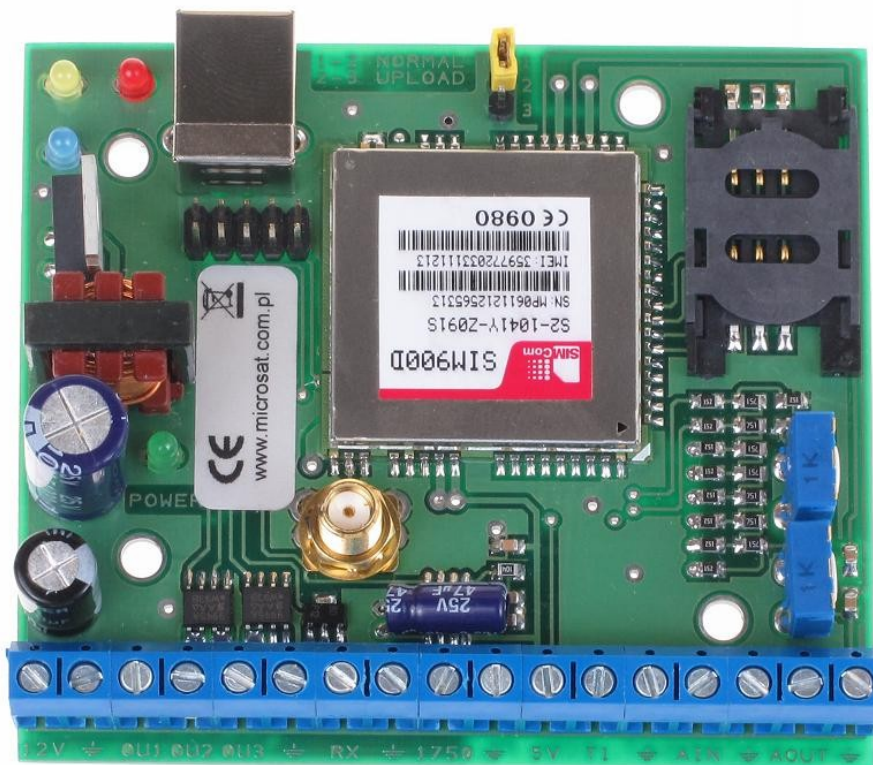


RPTC CONTROLLER (v1.11)

AMATEUR RADIO REPEATER CONTROLLER
VOICE WELCOME MESSAGES
MORSE CODE MESSAGES
OPTIONAL GSM MODULE

Instruction manual
Configuration software manual



Designer: Mateusz Płociński SQ3PLX
Producer: Microsat
info@microsat.com.pl



Table of Contents

1. Technical parameters.....	3
2. Device description.....	4
2.1. User accessible connectors, leds and pots.....	4
2.2. Repeater connection diagram.....	6
3. RPTC Configuration.....	6
3.1. Entering configuration state.....	6
3.2. Application main menu.....	7
3.3. Messages #1 window.....	7
3.4. Messages #2 window.....	8
3.5. Time setup window.....	9
3.6. GSM setup window.....	10
3.7. SMS (RX) setup window.....	11
3.8. SMS (TX) setup window.....	12
3.9. Other setup window.....	13

