# RPT_Server

## User manual

## *General information*

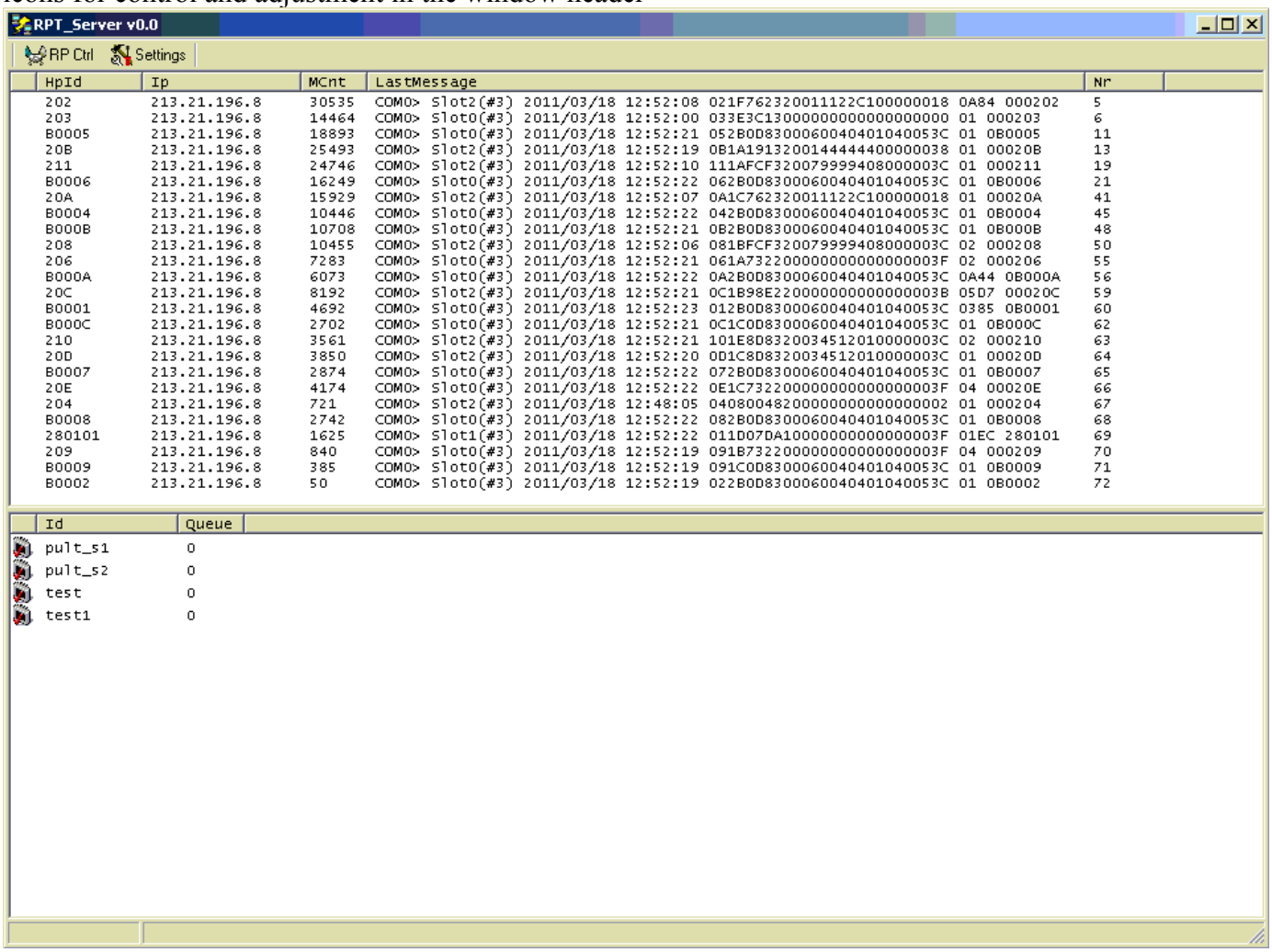
**RPT_Server** is the software, designed for processing and forwarding information from the **RP4000dm** repeaters and for managing the repeater network.

Software has the following functions:

- Receiving and processing of the information from the **RP4000dm** repeaters and it's further forwarding to the client's software.
- Flexible adjustment of information forwarding.
- Ability to remotely adjust repeater settings.
- Ability to remotely update repeater firmware.
- Ability to control repeater state.

