



## **Multi-channel Receiver RM10**

User manual

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## 1 Introduction

Multi-channel Receiver RM10 is designed to receive security system events from secured objects out of Ethernet network. Up to five different receiving modules can be inserted into the Receiver RM10 to receive messages sent through other communication channels. Receiver RM10 redirects received information to monitoring software in Surgard MLR2-DG protocol.

## 2 Features

- Integrated industrial computer running in Linux operating system with IPcom program to receive security control panel events out of Ethernet network
- Can receive security control panel events sent through 2 different Internet service provider (ISP) networks
- Automatically registers transmission modules and forms their list
- Automatically controls connection with transmission modules, each with individual schedule
- Up to 5 different receiving modules can be inserted to receive security panel messages sent in VHF/UHF frequency, GPRS, CSD, SMS connection or through telephone landlines
- Receiver's operating status is displayed by LED indication
- Can receive messages from modules G7, CG2, CG3, E2, GM4 (repeater RR-GSM and RR-IP), radio transmitters T7, T7U, T7M, T7MU and radio repeaters RR-VHF, RR-UHF
- Can receive data from other receivers through two RS232 serial ports
- Filter for repeating identical received messages
- Messages to monitoring software can be sent through RS232 serial port or by Ethernet connection (e.g.: through local area network (LAN))
- Messages are sent to monitoring software in Surgard MLR2-DG protocol according to the Contact ID table of codes
- USB security key, which parameters are used to grant the right of access
- Receiver RM10 is configured by using a computer operating in OS *MS Windows* environment with IPcomControl program installed

## 3 Technical Specifications

Power supply	~ 110 – 240 V (50 / 60 Hz)
Used power	60 W
Ethernet ports	2 x RJ45
RS232 data input ports	2 x DB9
Data input protocol/ encryption	TCP and UDP/ TRK
Receiver's IP addresses	2
Message flow rate	Up to 3000 messages/sec.
Installable receiving modules	5 different
RS232 data output ports	1 x DB9
Data output protocol	Surgard MLR2-DG
USB ports	4
Operating temperature	from 0 °C to +55 °C
Dimensions	19" 3U (450 x 150 x 320 mm)
Mass	≤4,5 kg

## 4 In the box

- Multi-channel Receiver RM10
- 1,5 m power supply cable
- 1,8 m COM cable
- LAN cable
- USB security key
- User Manual

## 5 Elements of the Receiver

### 5.1 Frontal view



Figure 1. Frontal view of the Receiver

Sheet 1. Light indication

Indicator	Operation
Power	LED is <b>green</b> when power supply is switched on.
System	LED is <b>green</b> when receiver is operating properly. LED is <b>red</b> when general error is indicated.
Out	LED <b>Active</b> is <b>green</b> when receiver is connected to monitoring software computer with RS232 cable (DB9/DB9). LED <b>Status</b> is <b>green</b> when connection to monitoring software is through RS232 port. With no connection, LED is <b>red</b> . LED <b>Event</b> is <b>blue</b> when a message is being sent to monitoring software.
TCP out	LED <b>Active</b> is <b>green</b> when receiver is connected to monitoring software computer with Ethernet cable. LED <b>Status</b> is <b>green</b> when there is TCP/IP or UDP/IP connection with monitoring software. With no connection present, LED is <b>red</b> . LED <b>Event</b> is <b>blue</b> when a message is being sent to monitoring software.
WAN1	LED <b>Active</b> is <b>green</b> when Ethernet cable is plugged to WAN1 port. LED <b>Status</b> is <b>green</b> when there is TCP/IP or UDP/IP connection with Wide Area Network (WAN). With no connection, LED is <b>red</b> . LED <b>Event</b> is <b>blue</b> when a message is being received through the port.
WAN2	LED <b>Active</b> is <b>green</b> when Ethernet cable is plugged to WAN2 port. LED <b>Status</b> is <b>green</b> when there is TCP/IP or UDP/IP connection with Wide Area Network (WAN). With no connection, LED is <b>red</b> . LED <b>Event</b> is <b>blue</b> when a message is being received through the port.
In1	LED <b>Active</b> is <b>green</b> when the device is connected to another receiver by RS232 cable (DB9/DB9). LED <b>Status</b> is <b>green</b> when there is RS232 connection to another receiver. With no connection, LED is <b>red</b> . LED <b>Event</b> is <b>blue</b> when a message is being received through the port.
In2	LED <b>Active</b> is <b>green</b> when the device is connected to another receiver by RS232 cable (DB9/DB9). LED <b>Status</b> is <b>green</b> when there is RS232 connection to another receiver. With no connection, LED is <b>red</b> . LED <b>Event</b> is <b>blue</b> when a message is being received through the port.
1-5	LED <b>Active</b> is <b>green</b> when a receiving module is inserted. LED <b>Status</b> is <b>green</b> when receiver's computer is communicating with receiving module. With no connection, LED is <b>red</b> . LED <b>Event</b> is <b>blue</b> when a message is being received through the port.

## 5.2 Backward view



Figure 2. View of Receiver's back panel

Sheet 2. Back panel elements

Name of the element	Function
WAN1	1 <sup>st</sup> Ethernet port RJ45
WAN2	2 <sup>nd</sup> Ethernet port RJ45
In1	1 <sup>st</sup> RS232 serial port for receiving data (Socket DB9)
In2	2 <sup>nd</sup> RS232 serial port for receiving data (Socket DB9)
Output	RS232 serial port to redirect information to computer with monitoring software (Socket DB9)
Reset	Micro-switch, which, by pressing it for more than 5 seconds, restores default parameters
100-240VAC	Power supply receptacle and <b>O/I</b> switch
	5 coverable slots for receiving modules to be inserted

## 6 Compatible receiving modules

- **RF7** – receiving module designed to receive security panel messages sent by radio VHF 146-174 MHz frequency.
- **RF7U** – receiving module designed to receive security panel messages sent by radio UHF 410-470 MHz frequency.
- **RG5** – receiving module designed to receive security panel messages sent by SMS messages or CSD connection.
- **RS232** – receiving module designed to receive messages sent by another receiver through RS232 serial port.
- **RT2** – receiving module designed to receive security panel messages sent through telephone landlines.

