EX20

ETHERNET TRANSMITTER

Installation and programming manual

CE DECLARATION OF CONFORMITY
EBS Ltd. Co. hereby declares that mentioned PX100D product conforms to all the applicable requirements of EU and Council Directive No.1999/5/EC of 9 March 1999. A copy of Conformity Declaration is available at: http://www.ebs.pl/certyfikaty/

This crossed out dustbin symbol indicates that when the last user wishes to discard the product at the territory of European Union, it shall be utilized at an authorized and approved collection point. It applies both to the device and accessories marked with this symbol. Do not discard these products along with unsorted municipal wastes.

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Policy of the device manufacturer is to constantly develop the product. The manufacturer reserves the right to make modifications and changes without prior notice in respect of any model functions described in this document.

Depending on programming of devices there are varied available functions. Further details available at Distributor of devices.

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1   INTRODUCTION

EX20 module is purposed for transmitting alarm signals from facilities using Ethernet-Internet network

The transmitters are characterized with great programming flexibility, facilitating use in systems with specific requirements, as well as a number of unique solutions absent in other transmitters of this standard.

The great advantages of the transmitters are the remote configuration option, as well as firmware update using dedicated software.

2   FUNCTIONAL AND TECHNICAL PARAMETERS

Inputs: (programmable)	– 4 NO/NC – DTMF – RS-232
	Sabotage - 1 NO/NC
Outputs: (programmable)	Sabotage - 1 Additional - 1
Data transmission	ETHERNET (IEE 802.3; 10Mbps/100Mbps; DHCP/Static IP; LAN/WAN)
Configuration:	- Remote - Local
Security:	AES encoding
Loading of AUX and SAB outputs	100 mA

In dependence from user's decision "Transmitter EX20" can be delivered in different versions. Therefore also the parameters as type of the power supply voltage, current consumption as well as the dimensions were introduced for following options separately:

Option 1 - Transmitter EX10 + power supply LX-ZAS in metal box
Option 2 – Transmitter EX20

	Option 1	Option 2
Voltage	type 230 VAC (190 – 250 VAC) 50 – 60 Hz	type 13.8 VDC (12 – 14 VDC)
Current/Power consumption (average/max)	4 W / 20 W @230 VAC	140 mA @13.8 VDC
Dimensions	502 x 502 x 88 mm (metal box)	102 x 73 x 35 mm

3 ASSEMBLY AND WIRING

Transmitter is delivered along with a power supply (See below). The manufacturer provides necessary wiring linking a power supply with the transmitter, and described procedures relate to wiring of a transmitter printed circuit board.

Switch power off to perform any connection.

3.1 SCHEME OF CONNECTIONS
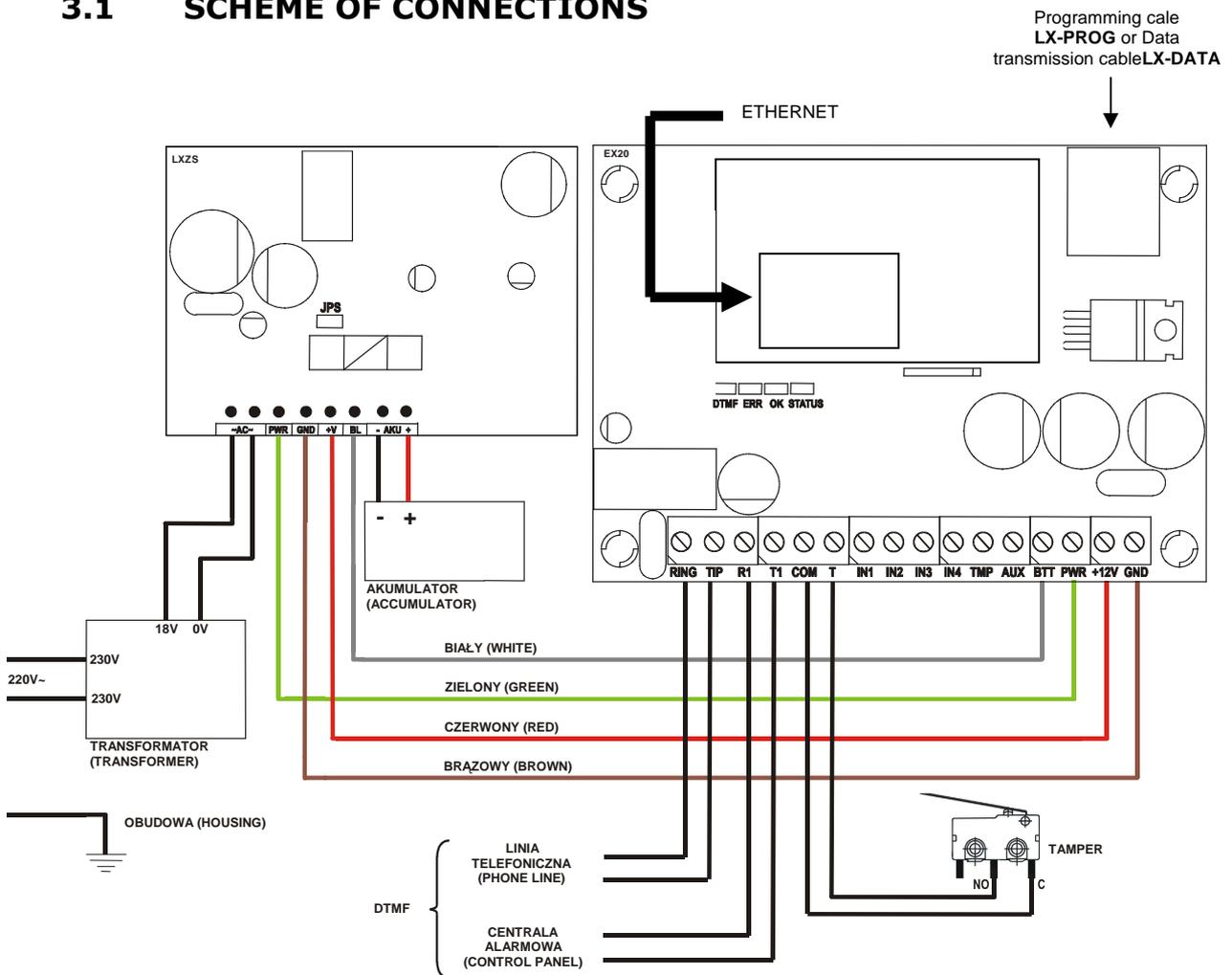
Figure 1. EX10 Transmitter with LX-ZAS

a) 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.
b) According to the above figure terminals of transmitter shall be connected to:

Terminal	Connection description.
RING-TIP	Terminals for an PSTN telephone line
T1 – R1	Connection to alarm control panel phone communicator
COM	Device ground, common for other input and output
T	Connection of monitoring sabotage switch (the second switch contact connected to COM terminal).
IN1 till IN4	Signal inputs. Possible connection of detectors contacts or alarm control panel outputs. COM terminal is common for all inputs.
TMP	Sabotage output indication output type OC. It may control external device. Provides ground during activation.
AUX	Type OC additional output. It may control external device. Provides ground during activation.

After careful connections examination a battery may be connected (to +/- AKU terminals of LX-ZAS power supply) and then power may be switched on for transformer and programming procedure of transmitter may begin (See Chapter 6).

3.2 PCB VERSION

If the users chose the option to buy only the transmitter circuit they will have to provide power supply for the device. It should be connected using the following terminals

+12 V	Power supply's positive end
GND	Power supply's negative end

-

*THE FOLLOWING CONNECTIONS ARE PURPOSED FOR COOPERATION WITH **LX-ZAS** POWER SUPPLY. IF OTHER POWER SUPPLY APPLIED, INPUTS SHALL BE LEFT WITHOUT WIRING.*

BTT	*Control input for verification of battery connected to EBS power supply.*
PWR	*Control input connected to adequate EBS power supply output. Purposed for monitoring AC power supply.*

MANUFACTURER RESERVES THE RIGHT TO AMEND APPEARANCE OF PRINTED CIRCUIT WITH NO EFFECT ON FUNCTIONALITY OF DEVICE.

3.3   LX-ZAS POWER SUPPLY

The dedicated power supply **LX-ZAS** (product of EBS) possesses the following parameters:

Parameter	Value
Served batteries	Acid-leaded 12V
Maximum voltage of charging battery	13.8V
Charging current	0.2A or 1A (switched by jumper)
Voltage of signalling of low level	11 V
Voltage of switch-off battery	9.5V

as well as it characterizes with following proprieties:

- protection against opposite connecting battery.
  protection against excessive unloading battery: The battery protects before damage in case of long-lasting fading the AC. In case of lack the AC and unloading below voltage 9.5 V the battery becomes separated from device automatically.
- quick charging of the battery:
  The jumper showed on drawing place causes settlement of maximum current of charging on 1A. We recommended jumper be taken off and the current of charging battery carries out 0.2 A.

jumper ON => charging current 1A

jumper OFF => charging current 0,2A
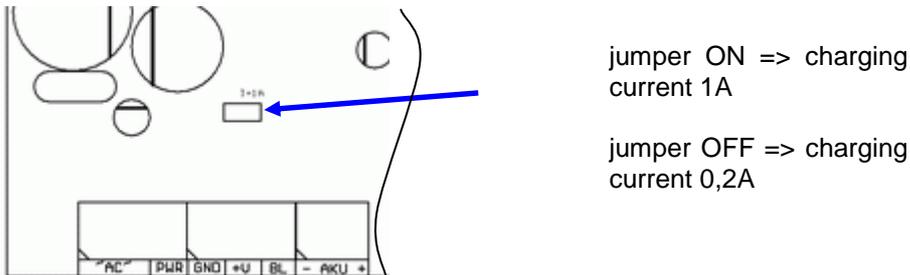
Figure 3. Choice of current of charging the battery

Note: the applying the quick charging can bring to damage of battery.

