

# RBMTX-Lite

USER MANUAL



GSM/UMTS/LTE



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## 1 Document history

| Revision | Date       | Changes               |
|----------|------------|-----------------------|
| #0.6     | 8.03.2018  | - Preliminary version |
| #0.8     | 21.05.2018 | - New screenshots     |
| #0.9     | 13.09.2018 | - LED description     |

## 2 Package

### 2.1 Box

User can find product sticker on the box which matches sticker placed on the device - it proves that your modem is an original product. More information about stickers are in chapter Product sticker

### 2.2 Package contents



Complete package contains:

1. RMTX-Lite router
2. Antenna GSM (SMA connector)
3. Power adapter
4. Wall holder

## 2.3 Router versions

There are many ways to upgrade your RBMTX-Lite router. List below shows typical configuration and different combinations (variants) of this terminal.

| Option       | Typical  | Option    |
|--------------|--|-----------|
| Power supply | 9-30V  | -         |
| Memory       | 256MB RAM, 512MB MicroSD card<br>(part used for Linux system, the size of<br>SD card can be changed in the future) | -         |
| Processor    | Cortex A7, max. 528MHz, I.MX6UL(L)   | -         |
| RS232        | System console   | -         |
| RS485        | 1  | -         |
| Connection   | UMTS/HSPA  | LTE       |
| Dual SIM     | -  | available |
| LAN          | Ethernet 10/100Mbps  | -         |
| WiFi         | -  | available |
| Bluetooth    | -  | available |

## 3 General presentation

### 3.1 Front panel



### 3.2 Back panel





## 3.3 External connections

### 3.3.1 GSM/UMTS/LTE antenna connector

SMA antenna connector placed on front panel is used to connect external GSM/UMTS/LTE. It must be connected to establish a connection with GSM/UMTS/LTE network. In good circumstances (good coverage, level of received signal is high) use antenna which is included in package. When signal strength is poor please use outdoor directional/omnidirectional or indoor antenna.

**Note:** If antenna is not connected, connection with GSM/UMTS/LTE network will be impossible.

### 3.3.2 Modem serial port, either full RS232/RS485

Serial RS232/RS485 (RJ-45 connector marked as "RS232/485") is placed on front panel of router. Serial connector pinout is described in a tables below.

| version        |          |        |
|----------------|----------|--------|
| RS232<br>RS485 | 2x RS485 | RB-MTX |
|                |          | RJ45   |
| A              | A1       | 1      |
| 5V             | 5V       | 2      |
| B              | B1       | 3      |
| GND            | GND      | 4      |
| TX             | A2       | 5      |
| RX             | B2       | 6      |
| RTS            | NC       | 7      |
| CTS            | NC       | 8      |

|     | Rb-MTX<br>RJ45 | RS232<br>DB9F | RS485<br>DB9F |
|-----|----------------|---------------|---------------|
| A   | 1              | nc            | 1             |
| 5V  | 2              | 2             | 2             |
| B   | 3              | 3             | nc            |
| GND | 4              | nc            | nc            |
| TX  | 5              | 5             | 5             |
| RX  | 6              | ns            | 6             |
| RTS | 7              | 7             | nc            |
| CTS | 8              | 8             | nc            |

### 3.3.3 LAN connector

Second RJ-45 connector (marked as "LAN") is placed next to serial connector and is used for communication with PC or laptop through Ethernet interface. WWW configuration is available in the web browser (default IP address is 192.168.1.234). You can change the default address in ["Local network"](#) tab.

### 3.3.4 Power supply connector

Please use power adapter which is included in package. It ensures “clean” power supply input and avoids short transients on power supply lines originating from inductive load switching. Power supply range of RBMTX-Lite router is 9-30V.



### 3.3.5 SIM card holders



One SIM card holder is placed in front panel of RBMTX-Lite and the second one is located inside the device. To insert SIM card into the extractable holder **push yellow button and take SIM drawer out** as show in the picture and place SIM card. To operate the module in a GSM network, it is necessary to insert at least one active SIM card.

### 3.4 Product sticker

A production sticker includes the following information:

- Product serial number
- CE marking
- 15-digit bar code
- model signature (RBMTX-Lite)

## 3.5 LED operation

Router has four LED indicating its operation. The diode description is presented in the table below.

| Diode | Color  | Description   |
|-------|--------|---|
| U1    | Green  | User controlled   |
| U2    | Yellow | Network indicator:<br>RBM TX-Lite 3G: <ul style="list-style-type: none"><li>• Flicker slowly (200ms ON, 1800ms OFF) – Network searching</li><li>• Flicker slowly (1800ms ON, 200ms OFF) – Idle/Data transfer</li><li>• Always ON – Voice/CSD calling</li></ul> RBM TX-Lite 4G: <ul style="list-style-type: none"><li>• Flicker slowly (200ms ON, 1800ms OFF) – Network searching</li><li>• Flicker slowly (1800ms ON, 200ms OFF) – Idle</li><li>• Flicker quickly (125ms ON, 125ms OFF) – Data transfer</li><li>• Always ON – Voice calling</li></ul> |
| S     | Blue   | Router activity   |
| PWR   | Green  | Power supply  |

## 4 Basic features and services

Basic features and available services are contained in table below.

| Feature / service                   | Description   |
|-------------------------------------|---|
| <b>Supported bands</b>              | UMTS/HSPA variant: <ul style="list-style-type: none"> <li>GSM 900/1800 MHz</li> <li>UMTS 900/2100 MHz</li> </ul> LTE variant: <ul style="list-style-type: none"> <li>GSM 900/1800 MHz</li> <li>WCDMA FDD B1, B8 Class 3</li> <li>LTE FDD B1, B3, B7, B8, B20 Cat. 1</li> </ul>  |
| <b>Data features</b>                | <ul style="list-style-type: none"> <li>LTE Cat. 1 (downlink 10 Mbit/s, uplink 5 Mbit/s)</li> <li>DC-HSPA+ (downlink 7.2 Mbit/s)</li> <li>GPRS (Multi-slot class 10, max BR downlink 85,6 Kb/s)</li> <li>Embedded protocols: PPP, TCP/IP, UDP/IP, MMS, HTTP, HTTPS, SSL, FTP, FTPS, SMTP, SMTPS, NTP, NITZ, PING</li> <li>Ports forwarding, Ipsec, OpenVPN</li> <li>Class B GSM 07.10 multiplexing protocol</li> </ul> |
| <b>WiFi*</b>                        | Standard: <ul style="list-style-type: none"> <li>802.11b/g/n</li> </ul> Data rate: <ul style="list-style-type: none"> <li>up to 150 Mbps</li> </ul>   |
| <b>Bluetooth*</b>                   | V4.1+EDR  |
| <b>Power supply</b>                 | <ul style="list-style-type: none"> <li>Nominal voltage range: 9V-30V</li> <li>Maximum continuous (average) supply power: 5W</li> <li>Peak (momentary) supply current: 1 A</li> </ul>  |
| <b>Interfaces (typical version)</b> | <ul style="list-style-type: none"> <li>GSM/UMTS/LTE antenna connector: SMA</li> <li>1x SIM Card: 1.8V, 3V standards</li> <li>RS232 and RS485 via RJ-45</li> <li>RJ-45 connector (x2)</li> <li>microUSB (OTG)</li> <li>Power supply connector</li> <li>Factory default reset button</li> <li>4 x LED</li> </ul>  |
| <b>Options*</b>                     | <ul style="list-style-type: none"> <li>Dual SIM (second SIM is internal)</li> <li>WiFi antenna connector: SMA male</li> <li>Bluetooth antenna connector: SMA</li> </ul>   |
| <b>Other</b>                        | Physical size: <ul style="list-style-type: none"> <li>Max. Dimensions: 83 x 53.5 x 26 mm (w/ connectors)</li> </ul> Operating temperature range: <ul style="list-style-type: none"> <li>Min. -20°C Max. 60°C</li> </ul>   |

\*option

## 5 Using the modem

### 5.1 Setting up the modem

To set the modem, do the following steps:

#### 5.1.1 Inserting SIM card(s)

- Push yellow button placed on front panel and take SIM drawer out.
- Place SIM card in the holder as shown in the picture:



Router is available with one or two SIM card slots. To insert the second SIM card please unscrew one of the routers panel, eject PCB board and put the SIM into internal SIM holder.

## 5.1.2 Connecting antenna

- Connect GSM/UMTS/LTE antenna to SMA connector





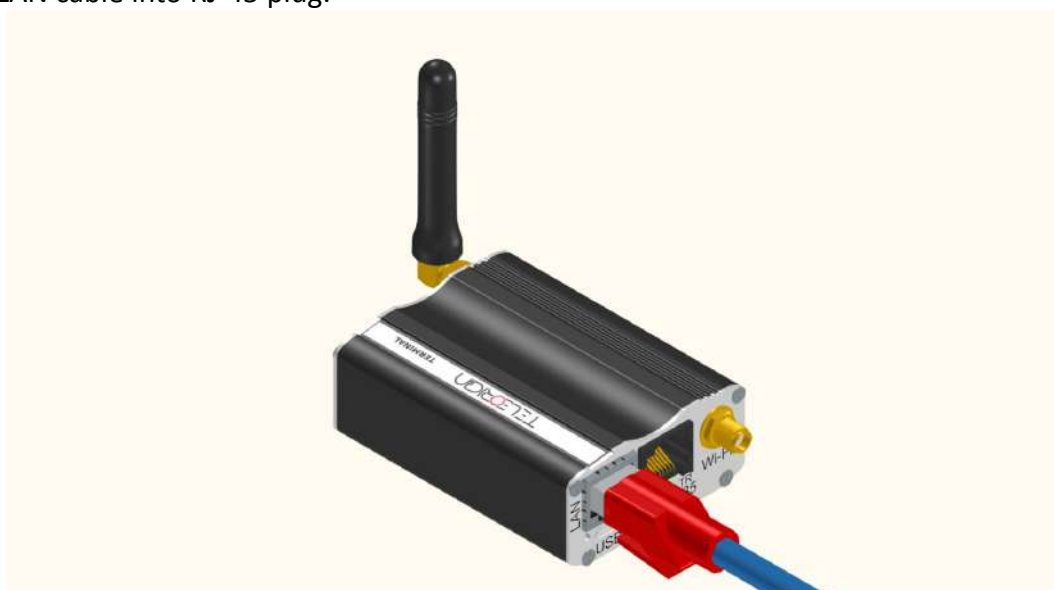
## 5.1.3 Connecting power supply cable

- Connect power supply cable into power supply connector



## 5.1.4 Connecting LAN cable with RJ-45

- Plug LAN cable into RJ-45 plug.





## 5.2 Router configuration

Router is configured via web browser. Modem settings are divided into sections which allows user to easily find needed option. If you need to save new settings please apply them using "Save settings". You can also discard changes by choosing appropriate option from menu.

*WARNING: Cache of router is cleared on device reset.*

*NOTE: Not all tabs are available on every modem version.*

### 5.2.1 Setting up the connection

When you connect all necessary cables (see Setting up the modem) you can setup connection. Connect LAN cable to your computer and go to Internet protocol TCP/IP properties (**Network connections -> Local Area Connection -> Internet protocol TCP/IP -> Properties**) and set your IP address as 192.168.1.x. Please read how to change TCP/IP settings of your network card in this thread (example for Windows 7):

<http://windows.microsoft.com/en-us/windows/change-tcp-ip-settings#1TC=windows-7>

### 5.2.2 Modem status page

Go to your web browser and put IP address **192.168.1.234**. You will be asked for username and password. By default it is:

*Username: admin*

*Password: 12345*

If everything is configured correctly you should see following screen:

This is status page of RBMTX-Lite router. Here you can check if modem is connected to network, its parameters and information about PPP connection. Device status page is refreshing automatically.