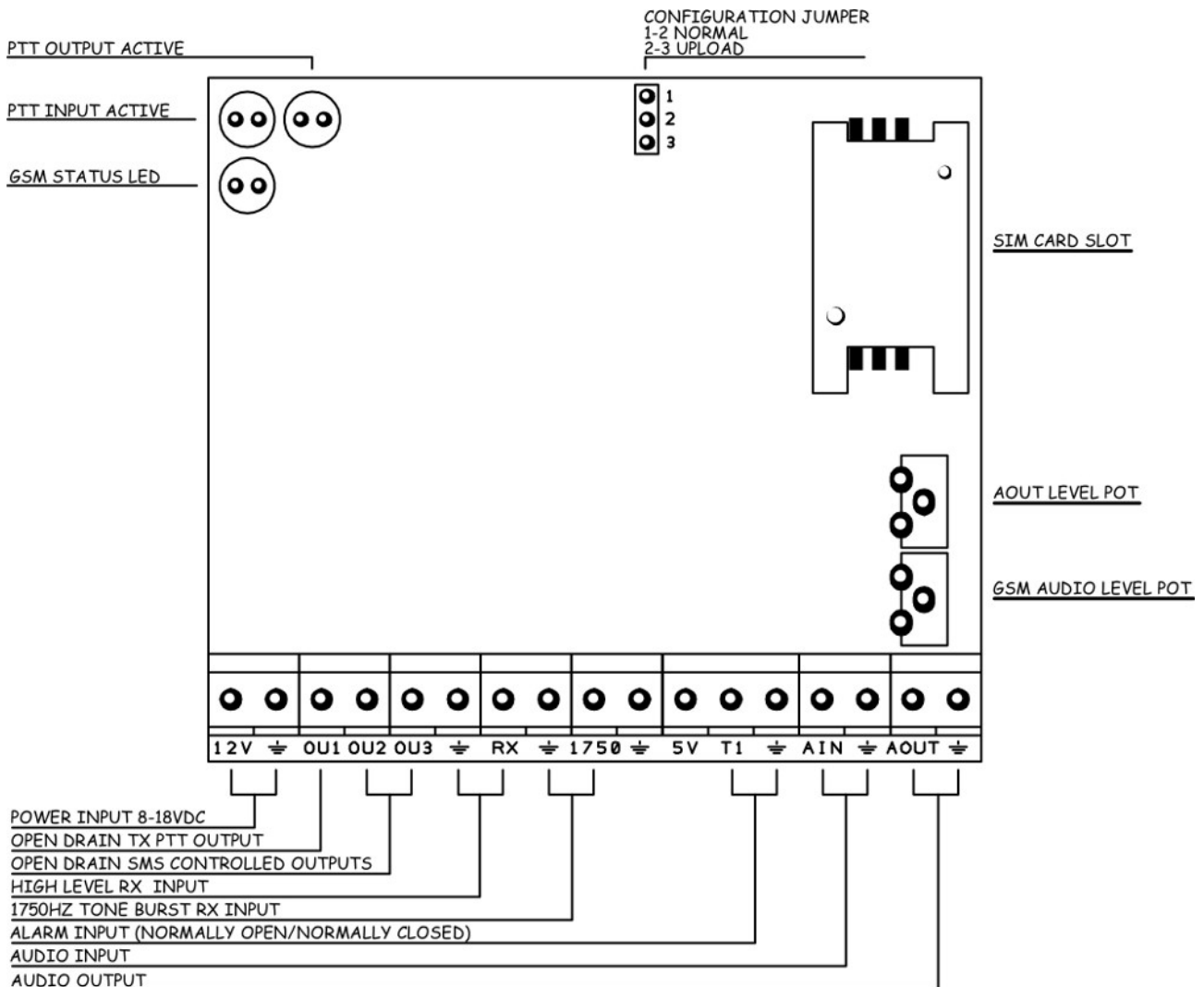
1. Technical parameters

Dimensions	85x75x30 mm
Weight	100g
Supply voltage	12VDC typ. (8 - 18VDC)
Power consumption	50mA (up to 500mA peak with GSM)
Operation temperature	-40 °C / +85 °C
Humidity	95% max.
Power outputs	Open drain MOSFET, 3A max.
Intrusion detect input	NO/NC, 0-5VDC
Voice messages	2 x 16sec, 16kHz/8bit WAV format
IDCW message	20 symbols max.

2. Device description

2.1. User accessible connectors, leds and pots

User accessible connectors are shown below.



Connectors:

- Power input 8-18VDC - supply voltage input. Please make sure that power source has a sufficient current efficiency (at least 500mA peak) for version with GSM module,
- Open drain TX PTT output - open drain PTT output for transmitter opening,
- Open drain SMS controlled outputs - open drain outputs controlled with SMS,
- High level RX input - high level on this pin opens the repeater,
- 1750Hz tone burst RX input - 1750Hz tone burst opens the repeater,
- Alarm input (normally open/normally closed) - input for intrusion detect switch (0-5VDC),
- Audio input - audio input from receiver,
- Audio output - audio output to transmitter (audio signal from audio input + voice/IDCW messages).