- protection against opposite connecting battery.

4   OPERATION

A device maintains communication with the monitoring station via Ethernet/Internet 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 IN4) 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.

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.

EX20 transmitter additionally is equipped with input of a PSTN telephone line, and input to connect telephone communicator module of alarm control panel.

Module constantly controls availability of an external telephone line. Decrease of line voltage below around 5V is deemed as a line damage. If an exterior phone line is operating, it is provided for output of telephone communicator module. If damage of urban line follows, a module disconnects an urban line and provides a voltage simulating telephone line to output of telephone communicator module. Module always provides voltage corresponding to operating phone line for an alarm control panel (namely to phone communicator module) regardless of urban line status.

Configuration of transmitter for cooperation with a control panel's phone communicator requires entering into memory a phone number for which transmitter is to answer.

Once a phone is picked up via an alarm control panel telephone communicator, a telephone number is being dialled to make connection. After the control panel dialled a number to which transmitter is to respond, a transmitter takes over a phone line namely disconnects an urban line from a control panel and provides to a phone communicator voltage that simulates an operating phone line. Next it generates confirmation signal and waits for data from a control panel –next DTMF tones generated with communicator are treated as data. After transmitting adequate number of DTMF signs (16 for ContactID and 9 for Ademco Express 4/2) a transmitter generates Kissoff signal. Collection of data from control panel finishes at hanging up a phone of a control panel by phone communicator module. After that transmitter comes back to standard operation –namely if urban line is operating, it is being connected to an alarm control panel and waits for dialling of new number.

If telephone number dialled with communicator is other than number module answers, no operation follows and it waits until communicator hangs up a phone and picks it up again – since picking up a telephone number dialled with a communicator module is being checked.

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.

5   CONFIGURATION PROGRAM

5.1   INITIAL REMARKS

The **GPRS transmitters configurator** (versions 1.1.709 and higher) allow to configure the EX20 Ethernet transmitter. For local parameters programming, firmware replacement and reading the events log the dedicated LX-PROG cable should be used. Monitoring of the devices should take place using a dedicated LX-DATA cable (not included).

5.2   COMPUTER - REQUIREMENTS

Minimum requirements for computer system where configuration software is to be installed:
Hardware:
- o Processor Pentium II 400 MHz,
- o 64 MB RAM,
- o 1 GB HD.
- o CD-ROM,
- o RS-232 serial port
- o Colour monitor (minimum 15 inch , min. 800x600 resolution),
- o Keyboard
- o Mouse

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

5.3   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 6).
Main window of program is divided into some fields.

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

Main menu contents:
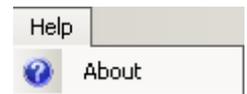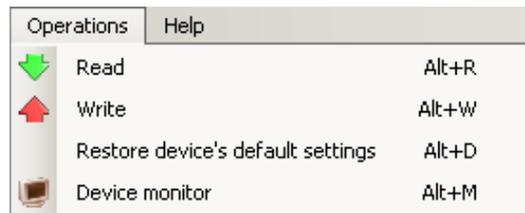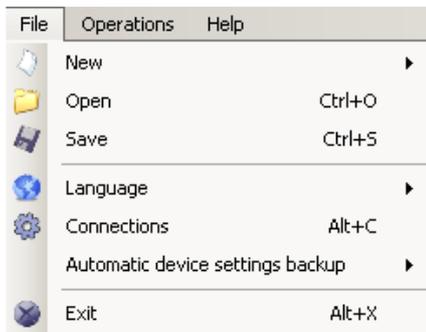
Main menu is available as icons on fast access bar:

5.3.1 File -> New

Opens new set of parameters. Editing of configuration parameters is possible.
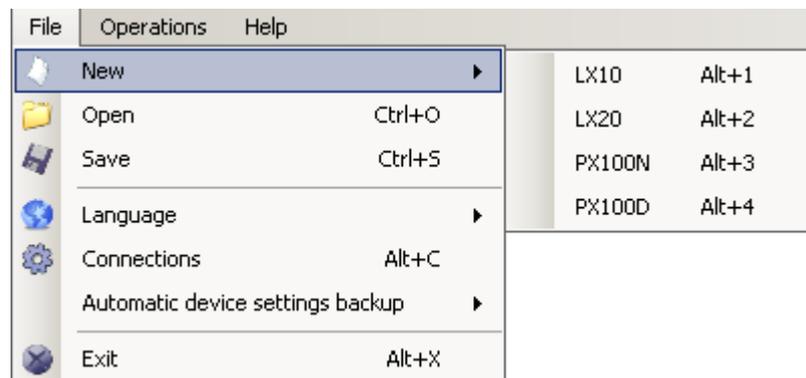
5.3.2 File -> Open

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.

5.3.3 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 saves 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).

5.3.4 File -> Language
Allows for selection of any available languages (determined in attached exterior language files).

5.3.5 File -> Connections
Before programming of devices, a connection type shall be defined. It is possible to do it with two methods: - locally, - remotely

5.3.5.1 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
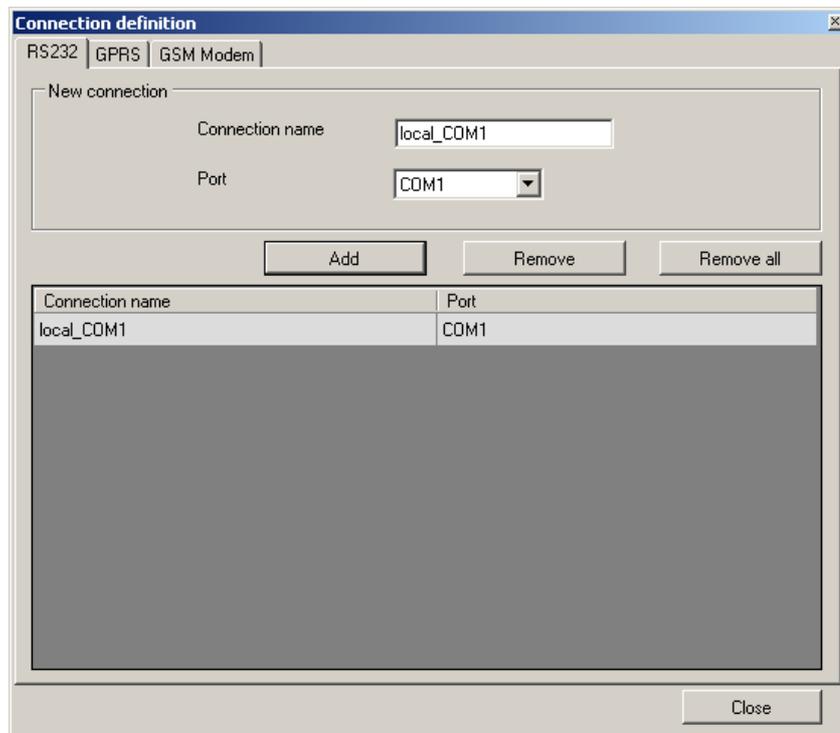
RS232 tab

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 memory will be possible.

5.3.5.2 Remote connection

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

GPRS

The GPRS tab allows for configuration of link with the device via OSM.2007 server.

Define:
- ➤ (Name of connection e.g.: **Remote**
- ➤ (Select name of analyzer e.g.: **Primary**
- ➤ (Enter analyzer address e.g.: **www.ebs.pl**
- ➤ (Enter port on which analyzer operates e.g. **9000**

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 memory is 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.

5.3.6 6.3.6.File-> Archiving

All configurator settings, both those read from devices and saved into devices, are automatically saved on hard disk. If the catalogues were not found during installation of configurator, the files can be found e.g. at:
C:\Program Files\EBS\KonfiguratorLX\configs\LX10_20000
The LX10_20000 catalogue contains all files connected with programming the LX10 device with factory number 20000. Their names contain date and time of operation, as well as its type (writing / reading). The files' extension is **cmi.**

5.3.7 File -> Exit

Finishes the programme operation.

5.3.8 Operations -> Read

The function reads out data saved in the module's memory. The data exchange takes place via the port selected in "Select connection type" section (see the description of "Configuration" option below). Correct readout is confirmed with appropriate massage. The data read from the device may be saved to a file (see point.5.3.3), and then use in other devices.
This function requires defining of the type and parameters of connection. For example, for the local connection the following view is displayed:
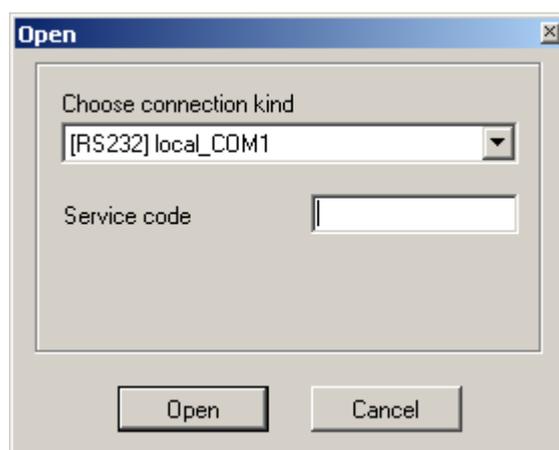
Where:

Port – serial port to which module is connected.
Access code– service code of transmitter

Detailed description of connections configuration is included in clause 5.3.5.