## 7 Preparing the Receiver for Operation

- 7.1 Lay the Receiver on clean horizontal surface. Screw out the fastening screws, take the lids off and insert the receiving modules. Receiving modules should be configured. (Fig. 2).
- 7.2 Mount the Receiver in 19" server cabinet
- 7.3 Screw on the necessary antennas.
- 7.4 Configure LAN according to figure 3.

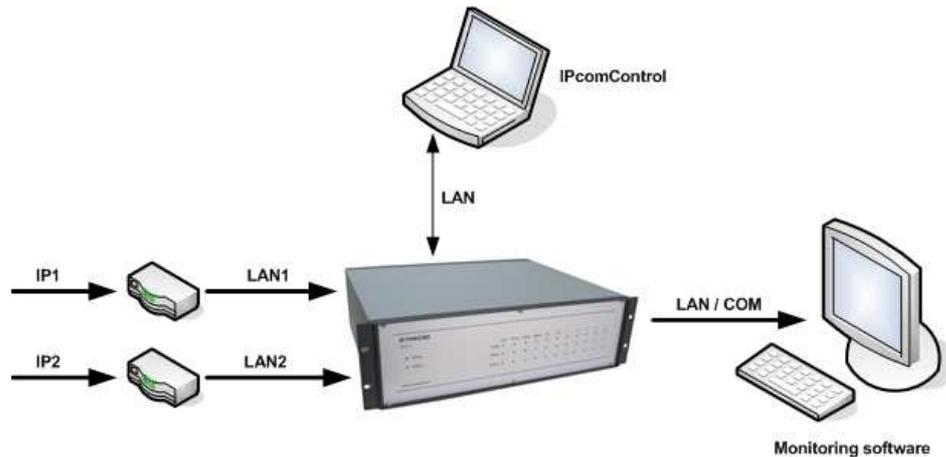


Figure 3. LAN overview

- 7.5 Turn the power supply switch **O/I** on position **O**. Connect the Receiver into power supply main by the power supply cable (Fig. 2).
- 7.6 Insert the USB security key into USB socket (Fig. 7).
- 7.7 Copy IPcomControl program file to a computer, with which you will configure Receiver RM10 (see Receiver Configuration).
- 7.8 Change the Internet address of the computer you will configure the Receiver RM10 with, to address required by the manufacturer (see Receiver Configuration).
- 7.9 Connect Receiver RM10 with a LAN cable to the computer you will configure the Receiver RM10 with (see Receiver Configuration).
- 7.10 Switch on the receiver's power supply. Turn the power supply switch on position **I** (Fig. 2). Receiver is powered when LED named "Power" is green (Fig. 1). After a sound signal the Receiver is ready for configuration.
- 7.11 Configure the Receiver RM10 (see Receiver Configuration).
- 7.12 After the required parameters are set, plug out the LAN cable from the Receiver and from the computer used for configuration, if it does not belong to a local area network (LAN).
- 7.13 Connect the Receiver RM10 with a monitoring software computer:
  - By connecting the Receiver's output RS232 port with the monitoring software computer, if messages are transferred to the monitoring software through RS232 serial port;
  - By connecting Receiver's WAN1 (WAN2) output with the monitoring software computer by a LAN cable, if messages are transferred to the monitoring software through Ethernet networks (e.g. through LAN).
- 7.14 Connect the Receiver RM10 to Ethernet network(-s):
  - Plug in the Internet cable connector to Receiver's WAN2 (WAN1) output socket. Receiver can receive messages simultaneously through both sockets, if two Internet service providers are chosen.

## 8 Receiver Configuration

Operational parameters for Multi-channel Receiver RM10 can be set and changed by a computer working in Microsoft Windows OS environment with IPcomControl program installed.

### 8.1 Change the Internet address of a computer you will use to configure the Receiver.

- Open the Network Connections window: **Start > All Programs > Accessories > Communications > Network Connections**. Select **Local Area Connection** icon and open menu by clicking it with the right mouse button. Select **Properties** in the menu (Fig. 4)

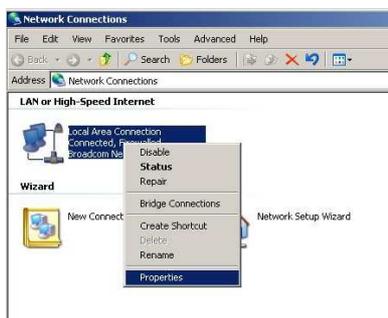


Figure 4.

- In the section of the opened window **This connection uses the following items:**, option **Internet Protocol (TCP/IP)** has to be selected (Fig. 5)

If this option is not present, press **Install...** button, select **Protocol** and press **Add...** button. Select **Internet Protocol (TCP/IP)** and press the **OK** button.

If protocol is present, it has to be selected and button **Properties** has to be pressed.