## *Interface*

Software main window consists of two parts: repeater window and client window. There are also two icons for control and adjustment in the window header




**Pic.1 Software main window.**

Repeater window is located in the upper part of the main window. In that window is shown all the repeaters that are currently in Online status and connected to the software. For every repeater the following information is shown:

**HpID** – repeater ID.

**IP** – repeater IP-address.

**MCnt** – number of messages, received from repeater during current session.

**LastMessage** – last received message.

**NR** – session duration.

Client window is located in the lower part of the main window and contains the foolowing information:

**ID** – client ID.

**Queue** – number of messages in the queue.

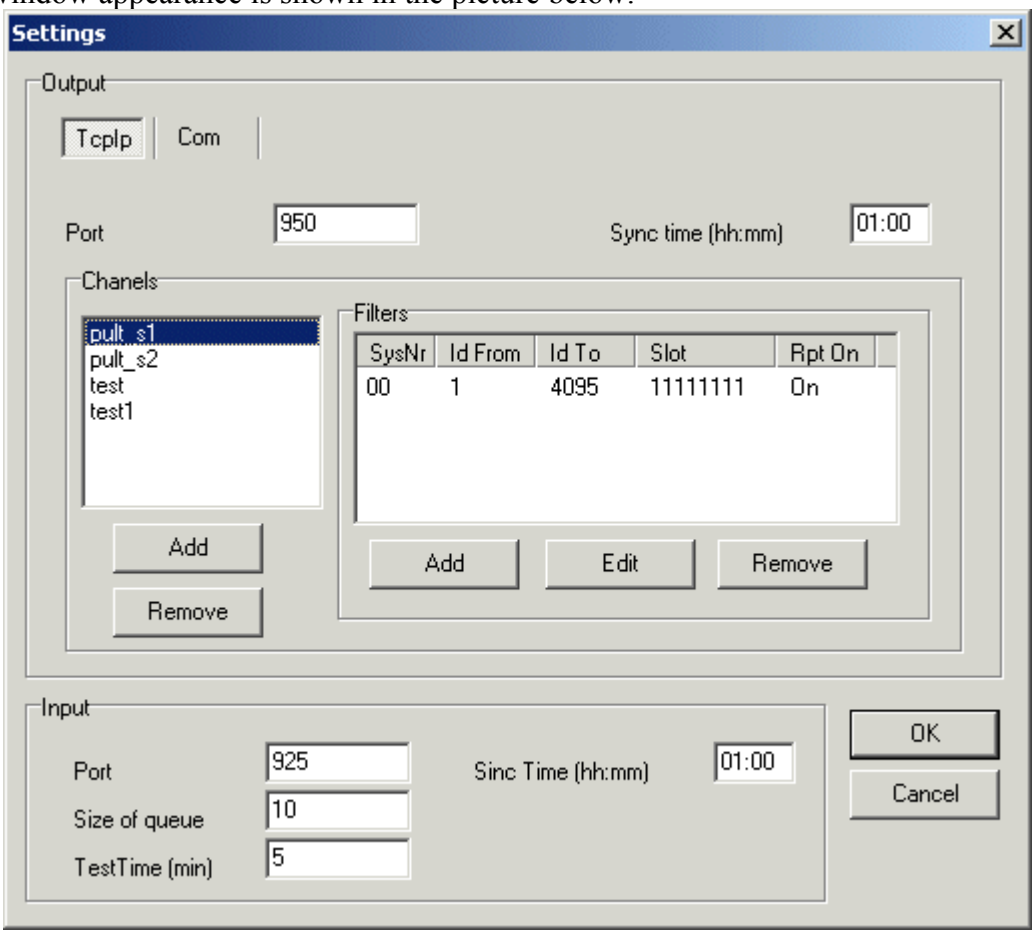
If a client is currently connected to the software, in front of it's ID is shown the symbol.

## *Software settings*

To open software settings window you have to press Settings icon.

Software settings window will open. There you can configure transmitting settings, users and assign address space.

Settings window appearance is shown in the picture below:




**Pic.2 Software settings window**

As you can see in the picture, window consists of two blocks: **Output** block, where yuo can configure client's parameters and **Input** block, where you can configure repeater information receiving paremeters.

