *Turn on output temporarily* – output will be turned on for an amount of time specified by parameter 7.3.3.2 *Time of output activation*
- *Turn off output* – output will be turned off

Press the [Reset] button to assign the action “Do Nothing” for each event.

The output state does not change if the current state of the output coincides with the result of the action.

7.3.3.2. Time of output activation

Parameter defining amount of time for which the output is to be turned on for the functions of advanced outputs control.

7.4. MONITORING

Thanks to this option you may determine which of available signals generated by the device shall be transmitted to monitoring station.

NOTE: "Configuration changed" event refer to configuration changes made by SMS or GPRS commands.

7.4.1. GPRS On / GPRS Off

In this column you define signals that are to be reported to monitoring station with GPRS transmission. There is possibility to send information on alarms (input state change from rest to action status) and on returns of input state from action to rest (normalization).

To transmit any signal you should only click it (proper square on your right).

Click on [Clear] button to remove all marked signals.

Click on [Invert] button to change markings to contrary.

Event	GPRS On	GPRS Off	SMS On	SMS Off	Skip initial state
Input 1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Input 2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Input 3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Input 4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Input 5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Input 6	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Input 7	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Input 8	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Tamper	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Power	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Battery	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Output 1 (OUT1/TMP)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Output 2 (OUT2/AUX)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
RS232 tests	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Temp. input 1 lock	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Temp. input 2 lock	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Temp. input 3 lock	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

Power loss: 600 [s] ☐ Sleep when the battery voltage less than 10.5 [V]

Type: PX100N | SN: | Firmware version: / | 11:57:38

7.4.2. SMS On / SMS Off

In this column you define signals that may be reported at monitoring station with SMS messages – when there is no connection with server over GPRS. There is possibility to send information on alarms (input state change from rest to action status) and on returns of input state from action to rest (normalization).

To transmit any signal you should only click it (proper square on your right).

Click on [Clear] button to remove all marked signals.

Click on [Invert] button to change markings to contrary.

7.4.3. Skip initial state

This option allow for locking of sending of information on status of active inputs at power connection. Information on inputs will be sent to server after the first change from inactive to active status.

For the events "Power" and "Battery" no selection "Skip initial state" will cause sending information about the power supply / battery on boot device regardless of the power supply / battery state.

7.4.4. Power loss

One of device additional options is monitoring of power supply voltage. As short voltage drop may follows at some facilities, it is possible to avoid reporting by entering time after which information will be sent.

Value of this parameter means that voltage drop shall follow within this determined time so that device recognizes it as real voltage drop and that information might be sent.

7.4.5. Sleep when the battery voltage less than

If you check an option "Sleep when the battery voltage less than" battery voltage threshold field becomes available. The threshold is used when the transmitter goes into Sleep mode. Due to the characteristics of the battery Sleep mode ensures reliable operation of the device when the battery is the only source of power at the time. If the option "Sleep when the battery voltage less than" will remain unchecked transmitter will work as long as it allows the battery. This may adversely affect the capacity of the battery for a further period of use as well as cause a generation of false alarms.

Transition to Sleep mode occurs when the battery voltage falls below the defined threshold (taken into account the 3 consecutive measurements performed in 10-second interval). The following steps are then performed:

1. *Too low voltage - sleep* event is generated
2. Transmitter for up to 30 seconds is trying to send *Too low voltage - sleep* event to the software
3. Device switches to Sleep mode, i.e. the modem goes to off, inputs are not being monitored, outputs are turned off, an external telephone line is attached

Sleep mode is indicated by alternating lighting and off LEDs: OK and ERR.

Exit from Sleep mode occurs when one of the following situations occurs:

- Main power supply is connected and the battery voltage exceeded a value of "threshold of sleep" + 0.6 V
- Overall disconnect power and re-connect the battery and / or AC power

For transmitter inputs are reported only changes in relation to the state before sleep.

7.5. RESTRICTIONS

7.5.1. SMS Authorized phones

User may restrict remote access to the device (via SMS) for determined phone numbers. A list of numbers (up to 5 numbers) determines which numbers are allowed to connect with transmitter.

Available options:

- Deny all: means no available telephone communication.
- Allow all: means that telephone communication is possible from any phone.
- Allow chosen: means that telephone communication is possible only from these numbers that are on the list. It is possible to list up to 5 phone numbers.

Select "Allow chosen" to get access to edition window. Enter another numbers and click on [Add] button to send them to the below table. Position cursor on line with number and click on "Remove" to remove number from table. Click on "Remove all" to remove all numbers from table.

Note:

- a) authorizing of coming SMS comes through comparing number of oncoming SMS with numbers from table. It is allowable to enter only a part of number e.g. 1234. As a result all numbers with this sequence will be authorized e.g. 600**1234**56 or 60**1234**567.
- b) If modem connected to OSM.2007 server will be used to send SMS, its number have to be entered on the list.

7.5.2. GSM modems authorized phones

For connections on CSD channel the user may limit remote access to device from GSM modems. Only numbers on the list (up to 5) allow for communication with transmitter.

Available options:

- Deny all: means no available telephone communication.
- Allow all: means that telephone communication is possible from any phone.
- Allow chosen: means that telephone communication is possible only from these numbers that are on the list. It is possible to list up to 5 phone numbers.

Select "Allow chosen" to get access to edition window. Enter another numbers and click on [Add] button to send them to the below table. Position cursor on line with number and click on "Remove" to remove number from table. Click on "Remove all" to remove all numbers from table.

Note:

- a) authorizing of coming CSD comes through comparing of number from which it was sent with numbers from table. It is allowable to enter only a part of number e.g. 1234. As a result all numbers with this sequence will be authorized e.g.600**1234**56 or 60**1234**567.
- b) If modem connected to OSM.2007 server will be used to make connections CSD, its number have to be entered on the list.

7.5.3. Validity period of outgoing SMS messages

User may limit time for the GSM operator to deliver information via SMS when recipient is unavailable due to out of GSM signal coverage for example. Time limit is defined separately for the following groups of information:

- SMS test to server
- SMS events sent to server
- SMS events sent to user
- Answers to comments

Selection is to be made from scrolled down values by clicking on arrow besides selection area. Allowable options: 5, 10,15, 30 minutes; 1,2,6, 12 hours; 1, 7 days, MAX (meaning no specified time).

7.5.4. SMS limits

User may limit number of SMS sending by transmitter. As the main way of transmission should be GPRS this limitation is essential to reduce costs.

Mark field [Turn on SMS limits] to activate access to information groups that shall subject to limitation:

- SMS test to server
- SMS event s sent to server
- SMS events sent to user
- Answers to comments

Limitation are defined by providing two values:

- SMS maximum number: determines maximum number of sent SMS messages per time unit (see SMS counter reset). This option protects user against sending too much of SMS messages e.g. in case of failure.
- SMS counter reset: This parameter determines time schedule (in minutes) according to which counter of sent SMS messages will be zeroed.