**RBMTX GPRS/HSPA Router Configuration Panel**  
Modem HE910, 1 SIM, , firmware: 171012  
[www.teleorigin.com](http://www.teleorigin.com)

|  |  |                          |   |                                     |  |               |  |              |  |              |  |                         |  |             |               |           |  |        |  |              |  |              |  |             |  |
|--|--|--------------------------|---|-------------------------------------|--|---------------|--|--------------|--|--------------|--|-------------------------|--|-------------|---------------|-----------|--|--------|--|--------------|--|--------------|--|-------------|--|
| <b>Device status</b><br><b>Basic</b><br>Wan config<br>Local network<br>GSM network<br>Connection control<br>Ports configuration<br>TCP/IP forwarding<br>VLAN<br>Static routes<br>Dynamic DNS<br>Access control<br><b>Advanced</b><br>OpenVPN<br>IPsec<br>IPsec authentication<br>NTRIP<br>Text messages actions<br>E-mail actions<br><b>Administration</b><br>Time<br>Syslog<br>User files<br><b>Configuration</b><br>Backup and restore<br>Discard changes<br>Save settings | <b>Status</b><br><br><table> <tr> <td><b>Modem information</b></td> <td> Model, firm. ver.<b>HE910-D (12.00.026)</b><br/> IMEI<b>351579051806568</b><br/> PINREADY<br/> Operator SelectionOrange<br/> Network Registration StatusRegistered (home network, LAC=E2D6, CI=2802751)<br/> Signal Strength (CSQ)Workable, -85 dBm (CSQ=14)<br/> Packet Data ServiceWCDMA<br/> GSM selectionMASTER </td> </tr> <tr> <td><b>GSM information</b><br/>Connected</td> <td> <table> <tr> <td><b>GSM IP</b></td> <td><b>10.81.95.93</b></td> </tr> <tr> <td>RX</td> <td>packets:4 errors:0 dropped:0 overruns:0 frame:0<br/>bytes:50 (50.0 B)</td> </tr> <tr> <td>TX</td> <td>packets:65 errors:0 dropped:0 overruns:0 carrier:0<br/>bytes:3134 (3.1 KiB)</td> </tr> </table> </td> </tr> <tr> <td><b>Wifi information</b></td> <td> <table> <tr> <td><b>SSID</b></td> <td>Not connected</td> </tr> <tr> <td><b>IP</b></td> <td></td> </tr> <tr> <td>AP MAC</td> <td></td> </tr> <tr> <td>Link quality</td> <td></td> </tr> <tr> <td>Signal level</td> <td></td> </tr> <tr> <td>Noise level</td> <td></td> </tr> </table> </td> </tr> </table> | <b>Modem information</b> | Model, firm. ver. <b>HE910-D (12.00.026)</b><br>IMEI <b>351579051806568</b><br>PINREADY<br>Operator SelectionOrange<br>Network Registration StatusRegistered (home network, LAC=E2D6, CI=2802751)<br>Signal Strength (CSQ)Workable, -85 dBm (CSQ=14)<br>Packet Data ServiceWCDMA<br>GSM selectionMASTER | <b>GSM information</b><br>Connected | <table> <tr> <td><b>GSM IP</b></td> <td><b>10.81.95.93</b></td> </tr> <tr> <td>RX</td> <td>packets:4 errors:0 dropped:0 overruns:0 frame:0<br/>bytes:50 (50.0 B)</td> </tr> <tr> <td>TX</td> <td>packets:65 errors:0 dropped:0 overruns:0 carrier:0<br/>bytes:3134 (3.1 KiB)</td> </tr> </table> | <b>GSM IP</b> | <b>10.81.95.93</b>   | RX           | packets:4 errors:0 dropped:0 overruns:0 frame:0<br>bytes:50 (50.0 B) | TX           | packets:65 errors:0 dropped:0 overruns:0 carrier:0<br>bytes:3134 (3.1 KiB) | <b>Wifi information</b> | <table> <tr> <td><b>SSID</b></td> <td>Not connected</td> </tr> <tr> <td><b>IP</b></td> <td></td> </tr> <tr> <td>AP MAC</td> <td></td> </tr> <tr> <td>Link quality</td> <td></td> </tr> <tr> <td>Signal level</td> <td></td> </tr> <tr> <td>Noise level</td> <td></td> </tr> </table> | <b>SSID</b> | Not connected | <b>IP</b> |  | AP MAC |  | Link quality |  | Signal level |  | Noise level |  |
| <b>Modem information</b>   | Model, firm. ver. <b>HE910-D (12.00.026)</b><br>IMEI <b>351579051806568</b><br>PINREADY<br>Operator SelectionOrange<br>Network Registration StatusRegistered (home network, LAC=E2D6, CI=2802751)<br>Signal Strength (CSQ)Workable, -85 dBm (CSQ=14)<br>Packet Data ServiceWCDMA<br>GSM selectionMASTER  |                          |   |                                     |  |               |  |              |  |              |  |                         |  |             |               |           |  |        |  |              |  |              |  |             |  |
| <b>GSM information</b><br>Connected  | <table> <tr> <td><b>GSM IP</b></td> <td><b>10.81.95.93</b></td> </tr> <tr> <td>RX</td> <td>packets:4 errors:0 dropped:0 overruns:0 frame:0<br/>bytes:50 (50.0 B)</td> </tr> <tr> <td>TX</td> <td>packets:65 errors:0 dropped:0 overruns:0 carrier:0<br/>bytes:3134 (3.1 KiB)</td> </tr> </table>   | <b>GSM IP</b>            | <b>10.81.95.93</b>  | RX                                  | packets:4 errors:0 dropped:0 overruns:0 frame:0<br>bytes:50 (50.0 B)   | TX            | packets:65 errors:0 dropped:0 overruns:0 carrier:0<br>bytes:3134 (3.1 KiB) |              |  |              |  |                         |  |             |               |           |  |        |  |              |  |              |  |             |  |
| <b>GSM IP</b>  | <b>10.81.95.93</b>   |                          |   |                                     |  |               |  |              |  |              |  |                         |  |             |               |           |  |        |  |              |  |              |  |             |  |
| RX   | packets:4 errors:0 dropped:0 overruns:0 frame:0<br>bytes:50 (50.0 B)   |                          |   |                                     |  |               |  |              |  |              |  |                         |  |             |               |           |  |        |  |              |  |              |  |             |  |
| TX   | packets:65 errors:0 dropped:0 overruns:0 carrier:0<br>bytes:3134 (3.1 KiB)   |                          |   |                                     |  |               |  |              |  |              |  |                         |  |             |               |           |  |        |  |              |  |              |  |             |  |
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| <b>SSID</b>  | Not connected  |                          |   |                                     |  |               |  |              |  |              |  |                         |  |             |               |           |  |        |  |              |  |              |  |             |  |
| <b>IP</b>  |  |                          |   |                                     |  |               |  |              |  |              |  |                         |  |             |               |           |  |        |  |              |  |              |  |             |  |
| AP MAC   |  |                          |   |                                     |  |               |  |              |  |              |  |                         |  |             |               |           |  |        |  |              |  |              |  |             |  |
| Link quality   |  |                          |   |                                     |  |               |  |              |  |              |  |                         |  |             |               |           |  |        |  |              |  |              |  |             |  |
| Signal level   |  |                          |   |                                     |  |               |  |              |  |              |  |                         |  |             |               |           |  |        |  |              |  |              |  |             |  |
| Noise level  |  |                          |   |                                     |  |               |  |              |  |              |  |                         |  |             |               |           |  |        |  |              |  |              |  |             |  |


In table below you can find the description of each field in “Device status” tab:

| Field                       | Example                   | Description   |
|-----------------------------|---------------------------|---|
| Model, firm. ver.           | GMM: LE910-C1 (19.01.522) | GSM module info   |
| IMEI                        | 359852050093104           | device serial number  |
| PIN                         | READY                     | SIM card status:<br>SIM PIN - PIN lock (please set right PIN number in “GSM network” tab)<br>READY - SIM unlocked<br>SIM PUK - PUK lock   |
| Operator Selection          | 0,0,Orange,2              | name (3rd parameter), access technology (4th parameter):<br><u>for UMTS/HSPA variant:</u><br>0 - GSM<br>2 - UTRAN<br>3 - GSM w/EGPRS<br>4 - UTRAN w/HSDPA<br>5 - UTRAN w/HSUPA<br>6 - UTRAN w/HSDPA and HSUPA<br><u>for LTE variant:</u><br>0 - GSM<br>2 - UTRAN<br>3 - GSM w/EGPRS<br>4 - UTRAN w/HSDPA<br>5 - UTRAN w/HSUPA<br>6 - UTRAN w/HSDPA and HSUPA<br>7 - E-UTRAN                                 |
| Network Registration Status | 2,1,E2D6,280BAD1,2        | registration status (2nd parameter), location area code (3rd parameter), cell ID (4th parameter). Possible statuses:<br>0 - not registered, terminal is not currently searching a new operator to register to<br>1 - registered, home network<br>2 - not registered, but terminal is currently searching a new operator to register to<br>3 - registration denied<br>4 - unknown<br>5 - registered, roaming |
| Signal Strength (CSQ)       | 7 ( Marginal, -99 dBm )   | -   |
| Packet Data Service         | LTE                       | type of packet data service   |
| GSM selection               | MASTER                    | SIM card selection  |
| GSM IP                      | 10.228.211.212            | -   |

|    |  |   |
|----|--|---|
| RX | packets:12 errors:0 dropped:0 overruns:0 frame:0<br>collisions:0 txqueuelen:1000 | - |
| TX | packets:20 errors:0 dropped:0 overruns:0 carrier:0                               | - |

## 5.2.3 WAN config

WAN config page is shown in the illustration below.



**RBMTX** GPRS/HSPA Router Configuration Panel

Modem UG95E, 1 SIM, , firmware: 180511

[www.teleorigin.com](http://www.teleorigin.com)

Device status

**Basic**

**Wan config**

Local network

Modem settings

Connection control

Ports configuration

TCP/IP forwarding

VLAN

Static routes

Dynamic DNS

Access control

**Advanced**

OpenVPN

IPsec

IPsec authentication

NTRIP

Text messages actions

E-mail actions

SNMP

**Administration**

Time

Syslog

User files

**Configuration**

Backup and restore

Discard changes

Save settings

### Wan configuration

#### WAN interface / default gateway configuration

|                              |   |
|------------------------------|---|
| WAN interface                | <input type="text" value="GSM"/>  |
| NAT                          | <input checked="" type="checkbox"/> <b>WAN</b><br><input type="checkbox"/> <b>LAN1</b><br><small>Network Address Translation on the interface</small> |
| Set default gateway manually | <input type="checkbox"/> <b>Enabled</b>   |
| Default gateway interface    | <input type="text" value="GSM"/>  |
| Default gateway IP address   | <small>Enter default gateway</small><br><input type="text"/>  |
| Set default DNS manually     | <input type="checkbox"/> <b>Enabled</b>   |
| Nameserver IP master         | <input type="text" value="8.8.8.8"/>  |
| Nameserver IP slave          | <input type="text" value="8.8.4.4"/>  |

## 5.2.4 Local network

On "Local network" configuration page you can find essential parameters needed for LAN connection. Here you can set IP Address (or set it to be downloaded via DHCP), mask, default gateway and DNS addresses. Last two options can be entered manually or downloaded automatically via GSM or DHCP. Modem can also work as DHCP server - you can define its range and set list of IP-MAC binds.

"Wireless configuration" field is available only in RBMTX-Lite with WiFi option. You can set there a parameters of your WiFi connection. To scan all available networks please use "Scanning" button. You will be redirected to page with list of networks in a view. You can set a WiFi mode (Access point or Station), fill a name and password of selected network. You can also enable DHCP server and AP clients.

|                       |
|-----------------------|
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| Discard changes       |
| Save settings         |

## Networking

### LAN configuration

| IP configuration                     | Configuration            | IP Address        | Mask          |
|--------------------------------------|--------------------------|-------------------|---------------|
|                                      | Static                   | 192.168.1.236     | 255.255.255.0 |
| DHCP Server                          | Enabled                  | Range Start       | Range End     |
|                                      | <input type="checkbox"/> | 192.168.1.100     | 192.168.1.200 |
| Defined DNS servers for DHCP clients | Enabled                  | Master            | Slave         |
|                                      | <input type="checkbox"/> |                   |               |
| MAC address                          | Set                      | Enter MAC Address |               |
|                                      | <input type="checkbox"/> |                   |               |

### Wireless configuration


|                  |                                     |                            |                            |
|------------------|-------------------------------------|----------------------------|----------------------------|
| Wifi scanner     | <div>Scanning</div>                 |                            |                            |
| Mode             | <div>Disabled</div>                 |                            |                            |
| Name (SSID)      | <div>RBMTX WIFI</div>               |                            |                            |
| Channel          | <div>5</div>                        |                            |                            |
| Security options | <div>WPA/WPA2-PSK</div>             |                            |                            |
| Passphrase       | <div>87654321</div>                 |                            |                            |
| IP configuration | Configuration                       | IP Address                 | Mask                       |
|                  | <div>Static</div>                   | <div>192.168.100.234</div> | <div>255.255.255.0</div>   |
| DHCP Server      | Enabled                             | Range Start                | Range End                  |
|                  | <div><input type="checkbox"/></div> | <div>192.168.100.100</div> | <div>192.168.100.200</div> |
| DNS              | Enabled                             | Master                     | Slave                      |
|                  | <div><input type="checkbox"/></div> | <div></div>                | <div></div>                |

### DHCP server: Bind MAC to IP

|            |   |     |    |
|------------|---|-----|----|
| Binds list | <div></div>   |     |    |
|            | <div>NewDelete</div> <p>Please choose DHCP bind you would like to edit. Please note that after editing DHCP binds you have to save global settings.</p> |     |    |
|            | Identifier  | MAC | IP |
|            |   |     |    |

## 5.2.5 Modem settings

On "Modem settings" page you can define internet connection parameters (APN, username, password, CSD, ISP IP and Modem band) for one or two SIM cards (depending on modem version). To use internet you should know those parameters - they are essential for getting access to internet. The parameters should be ensured by your mobile network provider.



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### Modem settings


| GSM connection settings |  |
|-------------------------|--|
| SIM slot                | Master   |
| PIN                     | <input type="checkbox"/> Enabled<br><input type="text"/><br>Enter PIN here           |
| Predefined APN          | enter manually ▼   |
| APN                     | <input type="text" value="internet"/><br>Enter APN here or select it from above list |
| Username                | <input type="text"/><br>Enter username here  |
| Password                | <input type="text"/><br>Enter password here  |
| Modem band              | 2G and 3G ▼<br>Select modem band   |
| Connection              | Always on ▼<br>Modem connect   |

To enter the PIN for SIM card you need to mark "Enabled" field and then fill the field below with correct PIN. Please note that outgoing calls are made always on MASTER SIM card.



## 5.2.6 Connection control

Here you can set parameters of switching between two SIM cards. You can define time for ping and ping counter for 4 IP addresses you choose. In example (picture) here after 3 pings that take 10 seconds each card will change from Master to Slave or opposite.