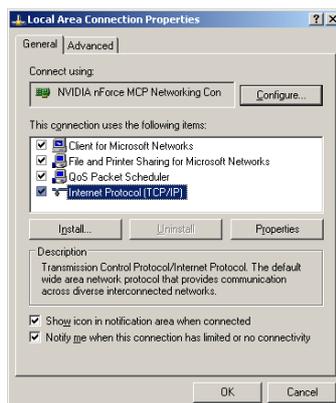


Figure 5.

- In the opened tab **Internet Protocol (TCP/IP) Properties** select function **Use the following IP address** (Fig. 6).
- Enter the new computer IP address 192.168.0.100 into **IP address** field.
- Enter the new subnet mask 255.255.255.0 into **Subnet mask** field.
- Enter the new default gateway 192.168.0.1 into **Default gateway** field.
- Press button **OK** to confirm the entered data.

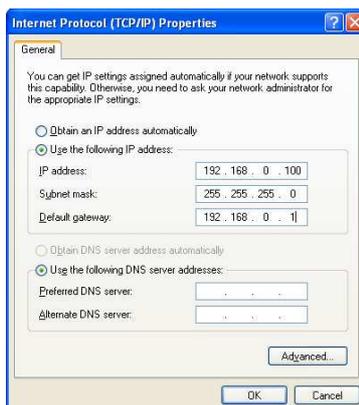


Figure 6.

- 8.2 Connect Receiver's WAN1 output to a computer with a LAN cable.  
 8.3 Insert the USB security key into the socket shown in Figure 7.



Figure 7.

- 8.4 Switch on the Receiver's power supply. Receiver is powered when LED *Power* is green. Switching the Receiver on/off is indicated by a sound signal.  
 8.5 Start the IPcomControl program by double-clicking the file. Program can be found in [www.trikdis.it](http://www.trikdis.it) site, the file has to be copied into the computer.  
 8.6 In the opened **Enter IP** window enter Receiver's default IP address 192.168.0.2 (Fig. 8) and press the **OK** button.

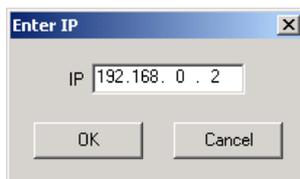


Figure 8.

- 8.7 In the **Login** window (Fig. 9) enter default password *admin*. After pressing **Login**, the program IPcomControl is started.



Figure 9.

If **Login** button is pressed without entering the password, IPcomControl program window for Security Service Operator will open (Fig. 10).

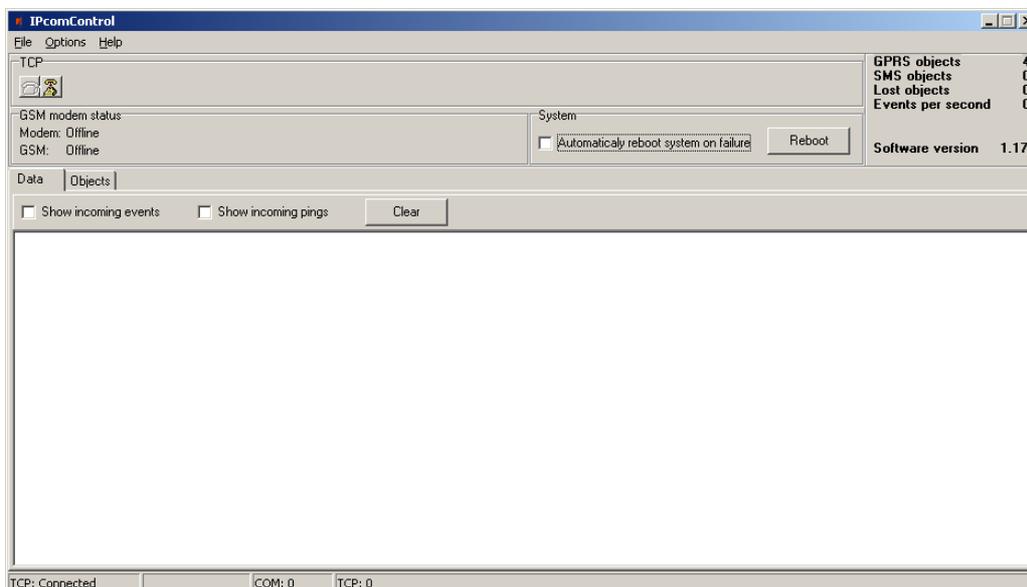


Figure 10.