7.6. SMS NOTIFICATIONS

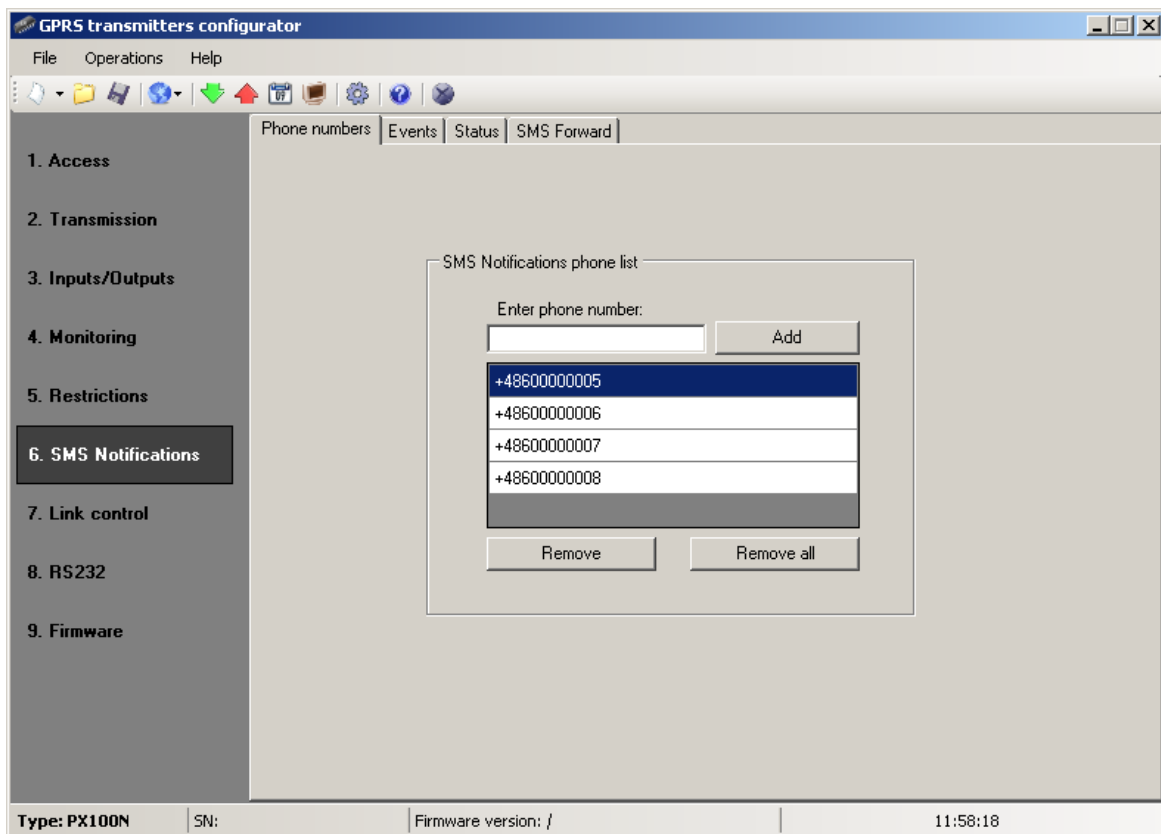
User may define messages that in case of any event (e.g. input state change) will be sent to private phone numbers. At the same time it is worth to remember about limitation in this respect.

7.6.1. Phone numbers

One way to limit amount of sent information (by SMS) is to define a list of 5 private phone numbers. This list means that only telephones listed on it will receive messages sent by transmitter.

To edit you shall follow this procedure:

- Enter due telephone number into edition field.
- Click on [Add] button to transfer number to the below table
- Repeat procedure (up to 5 phone numbers).



Position cursor on line with phone number and click on "Remove" button to remove number from table.

Click on "Remove all" button to remove all numbers from table.

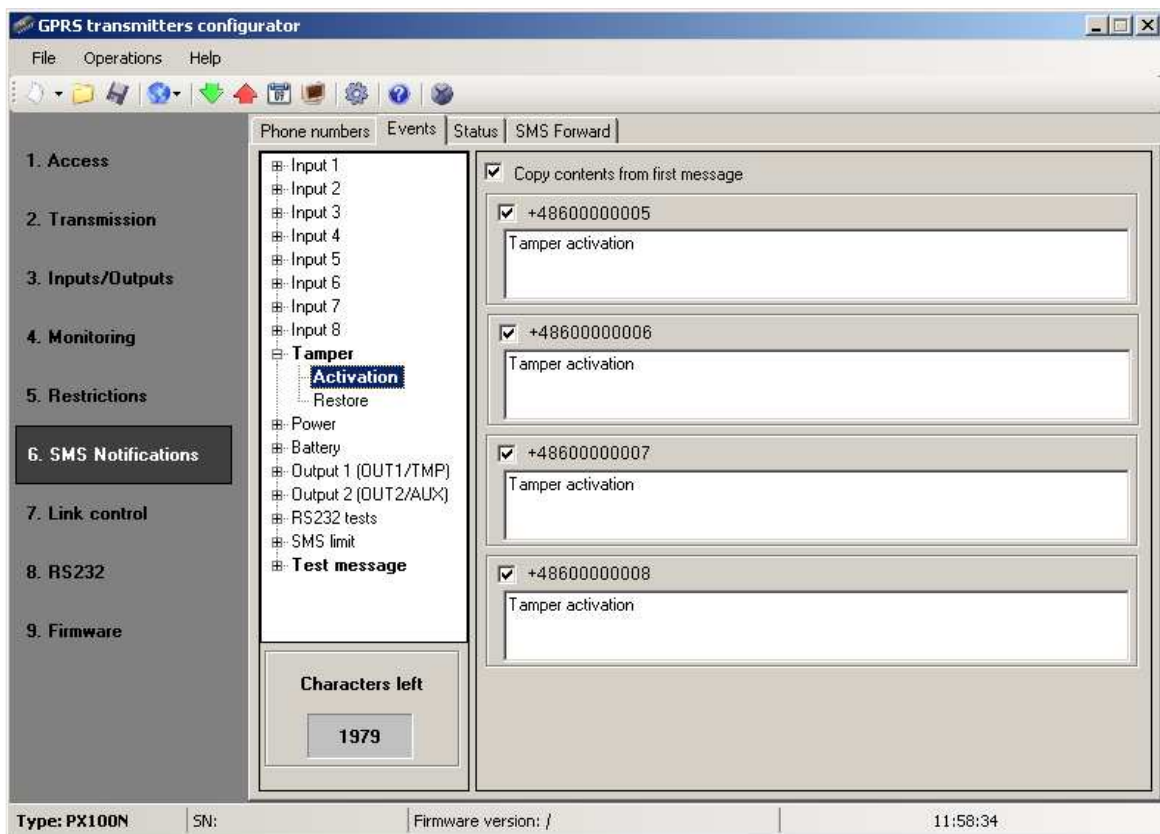
7.6.2. Events

This tab is to configure and edit SMS messages to be sent to listed phone numbers.

You may define SMS text message with reference to any event from the list (Tamper: Activation, Restore; Input1: Activation, Restore; etc) that will be sent if this event follows. To define use edition field on the right of events list.

Follow the procedure:

- a) Select event to edit from the list.
- b) Mark square next to phone number that SMS is to sent to
- c) Enter message text of SMS when field is active
- d) If the "Copy the contents from first message" will be marked then selection and text content will be automatically copied from the first message, otherwise you may copy one text and paste to other field manually



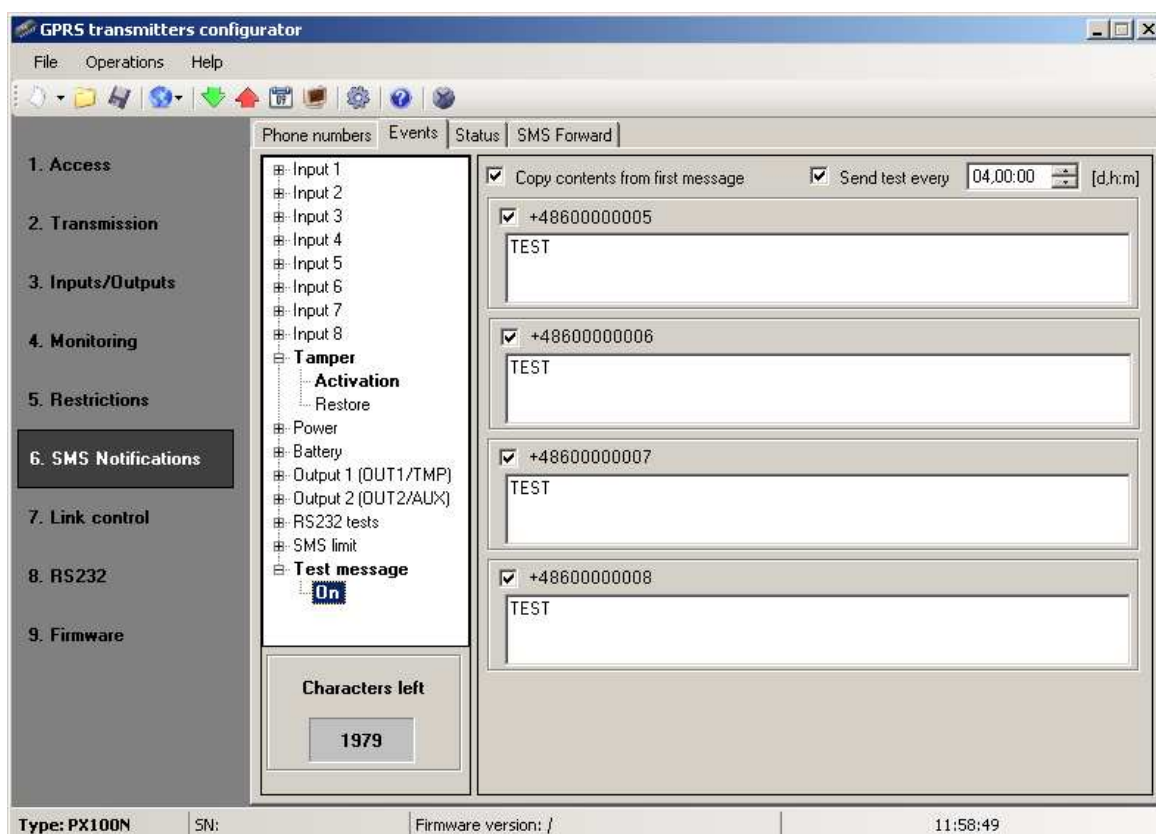
Note :