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### GSM switching


| GSM connection control |   |
|------------------------|---|
| Limits                 | <input type="text" value="10"/><br>Enter ping timeout in seconds (1-1000)                 |
|                        | <input type="text" value="3"/><br>Enter ping count (1-3600)                               |
|                        | <input type="text" value="600"/><br>Enter ping interval in seconds (0-86400, 0 - disable) |
|                        | <input type="text" value="60"/><br>Enter ping threshold in percent (1-100)                |
| IP 1                   | <input type="checkbox"/> <b>Enabled</b><br>Set this option to enable ping testing IP 1    |
|                        | <input type="text"/><br>Enter IP address  |
| IP 2                   | <input type="checkbox"/> <b>Enabled</b><br>Set this option to enable ping testing IP 2    |
|                        | <input type="text"/><br>Enter IP address  |
| IP 3                   | <input type="checkbox"/> <b>Enabled</b><br>Set this option to enable ping testing IP 3    |
|                        | <input type="text"/><br>Enter IP address  |
| IP 4                   | <input type="checkbox"/> <b>Enabled</b><br>Set this option to enable ping testing IP 4    |
|                        | <input type="text"/><br>Enter IP address  |



## 5.2.7 Ports configuration

User is able to set port settings under RS232/RS485 port configuration page. There are 3 configurable ports: /dev/ttyS0, /dev/ttyACM0 and /dev/ttyS1 or /dev/ttyUSB0 (depending on modem version). Every port can be set to different mode. On /dev/ttyS0 you can set terminal, ModBus gateway or NTRIP mode. Two other ports can work as modem port (modem control and modem data) or SMS receiving port (see also: SMS Actions section).

Every port can also be set to forwarding mode that allows user to forward it to TCP/UDP port (as server or client). Port /dev/ttyS0 can also be forwarded to modem control or modem data port. In that case no other mode can be set on that port. Setting modes on /dev/ttyS0 and /dev/ttyS1 (LTE modem variant only) enables setting port parameters: baud rate, data bits, parity checking and protocol. If parameter is inactive, this means that user can't control it in currently set mode.



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### Ports

| Port settings |   |   |                                     |
|---------------|---|---|-------------------------------------|
| Port type     | Serial RS-232<br>External<br>/dev/rs232 | Serial RS-485<br>External<br>/dev/rs485 | Modem control<br>Internal<br>Port-A |
| Mode          | None ▼                                  | None ▼                                  | None ▼                              |
| Baud rate     | 115 200 ▼                               | 115 200 ▼                               |                                     |
| Data bits     | 8 ▼                                     | 8 ▼                                     |                                     |
| Parity        | None ▼                                  | None ▼                                  |                                     |
| Stop bits     | 1 ▼                                     | 1 ▼                                     |                                     |
| Flow control  | None ▼                                  | None ▼                                  |                                     |

| Forwarding configuration |  |           |          |
|--------------------------|--|-----------|----------|
| To                       | Network ▼  | Network ▼ |          |
| Mode                     | Server ▼   | Server ▼  | Server ▼ |
| Interface                | LAN ▼  | WAN ▼     | LAN ▼    |
| Protocol                 | TCP ▼  | TCP ▼     | TCP ▼    |
| Server IP or domain      |  |           |          |
| Server as domain name    | <input type="checkbox"/> Enter Server as domain name |           |          |
| Port                     |  |           |          |

## 5.2.8 TCP/IP forwarding

You can forward single port or port ranges onto certain IP address. To add new rule for single port, enter TCP/IP Forwarding tab. In "Single port rules" section click button "New" and enter all necessary informations: Identifier, check "Enabled" field, enter external and internal port, choose protocol (TCP or UDP) and enter IP address. When adding new rule or switching tab, currently edited rule is automatically saved. You can delete it (or any other rule) by pressing "Delete" button. After changes click Save Settings to save whole configuration. You can edit port range rules in the same way in Port range rules section. You can also set IP address of demilitarized zone in DMZ section.



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- IPsec authentication
- NTRIP
- Text messages actions
- E-mail actions
- SNMP

**Administration**

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**Configuration**

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- Discard changes
- Save settings

### TCP/IP forwarding

#### Single port rules

|               |   |
|---------------|---|
| Rules list    | <input type="text"/>  |
|               | <input type="button" value="New"/> <input type="button" value="Delete"/> <p>Please choose a rule you would like to edit. Please note that after editing rules you have to save global settings.</p> |
| Identifier    | <input type="text"/> <p>Please enter any name/identifier</p>  |
| Enable rule   | <input type="checkbox"/> <b>Enabled</b><br>Set this option to enable this rule  |
| External port | <input type="text"/>  |
| Internal port | <input type="text"/>  |
| Protocol      | <input type="text"/>  |
| IP address    | <input type="text"/>  |

#### Port range rules


|             |   |
|-------------|---|
| Rules list  | <input type="text"/>  |
|             | <input type="button" value="New"/> <input type="button" value="Delete"/> <p>Please choose a rule you would like to edit. Please note that after editing rules you have to save global settings.</p> |
| Identifier  | <input type="text"/> <p>Please enter any name/identifier</p>  |
| Enable rule | <input type="checkbox"/> <b>Enabled</b><br>Set this option to enable this rule  |
| First port  | <input type="text"/>  |
| Last port   | <input type="text"/>  |
| Protocol    | <input type="text"/>  |
| IP address  | <input type="text"/>  |

#### DMZ (Demilitarized zone) settings

|                     |  |
|---------------------|--|
| DMZ Hosting         | <input type="checkbox"/> <b>Enabled</b><br>Set this option to enable DMZ Hosting |
| DMZ host IP address | <input type="text"/> <p>Enter IP address here</p>                                |

## 5.2.9 VLAN

VLAN tab enables user to create virtual IP addresses. You can define IP, netmask and identifier from range 0-4095. If you enable IEEE 802.1Q tagging Virtual IP becomes part of VLAN.



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### VLAN/Virtual IP configuration

|                      |   |
|----------------------|---|
| VLAN Virtual IP list | <div></div> <div>New Delete</div> <div>Please choose VLAN you would like to edit. Please note that after editing those things you have to save global settings.</div> |
| Enable VLAN          | <input type="checkbox"/> <b>Enabled</b><br>Set this option to enable this VLAN  |
| Description          | <div></div> <div>Please enter VLAN description.</div>   |
| Interface            | <div>LAN1</div>   |
| IEEE 802.1Q tagging  | <input type="checkbox"/> <b>Enabled</b><br>Set this option to enable IEEE 802.1Q tagging  |
| Identifier           | <div></div> <div>Please enter number from range 0-4095.</div>   |
| IP                   | <div></div>   |
| Netmask              | <div></div>   |

## 5.2.10 Static routes

Under static routes tab you can define your own routings. Please click Add new button to add new routing. Enter identifier (used only to distinguish routings in www configuration), choose interface, enter destination network, netmask and gateway.



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**Static routes**

| Static routes list  |   |
|---------------------|---|
|                     | <input type="button" value="New"/> <input type="button" value="Delete"/> <p>Please choose a route you would like to edit. Please note that after editing routes you have to save global settings.</p> |
| Identifier          | <input type="text"/> <p>Please enter any name/identifier/IP</p>   |
| Destination network | <input type="text"/>  |
| Destination netmask | <input type="text"/>  |
| Interface           | <input type="text" value="None"/>   |
| Gateway             | <input type="text"/>  |

## 5.2.11 Dynamic DNS

Dynamic DNS is a service which allows user to make your device available under specific www address regardless of its IP changes. In order to do that you must create an account on one of web pages that are supported by RBMTX-Lite modem (currently DynDNS.org or No-IP.com). After creating account, please enter necessary information in Dynamic DNS tab of www configuration: your service provider, in case of DynDNS its type, username, password, host name and two intervals. Update interval is time between two checks whether IP address had changed. Forced update interval is time between updating IP data regardless of IP change. Please last two fields empty to use default value if you're not sure what to input there.



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|  |  |                     |  |                    |                                     |                 |  |                 |  |                 |  |                              |  |                                    |   |
|--|--|---------------------|--|--------------------|-------------------------------------|-----------------|--|-----------------|--|-----------------|--|------------------------------|--|------------------------------------|---|
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| <b>DDNS service</b>  | <input type="text" value="Disabled"/><br>Note that DDNS can only work on devices with public IP.   |                     |  |                    |                                     |                 |  |                 |  |                 |  |                              |  |                                    |   |
| <b>DynDNS type</b>   | <input type="text" value="Custom"/>  |                     |  |                    |                                     |                 |  |                 |  |                 |  |                              |  |                                    |   |
| <b>Username</b>  | <input type="text"/><br>Enter username   |                     |  |                    |                                     |                 |  |                 |  |                 |  |                              |  |                                    |   |
| <b>Password</b>  | <input type="text"/><br>Enter password   |                     |  |                    |                                     |                 |  |                 |  |                 |  |                              |  |                                    |   |
| <b>Hostname</b>  | <input type="text"/><br>Enter hostname   |                     |  |                    |                                     |                 |  |                 |  |                 |  |                              |  |                                    |   |
| <b>Update interval (sec)</b>   | <input type="text"/><br>IP change check interval. Default: 1 min. Max: 10 days Leave this field empty to use default value   |                     |  |                    |                                     |                 |  |                 |  |                 |  |                              |  |                                    |   |
| <b>Force update interval (sec)</b>   | <input type="text"/><br>Forced DDNS server update interval. Default: 1 week Leave this field empty to use default value  |                     |  |                    |                                     |                 |  |                 |  |                 |  |                              |  |                                    |   |

## 5.2.12 Access control

First section of Access Control tab allows you to configure SSH protocol. You can turn it on or off, set on which port and interfaces (also OpenVPN and IPsec tunnels) it should be accessible. You can also toggle logging via SSH as root and change/delete passwords/keys for root and service user. Remember to save whole configuration after changing password by pressing Save Configuration button from main menu. Deleting password means that it won't be needed to log on. When logging via SSH, key authentication has higher priority than password. That means that user with authorized key won't be prompted for a password and user without key will be able to login using password. You can paste multiple keys into SSH root key and SSH service key fields.

**ATTENTION:** Service account is used to upgrade firmware. Turning SSH off will disable firmware upgrades.



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## Access control

### SSH configuration

|                   |  |
|-------------------|--|
| SSH enabled       | <input checked="" type="checkbox"/> <b>Enabled</b><br>Set this option to enable SSH service  |
| Interfaces        | <input checked="" type="checkbox"/> <b>LAN1</b><br><input type="checkbox"/> <b>GSM</b><br><input type="checkbox"/> <b>OpenVPN</b><br><input type="checkbox"/> <b>IPsec</b><br>Choose on which interfaces SSH should be accessible  |
| OpenVPN tunnels   | <input type="checkbox"/> <b>1</b> <input type="checkbox"/> <b>2</b> <input type="checkbox"/> <b>3</b> <input type="checkbox"/> <b>4</b><br>Choose tunnels on which SSH should be accessible  |
| IPsec tunnels     | <input type="checkbox"/> <b>1</b> <input type="checkbox"/> <b>2</b> <input type="checkbox"/> <b>3</b> <input type="checkbox"/> <b>4</b><br>Choose tunnels on which SSH should be accessible  |
| Port              | <input type="text" value="65535"/>   |
| SSH login as root | <input checked="" type="checkbox"/> <b>Enabled</b><br>Set this option to enable logon via SSH as root  |
| SSH root password | <input type="password" value="****"/>  |
| SSH root key      | <div> <input type="text"/> </div> <div> <input type="button" value="Generate"/> <input type="button" value="Get private key"/> <input type="button" value="Get public key"/> </div> <p>Paste public keys of authorized users here<br/>         You can also generate the public key and download its private key by clicking Generate button<br/>         Generating key may take up to 3 minutes, please be patient</p> |

### WWW config access configuration

|                  |  |
|------------------|--|
| Access protocols | <input checked="" type="checkbox"/> <b>HTTP</b><br><input type="checkbox"/> <b>HTTPS</b>   |
| Interfaces       | <input checked="" type="checkbox"/> <b>LAN1</b><br><input type="checkbox"/> <b>GSM</b><br><input type="checkbox"/> <b>OpenVPN</b><br><input type="checkbox"/> <b>IPsec</b><br>Choose on which interfaces www config should be accessible |
| OpenVPN tunnels  | <input type="checkbox"/> <b>1</b> <input type="checkbox"/> <b>2</b> <input type="checkbox"/> <b>3</b> <input type="checkbox"/> <b>4</b><br>Choose tunnels on which www config should be accessible                                       |
| IPsec tunnels    | <input type="checkbox"/> <b>1</b> <input type="checkbox"/> <b>2</b> <input type="checkbox"/> <b>3</b> <input type="checkbox"/> <b>4</b><br>Choose tunnels on which www config should be accessible                                       |
| HTTP port        | <input type="text" value="80"/>  |
| HTTPS port       | <input type="text" value="443"/>   |

### WWW config authorization

|                                 |   |
|---------------------------------|---|
| Authorization type for admin    | <input type="text" value="local_password"/><br>Select authentication type for account/interface admin   |
| Password for admin              | <input type="password"/><br><input type="password"/> (confirmation)<br>Enter new password for admin account<br><input type="button" value="OK"/>  |
| Authorization type for easy     | <input type="text" value="local_password"/><br>Select authentication type for account/interface easy  |
| Password for local account easy | <input type="password"/><br><input type="password"/> (confirmation)<br>Enter new easy account password twice<br><input type="button" value="OK"/> |

You can generate necessary keys directly on modem. Press the Generate button and wait for a while-the process can take few minutes. You should not change settings or switch tabs then. After the generation the message will be displayed. Public key will be automatically pasted into the keys field (if the field wasn't empty before pressing the button, its contents will be saved, the newly generated key will appear first on the list). From now you will be able to download private and public keys by pressing Get private key and Get public key buttons. To login using the key under Linux, you have to download private key, change its name to id\_rsa and put it in /home/user/.ssh folder.