5.3.9 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.

5.3.10 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:
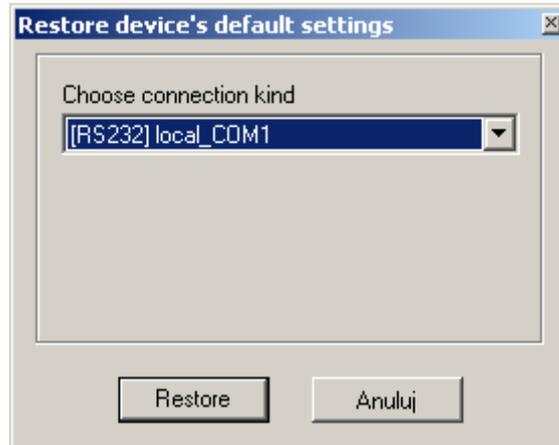
This operation is possible only with local connection. After operation completing device parameters shall come back to default settings.

5.3.11 Help -> About program

This option presents additional information about the programme.

6   PROGRAMMABLE PARAMETERS

Parameters available in configuration program are divided into three groups. Each of these groups will be described in detail in next part of this manual.

6.1   ACCESS
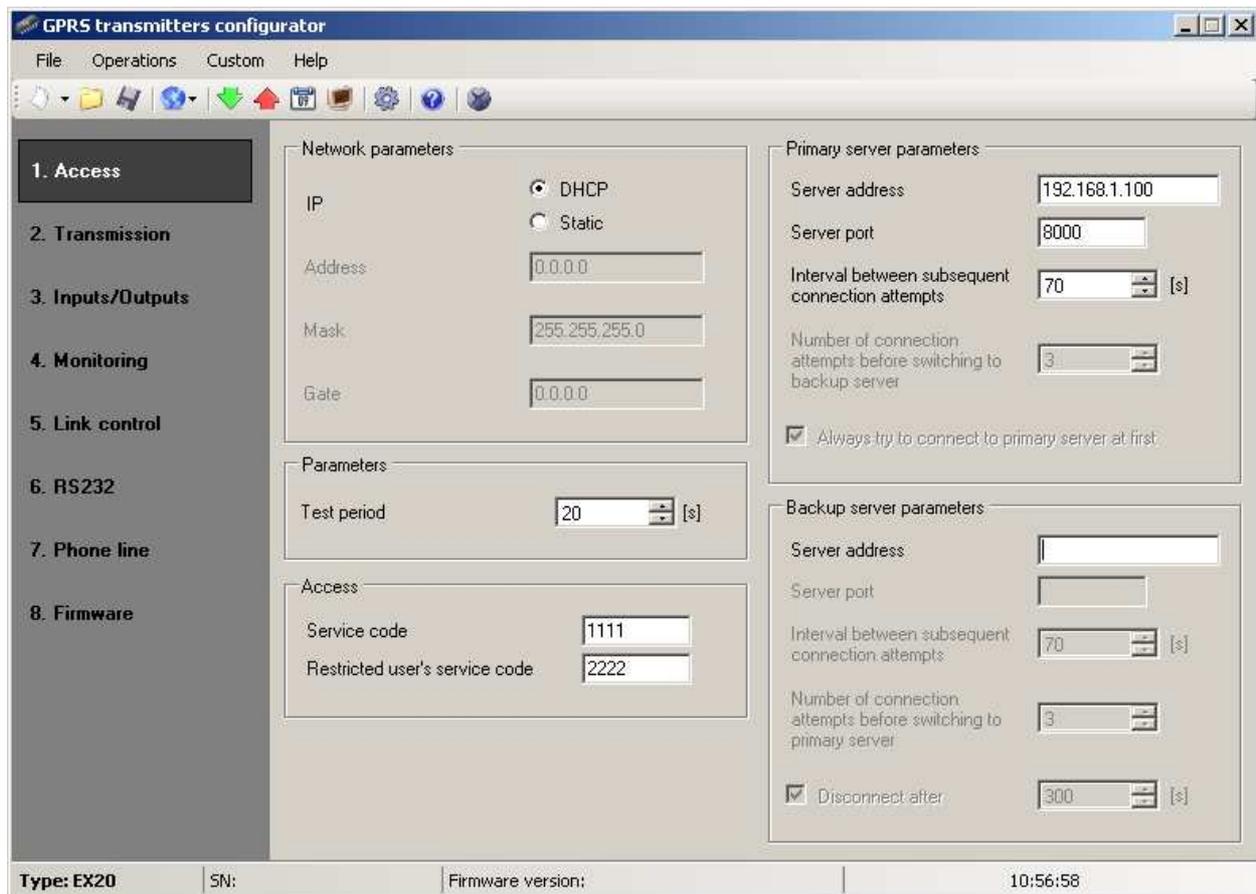
6.1.1 Transmitter's network parameters

6.1.1.1 IP

Depending on the device's network configuration the user may chose from the following operation modes:
- ► IP assigned by DHCP server,
- ► Static IP

If the operation mode with static IP is selected, the user should provide the basic network parameters of the transmitter:
- o *Address*
- o *Mask*
- o *Gate*

6.1.2 Parameter

6.1.2.1 Test sending 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).

6.1.3 Main Server Parameters

6.1.3.1 IP server 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.

6.1.3.2 Server port

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

6.1.3.3 Interval between subsequent connection

Programmable 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.

6.1.3.4 Number of connection attempts

In this filed you determine how many times device will try to make connection to server. If connections fail, the transmitter 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.

6.1.3.5 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).

6.1.4 Backup server parameters

6.1.4.1 IP server address

It is address of the second (reserve) receiver of monitoring system (OSM.2007) or computer where "Communication Server" software has been installed, e.g. 89.130.125.82.

6.1.4.2 Server port

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

6.1.4.3 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.

6.1.4.4 Number of connection attempts

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

6.1.4.5 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 6.1.3.5). 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.

6.1.5   Access

6.1.5.1 Administrator's service code

It provides security against unauthorized access. Allows for access to all configurable transmitter's options. 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.

6.1.5.2 Installer's service code

Allows for limiting the installer's access solely to the configurable parameters in "Monitoring", "Inputs/Outputs" and "Firmware" tabs. Factory setting is 2222. During the first starting of device (programming) it shall be changed. Code may consist of up to seven alpha numerical characters.

6.2   TRANSMISSION

For the purpose of maximum security of transmission, data is encrypted with AES key. The device also allows for entering user's own encryption key (256 bits – characters 0-9 and A-F). The option with default key parameters is activated by default.
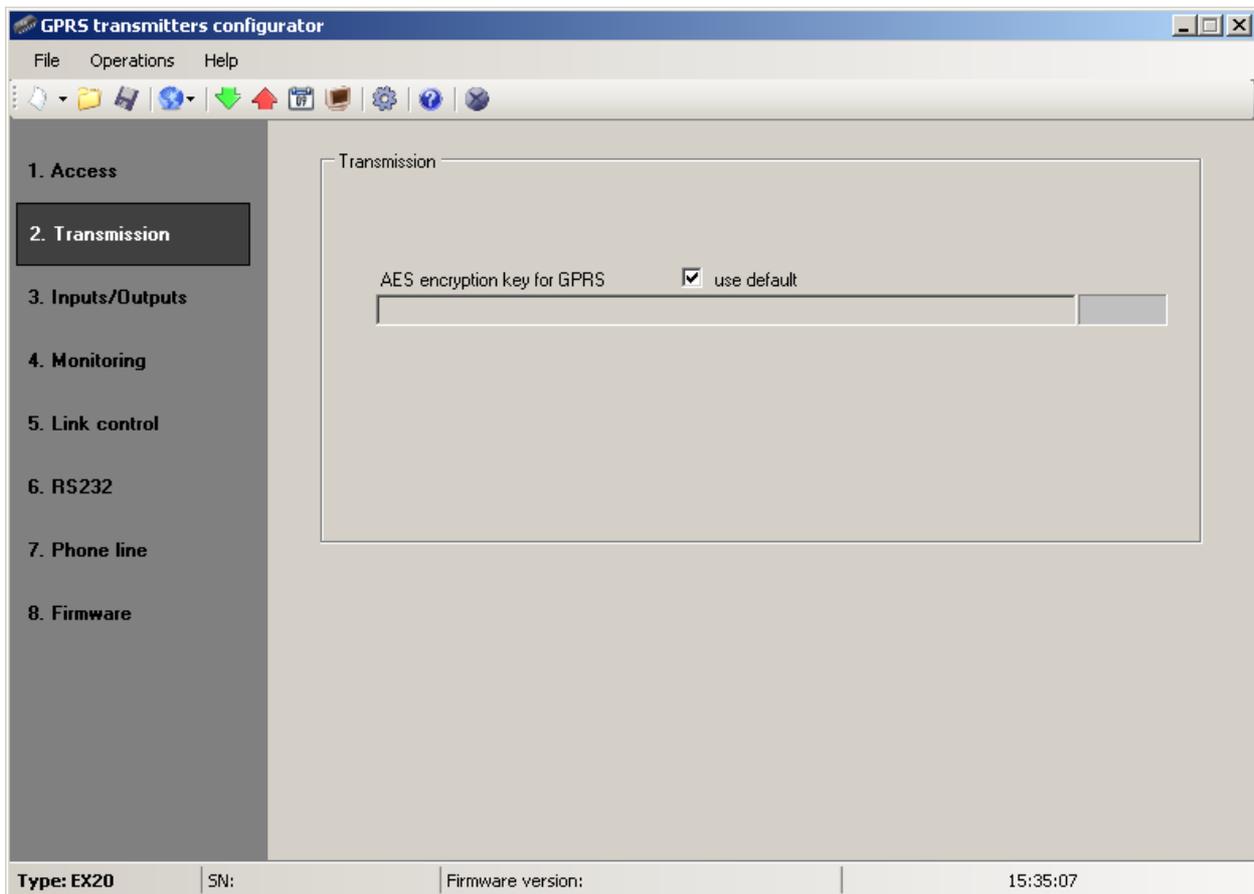
6.3   INPUTS/OUTPUTS

Transmitter has got 4 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.