**Output** block consists of two tabs:

**TcpIp tab** – in this tab you can configure parameters of the clients that connect to the software using IP-connection. The following parameters can be configured:

**Port** – port that is used to establish connection with the clients

**Sync time** – time synchronization period between client's computer and server software.

**Channels** – in this block new clients are added. To add a client you have to press the **Add** button and enter client's ID (any ASCII symbols).

**Filters** – in this block you can assign selected client's rights to see specified address space segments. To add a new segment you have to select user in the list and press **Add** button in the **Filters** block. Segment assignment window will appear. You can configure the following parameters there:

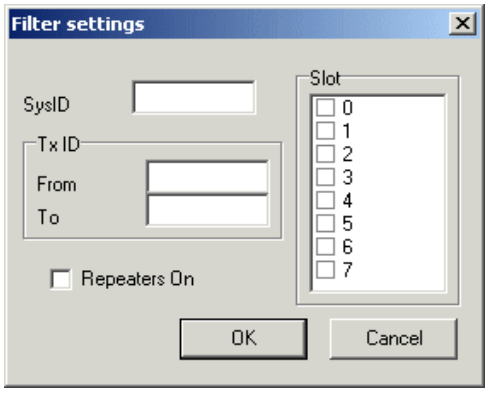
**SysID** – retranslation network ID (first two symbols of the repeater ID).

**TxID From –** segment starting address

**TxID To** – segment final address

**Slot –** repeater slot

**Repeaters on –** determines whether repeaters' own messages are transmitted or not



Pic.3 Segment assignment window

**Com tab –** in this tab are configured connection parameters that are used if client is connected to the software using computer COM port.

In this tab you have to set COM-port number, it's parameters and assign address space segments. Segment assignment process is fully identical to the one in **TcpIp** tab. In the **Input** block the following parameters are configured:

**Port** – port that is used to establish connection with the repeaters

**Size of queue –** queue size in case connection with the client will be lost

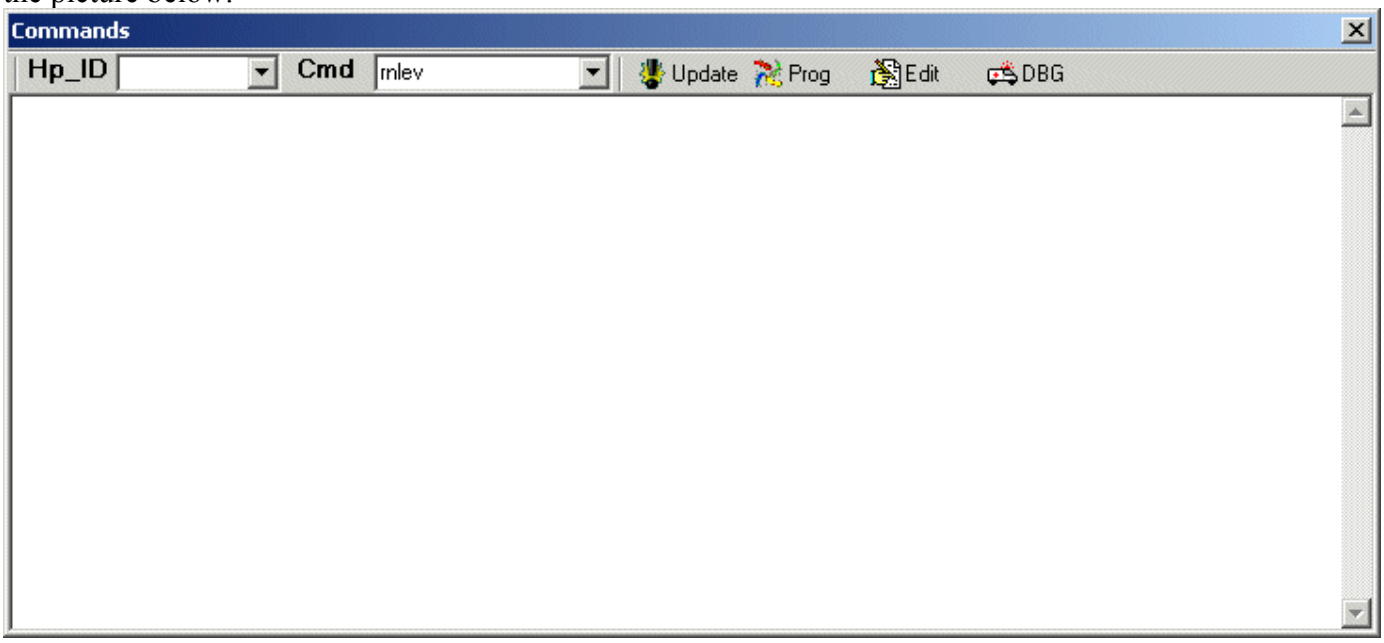
**Test time** – Test message period. Test message is formed only if during specified time period repeater transmitted at least one message.