8.8 In the opened window (Fig. 11), press buttons **Connect**  and **Read** .

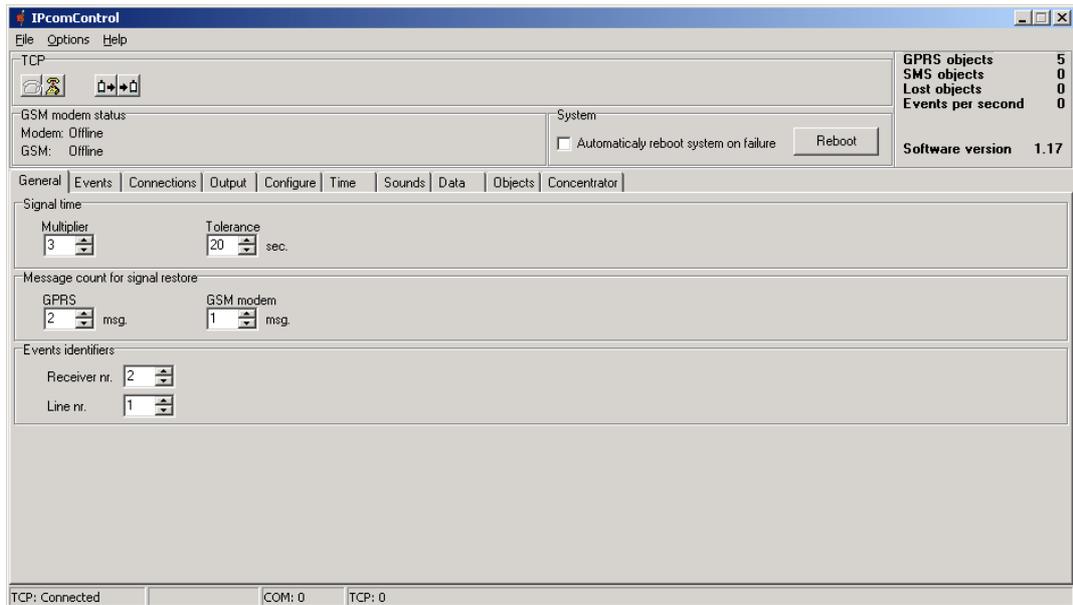


Figure 11.

- **GSM modem status.** This function is disabled.
  - If in section **System** option [Automatically reboot system on failure] is checked, when the Receiver is not working properly and the system identifies this failure, operating system will reboot itself automatically.  
Operating system can also be rebooted manually by pressing the **Reboot** button.
  - Number near the **GPRS objects** sign shows the amount of registered transmission devices which are connected to the Receiver by TCP/IP or UDP/IP protocols.
  - **SMS objects.** This function is disabled.
  - Number near the **Lost objects** sign shows the amount of registered objects, with which connection by TCP/IP or UDP/IP protocols is lost.
  - Number near the **Events per second** sign shows the rate of message flow (messages per second).
  - Number near the **Software version** sign shows Receiver's RM10 firmware version.
- 8.9 In the **General** tab (Fig. 11) signal control parameters can be set:
- In section **Signal time** set control parameters for the PING signal: [Multiplier] – 3, time adjustment coefficient [Tolerance] - 20 sec.
  - In section **Message count for signal restore** select after how many messages and/or PING signals restored connection with sending module will be indicated. Default: after receiving 2 signals through Ethernet interface [GPRS].
  - In section **Events identifiers** enter number of the Receiver [*Receiver nr.*] and its line number [*Line nr.*]

8.10 In the **Events** tab (Fig. 12) a list of various event descriptions and their message codes is displayed. It is explained in chapter 10.

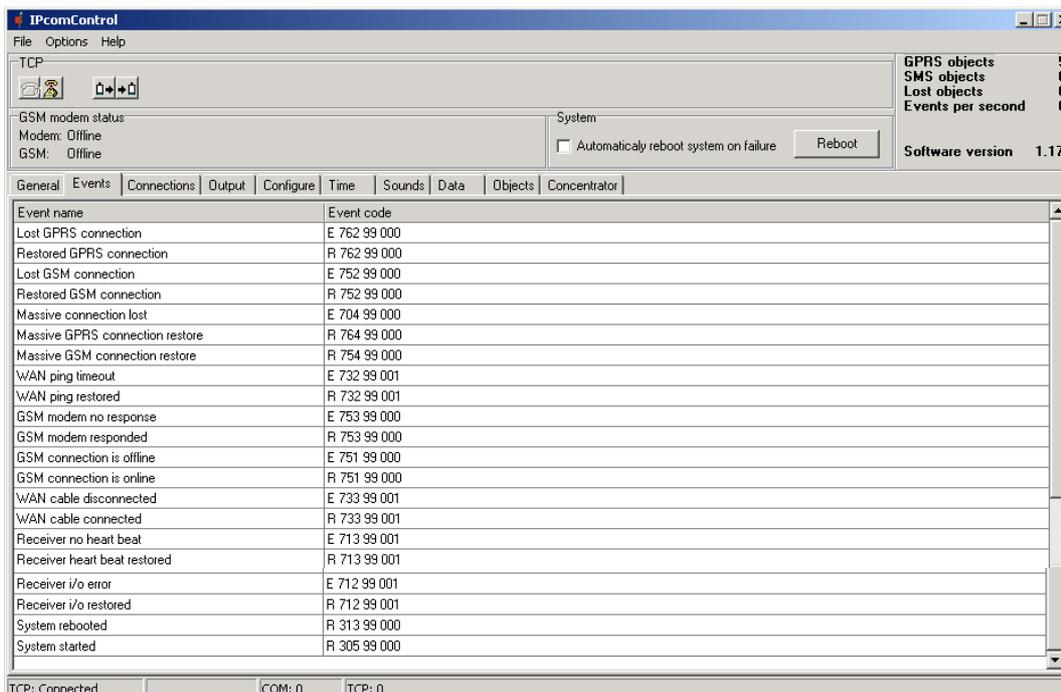


Figure 12.