- o The total number of characters for all SMS messages shall not exceed **2000**
- o Mark any mistake and delete by pressing [Del] button
- o You may copy one text and paste to other field.

7.6.3. SMS user tests

SMS user tests sent to specified phone numbers are carried out independently of the operating mode of the device (GPRS / SMS / GRPS & SMS / Serverless). To enable the cyclic tests provide up to 5 phone numbers in "SMS Notifications" tab.

Then, for the event "Test message", type your message and provide a period of the test message. To do this, mark "Send test every" and indicate the period of the test set out in the next field. The format of the test period field is *"the total number of days, number of hours:the number of minutes"*. No selection in the "Send test every" will disable SMS user tests.



7.6.4. Status

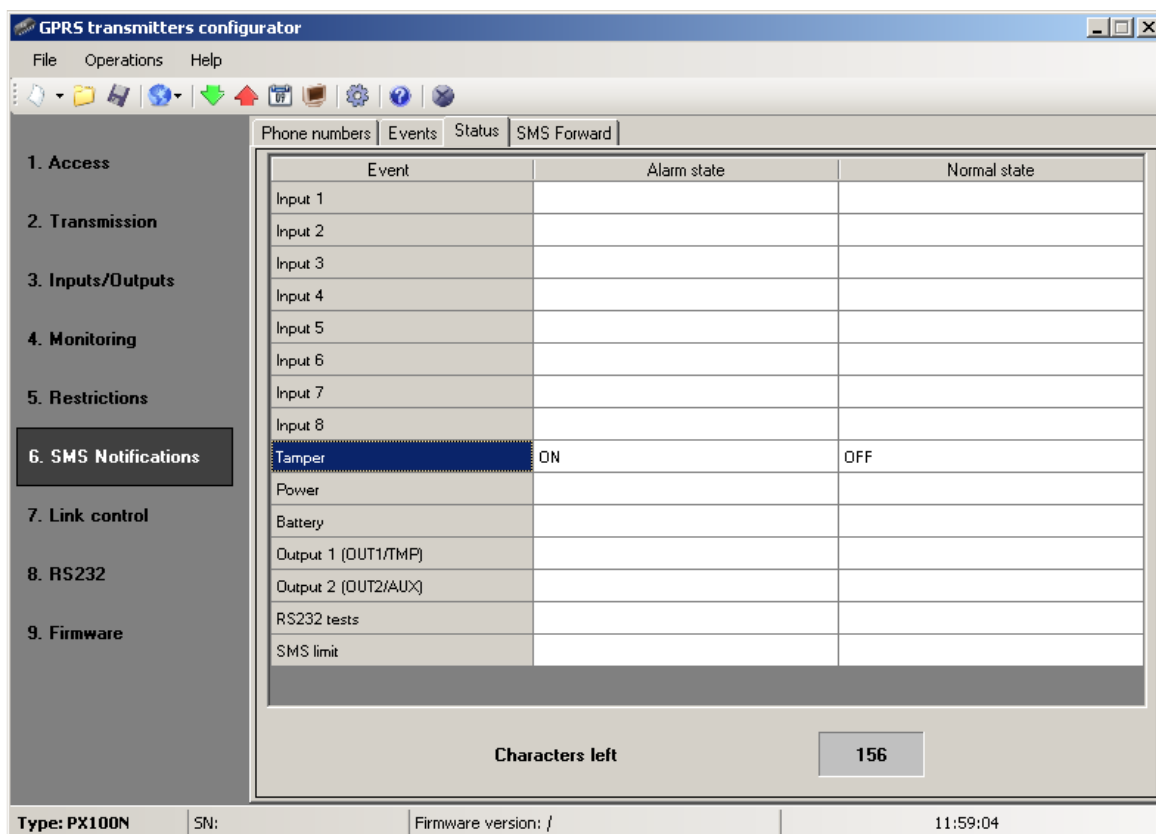
The device provides for remote enquiry about the status. Edit in this field message text that is to be sent to the user as a reply to command regarding status checking.

Telephone numbers authorized to send enquiry about status are defined in option Restrictions >Authorized SMS phones.

Reply from device shall be sent at number, from which enquiry was sent.

In reply about status a device shall send one SMS message containing proper text defining actual output , input state and power supply.

Note : Counter "**Allowed characters**" informs about the total number of characters that may be inserted into the table.

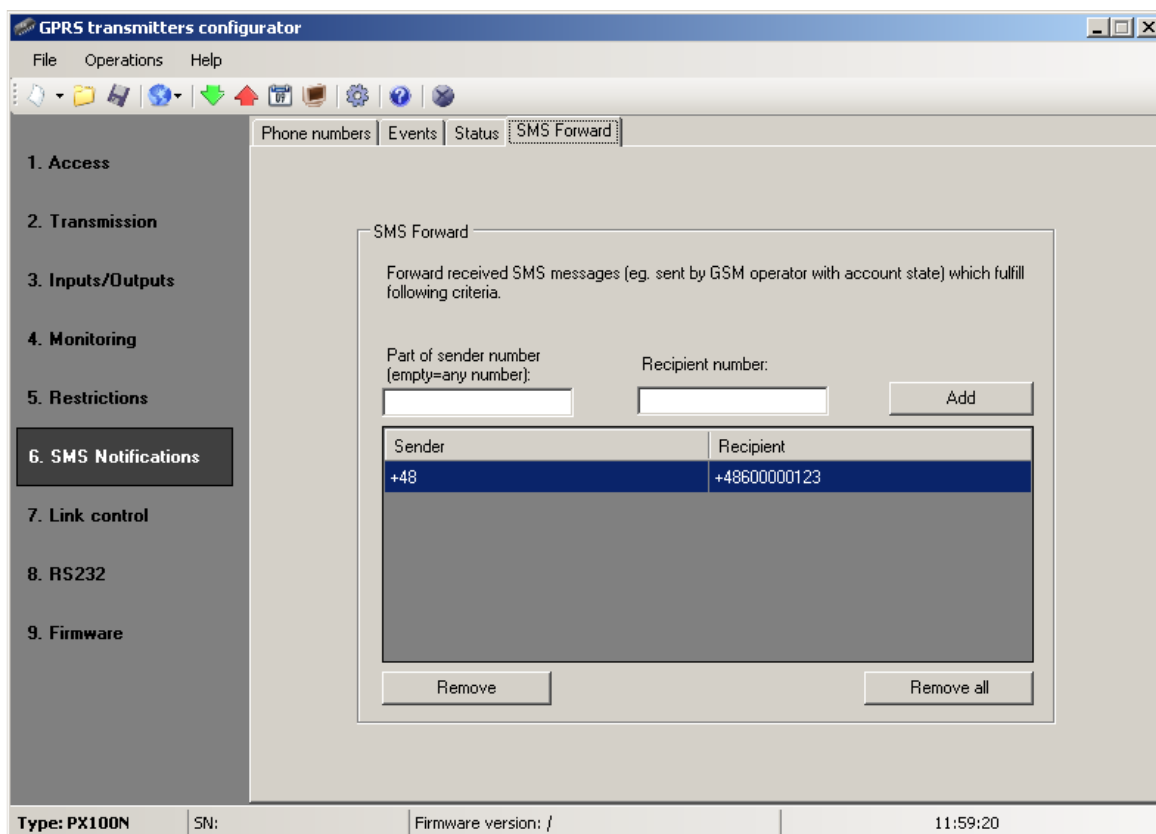


7.6.5. SMS Forward

The device is able to forward received SMS messages according to the specified rules. This function may be helpful for example when GSM operator sends messages with account state to SIM card installed within device. In this window you may provide up to 5 rules.