6.3.1   Inputs

For every input the following settings shall be determined respectively.

6.3.1.1 NO/NC

This parameter allow for setting of constant 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.

6.3.1.2 Delay [ms]

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

6.3.1.3 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. More detailed information about input locks is shown on a diagram.

Limit: count N = 3 in time Tb

Events sent to the server

▉ Input triger and restore	▍ Event: input triger
┊ Temporary locked input triger and restore – no transmition	▍ Event: input restore
▒ Locked input	▍ Event: automatic input lock
	▍ Event: automatic input unlock
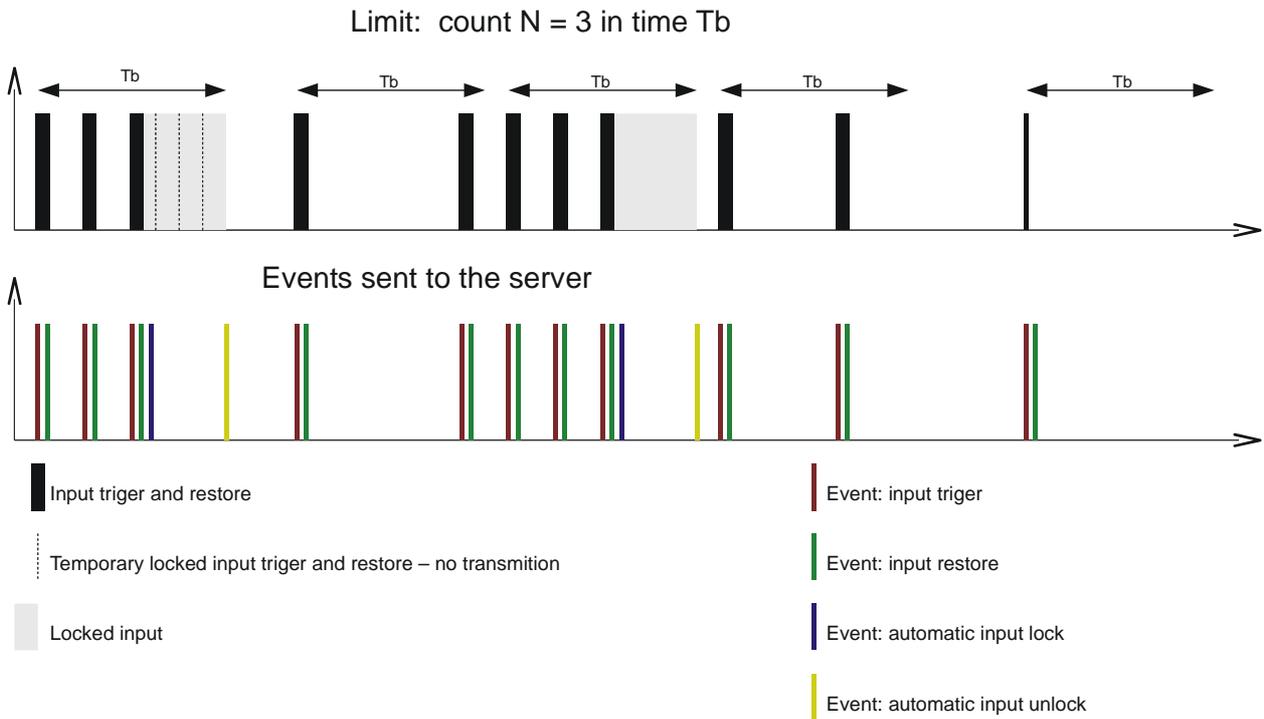
- For all inputs parameters N and Tb are configurable

- It is possible to sent 2 x N – 1 during Tb. Statically for long period a device sents max N events in Tb.

- Atomatic lock is engage after restor

Temporary lock may be deactivated by a command sent via OSM.2007 server (RLIMIT command)

The user may permanently block a given input checking a Permanent field corresponding to a given input.

Permanent lock may be activated and deactivated via OSM.2007 server.

6.3.2   Output 1 / Output 2
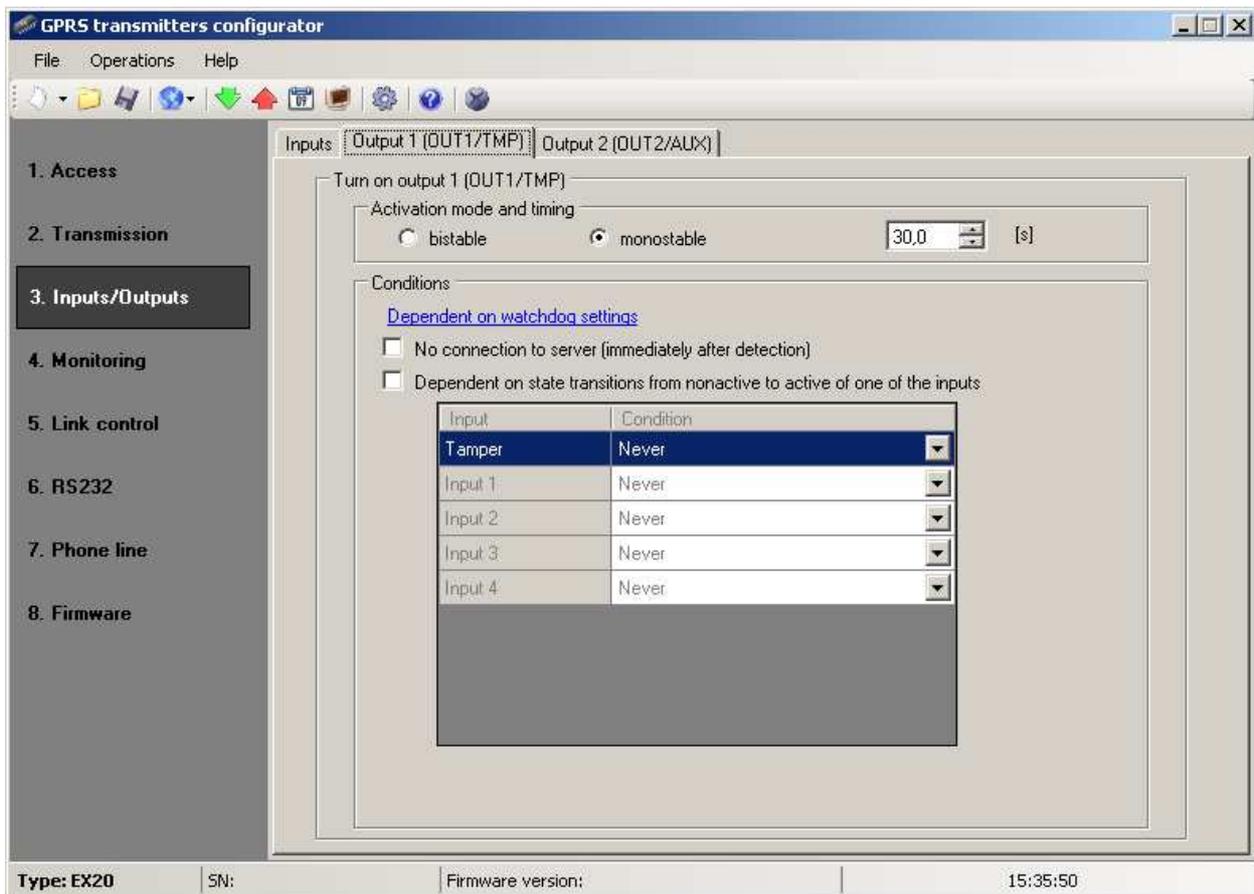
6.3.2.1 Active output mode and time

Thanks to this option you may choose output operation mode. There are two operation modes available:
- o *Bistable– connection follows for indefinite time- up to the moment of disconnection of power for module,*
- o *Monostable– connection follows for time defined by user - every 100ms.*

6.3.2.2 Conditions

Additionally describe other events to result in activation of inputs There are two options available:

a) When connection with the server is lost (directly upon detection)

b) Upon change of state of one of the inputs from non-active to active

There are two options available:

- o **Never:** *input disturbance does not cause operation of sabotage output,*
- o **No network**: *input disturbance causes actuation of sabotage output if sending of information to server is impossible.*
- o **Always:** *every input disturbance causes actuation of sabotage output.*

o **Available network:** *input disturbance causes actuation of sabotage output if sending of information to server is possible.*

6.4   MONITORING

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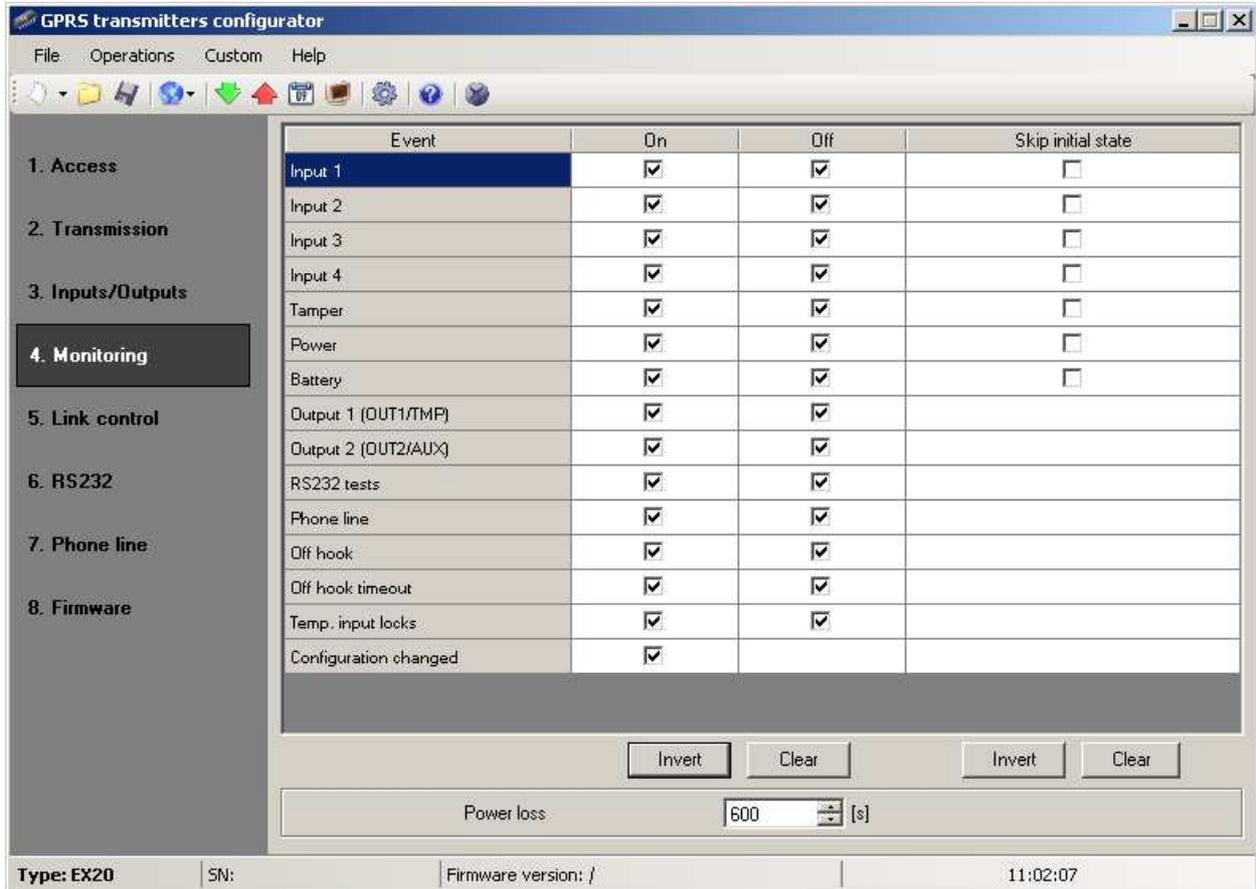
6.4.1   Turning on/off

In this part you define signals that may be reported at monitoring station. 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.

6.4.2   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.

6.4.3   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. 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.

6.5 LINK CONTROL
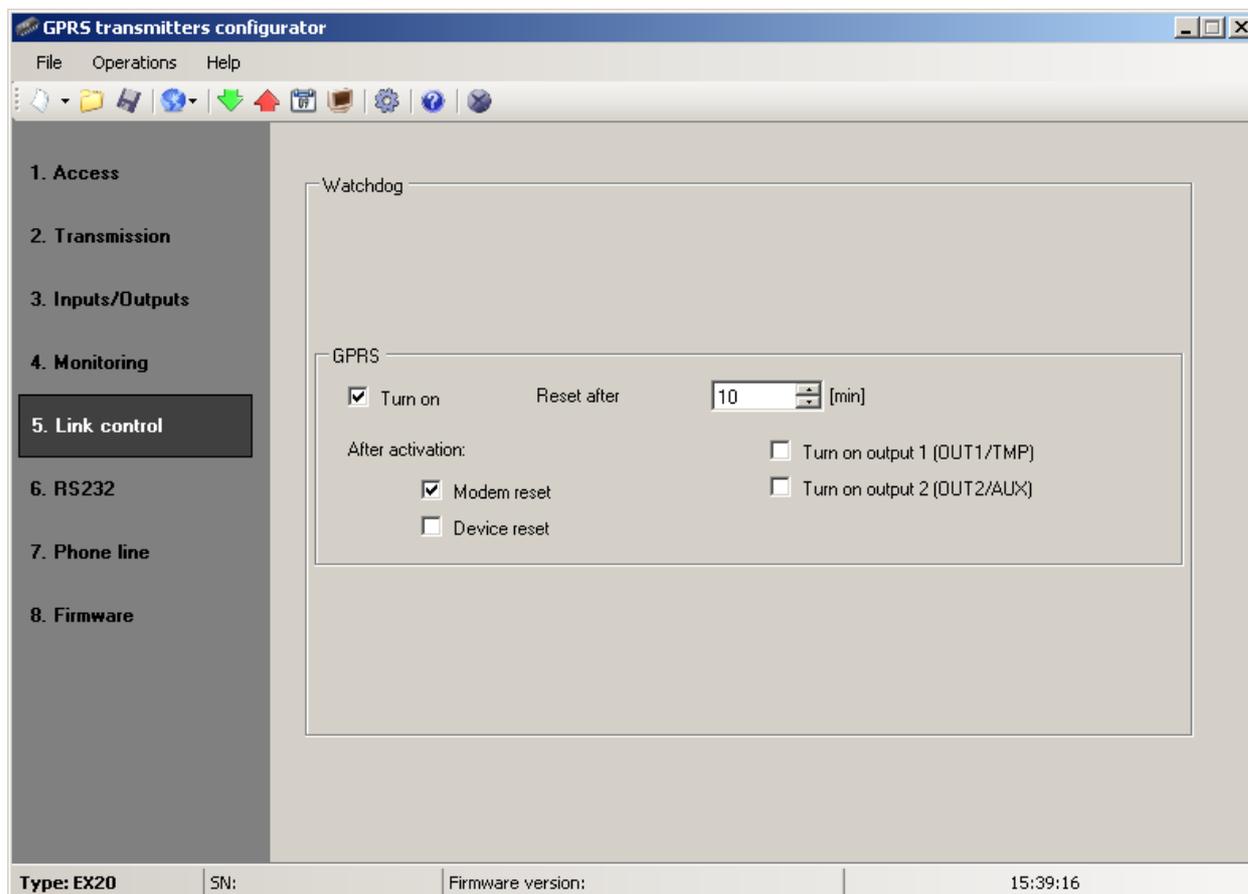
These options enable automatic action of device if communication with monitoring station was broken up.

Activate this function (mark [Turn On] field) to get access to parameters determining action of device.
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:
- o Ethernet module reset
- o Device Reset
- o Turn on Output 1
- o Turn on Output 2