**Sync time** – time synchronization period between repeater and server software

## *Repeater control*

After pressing the 

icon, repeater control window will open. Window appearance is shown in the picture below.



**Pic.4 Repeater control window**

## Control command sending

You can only send control commands from the software if repeater is in Online state and connected yto the software. To send a command to the repeater you have to enter repeater's ID in the **Hp_ID** field and enter command text in the **CMD** field. List of availabe command is shown below:

1. **Control commands**
   - **1.1. Configuration byte writing**
     Command **0000:wmcpeXXXX,YY** where 0000 – installer code (default - 0000), XXXX – decimal address value (0-8189), YY- decimal data byte value (0-255).
   - **1.2. Configuration byte reading**
     Command **0000:rmcpeXXXX** where 0000 – installer code (default - 0000), XXXX – decimal address value (0-8189).
     In response you will receive decimal number, that is a value of the configuration byte.
   - **1.3. Checksum update**
     Command **0000:newcs** where 0000 – installer code (default – 0000).
   - 1.4. **Repeater restart**
     Command **0000:sysres** where 0000 – installer code (default - 0000).
     Command must be executed is repeater configuration was changed.
   - **1.5. Installer code change**
     Command **0000:chmcode0000,abcd,abcd** where 0000 – old installer code, abcd – new installer code (twice).
2. **Service commands**
   - **2.1. Specialized counter reading**
     Command **rspec<ch_addr>,<countnumber>** where <ch_addr> – slot address from 1 to 8 (1 = Slot0 , 2 = Slot1 ... 8 = Slot7), <countnumber> - counter number from 1 to 4:
     1 – counter of successfully received nonrepeated messages;
     2 – counter of successfully received repeated messages;
     3 – counter of the messages with unknown address;
     4 – counter of the "bad" messages or messages with unknown mask;
     In response you will receive decimal number that is an amount of messages since repeater restart.
   - **2.2. Device working time reading**
     Command **rtos**
     In response you will receive decimal number that is device working time in hours since last restart.
   - **2.3. Channel interference level reading**
     Command **rnlev<ch_addr>** where <ch_addr> – slot address from 1 to 8 (1 = Slot0 , 2 = Slot1 ... 8 = Slot7).
   - **2.4. Radiotest imitation**
     Command **0000:rtest** where 0000 – installer code (default - 0000).
   - **2.5. Display information about current firmware version and active slots**
     Command **dicfg**
   - 2.6. **Display information about current firmware version and repeater settings**
     Command **diicfg**
   - **2.7. Display information about current network settings for Wiznet module**
     Command **dip**

For every command, besides an answer to the query (if made) there are 4 additional variants of repeater answer:

| | |
|---|---|
| **0K** | - command executed successfully |
| **ERROR 1** | - wrong command or parameters |
| **ERROR 3** | - reference to the nonexistent slot/error reading/I2C error |
| **ERROR 4** | - wrong installer code |

## Firmware update

**RPT_Server** allows you to remotely update repeater firmware. To do so you have to press Update icon, specify repeater number and installer code. After that specify route to the .**HEX** file, received from the developer.

Firmware update is possible only if repeater is in the Online state and connected to the software.