Leds:

- PTT output active - this led is lit when PTT output is active,
- PTT input active - this led is lit when repeater opening signal is detected on RX and/or 1750Hz input,
- GSM status led - signals the GSM module connection status:
 - One blink - GSM module start procedure,
 - Two blinks - GSM module SIM card or SIM PIN error,
 - Three blinks - GSM module is trying to connect,
 - Constant blinking - GSM module connected.

Configuration jumper:

- 1-2 normal working state,
- 2-3 device in configuration state,

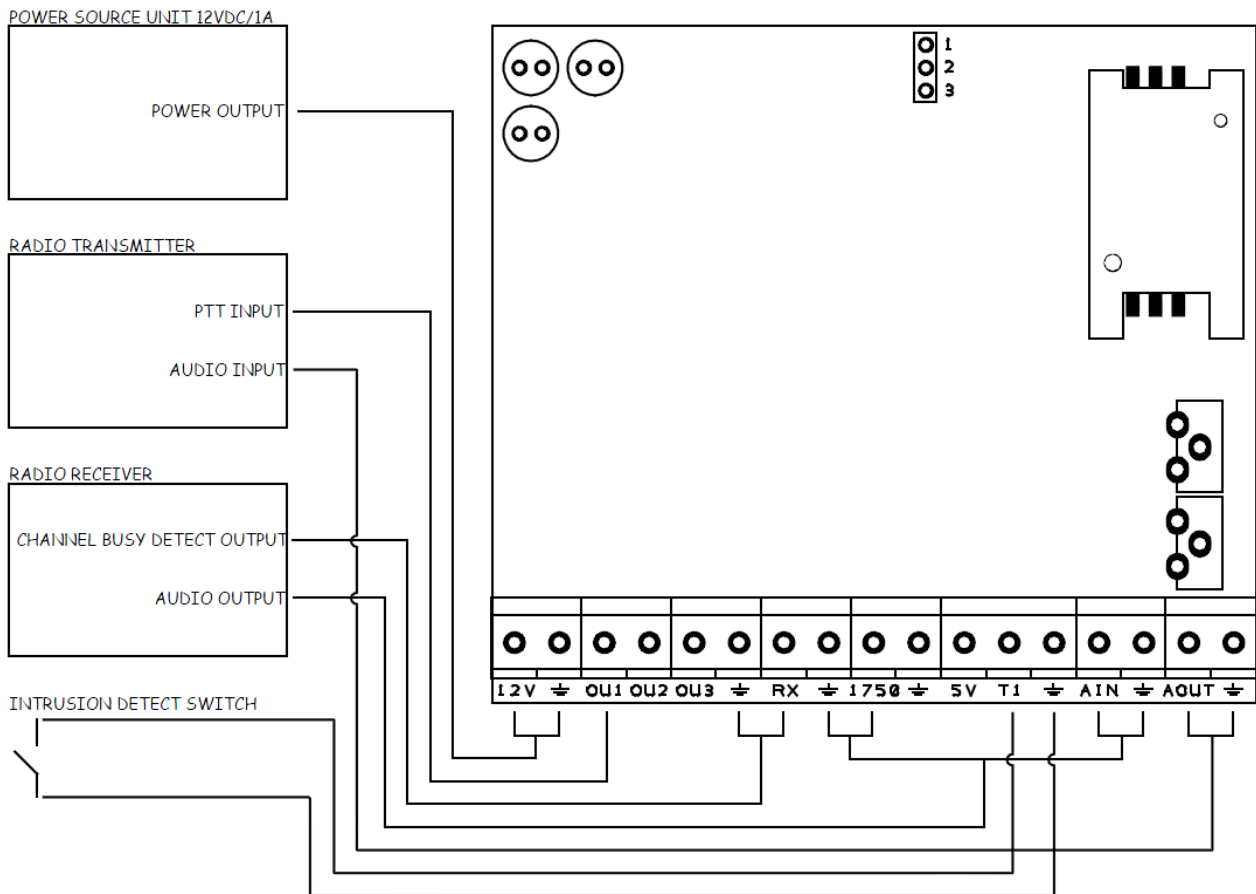
Potentiometers:

- GSM audio level pot - changes the level of audio signal heard when listening with phone call,
- AOUT level pot - changes the level of voice/IDCW messages.

Please note that signal level can be increased by clockwise or counter-clockwise turn. This is dependant on the potentiometer used in production. We used two types of potentiometers: rounded one (clockwise increase) or square one (counter-clockwise). We advise you to check it manually.