In WWW config access section you can toggle HTTP/HTTPS access www configuration and change ports and interfaces (OpenVPN and IPsec tunnels also) on which they will be available. You can also change password for www configuration (the change will be immediate, no saving configuration is needed). For security reasons disabling both HTTP and HTTPS is not possible.

### 5.2.13 Open VPN

You can connect your modem to a VPN network or create your own one using OpenVPN software. It is possible to create up to four VPN connections (tunnels). To view and change settings of any of tunnels select it from Tunnel configuration list under OpenVPN tab. Then choose if modem should be server or client and connection type: tun or tap. Tun connection can be single- or multiclient. Depending on what you choose here, you will later need to enter client/server IP addresses or network and netmask.

If the device should be server, please enter port on which it should listen for connections (the default VPN port is 1194, remember to open the port you chose under the firewall tab). Next, please select network device on which the connection should be held: eth (external RJ45 port) or ppp (connection via mobile network). It is also necessary to choose network protocol: TCP or UDP (use the second option if you are not sure what to choose). For tun mode user should also enter server and client IPs

(we advise you to use addresses from 10.x.x.x pool). For tap mode please enter VPN sub network address and net mask (for example 10.1.0.0 and 255.255.255.0). In most cases, your device will reserve first IP address from the pool (that is 10.1.0.1 if you are using 10.1.0.0 network).

If the device is set into client mode, in addition to settings same as those for server, you should input VPN server's IP in Remote Server IP field and its listening port in the Port field.

After filling in all necessary information user should fill in four certificate fields. The certificates should be generated on any PC (see VPN online help for more information). The contents of files should be pasted into appropriate fields of configuration. You can improve security of your VPN connection by entering TLS key into the TLS key field on every device in VPN network.

The last setting is toggling LZ0 compression (we advise you to enable it to improve network communication) and adding extra configuration parameters in Additional configuration field.

|                       |
|-----------------------|
| Device status         |
| <b>Basic</b>          |
| Wan config            |
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| Save settings         |

## OpenVPN tunnels

|                                     |   |
|-------------------------------------|---|
| <b>Tunnel configuration</b>         | <div>openVPN tunnel 1 ▾</div> <div>Please select VPN tunnel you would like to configure</div>   |
| <b>OpenVPN mode</b>                 | Disabled ▾  |
| <b>Connection mode</b>              | Router (TUN) single ▾   |
| <b>Remote Server IP or domain</b>   | <input type="text"/>  |
| <b>Remote Server as domain name</b> | <input type="checkbox"/> Enter Remote Server as domain name   |
| <b>VPN device</b>                   | <input type="text"/>  |
| <b>NAT-T</b>                        | <input type="checkbox"/> <b>Enable NAT Traversal (NAT-T)</b><br>Set this option to enable the use of NAT-T (i.e. the encapsulation of ESP in UDP packets) if needed, which can help with clients that are behind restrictive firewalls. |
| <b>Port</b>                         | <input type="text"/>  |
| <b>Protocol</b>                     | TCP ▾   |
| <b>Network</b>                      | <input type="text"/>  |
| <b>Netmask</b>                      | <input type="text"/>  |
| <b>Server IP</b>                    | <input type="text"/>  |
| <b>Client IP</b>                    | <input type="text"/>  |
| <b>CA cert</b>                      | <input type="text"/><br><input type="button" value="Generate"/>   |
| <b>CA key</b>                       | <input type="text"/>  |
| <b>Server/client cert</b>           | <input type="text"/><br><input type="button" value="Generate"/>   |
| <b>Server/client private key</b>    | <input type="text"/>  |
| <b>DH PEM</b>                       | <input type="text"/><br><input type="button" value="Generate"/>   |
| <b>TLS key</b>                      | <input type="text"/><br>This field is optional  |
| <b>LZO compression</b>              | <input checked="" type="checkbox"/> <b>Enabled</b><br>Set this option to enable LZO compression   |
| <b>Additional configuration</b>     | <input type="text"/>  |
| <b>Script up</b>                    | <input type="text"/>  |
| <b>Script down</b>                  | <input type="text"/>  |

## 5.2.14 Isec static/Isec mobile

IPsec is group of internet protocols that enables user to create safe connection between devices. To configure such connection on RBMTX-Lite modem you need to go through three tabs of configuration: Tunnels, Mobile Clients, Keys and Certificates. First of all, you need to enable IPsec under Tunnels tab. Below this option there is a combo box that enables you to switch between different tunnel configurations. If you want to enable specific tunnel, please select Enable tunnel checkbox. Then specify network interface on which the connection will be held. It is impossible to discuss all ways to create IPsec connection, so we have described sample configuration below.

Let's say we want to connect two RBMTX-Lite modems with following IP numbers: 123.45.67.1, 123.45.67.2. First option, DPD interval is time after which the connection is closed if the other device is not responding. You can put any value here, we will enter 3600 seconds. Then you have to choose local subnet that will be available on remote side of the connection. It can be single host, network or LAN subnet. Let's say we will be connecting more devices later so we choose network. On first modem we enter following settings: IP=192.168.36.1, Network=192.168.36.0 and Netmask=255.255.255.0. The IP must be set properly according to the network and netmask. Next step is entering remote subnet. The local subnet on first device must match remote subnet on the second device and vice versa. We have specified local subnet on second modem with following settings: IP=192.168.35.1, Network=192.168.35.0, Netmask=255.255.255.0, so on the first modem we enter following remote subnet: Address=192.168.35.0, Netmask=255.255.255.0. After specifying local and remote subnets, you should enter remote gateway which should be other device's IP. In our case we enter 123.45.67.2 on first modem and 123.45.67.1 on second one.

Afterwards we have to define first phase of the proposal. We choose negotiation mode-aggressive is less secure, but faster than main. Next setting is device's identifier. The most common setting is My IP address for PSK authentication and RSA Cert subject for RSA certificates. Now, please choose encryption, hash algorithm and DH key group-they must be the same on both sides of connection. Blowfish encryption is usually the fastest and AES is the slowest but most secure. You can optionally set lifetime of phase 1 or leave the field blank to use default value. The most important setting of phase 1 is choosing authentication method: Pre-shared key is like password, you have to enter the same key on both sides. More sophisticated authentication method is using RSA certificates, but you need to generate certificate and key for every device. You have two options here: either input other device's certificate in Peer certificate field or add CA certificate (we will cover that topic later).

In the second phase of proposal please specify the protocol (ESP is authentication with encryption, AH is authentication only), encryption algorithm, hash algorithm and PFS key group. Please note that you can choose multiple algorithms, but at least one should match on both sides of the connection. The last setting is phase 2 lifetime (leave field empty for using default value).

After configuring all settings remember to save configuration. The configuration of IPsec connection is finished unless you chose to authenticate with RSA certificates and CA certificate. In that case click on Keys and Certificates tab. Here you can add multiple Pre-shared keys and CA certificates. Adding both is similar, so we will explain only adding CA certificates. To add new one, please click on Add new button. Specify Identifier (which is used only for distinguish them in www configuration), paste CA certificate and certificate revoke list. Last field is optional and lets you ban users that shouldn't be allowed to join your network anymore.

**IMPORTANT:** After filling in fields click Save button and then save whole configuration by clicking Save settings. If you want to delete certificate, choose it from the list, click Delete button and then save whole configuration.

It is possible to create IPsec connection with non-static-IP-devices. In order to do this please click Mobile clients tab. Configuration is similar to the tunnel configuration, but there are less settings (for example there is no PSK field-you should add pre-shared keys for mobile clients in Keys and Certificates tab).

**IMPORTANT:** When configuring IPsec connection you will sometimes want to add custom routing. This topic is covered in next section.

### 5.2.15 Generating SSL certificates

In order to use SSL authentication creating few files and copying them into adequate fields under OpenVPN or IPsec tabs of www configuration is needed. This can be done using PC with Linux and openssl installed. There is also Windows version of software available at <http://gnuwin32.sourceforge.net/packages/openssl.htm>.

At first we need to create folder, in which all our keys and certificates will be stored. Let's say it will be ~/keys. We create two files in it: list of certificates and file enumerating them:

```
touch index.txt  
echo 00 > serial
```

and subdirectories, where the certificates and keys will be stored:


```
mkdir private certs newcerts crl
```

In order to create certificates, the certificate authority (CA) is needed . It is „main" certificate used to create other certificates. After creating private CA key:

```
openssl genrsa -des3 -out private/cakey.pem 1024
```

**Warning:** please remember the CA password!





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## IPsec tunnels

|                      |  |  |                                |
|----------------------|--|--|--------------------------------|
| Enable IPsec         | <input checked="" type="checkbox"/> Enabled  |  |                                |
| Tunnel configuration | <div>IPsec tunnel 1</div> <small>Please select IPsec tunnel you would like to configure</small>  |  |                                |
| Enable tunnel        | <input checked="" type="checkbox"/> Enabled  |  |                                |
| Local Interface      | <div>Interface</div> <div>GSM</div>  | <div>Default route</div> <div><input type="checkbox"/></div> |                                |
| Local subnet         | <div>Type</div> <div>Host only</div>   | <div>Network</div> <div></div>                               | <div>Netmask</div> <div></div> |
| Remote host(s)       | <div>IP Address</div> <div></div> <div>Any host</div> <div><input checked="" type="checkbox"/></div> <small>Enter the public IP address of the remote host or check Any host for server role.</small>  |  |                                |
| Remote subnet        | <div>Type</div> <div>Host only</div>   | <div>Network</div> <div></div>                               | <div>Netmask</div> <div></div> |
| Connection           | <div>Always on</div>   |  |                                |
| NAT-T                | <input checked="" type="checkbox"/> <b>Enable NAT Traversal (NAT-T)</b><br><small>Set this option to force use of NAT-T (i.e. the encapsulation of ESP in UDP packets), which can help with clients that are behind restrictive firewalls.</small> |  |                                |

### Phase 1 proposal (Authentication)

|                                    |   |  |  |
|------------------------------------|---|--|--|
| Protocol                           | <div>IKE v2</div>   |  |  |
| Change default algorithms proposal | <input checked="" type="checkbox"/> Enabled   |  |  |
| Encryption                         | <div><input checked="" type="checkbox"/> AES 256</div> <div><input checked="" type="checkbox"/> AES 192</div> <div><input checked="" type="checkbox"/> AES 128</div> <div><input checked="" type="checkbox"/> 3 DES</div> <div><input checked="" type="checkbox"/> Blowfish 256</div> <div><input checked="" type="checkbox"/> Blowfish 192</div> <div><input checked="" type="checkbox"/> Blowfish 128</div> <div><input checked="" type="checkbox"/> Camellia 256</div> <div><input checked="" type="checkbox"/> Camellia 192</div> <div><input checked="" type="checkbox"/> Camellia 128</div> |  |  |
| Integrity                          | <div><input checked="" type="checkbox"/> SHA2 512</div> <div><input checked="" type="checkbox"/> SHA1 96</div> <div><input type="checkbox"/> SHA2 384</div> <div><input type="checkbox"/> MD5 96</div> <div><input type="checkbox"/> SHA2 256</div>   |  |  |
| Diffie Hellman Groups              | <div><input checked="" type="checkbox"/> 8192 bit</div> <div><input checked="" type="checkbox"/> 3072 bit</div> <div><input checked="" type="checkbox"/> 1024 bit</div> <div><input type="checkbox"/> 6144 bit</div> <div><input type="checkbox"/> 2048 bit</div> <div><input type="checkbox"/> 768 bit</div> <div><input type="checkbox"/> 4096 bit</div> <div><input type="checkbox"/> 1536 bit</div>   |  |  |
| Force use                          | <div>propose only</div>   |  |  |
| My identifier                      | <input type="checkbox"/> IP address <div>IP address</div>   |  |  |
| Remote identifier                  | <input type="checkbox"/> User PQDN <div>User PQDN</div>   |  |  |
| Local side authentication method   | <div>Pre-shared key</div> <div>Certificate</div> <div>Private key</div> <small>Must match the setting chosen on the remote side.<br/>Keys and certificates are defined at IPsec authentication tab.</small>   |  |  |

### Phase 2 proposal (SA/Key Exchange)

|                                    |   |  |  |
|------------------------------------|---|--|--|
| Change default algorithms proposal | <input checked="" type="checkbox"/> Enabled   |  |  |
| Protocol                           | <div>ESP</div> <small>ESP is encryption, AH is authentication only</small>  |  |  |
| Encryption                         | <div><input checked="" type="checkbox"/> AES 256</div> <div><input checked="" type="checkbox"/> AES 192</div> <div><input checked="" type="checkbox"/> AES 128</div> <div><input checked="" type="checkbox"/> 3 DES</div> <div><input checked="" type="checkbox"/> Blowfish 256</div> <div><input checked="" type="checkbox"/> Blowfish 192</div> <div><input checked="" type="checkbox"/> Blowfish 128</div> <div><input checked="" type="checkbox"/> Camellia 256</div> <div><input checked="" type="checkbox"/> Camellia 192</div> <div><input checked="" type="checkbox"/> Camellia 128</div> |  |  |
| Integrity                          | <div><input checked="" type="checkbox"/> SHA2 512</div> <div><input checked="" type="checkbox"/> SHA1 96</div> <div><input type="checkbox"/> SHA2 384</div> <div><input type="checkbox"/> MD5 96</div> <div><input type="checkbox"/> SHA2 256</div>   |  |  |
| Diffie Hellman Groups (optional)   | <div><input checked="" type="checkbox"/> 8192 bit</div> <div><input checked="" type="checkbox"/> 3072 bit</div> <div><input checked="" type="checkbox"/> 1024 bit</div> <div><input type="checkbox"/> 6144 bit</div> <div><input type="checkbox"/> 2048 bit</div> <div><input type="checkbox"/> 768 bit</div> <div><input type="checkbox"/> 4096 bit</div> <div><input type="checkbox"/> 1536 bit</div>   |  |  |
| Force use                          | <div>propose only</div>   |  |  |

### User config options

|                         |   |  |  |
|-------------------------|---|--|--|
| User config             | <input checked="" type="checkbox"/> Enabled   |  |  |
| Add or replace options  | <div>Add options</div>  |  |  |
| Configuration           |   |  |  |
| View configuration file | <div>View</div> <small>After Save settings you can view generated config file</small> |  |  |

The CA certificate is generated:

```
openssl req -new -x509 -days 365 -key private/cakey.pem -out cacert.pem
```

When creating a certificate user has to provide some information like country, state/province, city, company name, e-mail address and common name. The last field is most important, it has to be unique for every device.