## Repeater programming

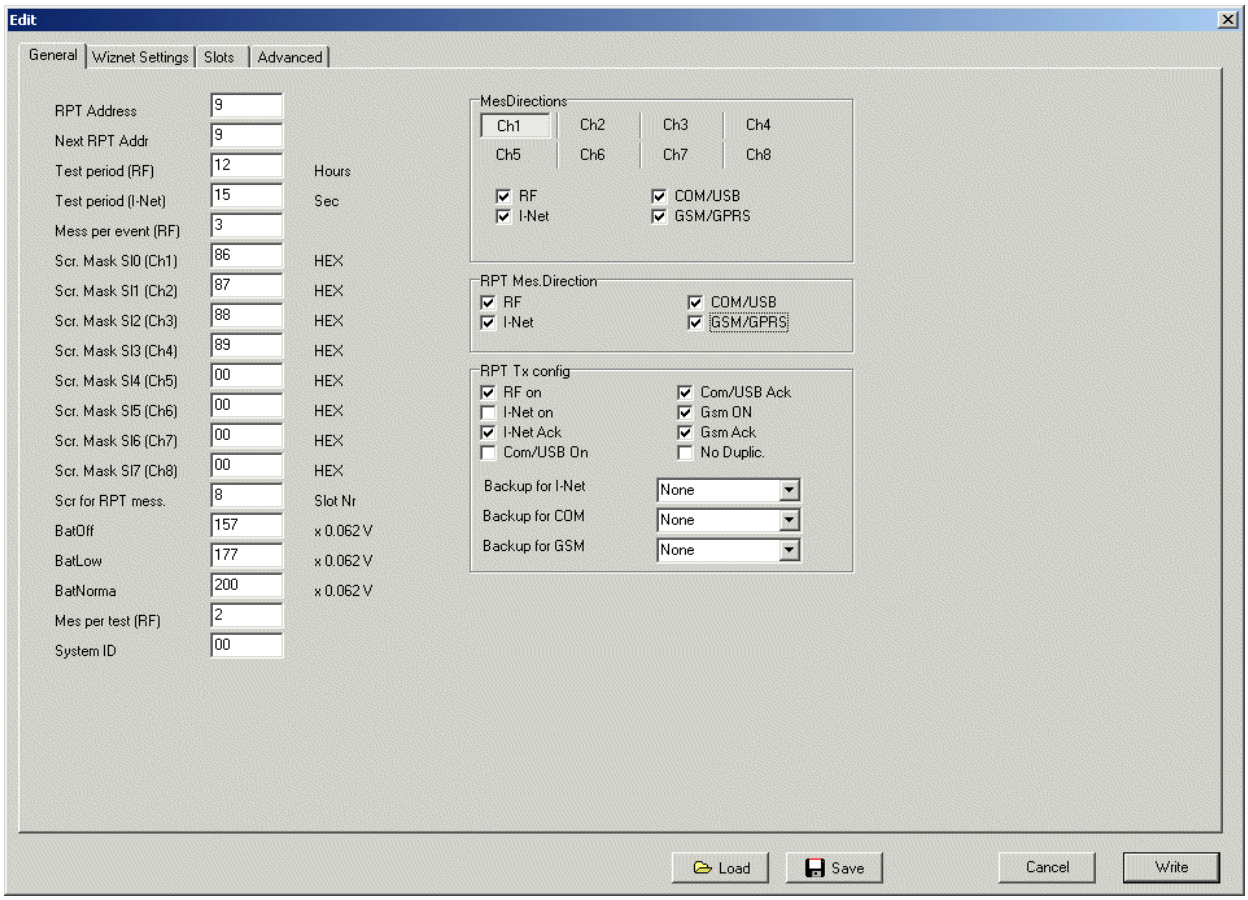
Using **RPT_Server** software you can remotely program the receiver. To do so icons Prog and Edit are used.

**Prog** icon is used to connect to a working repeater, read it's settings, it's configuration and saving the changes. During these actions repeater is excluded from the retranslation network.

**Edit** icon is used to configure parameters without direct connection to the repeater and parameter loading from existing profile.

Parameter configuration windows that are opened when icons are pressed are fully identical:

**General tab:**




In this tab are programmed repeater general settings:

**RPT Address** – repeater address

**Next RPT Address** –address of the Next repeater in chain (only for fixed repeaters)

**Test period (RF)** – test period (Radio channel)

**Test period (I-Net)** – test period (Internet connection)

**Mess. Per event (RF)** – number ot transmits for one event (Radio channel)

**Scr. Mask Sl0 (Ch1)** – scrambler mask for information transmitting via channel 1

**Scr. Mask Sl1 (Ch2)** – scrambler mask for information transmitting via channel 2

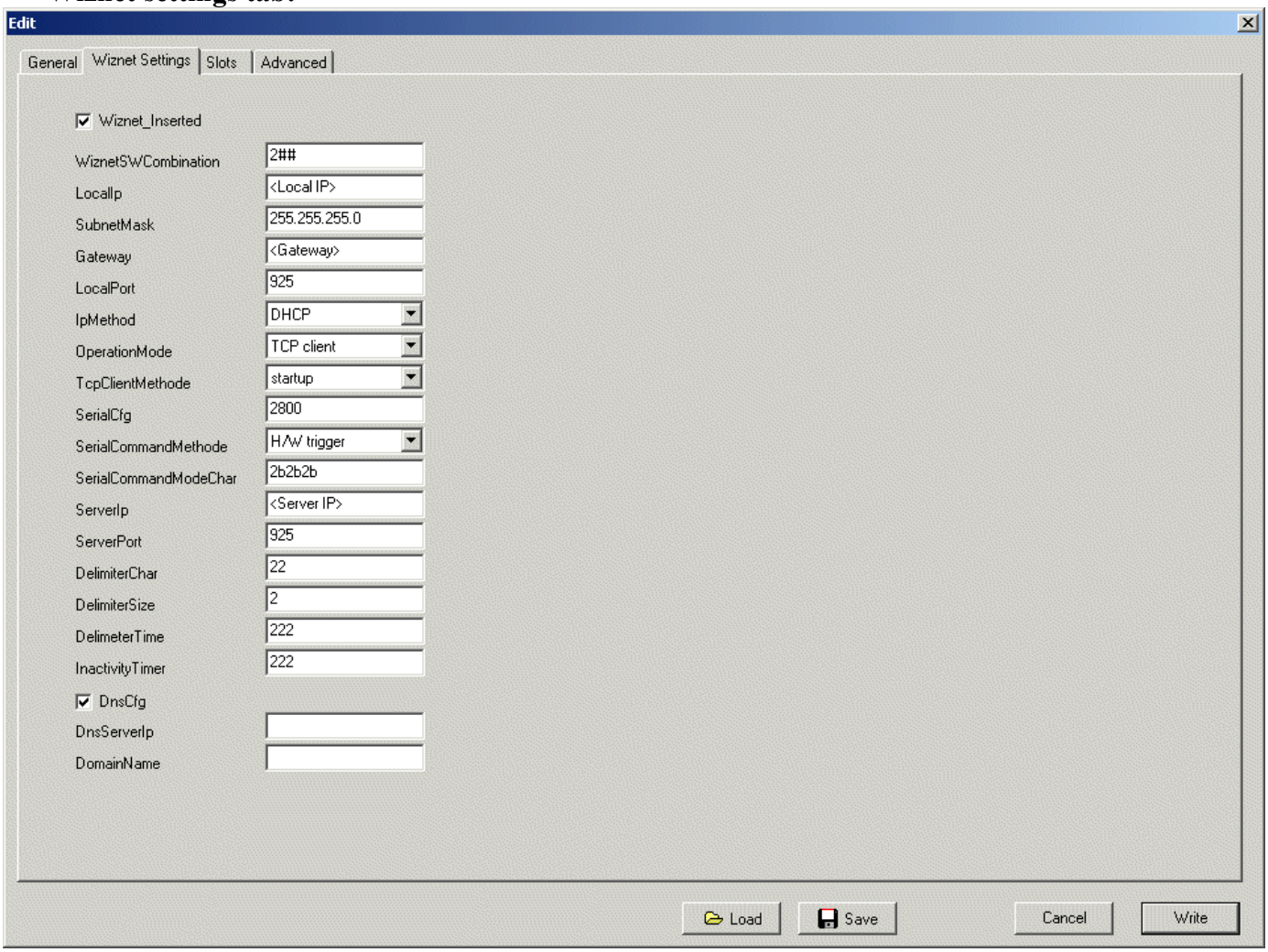
**Scr. Mask Sl2 (Ch3)** – scrambler mask for information transmitting via channel 3