8.11 In the **Connections** tab (Fig. 13) parameters for IPcom program's signal receiving ports can be set.

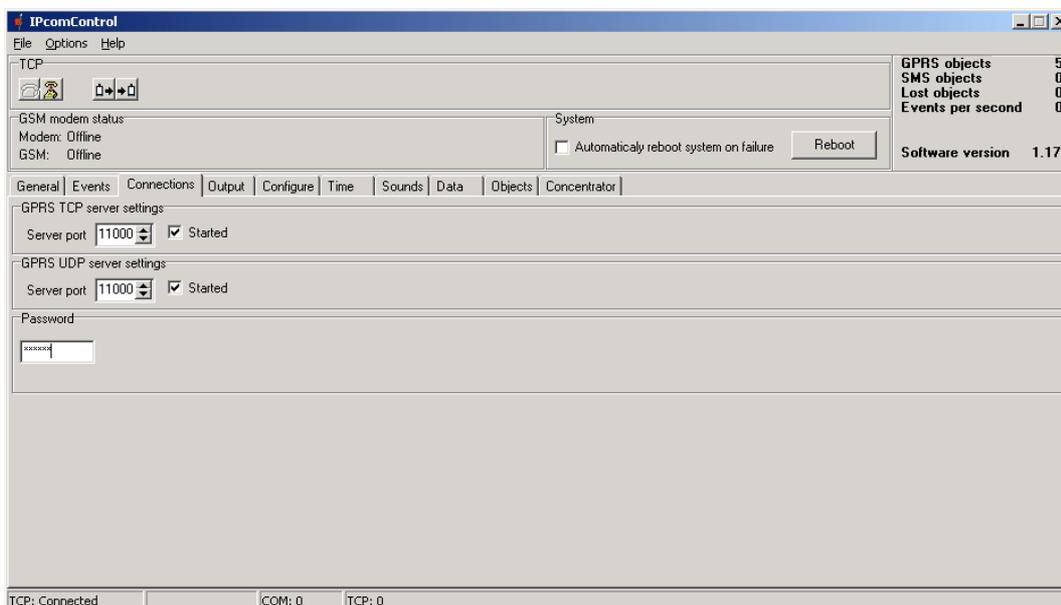


Figure 13.

- In section **GPRS TCP server settings** enter the port number [Server port], through which messages will be received in TCP protocol, and check [Started].
- In section **GPRS UDP server settings** enter the port number [Server port], through which messages will be received in UDP protocol, and check [Started].
- In section **Password** enter the 6-digit message decryption password (default 123456).

8.12 In the **Output** tab (Fig. 14) parameters for sending signals from *IPcom* program to monitoring software can be set.

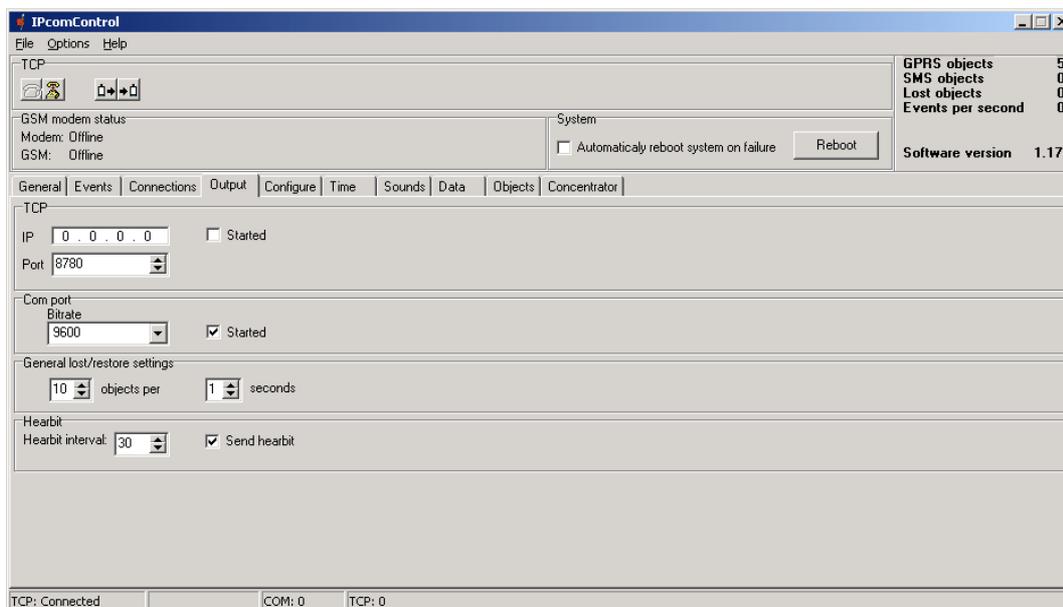


Figure 14.

- In section **TCP** enter the IP address [IP] and port number [Port number] of the monitoring software computer, if messages to the monitoring software are sent through Ethernet networks (e.g. through LAN), and check [Started].
- In section **Com port** enter the speed of data transfer [Bitrate] – 9600, if messages to the monitoring software are sent through RS232 serial port, and check [Started].
- In section **General lost/restore settings** parameters for function “create and send a message to the monitoring program, if connection is lost with a number of sending modules specified in [objects per] field during time specified in [seconds] field”.
- In element **Hearbit** enter the interval of sending the *heartbeat* signal [Hearbit interval] and check [Send hearbit].

8.13 In the **Configure** tab (Fig. 15) Receiver’s RM10 Internet addresses can be entered.

Prepare the local area network (LAN) so, that the information from Internet in TCP or UDP protocols would reach Receiver’s RM10 ports WAN1 and WAN2 [port forwarding].