After creating CA certificate generation of certificate for every device used is needed.

At first the private key is generated:

```
openssl genrsa -des3 -out private/device1key.pem
```

Then we generate certificate request:

```
openssl req -new -key private/device1key.pem -out device1req.pem
```

Here user has to enter country, state etc. again. They can be the same as before except the common name.

Certificate authority signs the certificate:

```
openssl ca -notext -in device1req.pem -out device1cert.pem
```

If certificate will be used on RBMTX-Lite modem, password on private key has to be disabled:

```
openssl rsa -in private/device1key.pem -out private/device1key.pem_nopass
```

The whole process is repeated for every device (unique common names and filenames have to be unique for different devices!).

If IPsec protocol will be used, certain fields in www configuration under Ipsec/Tunnels tab have to be filled in. Content of *device1cert.pem* file should be pasted into the Certificate field and contents of *device1key.pem\_nopass* into the Key field. Peer Certificate field can be filled with another device's certificate file or left empty. In this case the CA certificate has to be provided under Keys and Certificates tab. Contents of *cacert.pem* file should be inserted there.

If the OpenVPN protocol will be used, under OpenVPN tab content of *cacert.pem* has to be pasted into CA cert field, content of *device1cert.pem* into Server/Client cert field and *device1key.pem\_nopass* into Server/Client private key field. The Diffie- Hellman parameters file has to be created for VPN connection:

```
openssl dhparam -out dh1024.pem 1024
```

And its content should be copied into DH PEM field. This file is common for all devices in VPN network.



## RBMTX GPRS/HSPA Router Configuration Panel

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[www.teleorigin.com](http://www.teleorigin.com)

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- NTRIP
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- E-mail actions
- SNMP

### Administration

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## Keys & Certificates

### IPsec secrets

|                             |   |
|-----------------------------|---|
| Key list                    | <input type="text"/>  |
|                             | <input type="button" value="New"/> <input type="button" value="Delete"/> <p>Please choose a key you would like to edit. Please note that after editing keys you have to save global settings.</p> |
| Identifier                  | <input type="text"/> <p>Name to identify key and its value.</p>   |
| Key                         | <input type="text"/> <p>This can be: IP, FQDN, user@FQDN, %any, subnet in CIDR notation, address ranges (two addresses separated by a - without any spaces).</p>                                  |
| Key type                    | <input type="text"/>  |
| Key value                   | <input type="text"/> <p>To use certificate or key (RSA Key type) enter its Identifier.</p>  |
| Use own secret file         | <input type="checkbox"/> Enabled  |
| User defined secret file    | <input type="text"/> <p>Enter name of uploaded secrets file.</p>  |
| View generated secrets file | <input type="button" value="View"/> <p>If you enable IPsec after Save settings you can view generated ipsec.secrets</p>   |

### Keys & Certs

|                           |   |
|---------------------------|---|
| Keys & certs list         | <input type="text"/>  |
|                           | <input type="button" value="New"/> <input type="button" value="Delete"/> <p>Please choose a certificate you would like to edit. Please note that after editing certificates you have to save global settings.</p> |
| Identifier                | <input type="text"/> <p>Please enter any name/identifier</p>  |
| Type                      | <input type="text"/>  |
| Key / Certificate         | <input type="text"/>  |
| Export Client Certificate | <input type="button" value="Get PKCS#12"/> <p>Export client certificate, its private key, and the signing CA certificate.</p>   |




## 5.2.16 NTRIP configuration page

One of /dev/ttyS0 port modes is communication with external device using NTRIP protocol. If you decide to use it, it is necessary to set the mode under RS232 Port configuration page. Then, enter settings in NTRIP page. Server address, port and initial position fields are necessary. Username and passwords are optional.

It is also possible to choose data request mode. After entering required data, please click Get List button to download data streams list from the server – it may take a while, please be patient. After downloading the list please select one of data streams.

**Attention:** Entering initial position is necessary to login to NTRIP server if no external device sending NMEA frames is connected to the S0 port.



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### NTRIP

|                          |  |
|--------------------------|--|
| <b>NTRIP</b>             | <input type="checkbox"/> <b>Enabled</b><br>Set this option to enable NTRIP service   |
| <b>Server address</b>    | <input type="text"/>   |
| <b>Port</b>              | <input type="text"/>   |
| <b>Username</b>          | <input type="text" value="65535"/>   |
| <b>Password</b>          | <input type="password" value="....."/>   |
| <b>Initial position</b>  | <input type="checkbox"/> <b>Enabled</b><br>Set this option to enable login to NTRIP server with fixed position. Use this option when there is no external source of NMEA frames connected via RS232. |
| <b>Latitude</b>          | N ▾ 52 ° 0 ' 0   |
| <b>Longitude</b>         | W ▾ 22 ° 0 ' 0   |
| <b>Data request mode</b> | NTRIP Version 2.0 Caster in TCP/IP mode ▾  |
| <b>Mountpoint</b>        | <input type="text"/> <input type="button" value="Get List"/>   |

## 5.2.17 Text messages actions

Text messages (SMS) actions tab allows user to define shell scripts that will be executed every time modem receives SMS with specified content.

To enable this option ensure that global SMS Actions checkbox is enabled and you have set one of available ports into SMS receiving mode under Ports configuration tab. Then click New button, enter any identifier and command-sms content that will trigger action. You can write any shell script you want and/or set GPIO action to be executed.

TELEORIGIN

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www.teleorigin.com

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### Text messages actions

**Text messages (SMS) server**

|                   |  |
|-------------------|--|
| <b>Management</b> | <a href="#">Incoming text messages (SMS)</a><br><a href="#">Sent text messages (SMS)</a><br><a href="#">Report text messages (SMS)</a><br><a href="#">Help</a> |
|-------------------|--|

**Text messages (SMS) configuration**

|                |   |
|----------------|---|
| <b>Enabled</b> | <input type="checkbox"/> <b>Enabled</b> |
|----------------|---|

**Text messages (SMS) actions**

|   |  |
|---|--|
| <b>Text messages (SMS) actions list</b> | <div style="border: 1px solid #ccc; padding: 2px; display: inline-block;">SMSback my IP ▼</div>  |
|   | <div style="text-align: center; margin-bottom: 5px;"> <div style="border: 1px solid #ccc; padding: 2px 10px; margin: 0 5px;">New</div> <div style="border: 1px solid #ccc; padding: 2px 10px; margin: 0 5px;">Delete</div> </div> <p style="font-size: 0.9em;">Please choose action you would like to edit. Please note that after editing rules you have to save global settings.</p> |
| <b>Identifier</b>                       | <div style="border: 1px solid #ccc; padding: 2px; display: inline-block;">SMSback my IP</div><br>Please enter any identifier   |
| <b>Command</b>                          | <div style="border: 1px solid #ccc; padding: 2px; display: inline-block;">Myip</div><br>Please enter command (content of text message)   |
| <b>Script</b>                           | <div style="border: 1px solid #ccc; padding: 5px; min-height: 100px;"> <pre>#!/bin/bash  smssend.sh \$1 "GSM IP: \$(myip gsm); LAN IP: \$(myip lan) PPPoE IP: \$(myip pppoe)"</pre> </div> <p style="font-size: 0.8em;">This script will be executed after receiving text message (SMS) command</p>  |

## 5.2.18 E-mail actions

In the “E-mail Actions” section, the user can set up an e-mail account for sending messages (set the parameters: recipient, sender, server address, port, user and password). It is also possible to set up a script that will be launched automatically (messages can be sent with attachments or not, it is possible to compress the file before sending).

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## E-mail Actions


### E-mail configuration

|                       |  |
|-----------------------|--|
| <b>E-mail sending</b> | <input type="checkbox"/> <b>Enabled</b><br>Set this option if you want to allow router send e-mails.                 |
| <b>Recipient</b>      | <input type="text"/><br>All messages will be delivered to this e-mail address  |
| <b>From:</b>          | <input type="text"/><br>Enter "From:" field of e-mails here e.g. "me@example.com"                                    |
| <b>Host name</b>      | <input type="text"/><br>Enter host name here e.g. "smtp.gmail.com"   |
| <b>Port</b>           | <input type="text"/><br>Enter port number here e.g. "587"  |
| <b>Username</b>       | <input type="text"/><br>Enter your username of e-mail service  |
| <b>Password</b>       | <input type="password"/><br><input type="password"/> (confirmation)<br>Enter password from your e-mail service twice |

### E-mail Actions

|  |   |
|--|---|
| <b>E-mail actions list</b>                           | <input type="text"/> ▼  |
|  | <input type="button" value="New"/> <input type="button" value="Delete"/><br>Please choose action you would like to edit. Please note that after editing rules you have to save global settings.   |
| <b>Identifier</b>                                    | <input type="text"/><br>Please enter any identifier   |
| <b>Date (Month/Day of month) of script execution</b> | <input type="text"/> <input type="text"/><br>Please enter month(s) and day(s) of month(s) when script will be executed. Ranges can be defined with dashes e.g. "1-15", you can also use commas e.g. "1,6,7". Note, that using "*" replaces all months/days, and "1-12/2" means "every 2 months/days from range 1-12 (2,4,6,...)"  |
| <b>Day of week</b>                                   | <input type="text"/><br>Script will be executed every given day of week. Syntax is allowed as above. 0/7 - Sunday, 1 - Monday, 2 - Tuesday, etc.  |
| <b>Time (Hour/Minute) of script execution</b>        | <input type="text"/> <input type="text"/><br>Script will be executed every time in a given hour. Syntax is allowed as above. For more info and possibilities check cron manual in Linux   |
| <b>Script</b>  | <input type="text"/><br>Above script will be executed in a given time   |
| <b>E-mail content</b>                                | <input type="text"/><br>Above text will be attached to e-mail<br><input type="checkbox"/> <b>Add attachments?</b><br>Set this option if you want send e-mails with attached file.<br><input type="checkbox"/> <b>Tar attached file(s) before sending?</b><br>Set this option if you want compress attached file(s).<br><input type="text"/><br>Add file(s) location(s). Wildcards are allowed. Directories are ignored. |

## 5.2.19 SNMP



Device status
Basic
Wan config
Local network
Modem settings
Connection control
Ports configuration
TCP/IP forwarding
VLAN
Static routes
Dynamic DNS
Access control
Advanced
OpenVPN
IPsec
IPsec authentication
NTRIP
Text messages actions
E-mail actions
**SNMP**
Administration
Time
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Backup and restore
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Save settings


**RBMTX** GPRS/HSPA Router Configuration Panel
Modem UG95E, 1 SIM, , firmware: 180511
[www.teleorigin.com](http://www.teleorigin.com)

### SNMP

|                                   |   |   |   |
|-----------------------------------|---|---|---|
| <b>SNMP</b>                       | <input type="checkbox"/> <b>Enabled</b><br>Set this option to enable SNMP service.  |   |   |
| <b>RBMTX MIB file</b>             | <input type="button" value="Download"/>   |   |   |
| <b>SNMP networking</b>            |   |   |   |
| <b>Protocol &amp; Port</b>        | <b>Protocol</b><br><input type="text" value="UDP"/>   | <b>Port</b><br><input type="text" value="161"/> |   |
| <b>Interfaces</b>                 | <input checked="" type="checkbox"/> <b>LAN</b><br><input type="checkbox"/> <b>GSM</b><br>Choose on which interfaces SNMP should be accessible   |   |   |
| <b>SNMP information</b>           |   |   |   |
| <b>System location</b>            | <input type="checkbox"/> <input type="text" value="Location info"/><br>Set description of system location   |   |   |
| <b>Administrator contact</b>      | <input type="checkbox"/> <input type="text" value="Contact info"/><br>Set contact information to system administrator   |   |   |
| <b>SNMP users</b>                 |   |   |   |
| <b>Username</b>                   | <input type="text"/>  |   |   |
|                                   | <input type="button" value="New"/> <input type="button" value="Delete"/><br>Please choose a username you would like to edit. Please note that after editing you have to save global settings. |   |   |
| <b>Username &amp; access type</b> | <b>Access type</b><br><input type="text"/>  | <b>Username</b><br><input type="text"/>         |   |
| <b>Authentication</b>             | <b>Protocol</b><br><input type="text"/>   | <b>Password</b><br><input type="text"/>         | <b>Confirm password</b><br><input type="text"/> |
| <b>Encryption</b>                 | <b>Protocol</b><br><input type="text"/>   | <b>Password</b><br><input type="text"/>         | <b>Confirm password</b><br><input type="text"/> |