2.2. Repeater connection diagram

Example repeater connection diagram is shown below.



3. RPTC Configuration

When using every new version of RPTC Configurator application, it is **necessary to update device firmware** to be compatible with new software version. Updating is possible with "Firmware" button from application menu. It is necessary to rewrite configuration and voice files to device after firmware update.

3.1. Entering configuration state

Before making the first connection to RPTC, you need to install USB device drivers for Windows system. To do that, please use the following procedure:

- disconnect RPTC from PC if it has been connected,
- install FTDI driver package (available on our RPTC product web page)

To enter device configuration state, you need to use following procedure:

- disconnect power from RPTC,
- connect USB type A-B cable to device,
- power-on the device,

- wait for device detection by Windows system on PC,
- run the application program rptc_configurator_vXXX.exe (where XXX is the current application version number),
- click Connect button in the main menu.

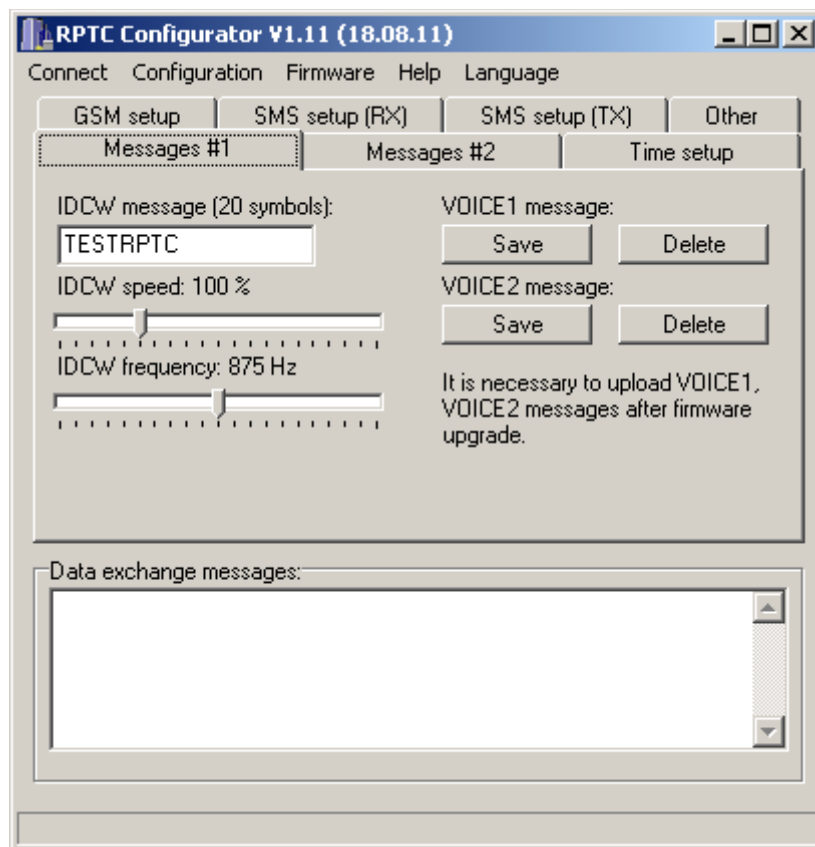
3.2. Application main menu

Bellow we will explain main menu buttons:

Connect - opens connection to RPTC, after connecting you should see the confirmation window,

- Configuration/Save to device - writes current configuration from application to device,
- Configuration/Read from device - reads current configuration from device to application,
- Firmware/Upload to device - writes firmware file to device,
- Help - more detailed explanation of application options,
- Language - changes application language polish/english.