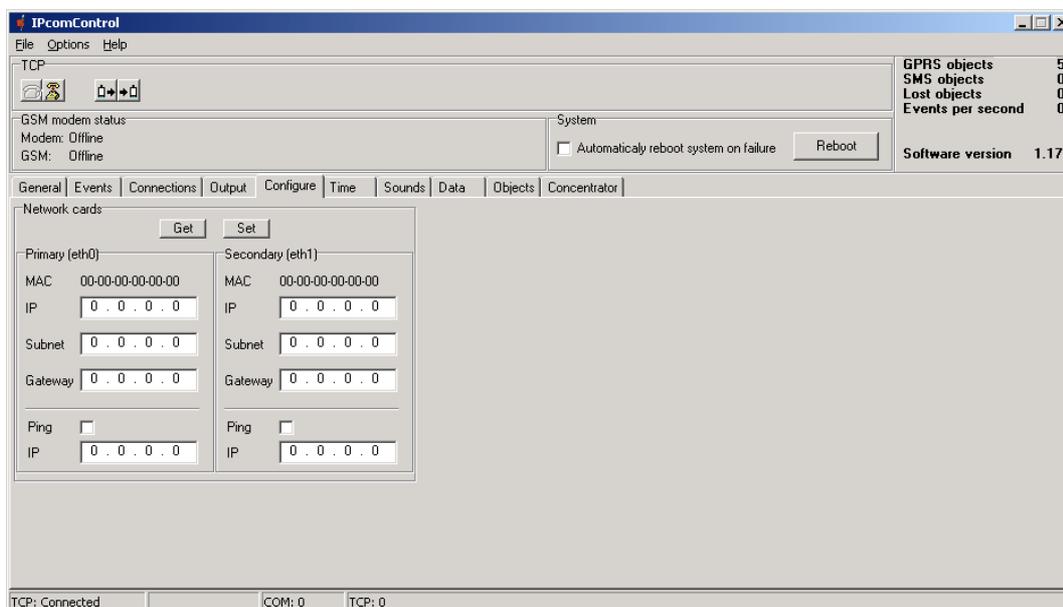


Figure 15.

- In section **Network cards** press the **Get** button and enter the addresses of first WAN1 and second WAN2 ports: IP address(-es) [IP], subnet mask(-s) [Subnet], default gateway(-s) [Gateway].  
Enter IP address(-es) [IP] of a remote server and check [PING] for controlling Receiver's connection to a Wide Area Network (WAN) via WAN1 and/or WAN2 ports.
- Press the **Set** button to apply entered parameters.

8.14 In the **Time** tab (Fig. 16) set the Receiver's clock.

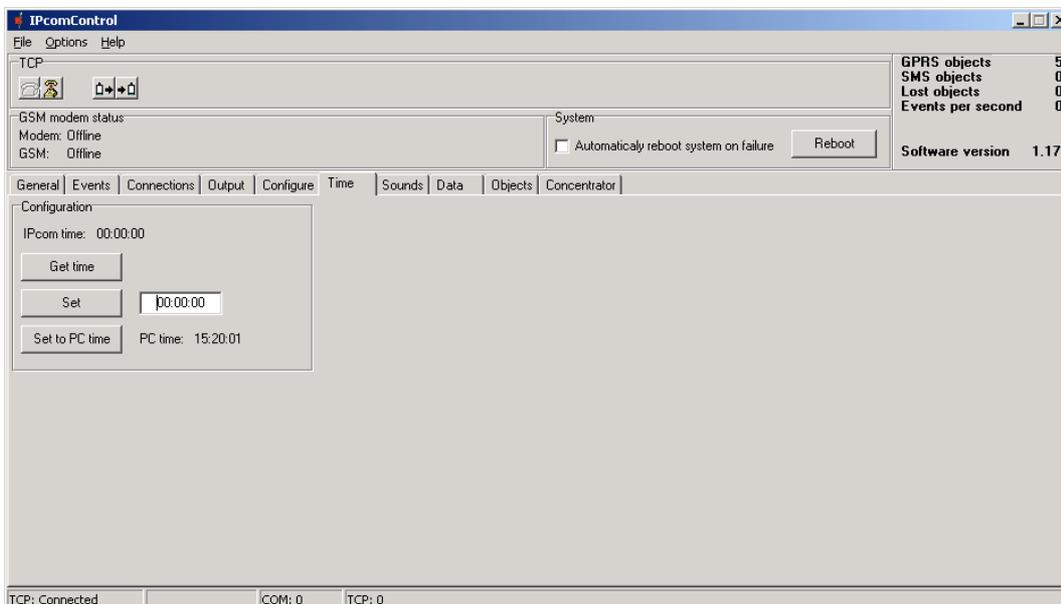


Figure 16.

- When **Set to PC time** button is pressed, Receiver's clock is synchronised with computer's internal clock.
- Different time can be set by pressing **Get time** button in the **Configuration** field and entering the required values in the field (hours:minutes:seconds). Time is set by pressing the **Set** button.

8.15 In the **Sounds** tab (Fig. 17) sound notification can be set.

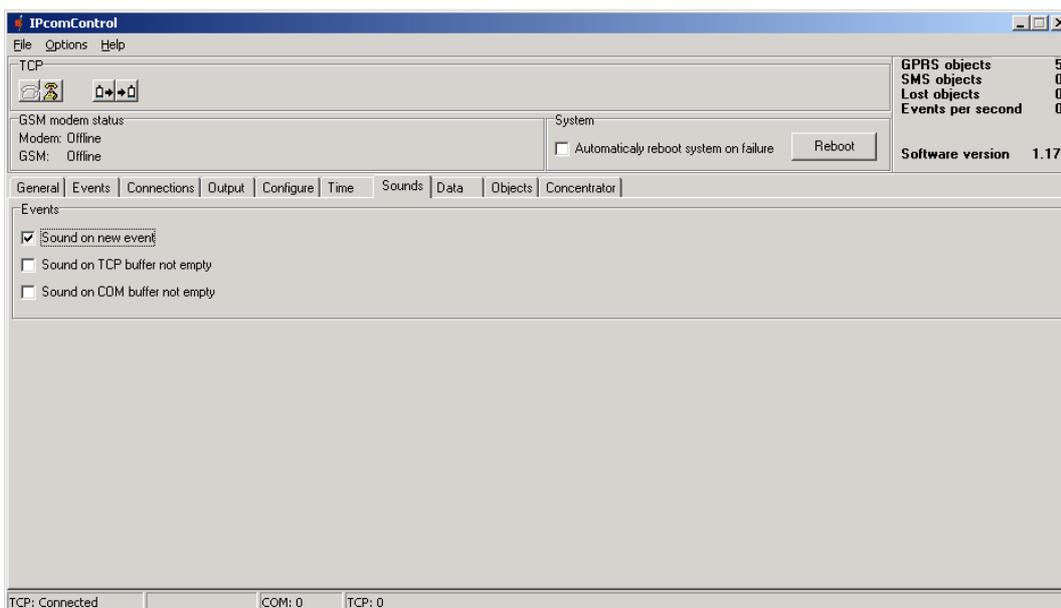


Figure 17.