Each rule contains a pair: part of sender phone number and correct recipient phone number. In some cases a part of sender phone number may be an empty string which means that any phone number matches to the rule. All rules are processed with given order. It means that in some cases one SMS message may be forwarded to more than one recipients and/or some of them may be forwarded more than once to the same recipient. The second case may occur when there are at least two rules with the same recipient phone number and their part of sender phone number matches with message sender phone number.

Note : It is a user's responsibility to provide correct rules which will not create loops of forwarded SMS messages.



7.7. LINK CONTROL

These options enable automatic action of device if communication with monitoring station was broken up. It relates to situations when device lost connection to GSM network or if GPRS transmission is impossible.

7.7.1. GSM

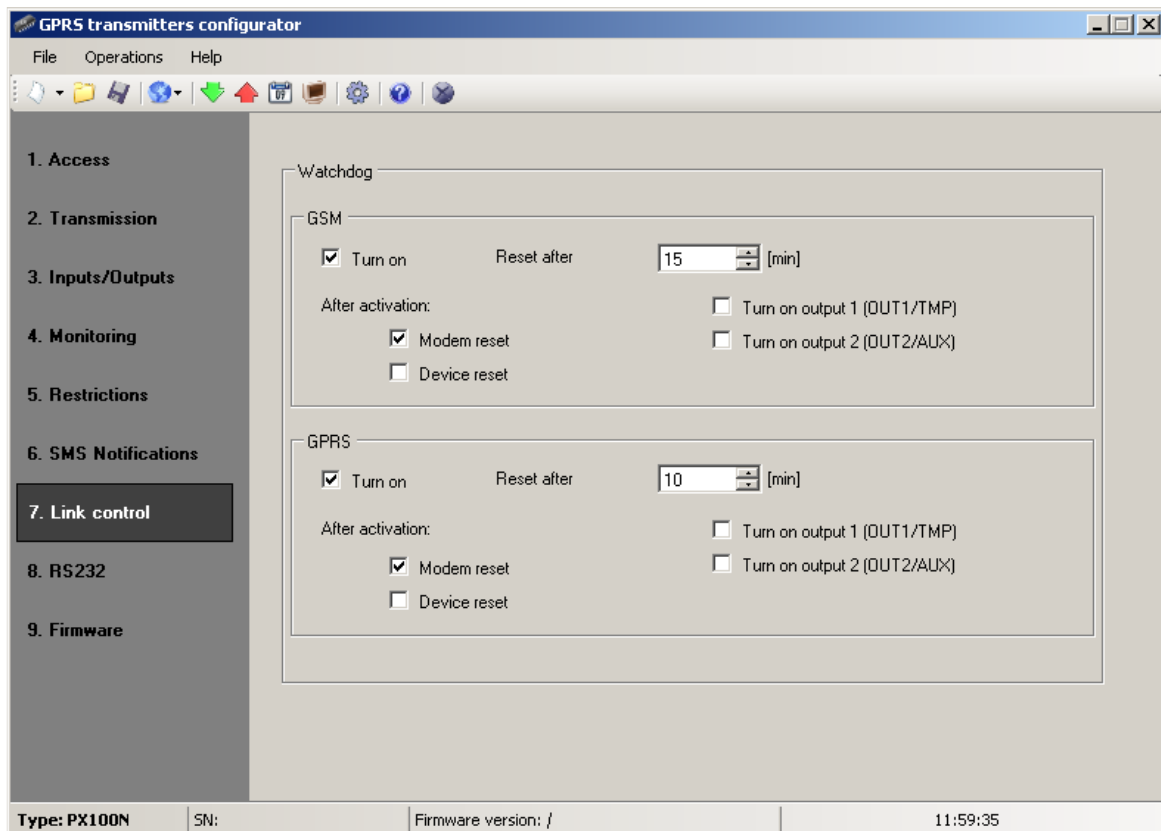
Activate this function (mark [Turn On] field) to get access to parameters determining action of device if outside GSM network.

Define time limit after which transmitter shall reconnect to network. Enter time limit in field [Reset after] and provide this value in minutes.

Next define action that the device shall perform. Select action by marking proper square next action description:

- ☐ Modem Reset
- ☐ Device Reset
- ☐ Turn on auxiliary output
- ☐ Turn on sabotage output

In case of no connection with GSM network the device after recognizing the situation shall wait during provided time limit and then shall perform programmed actions.



7.7.2. GPRS

Activate this function to (mark [Turn On] field) to get access to parameters determining action of device if GPRS connections is lost.

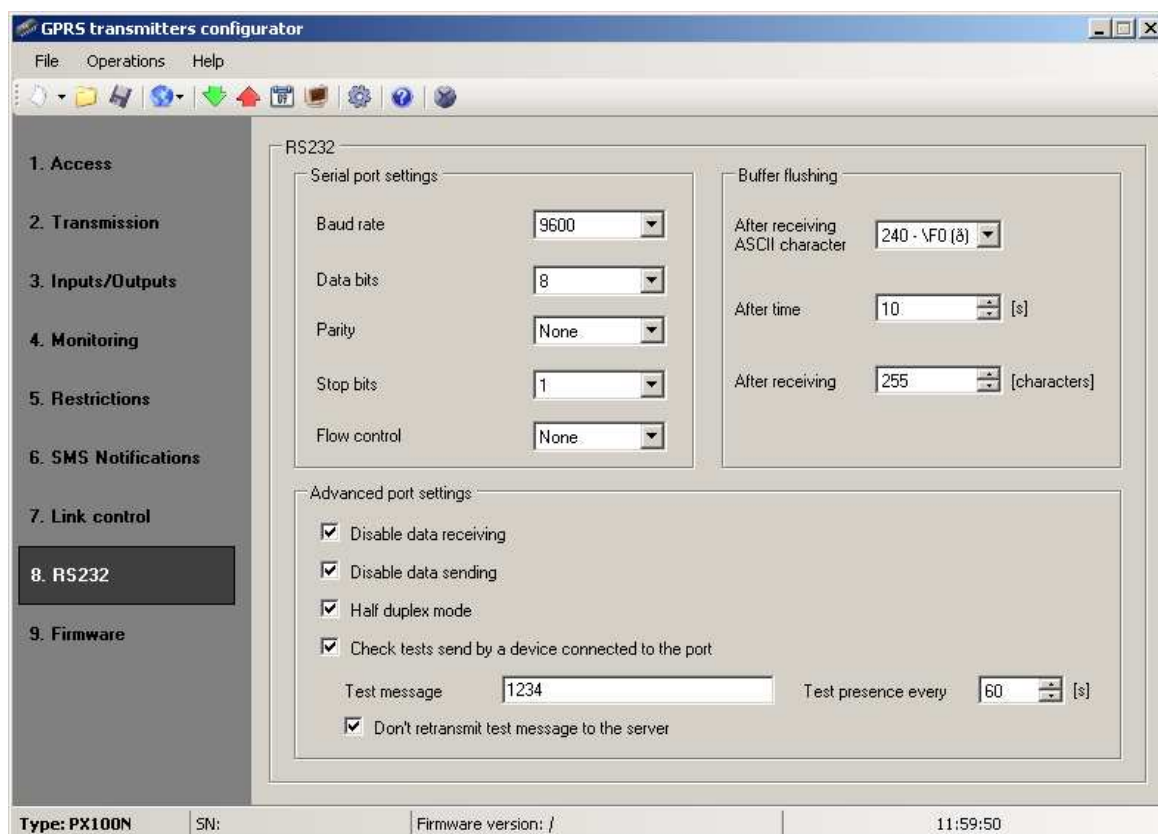
Define time limit after which transmitter shall reconnect to network. Enter time limit in field [Reset after] and provide this value in minutes.