## 5.2.20 Time

Here you can manually set hardware clock or input IP of NTP server to synchronize time automatically



Device status

Basic

Wan config

Local network

Modem settings

Connection control

Ports configuration

TCP/IP forwarding

VLAN

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[www.teleorigin.com](http://www.teleorigin.com)


### NTP

|                             |  |
|-----------------------------|--|
| RTC time (UTC)              | 2018-05-21 08:43:22  |
| NTP Peer 1 preferred server | <input checked="" type="checkbox"/> <b>Enabled</b><br>Set this option to enable peer 1 server querying |
|                             | <input type="text" value="0.europe.pool.ntp.org"/><br>Enter IP address NTP server                      |
| Server as domain name       | <input checked="" type="checkbox"/> <b>Enter NTP Server as domain name</b>                             |
| NTP Peer 2 server           | <input type="checkbox"/> <b>Enabled</b><br>Set this option to enable peer 2 server querying            |
|                             | <input type="text"/><br>Enter IP address NTP server  |
| Server as domain name       | <input type="checkbox"/> <b>Enter NTP Server as domain name</b>  |
| NTP Peer 3 server           | <input type="checkbox"/> <b>Enabled</b><br>Set this option to enable peer 3 server querying            |
|                             | <input type="text"/><br>Enter IP address NTP server  |
| Server as domain name       | <input type="checkbox"/> <b>Enter NTP Server as domain name</b>  |
| Date (Y/M/D)                | <input type="text" value="2018"/> <input type="text" value="5"/> <input type="text" value="21"/>       |
| Time (h:m:s)                | <input type="text" value="8"/> <input type="text" value="43"/> <input type="text" value="19"/>         |
| Set date/time               | <input type="button" value="Set"/><br>Please enter date/time below and press Set button                |



## 5.2.21 Syslog

Here you can define how modem should save your logs. Modem has internal memory that get overwritten when it reaches its end. You can also save logs on your computer by clicking download (manually). It is also possible to get remote access to logs by enabling Remote service and setting SYSLOG host.



**RBMTX** GPRS/HSPA Router Configuration Panel  
Modem UG95E, 1 SIM, , firmware: 180511  
[www.teleorigin.com](http://www.teleorigin.com)

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### SYSLOG


|                            |   |   |
|----------------------------|---|---|
| Local service log          | <input type="button" value="View"/>   | <input type="button" value="Download"/> |
| Remote service             | <input checked="" type="checkbox"/> <b>Enabled</b><br>If this option is set, device will store system logs on remote host |   |
| SYSLOG host                | <input type="text"/><br>Enter SYSLOG host IP address here   |   |
| SYSLOG host as domain name | <input type="checkbox"/> <b>Enter SYSLOG host as domain name</b>  |   |

## 5.2.22 User files

You can upload to the modem your own scripts and executable files and set them to be used in certain situations (e.x. when the VPN connection is established or at modem startup). Under User files tab there is a list of user files. It is refreshed automatically after selecting tab, it can be also manually refreshed by pressing Refresh button. To delete file, select it from the list and press Delete button. To upload file, click Upload new button. You will be redirected to separate site. Choose file by pressing Browse... button and commit your choice by clicking Upload. After upload you will be informed if the whole operation was successful or the error message will be displayed. Use link to return to the main page of www configuration. All files are stored with rights for file execution, so they can be used in scripts.

Below the file upload panel there are two fields, where you can write scripts. Startup script will be executed after startup procedure of modem and Reconfiguration script every time you click Save Configuration button in www configuration. You can write your scripts in Bash or PHP, but remember to use special header for scripts ((#!/bin/bash lub #!/usr/bin/php). You can execute uploaded user files, they are stored in /root/userfiles.

**WARNING:** Binary files uploaded to modem should be compiled for processor installed in modem!



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[www.teleorigin.com](http://www.teleorigin.com)

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Save settings

**User files**

Files upload

User files list

Refresh

Delete

Download

Select File: Wybierz plik Nie wybrano pliku

Upload

Files are stored in /root/userfiles/. You can delete files by choosing one from list and clicking Delete button

**Scripts**

Startup script

This script will be executed after boot-up procedure

Reconfiguration script


This script will be executed after reconfiguration procedure (changing settings via www configuration)



## 5.2.23 Backup and restore

Under backup and restore tab user can:

- Save/load alternative configurations
- Configure FTP client to periodically check FTP server for latest configuration
- Download/Upload backup configuration



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**Configuration**

**Backup and restore**

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### Backup and upgrade

#### Alternative configurations

**Configuration list** <<unused>>

---

Configuration name <<unused>>

Here you can save/load alternative configuration files

#### Downloading configuration from FTP

|  |   |
|--|---|
| <b>FTP configuration daemon</b>            | <input type="checkbox"/> <b>Enabled</b>   |
| <b>URL</b>                                 | <input type="text"/> <p>Please enter full FTP path to compressed configuration file, e.x. ftp://192.168.1.1/configuration.tar.bz2</p> |
| <b>Username</b>                            | <input type="text" value="65535"/>  |
| <b>Password</b>                            | <input type="password" value="*****"/>  |
| <b>Force SSL connection</b>                | <input type="checkbox"/> <b>Enabled</b><br>FTP server has to support SSL.   |
| <b>Check interval</b>                      | <input type="text"/> <p>Enter interval in seconds between FTP checks or leave the field empty to use the default value (60).</p>      |
| <b>Upload current configuration to FTP</b> | <input type="button" value="Upload"/>   |

#### Download configuration

Here you can download your current configuration for later use.

#### Upload configuration

Select File:  Nie wybrano pliku

Here you can upload previously downloaded backup to restore old settings.

## 5.2.24 Discard changes

Discard current changes in configuration which were not saved yet.

## 5.2.25 Save settings

To save your settings click save setting and wait until message will show up to confirm your configuration data was saved.

## 5.3 System logs description

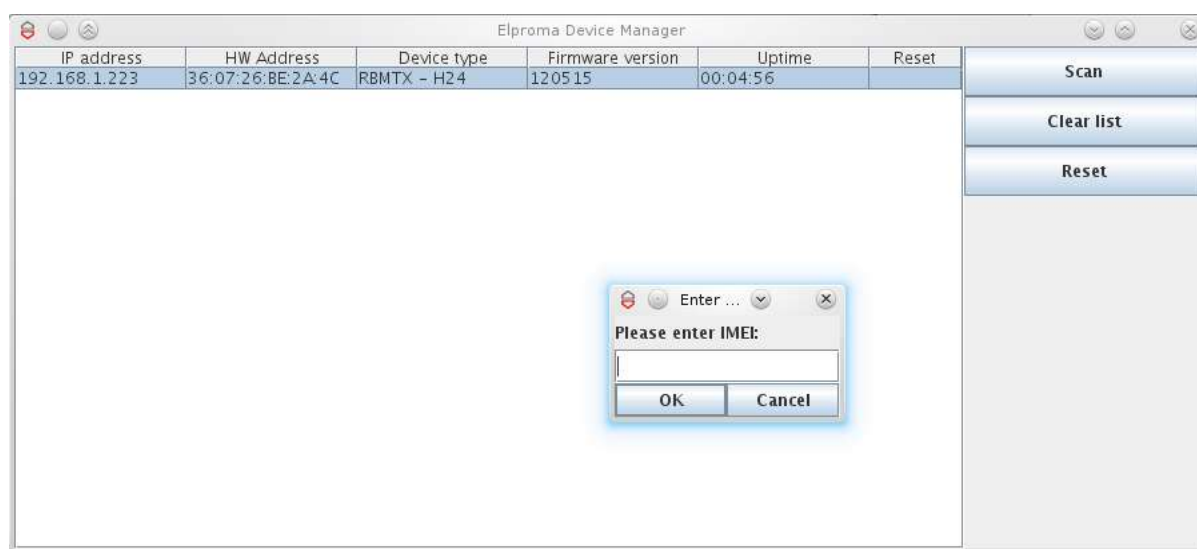
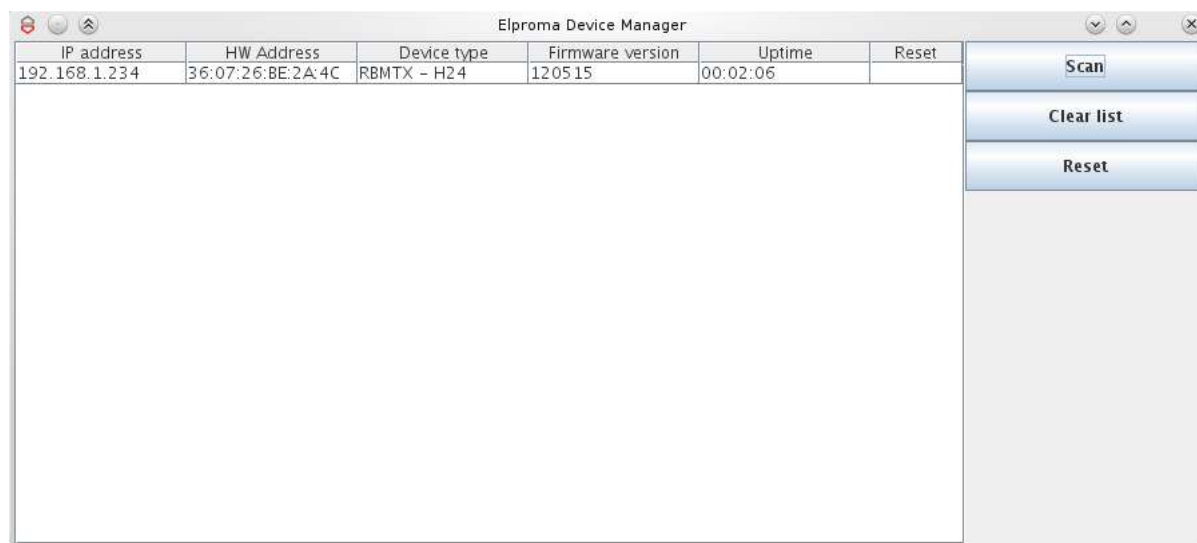
This paragraph shows structure of typical System log with some basic errors:

```
01/01/0000:00:30 rbmtx-lite syslogd 1.4.1: restart.
01/01/0000:00:31 rbmtx Start: RBMTX-Lite - FIRM:171026 – modem and firmware info
01/01/0000:00:35 rbmtx supervisor[560]: SIM Holder open/closed – SIM holder open/closed by software
01/01/0000:00:36 rbmtx supervisor[560]: Modem init 1 – first initialization try
01/01/0000:01:09 rbmtx supervisor[560]: Init /dev/ttyS1 – port initialization
01/01/0000:01:10 rbmtx supervisor[560]: Init /dev/ttyACM0
01/01/0000:01:13 rbmtx supervisor[560]: Modem is not registered on the GSM network – modem is not able to log into network
01/01/0000:01:13 rbmtx supervisor[560]: Entering Modem is ready
01/01/0000:01:13 rbmtx supervisor[560]: Entering PIN OK – modem is ready for connection
01/01/0000:01:13 rbmtx supervisor[560]: Entering PIN error code: - wrong PIN message
01/01/0000:01:14 rbmtx login[811]: unable to change tty `/dev/ttyS0' for user `root'
01/01/0000:01:14 rbmtx login[811]: ROOT LOGIN on `ttyS0'
01/01/0000:01:20 rbmtx pppd[901]: pppd 2.4.5 started by root, uid 0 – connection
01/01/0000:01:21 rbmtx chat[903]: timeout set to 2 seconds
01/01/0000:01:21 rb chat[903]: send (AT)
01/01/0000:01:21 rbmtx chat[903]: expect (OK)
01/01/0000:01:21 rbmtx chat[903]: AT
01/01/0000:01:21 rbmtx chat[903]: OK
01/01/0000:01:21 rbmtx chat[903]: send (ATZ0)
01/01/0000:01:21 rbmtx chat[903]: expect (OK)
01/01/0000:01:21 rbmtx chat[903]: ATZ0
01/01/0000:01:21 rbmtx chat[903]: OK
01/01/0000:01:21 rbmtx chat[903]: send (AT)
01/01/0000:01:21 rbmtx chat[903]: abort on (NO DIALTONE)
01/01/0000:01:21 rbmtx chat[903]: abort on (ERROR)
01/01/0000:01:21 rbmtx chat[903]: abort on (NO ANSWER)
01/01/0000:01:21 rbmtx chat[903]: abort on (BUSY)
01/01/0000:01:21 rbmtx chat[903]: expect (OK)
01/01/0000:01:21 rbmtx chat[903]: AT
01/01/0000:01:21 rbmtx chat[903]: OK
01/01/0000:01:21 rbmtx chat[903]: send (ATZ0)
01/01/0000:01:21 rbmtx chat[903]: abort on (NO CARRIER)
01/01/0000:01:21 rbmtx chat[903]: timeout set to 30 seconds
01/01/0000:01:21 rbmtx chat[903]: expect (OK)
01/01/0000:01:21 rbmtx chat[903]: ATZ0
01/01/0000:01:21 rbmtx chat[903]: OK
01/01/0000:01:21 rbmtx chat[903]: send (AT)
01/01/0000:01:21 rbmtx chat[903]: expect (OK)
01/01/0000:01:21 rbmtx chat[903]: AT
01/01/0000:01:21 rbmtx chat[903]: OK
01/01/0000:01:21 rbmtx chat[903]: send (AT+CGDCONT=1,"ip","example.apn")
01/01/0000:01:22 rbmtx chat[903]: clear abort on (ERROR)
01/01/0000:01:22 rbmtx chat[903]: send (dddATD*99#)
01/01/0000:01:23 rbmtx supervisor[560]: pppd check loop:1
01/01/0000:01:25 rbmtx chat[903]: expect (CONNECT)
01/01/0000:01:25 rbmtx chat[903]: AT+CGDCONT=1,"ip","example.apn"
```