**Scr. Mask Sl3 (Ch4)** – scrambler mask for information transmitting via channel 4

**Scr. Mask Sl4 (Ch5)** – scrambler mask for information transmitting via channel 5

**Scr. Mask Sl5 (Ch6)** – scrambler mask for information transmitting via channel 6
**Scr. Mask Sl6 (Ch7)** – scrambler mask for information transmitting via channel 7
**Scr. Mask Sl7 (Ch8)** – scrambler mask for information transmitting via channel 8
**Scr. For RPT mess**. – channel number for repeater own messages
**BatOff** – voltage value, when repeater stops transmitting information via radio channel
**BatLow** – voltage value, when repeater forms the "Low battery" alarm message
**BatNorma** – normal voltage value (battery restore)
**Mes Per test (RF)** – number of transmits of the test message (Radio channel)
**System ID** – retranslation network ID
**MesDirections block:**
In this block for every channel is specified how the information will be send. To choose the shannel just press **Ch1, Ch2 ... Ch8** buttons.
**RPT MesDirections block:**
In this block is specified what channel will be used to transmit repeater's own messages.
**RPT Tx Config block:**
In this block are configured main and backup channels for information transmitting.
**Attention:** One channel can only have one function. It's either main channel or backup. One backup channel cannot backup two or more main channels.
**RF on** – radio channel is set as main
**I-Net on** – Ethernet channel is set as main
**I-Net Ack** – determines if message delivery acknowledge is expected on Ethernet channel
**Com/USB on** –repeater COM/USB channel is set as main
**Com/USB Ack** – determines if message delivery acknowledge is expected on repeater COM/USB channel
**GSM on** –GSM/GPRS channel is set as main
**GSM Ack** – determines if message delivery acknowledge is expected on GSM/GPRS channel
**No Duplic.** – if active duplicated messages in the buffer will be deleted to reduce traffic (except radio channel messages).
**Backup for I-net** – backup channel for the Ethernet
**Backup for Com** – backup channel for the COM/USB
**Backup for GSM** – backup channel for the канала GSM/GPRS

**Wiznet settings tab:**




In this tab Wiznet module parameters can be programmed:

**Wiznet_Inserted** – Determines whether Wiznet module is connecter to the repeater or not

**LocalIP** – Wiznet module IP-address

**SubnetMask** – Wiznet module subnet mask

**Gateway** – Wiznet module gateway

**LocalPort** – port, used by Wiznet module to connect ot server

**IPMethod** – method of determining IP-address (static – assigned manualy, DHCP – assigned by DHCP-server)

**ServerIP** – RPT_Server IP-address

**ServerPort** – port used by server

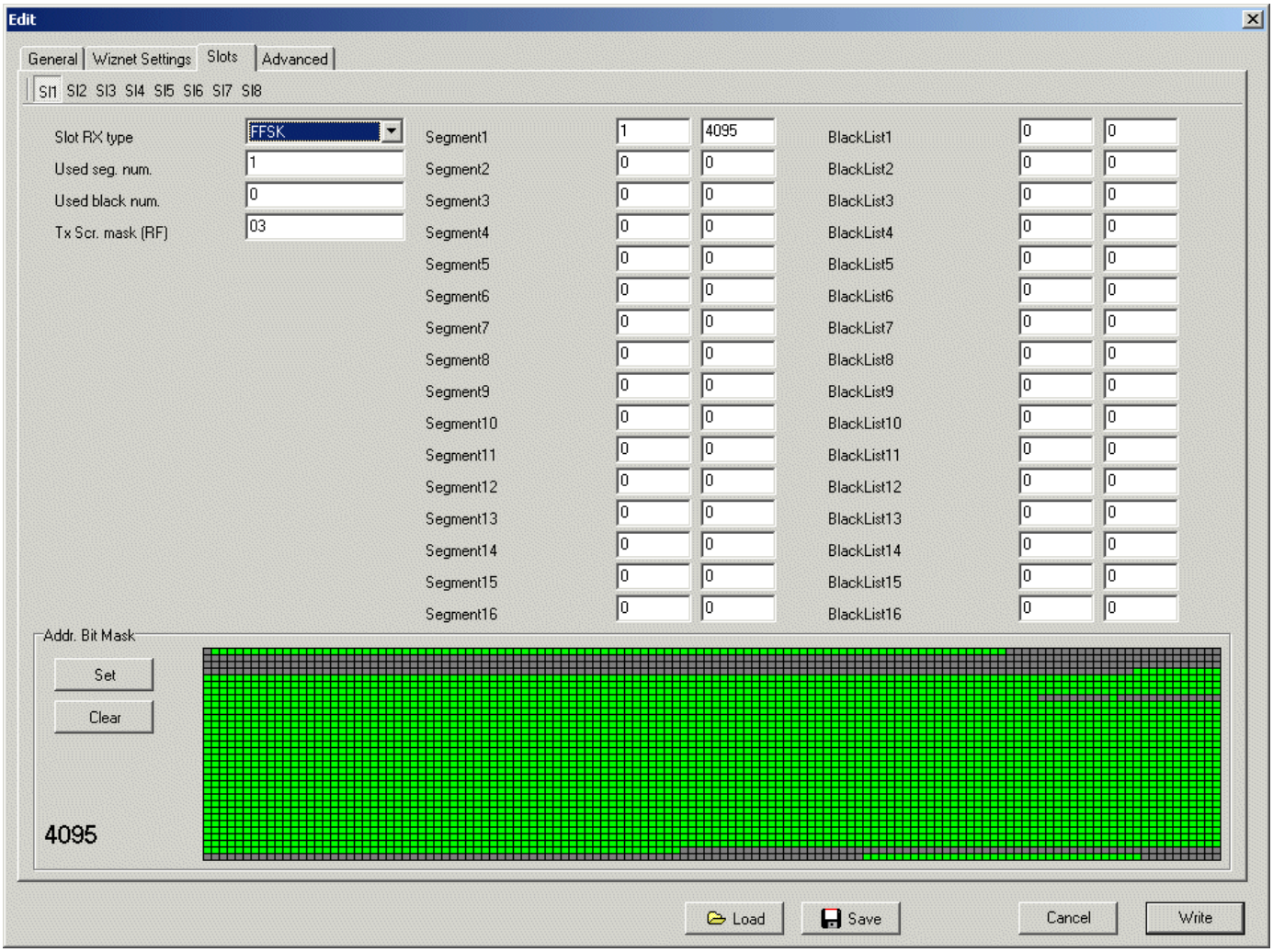
**DnsCfg** – determines if domain name is used instead of IP-address to connect to server