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

6.6   RS232
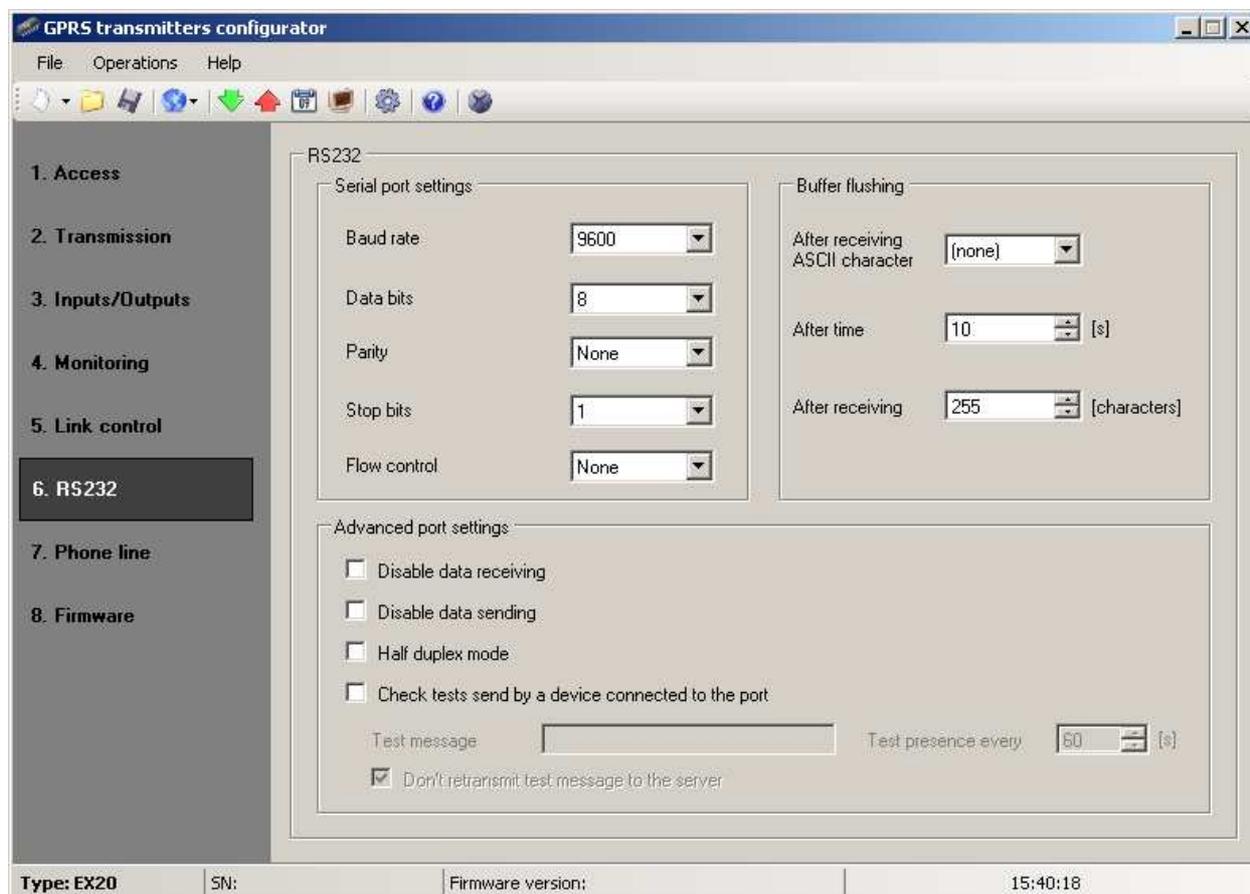
6.6.1   Serial port settings

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.

6.6.2   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 me 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.

6.6.3   Advanced port options

6.6.3.1 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 EX20 is being used to control the device.

6.6.3.2 Disable data sending

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

6.6.3.3 Half Duplex mode

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

6.6.3.4 Tests of device connection to port

If the device connected to transmitter port generates periodical connection tests, these tests may be under EX20 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, EX20 sends to server due message (See chapter 6.4 Tests RS232).

6.7   PHONE LINE

The device is equipped with an external, city telephone line. It may be used to transmit data from an alarm control panel. Additionally transmitter may collect information from a control panel using its phone communicator, and next transmit them to the server via Ethernet. The mentioned below parameters shall be defined for proper operation of the device.

6.7.1 Phone line

This tab is provided to determine settings of telephone line.
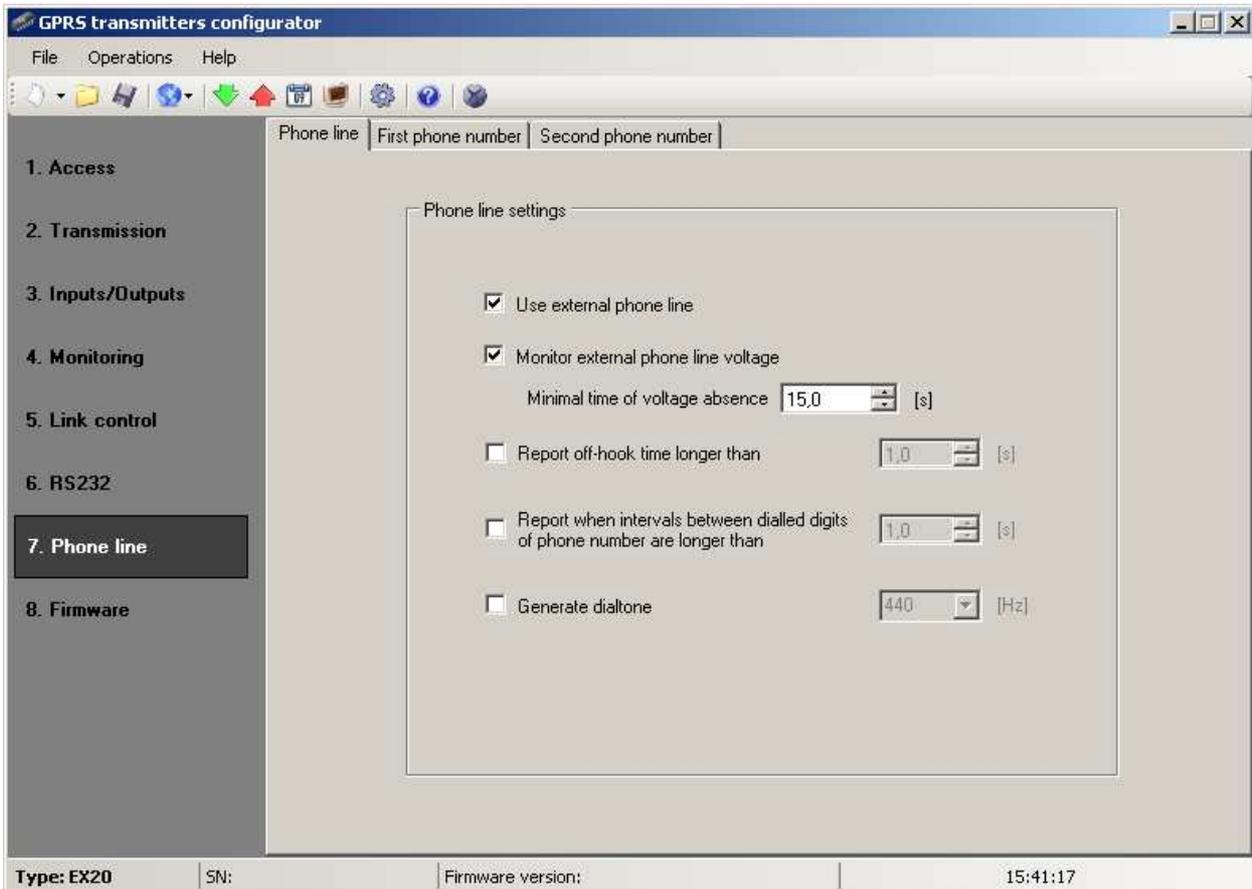
6.7.1.1 External phone line

If this function has been chosen (Activation) the transmitter will be cooperating with PSTN line. This way data transmission is possible from an alarm control panel with two ways: via Ethernet and standard telephone line.

6.7.1.2 Monitor external phone line voltage

If transmission with two ways follows, it is necessary that operator of monitoring system received information on access to an external telephone line. Choice of this option will result in voltage drop on telephone line (longer that defined minimal time of decay) that will be signalized with an adequate message sent via Ethernet.

Note: *The transmitter is to simulate a telephone line access if:*
   o *A PSTN line is not connected*

o *A PSTN line is connected but has not been activated –option from clause 6.7.1.1*
o *Options from clause 6.7.1.1 and clause 6.7.1.2 are active and voltage on terminals TIP–RING decreased below 8V.*

6.7.1.3 Report off-hook condition

If a phone set is connected in parallel output of control panel communicator (to terminals T1-R1 of transmitter), picking up of a phone prevent from exchange of data between a control panel and a transmitter. There is possibility to control this situation. Choice of this option result in sending a report to monitoring station if time of picking up the phone exceeds determined time limit.

6.7.1.4 Report "intervals too long"

This option is being used if in configuration PSTN line– EX20- Alarm Control Panel there are not other telecommunication devices. If such device will be connected and telephone number will be dialled (and a call will follow) after expiry defined time limit (counted since conclusion of last digit dialling) the transmitter sends a message. This operation prevents unauthorised installation of additional devices.

6.7.1.5 Generate dial tone

Some alarm control panels require that during a receiver picking up a tone of dialling was actuated. To enable cooperation with a transmitter it is possible to make a transmitter to generate such tone.