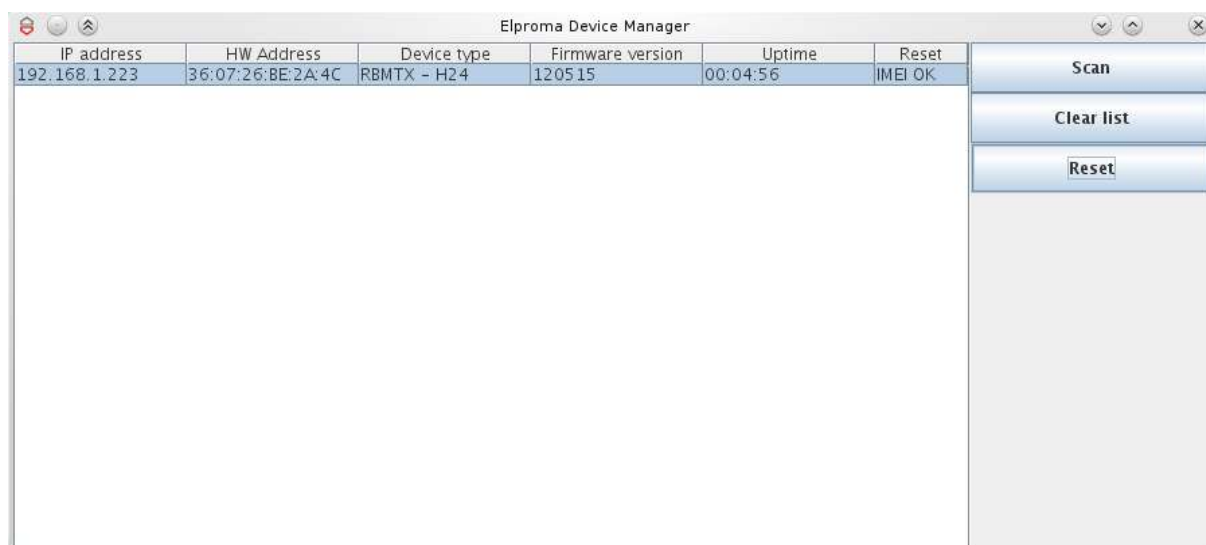
## 5.4 Elproma Device Manager

Elproma Device Manager is an application which allows you to find RBMTX-Lite modems in local area network (LAN) and then restore factory settings by entering their IMEI number. It is particularly useful when you forgot IP number of device and you can't access it by terminal on serial port.

The installation process is pretty simple-you launch .exe file and choose path where to unpack the application. The main window of program consists of table-list of devices available on your network and buttons: Scan, Clear List, Reset and About. First you need to scan the network for devices. It takes few seconds to list all the devices. Please also keep in mind that it takes a while to boot modem so it won't respond immediately after you turn it on.



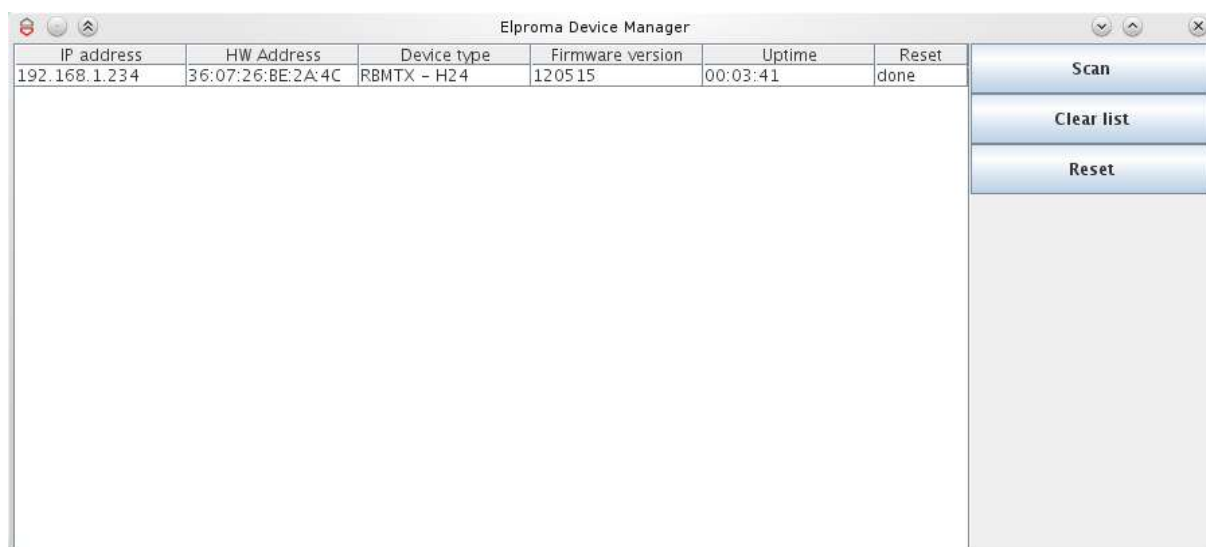
When the scan is complete you can see list of available devices in the table. You can review information like IP address, MAC address, device name, firmware version and uptime. If you want to restore factory settings on any device on the list, click the Reset button and enter IMEI. Program will send special packet to all devices, but only the one with IMEI you have entered will be affected. If the IMEI is correct and the factory settings have been restored you should see „IMEI OK" in one of cells of last column. This device will now reset to load new settings and after about 1-2 minutes it will confirm that whole operation was successful - you should see then that „IMEI OK" will change to „done".



The screenshot shows the 'Elproma Device Manager' window. It contains a table with the following data:

| IP address    | HW Address        | Device type | Firmware version | Uptime   | Reset   |
|---------------|-------------------|-------------|------------------|----------|---------|
| 192.168.1.223 | 36:07:26:BE:2A:4C | RBMTX - H24 | 120515           | 00:04:56 | IMEI OK |

On the right side of the window, there are three buttons: 'Scan', 'Clear list', and 'Reset'.



The screenshot shows the 'Elproma Device Manager' window after a reset. The table now shows the device with a 'done' status in the Reset column:

| IP address    | HW Address        | Device type | Firmware version | Uptime   | Reset |
|---------------|-------------------|-------------|------------------|----------|-------|
| 192.168.1.234 | 36:07:26:BE:2A:4C | RBMTX - H24 | 120515           | 00:03:41 | done  |

The buttons 'Scan', 'Clear list', and 'Reset' remain on the right side.

## 6 Troubleshooting

### 6.1 No communication with the modem

If there is no communication with the modem do the following steps:

- Check all external connections of the modem
- Verify if power supply is correct
- Check if TCP/IP parameters are correct
- Check if any firewall is not blocking connection with the modem

### 6.2 Modem answers but there is no internet connection

If there is no internet connection do following:

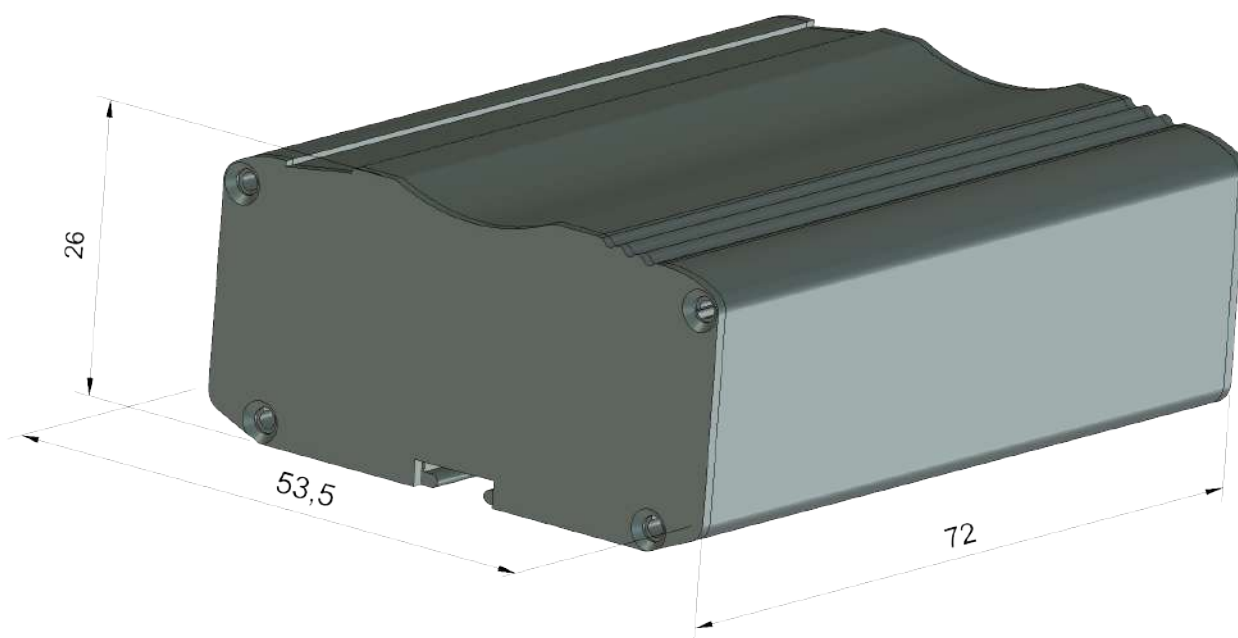
- Check if antenna is connected properly
- Check if you have reception of GPRS/UMTS/LTE signal in your area (on website of GSM provider)
- Check if you configured your modem with proper parameters provided by your network provider (they should match in order to connect to internet)
- In case you do not have internet access contact your provider in order to get internet access

## 7 Technical characteristics

### 7.1 Mechanical characteristic

|                 |  |
|-----------------|--|
| Max. dimensions | 72 x 53.5 x 26 mm (w/o connectors)             |
| Weight          | ≈90 g (only modem w/o any external connection) |
| Volume          | ≈100 cm <sup>3</sup> (w/o connectors)          |

### 7.2 Housing (dimension diagram)



### 7.3 Electrical characteristic

#### 7.3.1 Power supply

- Nominal voltage range: 9V-30V
- Maximum continuous (average) supply power: 5W
- Peak (momentary) supply current: 1A



## 7.3.2 RF characteristics

### 7.3.2.1 Frequency ranges – UMTS/HSPA variant

| Band     | Receive     | Transmit    | Unit |
|----------|-------------|-------------|------|
| EGSM900  | 925 ~ 960   | 880 ~ 915   | MHz  |
| DCS1800  | 1805 ~ 1880 | 1710 ~ 1785 | MHz  |
| UMTS2100 | 2110 ~ 2170 | 1920 ~ 1980 | MHz  |
| UMTS1900 | 1930 ~ 1990 | 1850 ~ 1910 | MHz  |
| UMTS900  | 925 ~ 960   | 880 ~ 915   | MHz  |
| UMTS850  | 869 ~ 894   | 824 ~ 849   | MHz  |



## 7.3.2.2 Frequency ranges - LTE variant

| 3GPP Band    | Transmit  | Receive   | Unit |
|--------------|-----------|-----------|------|
| EGSM900      | 880~915   | 925~960   | MHz  |
| DCS1800      | 1710~1785 | 1805~1880 | MHz  |
| WCDMA B1     | 1920~1980 | 2110~2170 | MHz  |
| WCDMA B2     | 1850~1910 | 1930~1990 | MHz  |
| WCDMA B4     | 1710~1755 | 2110~2155 | MHz  |
| WCDMA B5     | 824~849   | 869~894   | MHz  |
| WCDMA B8     | 880~915   | 925~960   | MHz  |
| LTE-FDD B1   | 1920~1980 | 2110~2170 | MHz  |
| LTE FDD B2   | 1850~1910 | 1930~1990 | MHz  |
| LTE-FDD B3   | 1710~1785 | 1805~1880 | MHz  |
| LTE FDD B4   | 1710~1755 | 2110~2155 | MHz  |
| LTE FDD B5   | 824~849   | 869~894   | MHz  |
| LTE-FDD B7   | 2500~2570 | 2620~2690 | MHz  |
| LTE-FDD B8   | 880~915   | 925~960   | MHz  |
| LTE FDD B12  | 699~716   | 729~746   | MHz  |
| LTE FDD B13  | 777~787   | 746~756   | MHz  |
| LTE-FDD B20  | 832~862   | 791~821   | MHz  |
| LTE-FDD B28A | 703~733   | 758~788   | MHz  |

## 7.3.2.3 WiFi characteristics

|                |  |
|----------------|--|
| Standards      | 802.11b/g/n  |
| Frequency band | 2.4 Ghz  |
| Output power   | 13 dBm@11n<br>17 dBm@11b<br>15 dBm@11g<br>tolerance $\pm 2$ dBm. |
| Data rates:    | up to 150Mbps  |

## 7.3.2.4 External antenna

The external antenna is connected to the modem via SMA connector.