**DnsServIP** – DNS server IP-address

**DomainName** – domain name

Other settings are described in the Wiznet module manual and it is recommended to leave them in default state.

**Slots tab**




**Slots** tab is used to configure address space of the repeater slots.

Necessary slot can be chosen in the window upper part using **Sl1, Sl2, ... Sl8** icons. After choosing slot you can configure the following parameters:

**Slot RX type** – type of the receiver, connected to slot

**Used seg. num.** – number of used segments (starting from the first)

**Used black num.** – number of used black list segments (starting from the first)

In case if number of used segments doesn't equals to the number of assigned segments, warning window will appear.

**Tx Scr.mask (RF)** – transmitter scrambler mask

In the **Segment1 – Segment16** fields are entered starting and final addresses of the retranslated address space.

In the **BlackLict1 – BlackList16** fields are entered starting and final addresses of the ignored address space.

In the **Addr. Bit Mask** table are marked out retranslated and ignored transmitter addresses. Green color – address is retranslated, grey – address ignored.

To mark out an addres you have to select it in the table, by pressing left mouse button (they will change color to white) and press **Set** button. Or you can press **Set** button first and, in the appeared field, enter starting and final addresses of the retranslated segment, separated with the space.

To remove marking you have to select address in the table, by pressing left mouse button (it will change color to white) and press **Clear** button. Or you can press **Clear** button first and, in the appeared field, enter starting and final addresses of the ignored segment, separated with the space.

**Attention!** Data entered in the **Segment1 – Segment16** and **BlackLict1 – BlackList16** fields are summed with the data in the **Addr. Bit Mask** table. Address will be retranslated only if it is marcked for retranslation in both.

## Communication monitoring

Using this function allows you to see communication of the selected repeater with the software. To open communication monitoring window you have to press 

icon and enter repeater number.

In the opened window you will be able to see data exchange. Also, using three control buttons, you can carry out the following functions:

**Hold** – hold the displaying of data exchange
**HEX** – change encoding format from ASCII to HEX
**File** – save data exchange into the text file

## *Creating a client in the WinSC software*

To receive information from the server in WinSC software you have to do the following:

1. Assign the **RP4000dm** receiver in the software. Assigning path is – Service/receiver settings. In the opened window you have to choose free channel and in the **Receiver type** field choose **RP4000dm2**, and in the **Source** field**– File**.
2. Open **Rp4000dm.ini** file that is located in the root folder and enter there the following data:
   **Client**=1 // 1 – client on, 0 – client off.
   **Host**=<server IP-address> // server IP-address
   **Port**=<server port> // server port
   **CmdDelay**=2000 // message sending delay
   **Id=**<client name> // client name. Must be the same as set in the RPT_Server

3. Reinitialize receivers in the WinSC software. To do so enter in Service/receiver settings and press OK.