Next define action that the device shall perform. Select action by marking proper square next action description:

- Modem Reset
- Device Reset
- Turn on sabotage output
- Turn on auxiliary output

In case of no connection with GPRS network the device after recognizing the situation shall wait during provided time limit and then shall perform programmed actions.

7.8. RS-232



7.8.1. Serial port settings

The device has been equipped with RS-232 serial port to enable obtaining additional information. To make use of this link it is required to define its parameters. For this purpose select parameters from the below table:

Parameter	Value
Baud rate (bits/sec)	300,1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200.
Data bits	5, 6, 7, 8
Parity	None, even, odd, mark, space
Stop bits	1,2
Flow control	None, RTS, CTS, RTS/CTS

The selected parameters shall correspond to RS-232 port settings in device, with which the transmitter is to cooperate.

7.8.2. Buffer flushing

Data received from connected device are stored in transmitter buffer. Buffer capacity is 511 bytes. Define criteria that meeting shall mean data transmission to monitoring system transmitter. The following options are available:

- After receiving ASCII character

- After expiry of defined time
- After receiving defined amount of characters

For every option list of available values are provided, and they may be scrolled down after clicking on adequate arrow.

The transmitter controls buffer contents in respect of meeting of determined criteria. It is performed with the following order: selected character, time, number of characters.

Discharge of buffer (transmission) follows if one criteria is fulfilled.

7.8.3. Advanced port options

7.8.3.1. Disable data receiving

This option allow for lock of data received from device connected to RS-232 port of transmitter. It is used in case of failure or situation when PX100N is being used to control the device.

7.8.3.2. Disable data sending

This option allow for lock of data sending to device connected to RS-232 port of transmitter. This prevent accidental or unauthorized controlling of the device.

7.8.3.3. Half Duplex mode

This option provides for automatic lock of data receiving (via RTS) if transmitter begin to send data to the device.

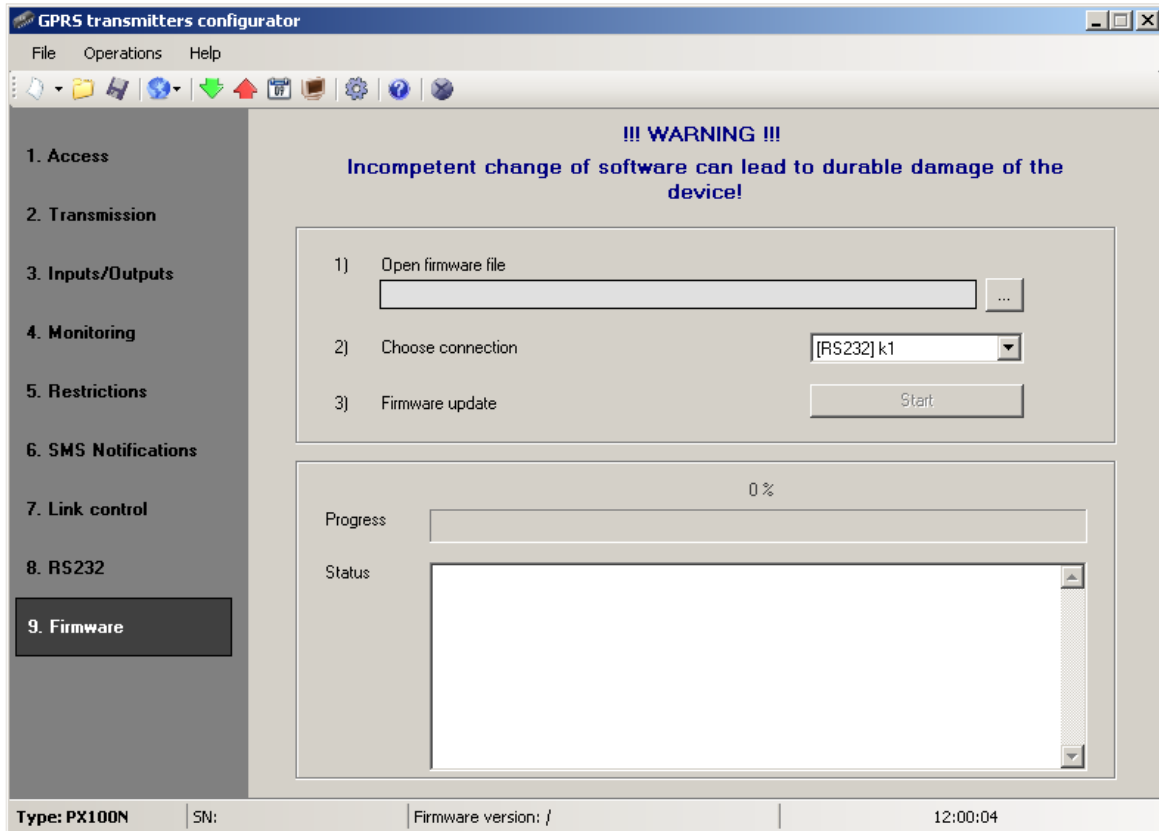
7.8.3.4. Tests of device connection to port

If the device connected to transmitter port generates periodical connection tests, these tests may be under PX100N control. To provide for that (after this option activation) enter text message and define frequency (in "Test presence every [s]" option).

Additionally user may determine if text messages will be sent to server. If this option was not selected it is required to make sure that while the device connected to transmitter port is not sending text message to transmitter, PX100N sends to server due message (See chapter 7.4 – option "RS232 tests").

7.9. FIRMWARE

The device is equipped with built in bootloader that allow for updating and change of firmware. During programming all information is displayed in respect of carried out operation.



Follow the following procedure:

- a) Launch configuration program
- b) Open "Firmware" option of configuration wizard
- c) Open file with new firmware (click [Open] button to locate where file is).
- d) Select file transmission mode: local or remote.

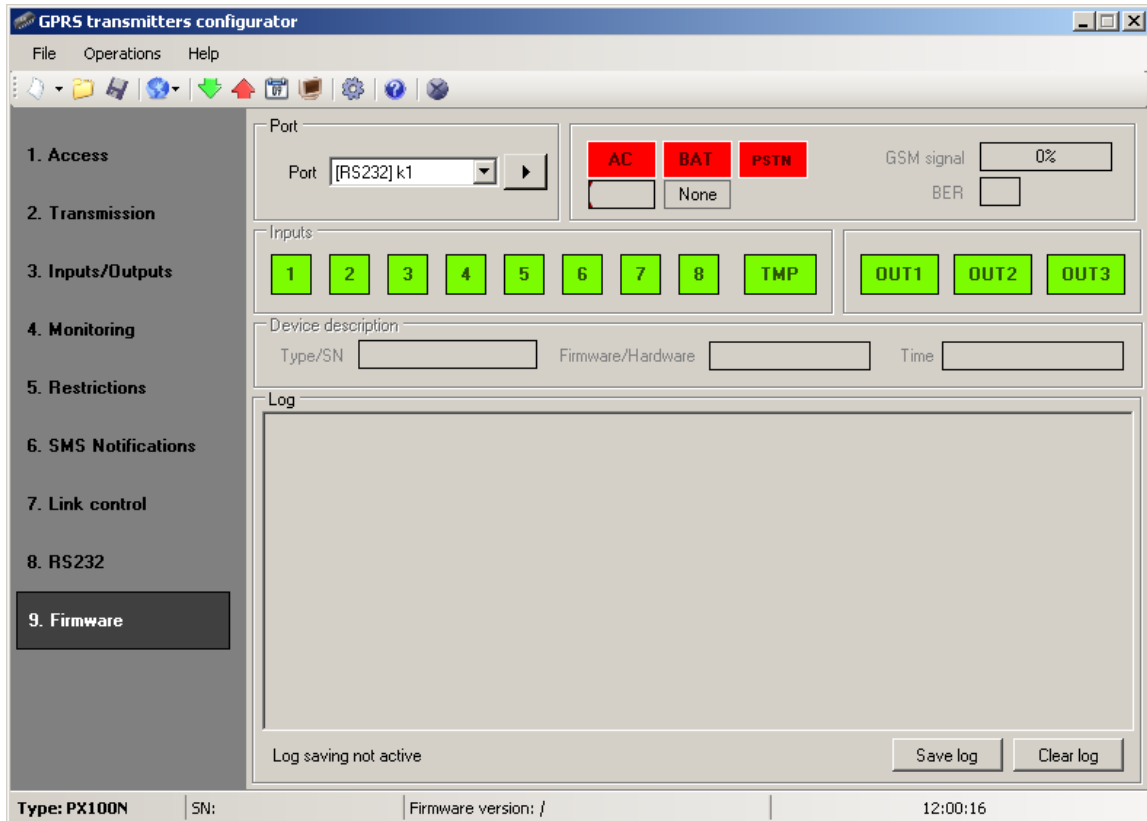
Note: Procedure of assigning firmware to a device is analogous to programming a device. For procedure refer to chapter 8 Programming of the device.