- When [Sound on new event] is checked, a sound will be played when message is received.
- When [Sound TCP buffer not empty] is checked, a sound will be played when Ethernet connection is lost with the monitoring software.
- When [Sound COM buffer not empty] is checked, a sound will be played when RS232 connection is lost with the monitoring software.

8.16 In the **Data** tab (Fig. 18) received information is shown.

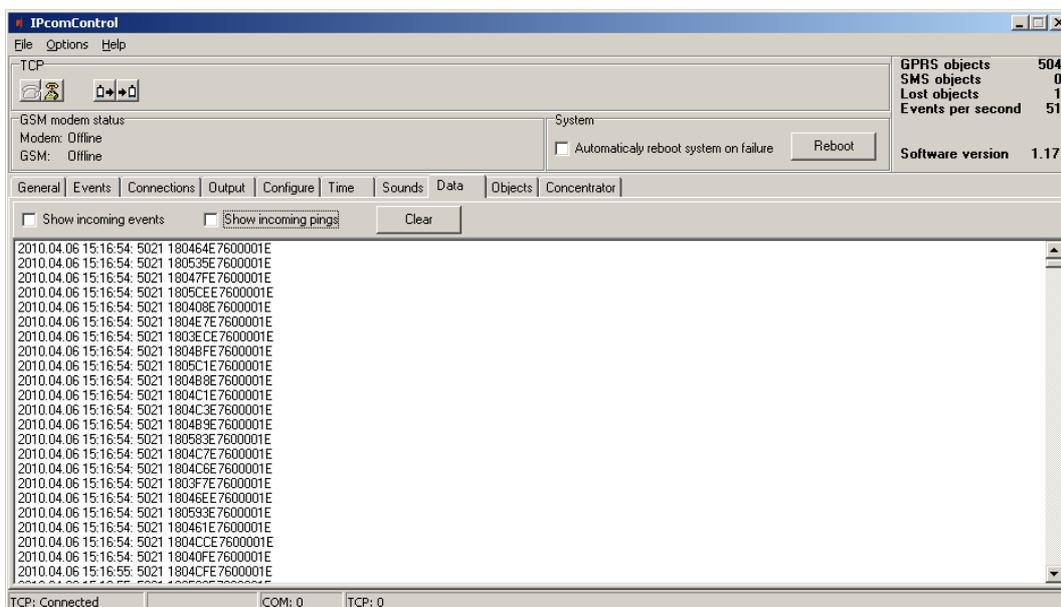


Figure 18.

- When [Show incoming events] filter is checked, only the received messages will be shown.
- When [Show incoming pings] filter is checked, only the received PING signals will be shown.
- When button **Clear** is pressed, all entries in this window are deleted.

8.17 In the **Objects** tab (Fig. 19) a list of automatically registered sending modules and their administrative information is shown.

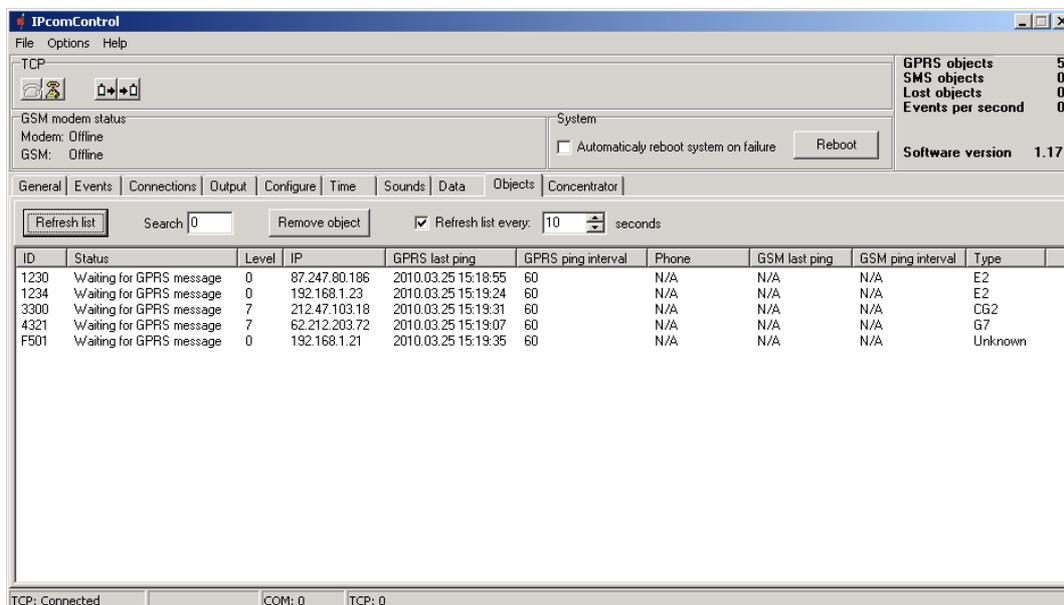


Figure 19.