3.3. Messages #1 window

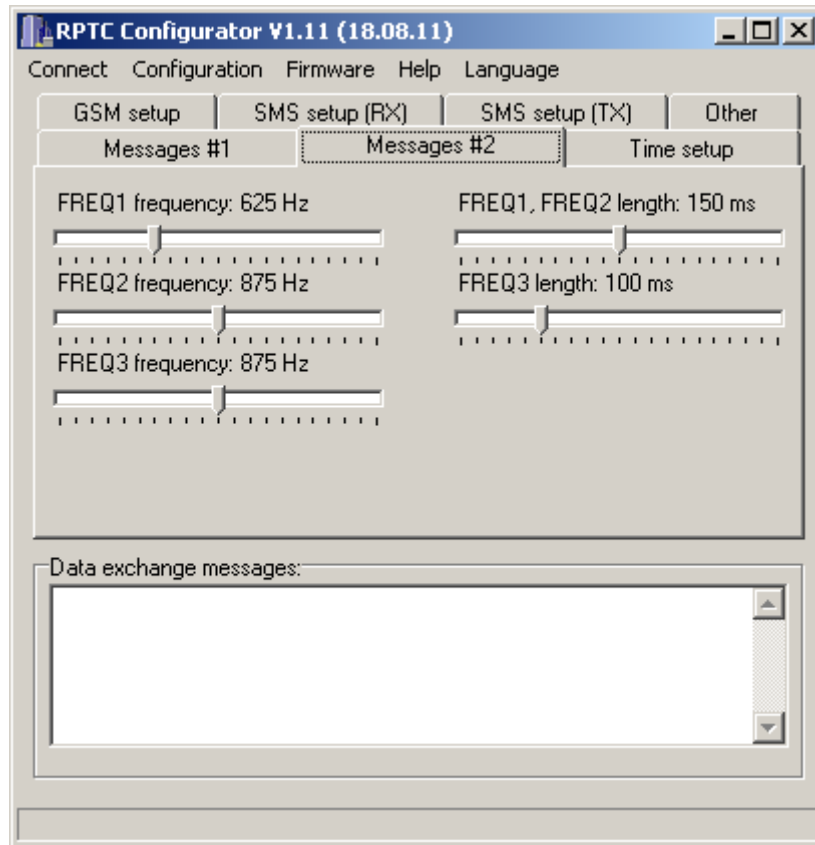


Bellow we will explain messages #1 window options:

- IDCW message - must be less or equal 20 symbols, only numbers and uppercase letters are allowed,
- IDCW speed - speed is configurable in specified range,

- IDCW frequency - tone frequency of IDCW
- VOICE1 message - this message is played on the repeater opening, MUST be uploaded in WAV, 8bit, 16kHz audio format, 16 seconds max.
- VOICE2 message - this message is played in interval defined by TIME6 (discussed in next sections) when there is no RX detection, MUST be uploaded in WAV, 8bit, 16kHz audio format, 16 seconds max.

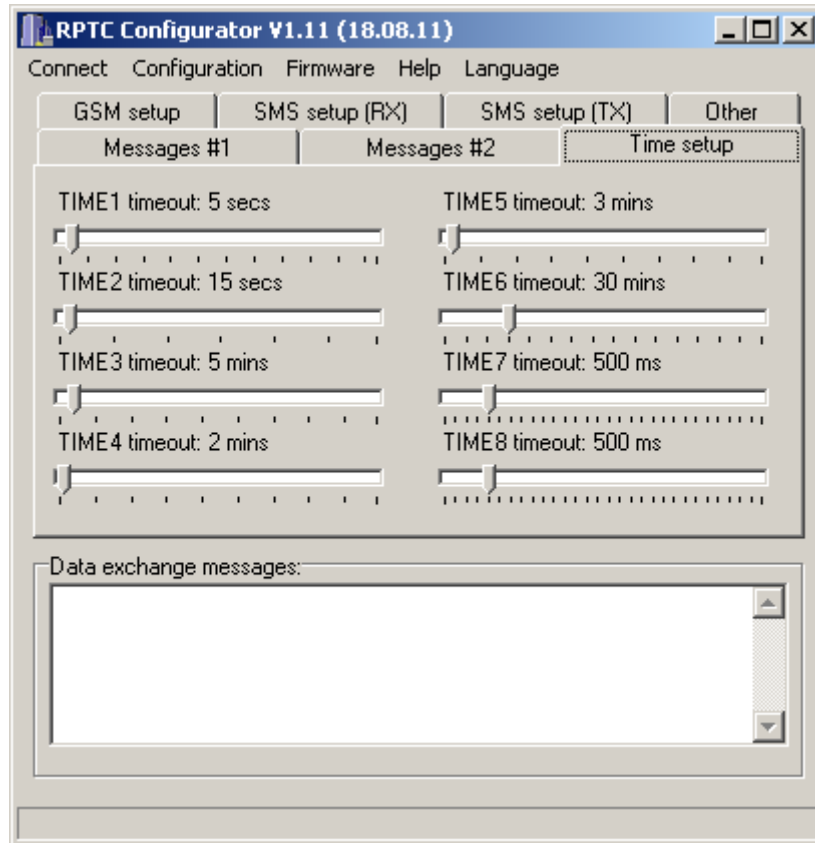
3.4. Messages #2 window



Bellow we will explain messages #2 window options:

- frequency of beep signals is configurable in specified range,
- length of beep signals is configurable in specified range,
- BEEP1 signal (FREQ3) is sent as confirmation of RX detection,
- BEEP2 signal (FREQ1, then FREQ2) is sent after every TX open,
- BEEP3 signal (FREQ2, then FREQ1) is sent before every TX close.

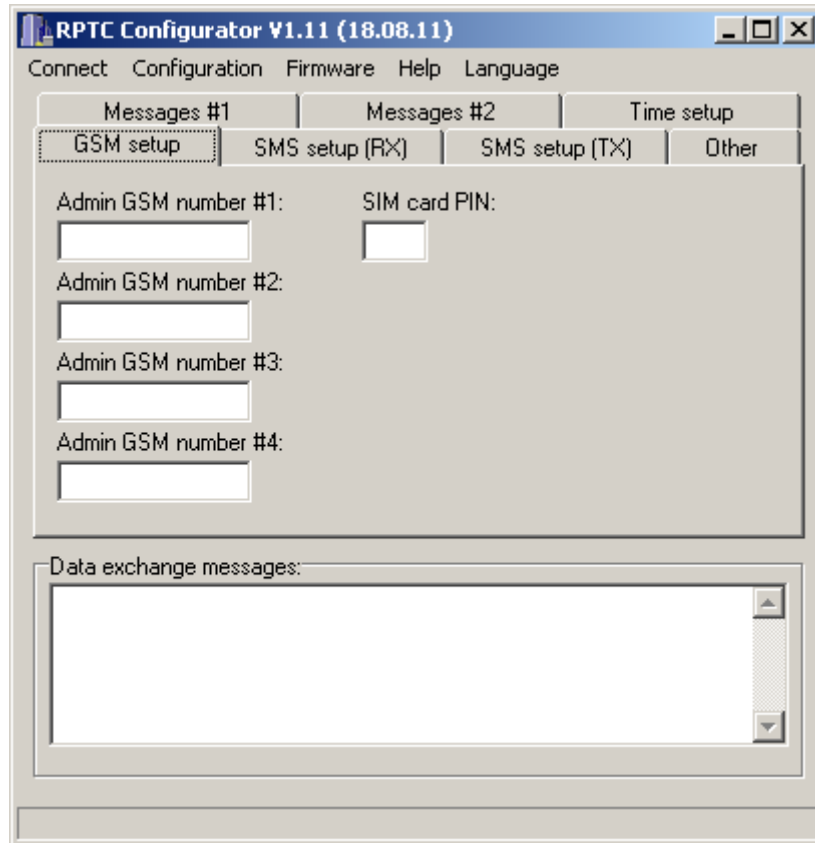
3.5. Time setup window



Bellow we will explain Time setup window options:

- TIME1 - time to TX close in the absence of RX signal after first opening,
- TIME2 - time to TX close in the absence of RX signal after the last relationship,
- TIME3 - time interval of IDCW message generation during the relationship,
- TIME4 - if time after last relationship is shorter than TIME4, only BEEP2 is generated on next RX detection,
- TIME5 - if time after last relationship is longer than TIME4 and is shorter than TIME4+TIME5, only IDCW message is generated on next RX -
- when time after last relationship is longer than TIME4+TIME5, full VOICE1 message is generated.
- TIME6 - the time after which VOICE2 message is generated if there were no RX detection,
- TIME7 - time after which BEEP1 is generated when RX is off during the relationship,
- TIME8 - minimal RX signal active time for detection on first opening.