- e) Click [Start] button to start software exchange.
- f) Loading course is displayed on special window.
- g) Close the window after completed saving

From this time on the device will work under control of new firmware.

Note : The above procedure shall be carry out with due care to avoid improper device operation.

7.10. Device Monitor

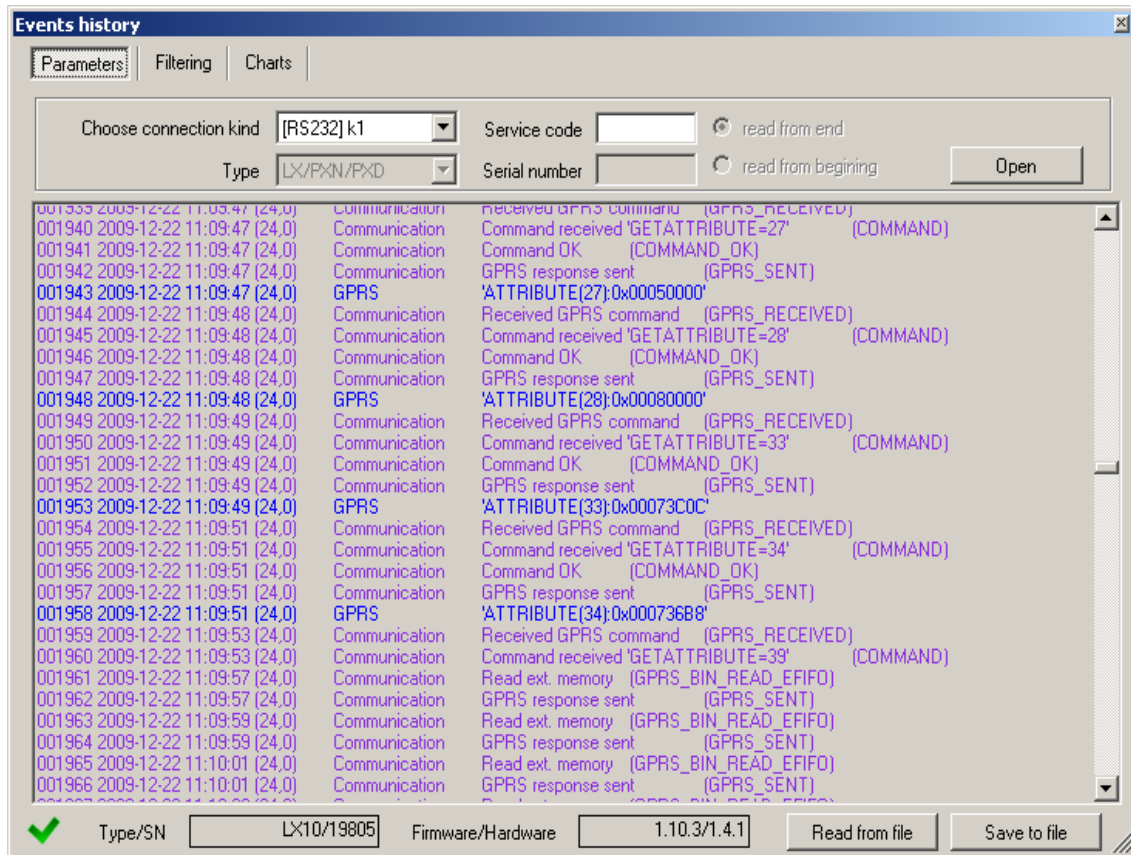


“Device Monitor” provides real-time information on device state. To use this function device must be connected to PC computer with LX-DATA cable (using DEBUG plug). Correct RS232 port must be chosen in “Port” field. “Device monitor” provides following information:

- AC power indication
- Battery power indication
- PSTN line indication
- GSM network signal level indication
- Bit-Error-Rate level measuring
- Inputs and outputs state monitoring
- Type or serial number of device
- Firmware and hardware revision
- Device time

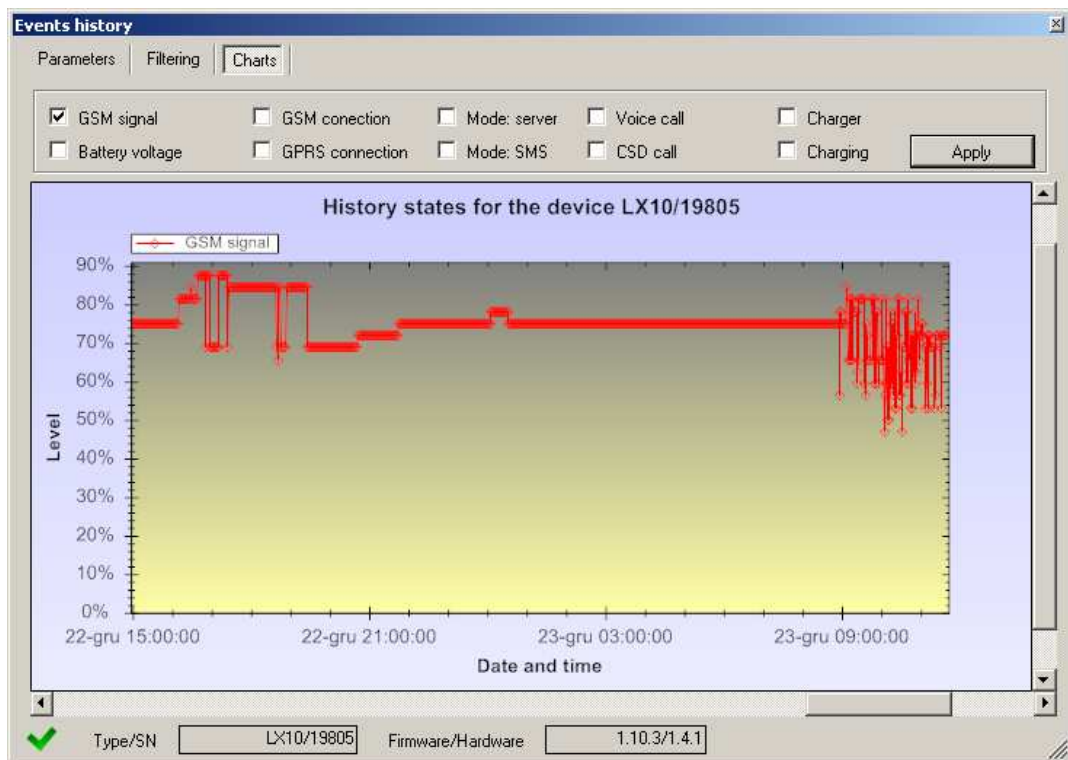
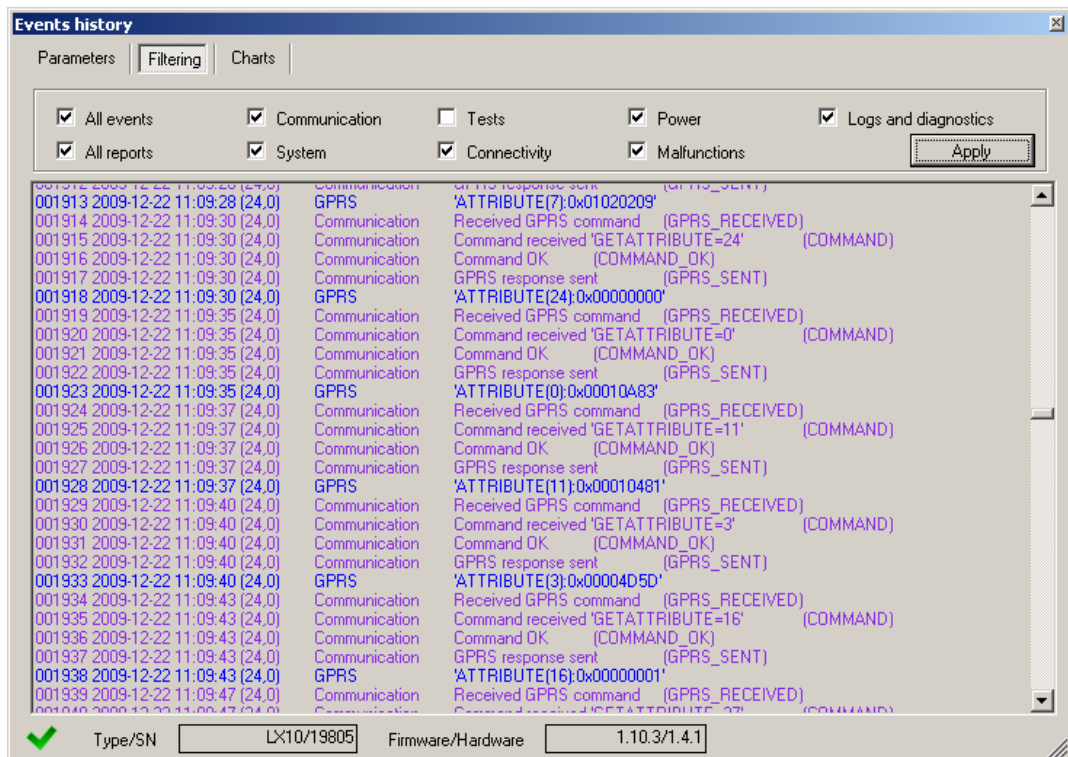
These parameters are also shown in LOG window in text style. All data can be saved to file.