Antenna must have parameters as shown below in table.

|                         |   |
|-------------------------|---|
| Antenna frequency range | Supporting GSM, UMTS or LTE frequencies for GSM or ISM 2.4 GHz for WIFI |
| Impedance               | 50 $\Omega$   |
| DC impedance            | 0 $\Omega$  |
| Gain                    | 0 dBi   |
| VSWR (with cable)       | -10 dB  |

The antenna chosen for working with modem should best fit to circumstances of environment it is used in. When the modem is placed in a room or somewhere where the range of networks signal is too low, the outdoor or specific indoor antenna should be used to increase it.

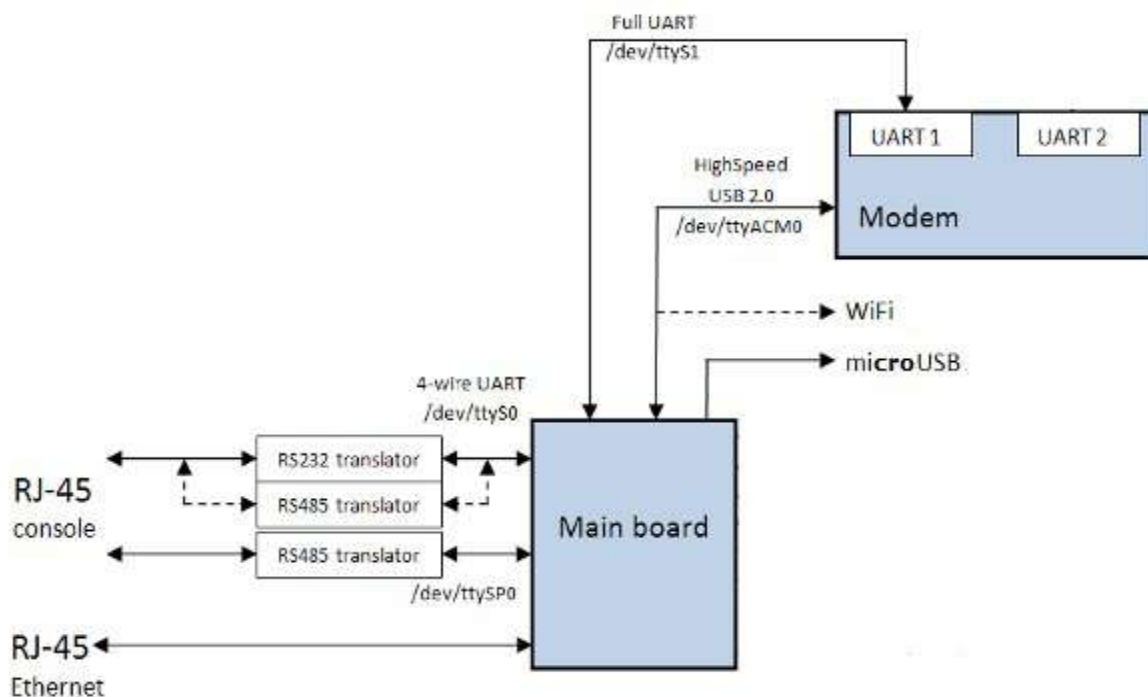
## 7.4 Environmental characteristic

**Attention!** Exceeding the values may result in permanent damage to the module.

| Parameter                     | Min | Max | Unit |
|-------------------------------|-----|-----|------|
| Ambient Operating Temperature | -20 | 60  | °C   |

## 8 Router architecture

Diagram below shows simplified architecture of RBMTX-Lite. Features marked with dotted lines are available as option



## 9 Safety recommendations

### 9.1 General Safety

Please follow safety regulations regarding the use of radio equipment due to the possibility of radio frequency interference. Read given advices carefully.

Switch **off** GSM terminal when:

- in an aircraft – using cellular telephones in aircraft may endanger the operation of the aircraft; it is illegal
- at a refuelling point
- in any area with potentially explosive atmosphere which could cause an explosion or fire
- in hospitals and any other places where medical equipment is in use

Respect restrictions on the use of radio equipment in any area or place where it is signalized that using cellular telephony is forbidden or dangerous.

Using GSM modem close to other electronic equipment may also cause interference if the equipment is inadequately protected. It may lead to damage or failure of GSM modem or the other equipment.

### 9.2 Care and Maintenance

The RBMTX-Lite terminal is a electronic product that should be treated with care.

Please follow suggestions shown below due to using modem for many years.

- Do not expose terminal to any extreme circumstances like high temperature or high humidity
- Do not keep modem in dirty and dust places
- Do not disassemble the modem
- Do not expose the modem to any water, rain or steam
- Do not drop, shake or knocking your modem
- Do not place your modem close to magnetic devices – credit cards, etc
- Use of third party equipment or accessories, not made or authorized by Elproma Elektronika Sp. z o.o. may invalid the warranty of modem and/or cause failure or permanent damage of modem
- Do not expose the modem to children under 3 years

### 9.3 Responsibility

The modem is under your responsibility. Please treat it with care, and respect local regulations. This is not a toy – keep it out of the reach of children.

Try to use security features (PIN etc.) to block unauthorized use or theft.

## 10 Accessories

The tables below shows recommended accessories for RBMTX-Lite terminal.

| Part No.      | Name                   | Description          |
|---------------|------------------------|----------------------|
| RB-PS12VP2L15 | 12V power adaptor      | <1,5m> 2 PIN         |
| RB-PSCP2L15   | Supply cable           | 2PIN <1,5m> open end |
| RB-904G       | GSM/UMTS/LTE antenna   | 2J011                |
| RB-89MSH      | SIM drawer             | MOLEX 0912360001     |
| RB-MDI        | DIN Holder             |                      |
| RB-MR2R4      | RS232/RS485 2in1 cable |                      |

### Power cable - open end



### RS232/485 cable



**DIN rail holder:**

**Velctro:**





## 11 Safety Recommendations

### **READ CAREFULLY**

Be sure the use of this product is allowed in the country and in the environment required. The use of this product may be dangerous and has to be avoided in the following areas:

- Where it can interfere with other electronic devices in environments such as hospitals, airports, aircrafts, etc
- Where there is risk of explosion such as gasoline stations, oil refineries, etc

It is responsibility of the user to enforce the country regulation and the specific environment regulation.

Do not disassemble the product; any mark of tampering will compromise the warranty validity.

We recommend following the instructions of the hardware user guides for a correct wiring of the product. The product has to be supplied with a stabilized voltage source and the wiring has to be conforming to the security and fire prevention regulations.

The product has to be handled with care, avoiding any contact with the pins because electrostatic discharges may damage the product itself. The same cautions have to be taken for the SIM, checking carefully the instruction for its use. Do not insert or remove the SIM when the product is in power saving mode.

The system integrator is responsible of the functioning of the final product; therefore, care has to be taken to the external components of the module, as well as of any project or installation issue, because the risk of disturbing the GSM network or external devices or having impact on the security. Should there be any doubt, please refer to the technical documentation and the regulations in force.

Every module has to be equipped with a proper antenna with specific characteristics. The antenna has to be installed with care in order to avoid any interference with other electronic devices and has to guarantee a minimum distance from the people (20 cm). In case of this requirement cannot be satisfied, the system integrator has to assess the final product against the SAR regulation.

1. The unit does not provide protection from lightning and surge. For outdoor installation use outdoor nonmetallic case safety approved according UL 50. Additionally you should provide protection from lightning and over voltage according National code.

2. Be sure the use of this product is allowed in the country and in the environment required. The use of this product may be dangerous and has to be avoided in the following areas: Where it can interfere with other electronic devices in environments such as hospitals, airports, aircrafts, etc. Where there is risk of explosion such as gasoline stations, oil refineries, etc. It is responsibility of the user to enforce the country regulation and the specific environment regulation. Do not disassemble the product; any mark of tampering will compromise the warranty validity. We recommend following the instructions of the hardware user guides for a correct wiring of the product. The product has to be supplied with a stabilized voltage source and the wiring has to be conforming to the security and fire prevention regulations. The product has to be handled with care, avoiding any contact with



the pins because electrostatic discharges may damage the product itself. Same cautions have to be taken for the SIM, checking carefully the instruction for its use. Do not insert or remove the SIM when the product is in power saving mode. The system integrator is responsible of the functioning of the final product; therefore, care has to be given to the external components of the unit, as well as of any project or installation issue, because the risk of disturbing the GSM network or external devices or having impact on the security. Should there be any doubt, please refer to the technical documentation and the regulations in force. Every unit has to be equipped with a proper antenna with specific characteristics. The antenna has to be installed with care in order to avoid any interference with other electronic devices and has to guarantee a minimum distance from the body (20 cm/8"). In case this requirement cannot be satisfied, the system integrator should assess the final product against the SAR regulation. The European Community provides some Directives for the electronic equipment introduced on the market. All the relevant information and the text of the Directive 2014/53/EU (RED) regarding telecommunication equipment are available at the European Commission website: [http://ec.europa.eu/growth/sectors/electrical-engineering/red-directive\\_en](http://ec.europa.eu/growth/sectors/electrical-engineering/red-directive_en)

## 12 Certifications

### 12.1 Conformity Assessment Issues

The RBMTX-Lite has been assessed in order to satisfy the essential requirements of the RED Directive 2014/53/EU (Radio Equipment Directive) to demonstrate the conformity against the harmonised standards with the final involvement of a Notified Body.



### 12.2 Declarations of conformity

The RBMTX-Lite product is in conformity with the following standards or other normative documents:

### 12.3 National restrictions

This device is intended for use in all EU countries (and other countries following the EU directive 2014/53/EU) without any limitation except for the countries mentioned below:

|        |   |
|--------|---|
| Norway | This subsection does not apply for the geographical area within a radius of 20 km from the centre of Ny-Ålesund |
|--------|---|

## 13 List of Acronyms

|       |  |
|-------|--|
| ACM   | Accumulated Call Meter                             |
| ASCII | American Standard Code for Information Interchange |
| AT    | Attention commands                                 |
| CB    | Cell Broadcast                                     |
| CBS   | Cell Broadcasting Service                          |
| CCM   | Call Control Meter                                 |
| CLIP  | Calling Line Identification Presentation           |
| CLIR  | Calling Line Identification Restriction            |
| CMOS  | Complementary Metal-Oxide Semiconductor            |
| CR    | Carriage Return                                    |
| CSD   | Circuit Switched Data                              |
| CTS   | Clear To Send                                      |
| DAI   | Digital Audio Interface                            |
| DCD   | Data Carrier Detected                              |
| DCE   | Data Communications Equipment                      |
| DRX   | Data Receive                                       |
| DSR   | Data Set Ready                                     |
| DTA   | Data Terminal Adaptor                              |
| DTE   | Data Terminal Equipment                            |
| DTMF  | Dual Tone Multi Frequency                          |
| DTR   | Data Terminal Ready                                |
| EMC   | Electromagnetic Compatibility                      |
| ETSI  | European Telecommunications Equipment Institute    |
| FTA   | Full Type Approval (ETSI)                          |
| GPRS  | General Radio Packet Service                       |
| GSM   | Global System for Mobile communication             |
| HF    | Hands Free   |
| IMEI  | International Mobile Equipment Identity            |
| IMSI  | International Mobile Subscriber Identity           |
| IRA   | Internationale Reference Alphabet                  |
| ITU   | International Telecommunications Union             |
| IWF   | Inter-Working Function                             |
| LCD   | Liquid Crystal Display                             |

|      |   |
|------|---|
| LED  | Light Emitting Diode  |
| LF   | Linefeed  |
| ME   | Mobile Equipment  |
| MMI  | Man Machine Interface   |
| MO   | Mobile Originated   |
| MS   | Mobile Station  |
| MT   | Mobile Terminated   |
| OEM  | Other Equipment Manufacturer  |
| PB   | Phone Book  |
| PDU  | Protocol Data Unit  |
| PH   | Packet Handler  |
| PIN  | Personal Identity Number  |
| PLMN | Public Land Mobile Network  |
| PUCT | Price per Unit Currency Table   |
| PUK  | PIN Unblocking Code   |
| RACH | Random Access Channel   |
| RLP  | Radio Link Protocol   |
| RMS  | Root Mean Square  |
| RTS  | Ready To Send   |
| RI   | Ring Indicator  |
| SAR  | Specific Absorption Rate (e.g. of the body of a person in an electromagnetic field) |
| SCA  | Service Center Address  |
| SIM  | Subscriber Identity Module  |
| SMD  | Surface Mounted Device  |
| SMS  | Short Message Service   |
| SMSC | Short Message Service Center  |
| SPI  | Serial Protocol Interface   |
| SS   | Supplementary Service   |
| TIA  | Telecommunications Industry Association   |
| UDUB | User Determined User Busy   |
| USSD | Unstructured Supplementary Service Data   |

## 14 On-line support

Elproma provides a range on on-line support which includes:

- the latest version of this document
- the latest drivers for RBMTX-Lite
- technical support

This information can be found on our websites at:

[www.elpromaelectronics.com](http://www.elpromaelectronics.com) or [www.teleorigin.com](http://www.teleorigin.com)

For further information You can contact us at:

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THANK YOU