6.7.2 First and Second phone number

To provide for proper cooperation between a transmitter and a control panel in DTMF mode determination of some parameters is required. The below described functions are analogous to the both telephone numbers that may be saved in the device memory.
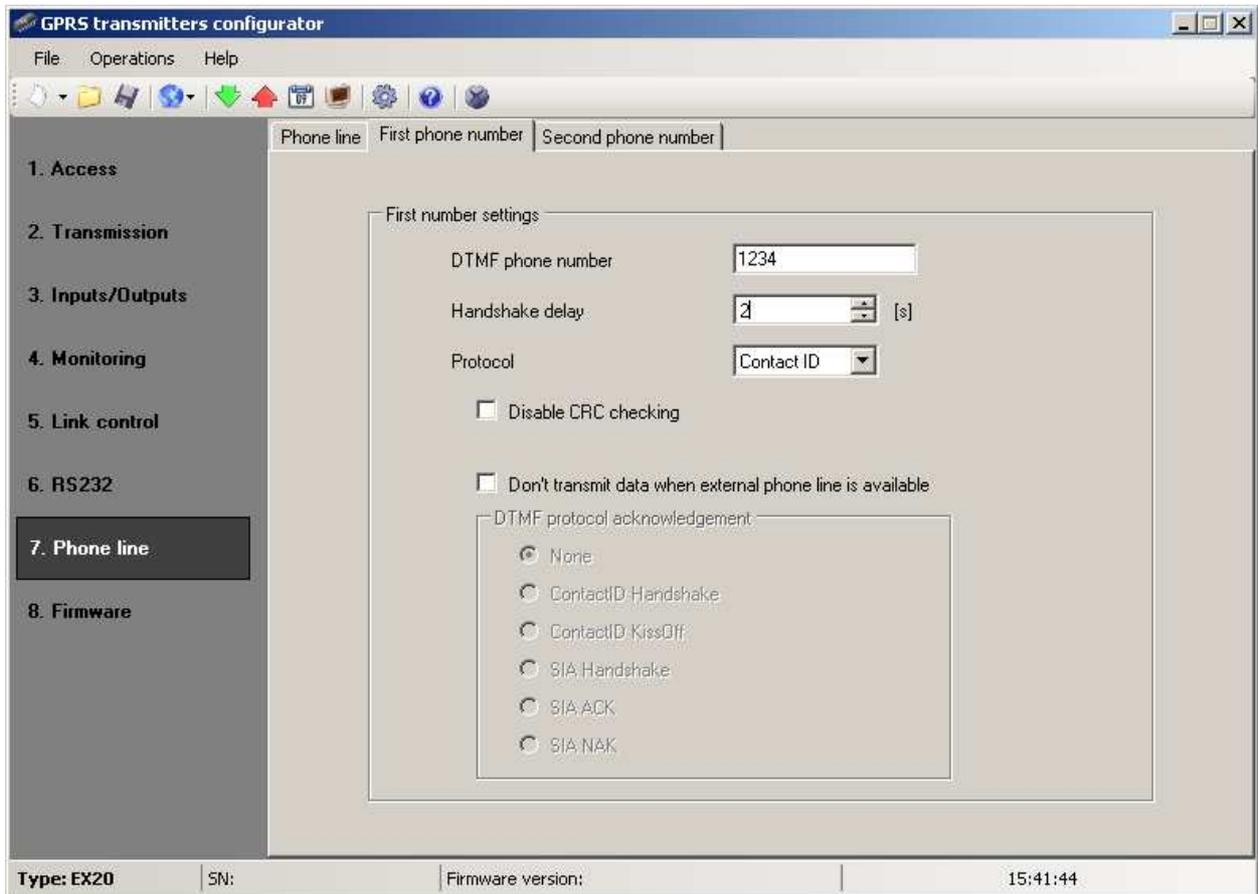
6.7.2.1 DTMF phone number

This is a number that has been saved in memory of an alarm control panel. If the panel is to transmit information on an event it shall dialled this number. Transmission of this information via Ethernet will be possible if this number will be identical as a number entered into the transmitter.

6.7.2.2 Handshake delay

This defines time after which a transmitter generates confirmation to an alarm control panel for correct phone number dial. Default setting is 2.0 sec. European Standard determines this value at 0.5 to 12.5 sec.

6.7.2.3 Protocol

Select protocol of data transmission used by an alarm control panel and that is acceptable for monitoring station. Available options: ContactID, Ademco Fast, and DTMF.

Note:
1) [Disable CRC checking] option may be used for ContactID and Ademco formats. Some control panel generate improper messages regarding a control sum for transmitted data, the device is not able to confirm collection of data, and as a result the panel tries to send them again (until execution of all determined trials). Select this option to avoid the above mentioned.

2) In case of DTMF protocol we gain access to specific parameters used to generate some control signals.

6.8   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.
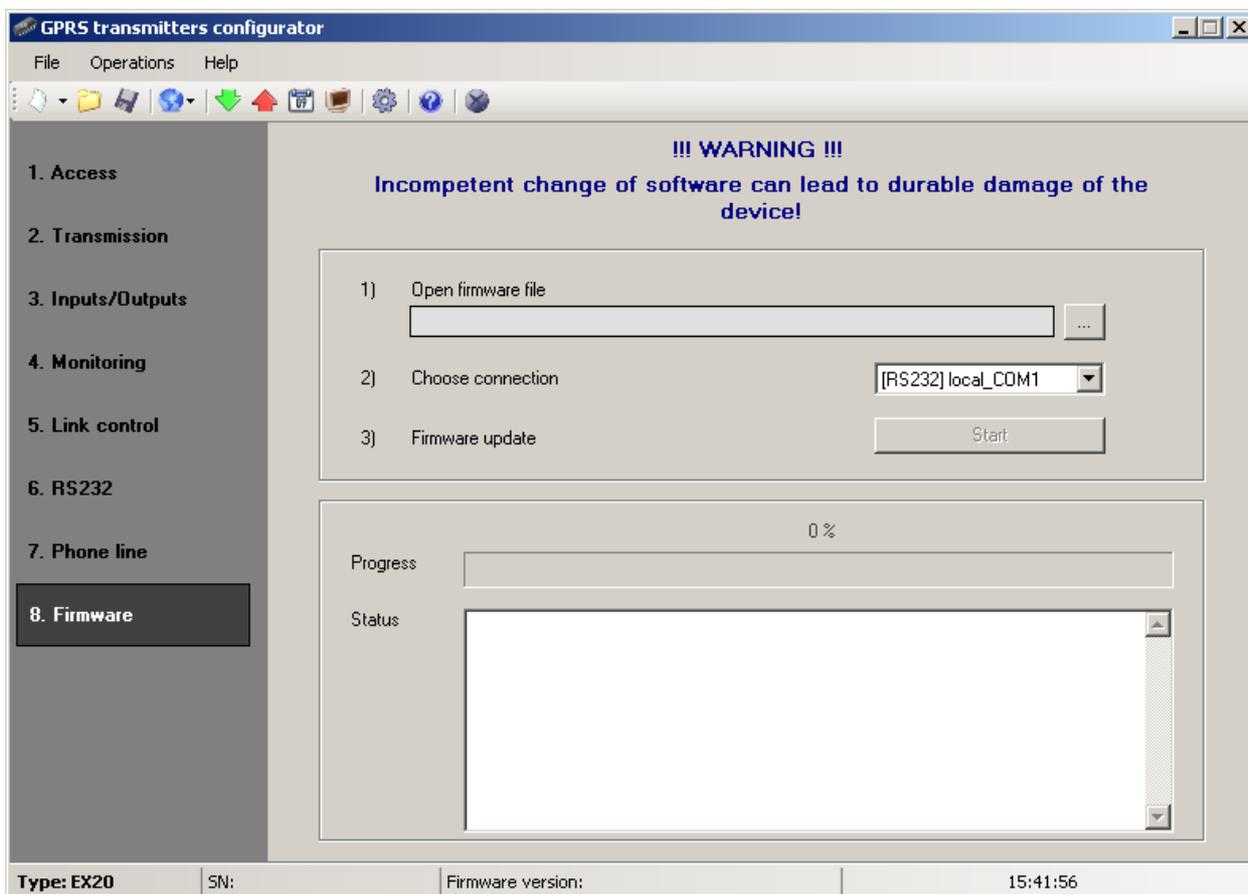
Follow the following procedure:
- a)   Launch configuration program
- b)   Open "Firmware" option of configuration wizard
- c)   Open file with new firmware (click [Open] button to locate where file is).
- d)   Select file transmission mode: local or remote.
    Note: *Procedure of assigning firmware to a device is analogous to programming a device. For procedure refer to chapter 7.*
- 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 carried out with due care to avoid improper device operation.