7.11. Events history



„Events history” provides information about last events stored in PX100N device memory. PX100N transmitter is able to save 192kB of data, which is about 8000 events. It is possible to read the history of both using a GPRS connection and RS232. In the second case data can be send to PC only via LX-PROG cable (the white one). Correct RS232 port or GPRS connection must be chosen in “Choose connection kind” field. After providing Service code and clicking “Open” button events data will be downloaded from PX100N memory. After properly reading access to features such as the “Filtering” and “Charts” becomes possible. Both of them may be used to quickly diagnose the device.

Note: This feature is available for PX100N devices with serial numbers above 44643.



8. DEVICE PROGRAMMING

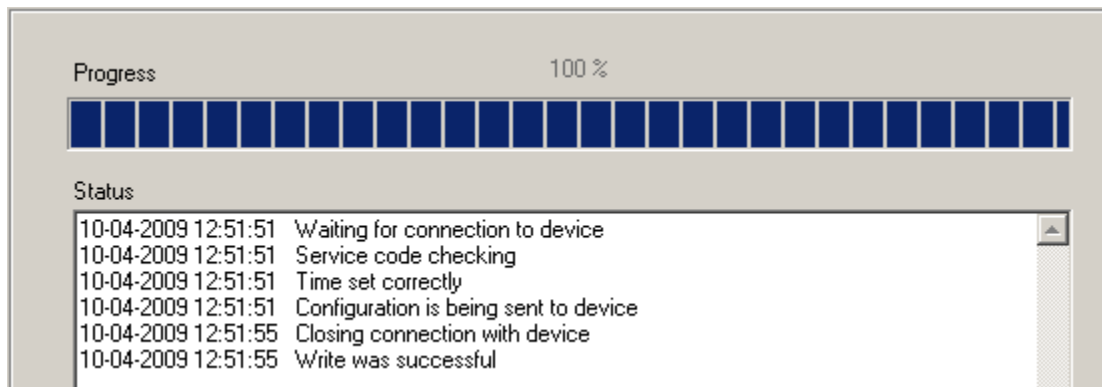
Programming of device is possible with "GPRS transmitters configurator" configuration program described in chapter 6. To program the device establish connection with a device.

Depending on connection mode there are two ways for programming.

8.1. LOCAL PROGRAMMING

To program a device locally follow the procedure:

- a) Connect PROG joint (on printed circuit) with COM computer port by way of service wire, defined in option -> RS-232.
- b) Connect power supply to terminals **+12V** and **GND**. After connection and detection of programming wire a module shall signal this with LED diodes: a green one shall flash and red one shall flicker.
- c) Launch software and define device options (description is in chapter 6 of this Manual). Provide right PIN code for SIM card.
- d) Save settings into memory of device. Saving course is displayed in special window.



- e) After saving disconnect power supply and disassembly service wire.
- f) Insert SIM card. Connect module wiring pursuant to guidelines from chapter 3. Turn power supply on.
- g) The device is ready to transmit data.

8.2. REMOTE PROGRAMMING

Remote programming of device is possible if:

- user uses GPRS transmitters configurator and GSM modem connected to PC
- user uses OSM.2007 monitoring system receiver.

In first case remote programming is possible on CSD channel and its procedure is analogous to local programming, remembering that "Modem GSM" shall be selected from connection options (See chapter 6.3.5.2 – CSD connection).

Note: Remote configuration with use of CSD canal is possible only if transmission of CSD data is active both for SIM card inserted in the device, and for SIM card installed in GSM modem.

In second case according to description in chapter 6.3.5.2 – GPRS linking , it is required to define remote link on grounds of OSM.2007 parameters. As OSM.2007 collects (and transmits) information exclusively from devices saved in data base, the first operation during remote programming is proper registration of the device. This procedure has been described in OSM.2007 Operation Manual.

8.2.1. The first programming of device

As the device does not have defined access parameters in respect of GPRS network and OSM.2007, programming shall be begun with providing parameters.

Irrespectively of providing these parameters the first operation shall be registration of device in OSM.2007 data base.

Before remote programming user shall check that the device is furnished with SIM card (with reservations provided in chapter 7.1.5.3) and is connected to power supply. User shall know serial number of device and phone number for SIM card.

Follow the procedure:

- a) With the use of OSM.2007 console position cursor on proper device in "Devices" tab.
- b) Click "Config." option and then select "Set Configuration" function to display list of parameters.
- c) Enter server address, server port and APN. Click OK and system shall send to device provided parameters (SMS).
- d) Wait till device addresses server (in "Devices" tab it will be marked with green colour).
- e) Launch software and define options of device (description is provided in chapter 7 of this Manual).
- f) Select "Send" to display a new window and select remote connection (GPRS tab). Save settings in memory of device. Saving course is displayed on special window.
- g) After saving completion close Configuration Wizard.
- h) The device is ready to transmit data.

8.2.2. Reprogramming of device

As the device has defined access parameters in respect of GPRS network and OSM.2007, it is possible to program device at any time.

If device is installed in secured object and is furnished with SIM card and connected to power supply follow the procedure:

- a) Launch configuration wizard and define options of device (description is provided in chapter 7 of this Manual).
- b) Select "Send" to display a new window and select remote connection (GPRS tab). Save settings in memory of device. Saving course is displayed in special window.
- c) After saving completion close Configuration Wizard
- d) The device is ready to transmit data according to new settings.

9. RECEIVING OF SMS MESSAGE

GPRS module receives specially prepared SMS. If received SMS is not correct it will be automatically cancelled and device will not operate any action.

As mentioned above the device may operate in two modes:

- with a new encoded protocol
- with PX protocol

Depending on operation mode there are varied commands available to control the device.