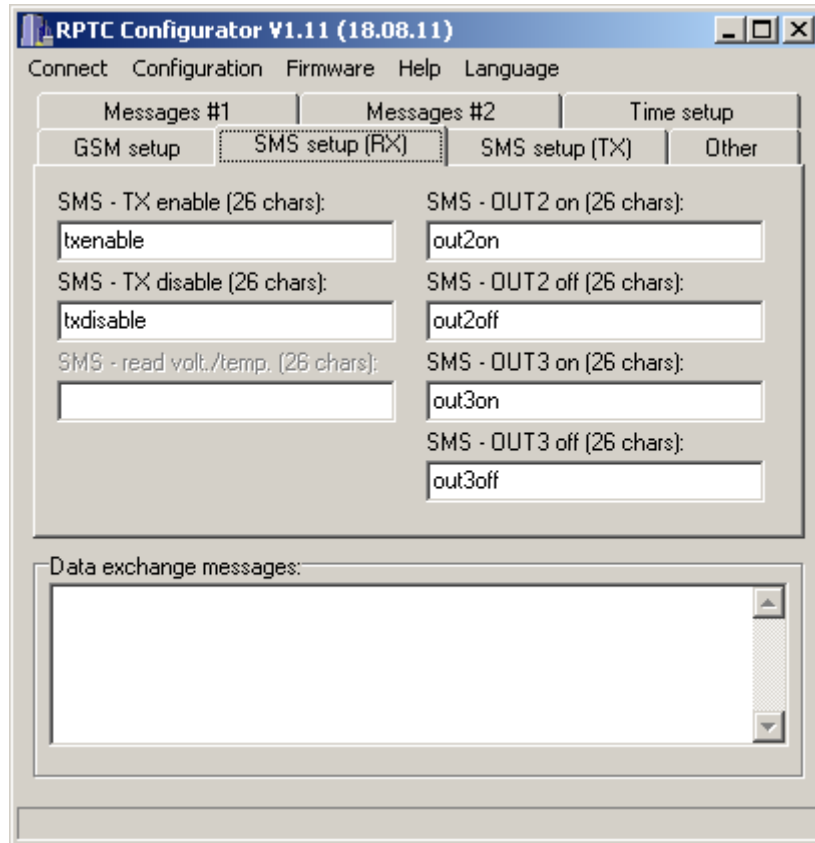
3.6. GSM setup window



Bellow we will explain GSM setup window options:

- simcard PIN must be 4 numbers in length,
- admin GSM numbers are phone numbers from which SMS commands are received and to which alarm SMS are sent,
- admin GSM numbers must be preceeded with contry code (48 for Poland),
- depending on country, admin GSM numbers can be up to 13 numbers long.