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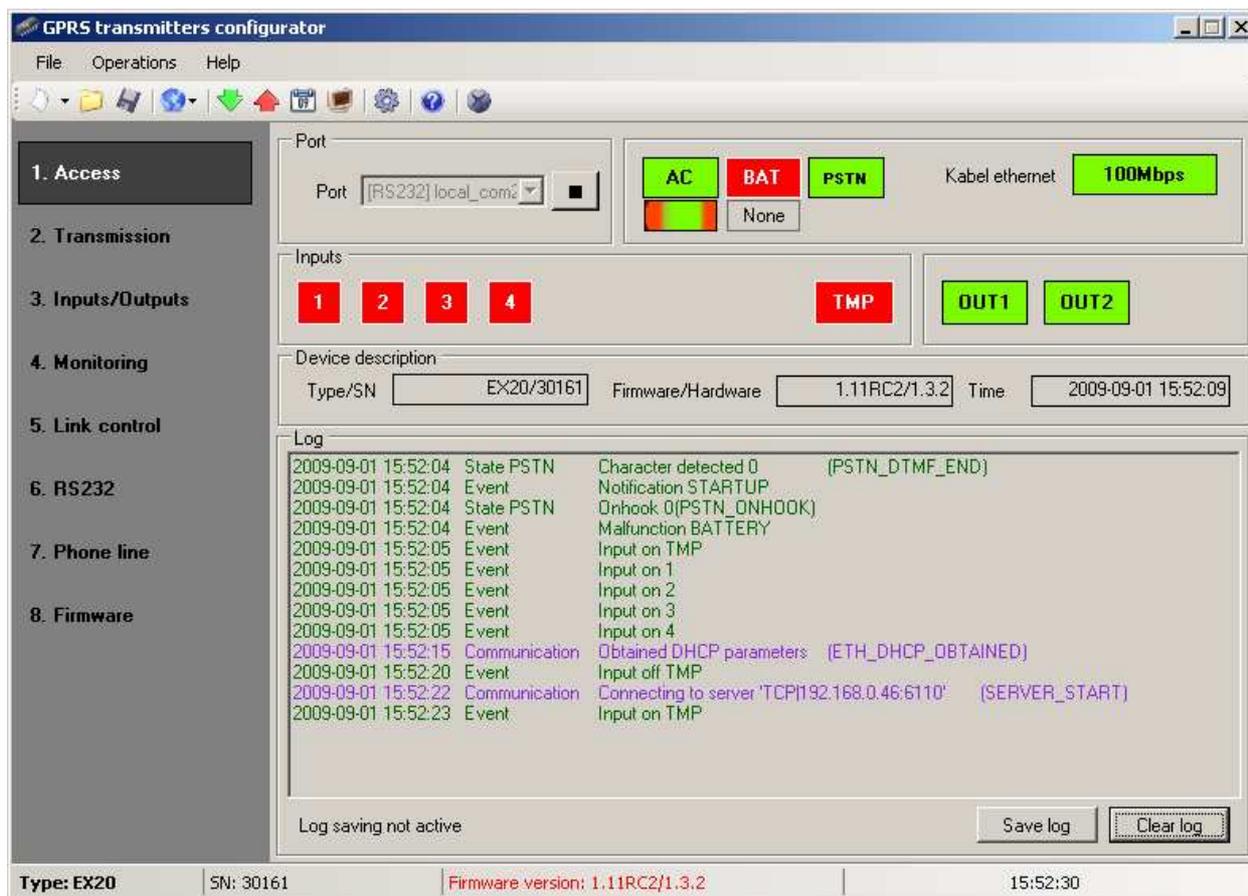
"Device Monitor" provides real-time information about device state. To use this function device must be connected to PC computer with LX-DATA cable (using DEBUG plug). Correct RS232 port must be chosen in "Port" field. "Device monitor" provides following information:

- AC and battery power indication
- PSTN line indication
- Correct network connection
- Inputs state monitoring
- Outputs state monitoring
- Type or serial number of device
- Firmware and hardware revision
- Device time

Changes to all parameters are also shown as text in LOG window

6.10   EVENTS HISTORY

Events history

Choose connection kind [RS232] local_COM1 ▼ Service code ●●●● Open

```
2009-09-01 15:52:58  Serial port opening
2009-09-01 15:52:58  Service code checking
2009-09-01 15:52:58  Reading device information
2009-09-01 15:52:58  Reading events history
2009-09-01 15:53:14  Closing connection with device
2009-09-01 15:53:14  Read successful
NUM-------DEVICE TIME-(CSQ,BER)------EVENT-----------------------------------------------------------------
000001 2000-01-02 00:00:00 (0,0)      Event          Zone armed 0
000002 2000-01-02 00:00:00 (0,0)      Event          Zone armed 1
000003 2000-01-02 00:00:00 (0,0)      State PSTN     Character detected 0        (PSTN_DTMF_END)
000004 2000-01-02 00:00:00 (0,0)      Event          Notification STARTUP
000005 2000-01-02 00:00:00 (0,0)      State PSTN     Onhook 0(PSTN_ONHOOK)
000006 2000-01-02 00:00:00 (0,0)      Event          Malfunction POWER
000007 2000-01-02 00:00:00 (0,0)      Event          Malfunction BATTERY
000008 2000-01-02 00:00:05 (0,0)      State General  Service cable connected 0   (SERVICE CABLE BEGIN)
000009 2000-01-02 00:00:00 (0,0)      Event          Zone armed 0
000010 2000-01-02 00:00:00 (0,0)      Event          Zone armed 1
000011 2000-01-02 00:00:00 (0,0)      State PSTN     Character detected 0        (PSTN_DTMF_END)
000012 2000-01-02 00:00:00 (0,0)      Event          Notification STARTUP
000013 2000-01-02 00:00:00 (0,0)      State PSTN     Onhook 0(PSTN_ONHOOK)
000014 2000-01-02 00:00:00 (0,0)      Event          Malfunction POWER
000015 2000-01-02 00:00:00 (0,0)      Event          Malfunction BATTERY
000016 2000-01-02 00:00:12 (32,99)    State General  Network cable disconnected 1     (ETH_CABLE_ERROR)
000017 2000-01-02 00:00:14 (32,99)    Communication  Connecting to server 'TCP|??????????????????????????????????:??????'
                (SERVER_START)
000018 2000-01-02 00:00:16 (32,99)    Communication  Connection to server unsuccessful     (SERVER_FAILURE)
000019 2000-01-02 00:00:18 (32,99)    State General  Watchdog GPRS 0          (GPRS WATCHDOG)
000020 2000-01-02 00:00:00 (0,0)      Event          Zone armed 0
000021 2000-01-02 00:00:00 (0,0)      Event          Zone armed 1
000022 2000-01-02 00:00:00 (0,0)      State PSTN     Character detected 0        (PSTN_DTMF_END)
000023 2000-01-02 00:00:20 (0,0)      Event          Notification STARTUP
```

Type/SN EX20/30161   Firmware/Hardware 1.11RC2/1.3.2   Read from file   Save to file

The function allows to read the recent events recorded in the device's memory The memory may store about 5 thousand recent events In order to read it, the EX20 should be connected to a PC using LX-PROG cable The user should then select appropriate RS232 port in the „Events history" window, enter the installer's code and click "Read"

7   DEVICE PROGRAMMING

Programming of device is possible with "GPRS transmitter's configurator" configuration program described in chapter 5. To program the device establish connection with a device. Depending on connection mode there are two ways for programming.

7.1   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. Provide right servicing code.

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) Connect module wiring pursuant to guidelines from chapter 4. Turn power supply on.

g) The device is ready to transmit data.

7.2   REMOTE PROGRAMMING

Remote programming of device is possible if user uses OSM.2007 monitoring system receiver.

According to description in chapter 6.3.5.2, 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.2007.

8   LED DIODES INDICATION

Four LED diodes mounted directly on the main circuit, and two LED diodes on the Tibbo Ethernet module, are purposed to show actual condition of the device.

8.1   PROGRAMMING

After detection of programming wire diodes indicate programming.

Description	LED diodes of the main circuit	
	Green	Red
Connected Service wire		
Programming in CSD mode		
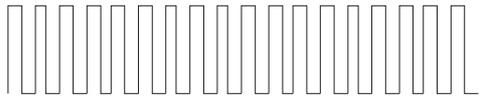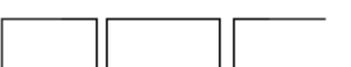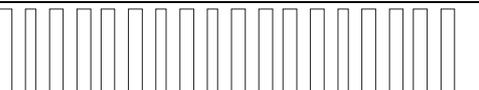
8.2   RECEIVING OF DTMF DATA

Yellow diodes marked as STATUS and a yellow one marked as DTMF indicate actual condition during receiving data from a control panel.

LED diodes of the main circuit	Signalling
STATUS (yellow) 🟦🟥🟩🟨 |/	
DTMF (blue) |/ 🟦🟥🟩🟨	(HandShake)　　　　　　　　　　　　　(KissOff) 6 digits of phone　　　　　16 digits ContactID

8.3   FIRMWARE UPDATING

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

Description	LED diodes of the main circuit |/|/ 🟦🟥🟩🟨 /|\/|	
	Green	Red
No program in device	 (1/sek)	───────── (constant light)
Software updating		
Received firmware decoding	10 sec	

8.4 CORRECT NETWORK CABLE CONNECTION

Correct EX20 connection to the Ethernet/Internet network is signalled by a green LED diode of the Ethernet Tibbo module going on with constant light.
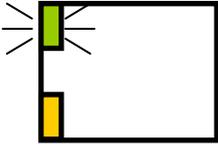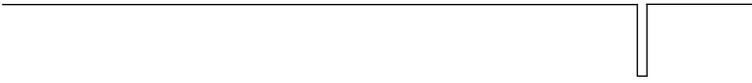
LED diode	Signalling
(green)	* each short decline in brightness of the LED diode signals reception of a package

8.5 NO NETWORK CABLE

Damage to or lack of network cable is also signalled by the green LED diode of the Ethernet Tibbo module

LED diode	Signalling
(green)	2 sec
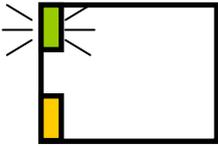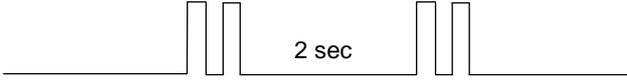
8.6 10MB /100MB NETWORK STANDARD

The Tibbo Ethernet module detects the present network standard and signals its type using the yellow LED diode.

Network standard	LED diode	Signalling
10Mb	(yellow)	(off)
100Mb	(yellow)	(constant light)
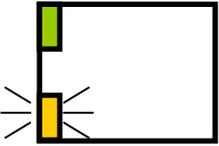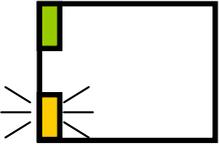
9   CHANGELOG

Date/Version	Description
14.09.2009	English version
07.07.2009	First version of the manual
04.08.2009	Revision; some configurator's tabs views updated to version 1.1.716