9.1. NEW PROTOCOL

The following format of message is acceptable allowing to send some commands with one SMS (every command shall be separated with SPACE):

SERVICE CODE **COMMAND** **COMMAND**

Where:

SERVICE CODE - device service code
 - SPACE

COMMAND - order (see the table below)

List of commands

DISC	Disconnects active TCP connection.
KILL	Reset modem; after execution of command a confirmation is sent.
RESET	Reset device. Note: all unsent events will be lost.
OUT=outNr, state	Turn on or turn off outputs. outNr specifies output number (0 for relay output, 1 for OUT1), state specifies requested output state (0 – switched off, 1 – switched on). <u>Examples:</u> <i>OUT=1,0</i> – switches off OUT1 output <i>OUT=1,1</i> – switches on OUT1 output
CMD= [timeout], command	Issues AT command to GSM modem and sends response back. Optional timeout parameter defines time for modem response. Time determined in seconds and ranges from 1-30 seconds. If timeout isn't specified, 3 seconds is assumed.
DESC	Returns device description, serial number (hexadecimal number) and firmware version.
GETSTATUS	Download device status. Command sends text back according to definition from chapter 7.6.4
GETPARAM= parameter_name	Gets inquired parameter :SERVER, PORT, APN, UN, PW, DNS1, DNS2, SMS, SMSPERIOD
GETCFG	Gets primary communication parameters of device in form: SERVER:PORT,APN UN PW,DNS1
APN=apn	Access point to GPRS network. Parameter should be obtained from mobile network operator. If APN address contain space sign put it with "" e.g. "my apn".

UN=un	APN user name. Parameter should be obtained from mobile network operator. If APN user name contain space sign put it with "" e.g. "my user name".
PW=pw	APN password. Parameter should be obtained from mobile network operator. If APN password contain space sign put it with "" e.g. "my password".
SERVER=server	Server address; it can be in form of IP or domain name address.
PORT=port	Server port number.
DNS1=dns1	Specifies primary DNS server address (only needed when domain name address is used as SERVER address)
DNS2=dns2	Specifies secondary DNS server address (only needed when domain name address is used as SERVER address)
SMS=phone number	Server phone number. When there is GPRS failure, SMS with events will be sent to this number.
SMSPERIOD=time	Defines in minutes time between SMS test messages sending to the server.
OLD	Switch device operating in encoded protocol mode into operation in old PX device emulation mode.
RLIMIT	Removes automatic temporary locks on all inputs
RLIMIT=inputs_mask	Removes selected automatic temporary locks. Parameter is decimal number made from 9-bit word: A9 ... A2, A1, where A1 means TAMPER, A2 INPUT 1 and A9 INPUT8. <u>EXAMPLE:</u> <i>RLIMIT=7</i> removes locks on inputs: TAMPER, IN1, IN2 <i>RLIMIT=1</i> remove lock on input TAMPER
DT=YY/MM/DD, hh:mm:ss	Sets date and time in the transmitter; must be putted in a specific format (see the table on the left)
FLUSH=x	Flushes events buffer, where x is: ▪ 2 – system events history

Note: DESC, CMD, GETSTATUS, GETPARAM, GETCFG commands require separate SMS, so one command with only one SMS.

Samples of commands and device reaction:

Parameters setting:

1111■APN=general.t-mobile.uk■SERVER=89.112.43.78■PORT=6670■
SMS=500445566■SMSPERIOD=25

Parameters verification:

Inquiry: 1111■GETCFG

Answer: 89.112.43.78:6670,general.t-mobile.uk■,

Inquiry: 1111■GETPARAM=SMS

Answer: 500445566

9.2. OLD PROTOCOL

The following format of message is acceptable allowing to send some commands with one SMS (every command shall be separated with SPACE):

SERVICE CODE COMMAND COMMAND

Where:

SERVICE CODE - device service code
 - SPACE

COMMAND - order (see the table below)

List of commands

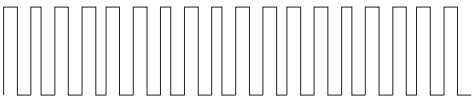

NEW	Switch device operating in PX emulation mode into encoding protocol mode.
STAT	Enquiry regarding actual module condition
VER	Gets device firmware version
TMP1	Switches on relay output
TMP0	Switches off relay output
AUX1	Switches on OUT1 output
AUX0	Switches off OUT1 output
INT_ON	TMP (sabotage) input lock
IN1_ON	1 input lock
IN2_ON	2 input lock
IN3_ON	3 input lock
IN4_ON	4 input lock
IN5_ON	5 input lock
IN6_ON	6 input lock
IN7_ON	7 input lock
IN8_ON	8 input lock
INA_ON	All inputs lock (with no impact on sabotage input)
INT_OFF	TMP (sabotage) input unlock
IN1_OFF	1 input unlock
IN2_OFF	2 input unlock
IN3_OFF	3 input unlock
IN4_OFF	4 input unlock
IN5_OFF	5 input unlock
IN6_OFF	6 input unlock
IN7_OFF	7 input unlock
IN8_OFF	8 input unlock
INA_OFF	All inputs unlock (with no impact on sabotage input)
KILL	GSM modem reset

10. LED DIODES INDICATION

LED diodes, mounted directly on printed circuit, are purposed to show actual condition of the device.

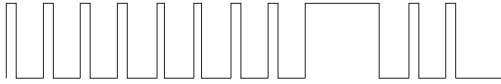

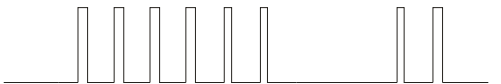

10.1. LOGGING TO GSM NETWORK

Once SIM card has been inserted into the device and power supply was turned on logging to GSM system follows.

Description	LED Diodes	
	Green	Red
Logging to GSM		





10.2. GSM RANGE

Flickering of a green diode indicates GSM signal (1-8 flickers). Device operation mode is signalled with a green diode on during 2 seconds once the range was detected. If after signalling range diode will not flash for 2 seconds the device is in SMS mode. Range indication is interrupted during data transmission, and after sending of data again GSM range is being indicated.

Description	LED Diodes	
	Green	Red
GSM range = 8 GPRS mode		
GSM range = 6 SMS mode		


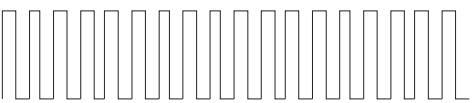

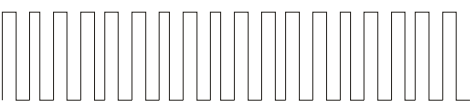
10.3. DATA TRANSMISSION

During data transmission a green diode indicates data transmitting.

Description	LED Diodes	
	Green	Red
GPRS Transmission		
SMS Transmission		



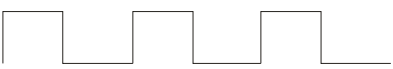

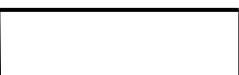
10.4. PROGRAMMING

After detection of programming wire diodes indicate programming.

Description	LED Diodes	
	Green	Red
Connected Service wire		
Programming in CSD mode		

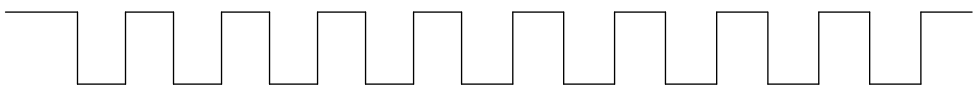

10.5. FIRMWARE UPDATING

During programming bootlader operating is indicated. If error follows during updating there is bootlader in device and another programming of device is possible.

Description	LED Diodes	
	Green	Red
No program in device	 (1/sec)	
Software updating		
Received firmware decoding	10 sec  	

10.6. SIM CARD ERROR

In case of SIM card problems, device states this with OK and ERROR LEDs

LED diode	Signalling
OK (green)	
ERROR (red)	

10.7.SYSTEM ERROR

During operating errors may follow. Any error is indicated by constant flashing of a red diode and mostly it means communication problem with modem or SIM card.

11. CHANGELOG

<i>Date / Version</i>	<i>Description</i>
14.04.2009 / 1.10i7	Updated list of commands; Added monitor device
25.11.2009 / 1.11i8	Firmware update and GPRS configurator update
05.02.2010 / 1.11i9	User SMS tests, Events History, battery voltage threshold for Sleep mode