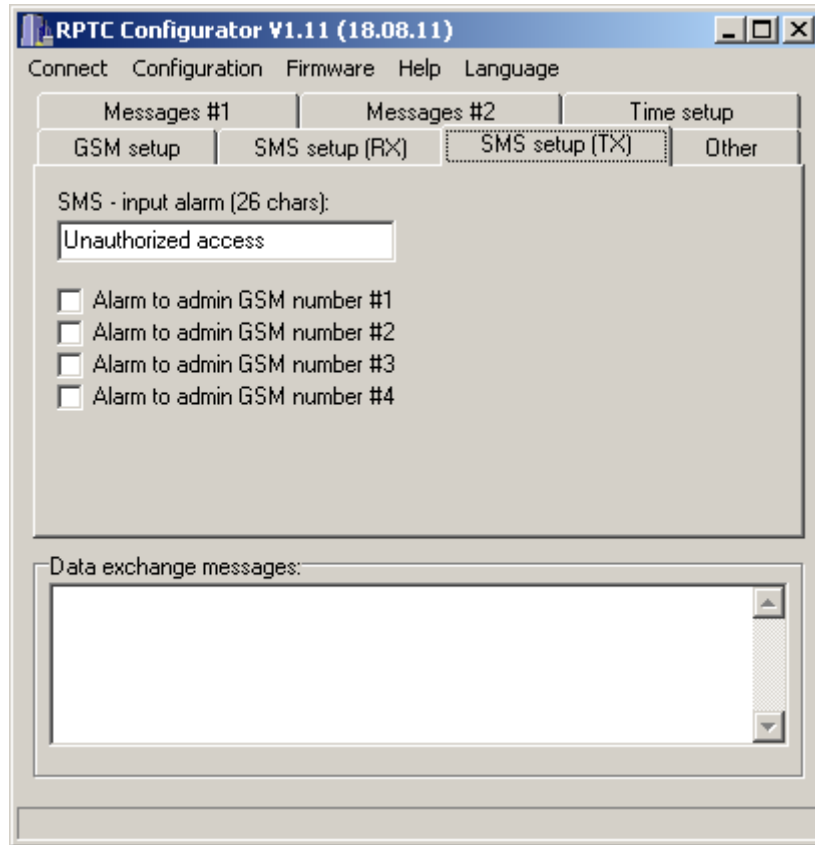
3.7. SMS (RX) setup window



Bellow we will explain SMS (RX) setup window options:

- this tab contains SMS content for commands received by device,
- SMS content is limited to 26 symbols (letters, numbers and spaces),
- SMS - TX enable - this SMS message enables TX PTT output,
- SMS - TX disable - this SMS messages disables TX PTT output, after issuing this command it wont be possible to open the repeater by radio,
- SMS - OUT2 on - activates the OUT2 transistor output (active low),
- SMS - OUT2 off - deactivates the OUT2 transistor output,
- SMS - OUT3 on - activates the OUT3 transistor output (active low),
- SMS - OUT3 off - deactivates the OUT3 transistor output.

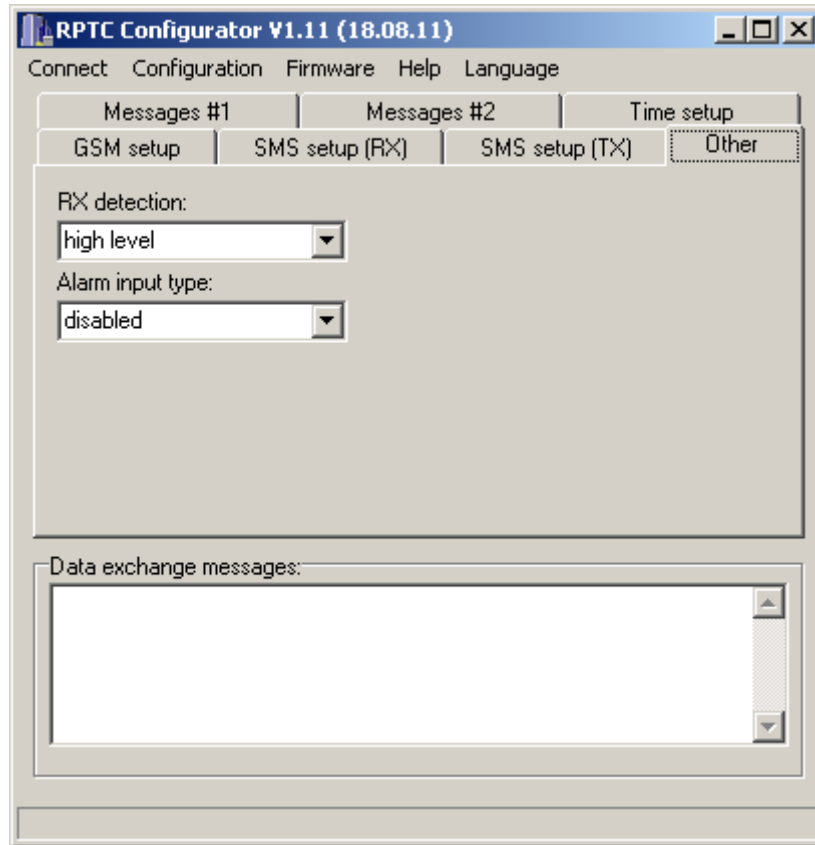
3.8. SMS (TX) setup window



Bellow we will explain SMS (TX) setup window options:

- this tab contains content for SMS sent by device,
- SMS content limited to 26 symbols (letters, numbers and spaces),
- SMS - input alarm - this SMS message will be sent on intrusion detect switch activation,
- user can select which admin GSM numbers will alarm SMS be sent to after alarm input detection.

3.9. Other setup window



Bellow we will Other setup window options:

- RX detection - RX input can be configured to detect high level on RX pin or to detect high level on RX pin + 1750 Hz tone on 1750 pin,
- alarm input can be configured to be disabled, normally open, or normally closed.