- When **Refresh list** button is pressed, only the newest data is shown.
- When a 4-digit object's number is entered into the **Search** field, information about the desired object will be shown highlighted in the window.
- When a row is selected with mouse and button **Remove object** is pressed, the selected row will be deleted.
- The list is refreshed automatically only when function [Refresh list every] is checked and interval for refreshing the data list is specified in the field [seconds].

Sheet 3. Description of data types shown in **Objects** tab

Column	Description
<i>ID</i>	Object number of a particular transmitting device
<i>Status</i>	Objects Control Status ( <i>Waiting for GPRS message</i> – Receiver is waiting for PING signal being sent in TCP/IP or UDP/IP protocol).
<i>Level</i>	Level of reception between a particular transmitting device and GSM network.
<i>IP</i>	IP address of a particular transmitting device
<i>GPRS last ping</i>	Time of last PING signal or message, sent by a particular transmitting device in TCP/IP or UDP/IP protocol
<i>GPRS ping interval</i>	PING signal intervals (in seconds) of a particular transmitting device sent in TCP/IP or UDP/IP protocol
<i>Phone</i>	This function is disabled
<i>GSM last ping</i>	This function is disabled
<i>GSM ping interval</i>	This function is disabled
<i>Type</i>	Product Name of a particular transmitting device

8.18 In the **Concentrator** tab (Fig. 20) parameters for message filtering can be entered.

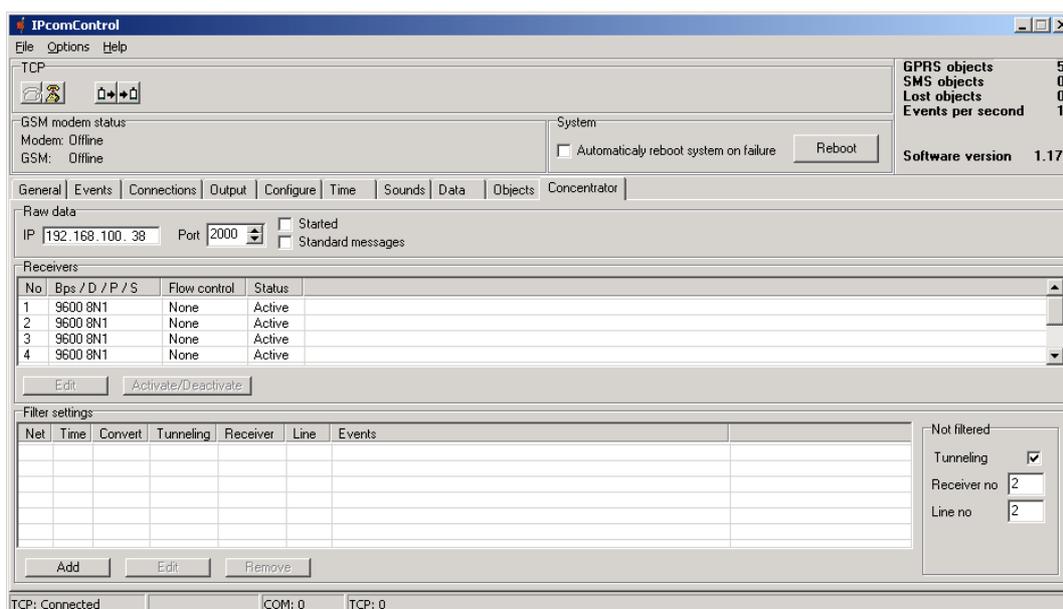


Figure 20.

- In section **Raw data** the IP address [IP] or port number [Port] should be entered for receiver to send forward the received data. Receiver will send the received data forward to specified address only when [Started] is checked. When [Standard messages] is checked, receiver will send the received messages forward according to Contact ID table of codes.
- In section **Receivers** parameters for addressee receiving ports can be entered and changed by pressing the **Edit** button. Pressing **Activate/Deactivate** button can set active or passive status of selected port.
- In section **Filter settings** parameters for message filtering can be set, when messages are received from radio system RAS-2M repeaters in TCP/IP or UDP/IP protocols. By pressing **Add** button, a new **Filter settings** window is opened (Fig. 21).

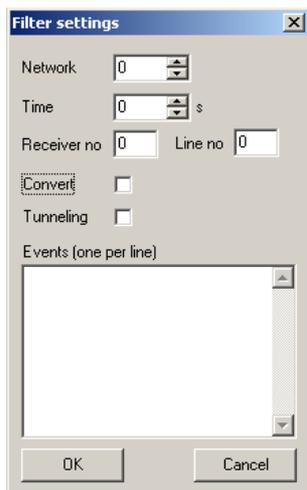


Figure 21.

- In [Network] network number is entered (1-99).
- In [Time] time of insensitivity for periodic messages is entered (in seconds).
- In [Receiver no] receiver's number is entered.
- In [Line no] line number of the receiver is entered.
- [Convert] should be checked to change the structure of messages while redirecting
- [Tunneling] should be checked to redirect messages without changing their structure
- In [Events (one per line)] special RAS-2M system event codes can be entered.
- To confirm the entered values press the **OK** button.

8.19 To enter new parameters into the Receiver's memory, press the *Write*  button.

8.20 When finished configuring the Receiver, press the *Disconnect*  button and plug out the programming cable from WAN1 socket.

## 9 Restoring primary (default) parameters

To restore primary (default) Internet addresses, press RESET micro-switch for more than 5 seconds. Operation finish is followed by a sound signal.

Sheet 4. Default Receiver's RM10 Internet addresses

	WAN1	WAN2
IP address	192.168.0.2	192.168.100.3
Port	55000	55000
Subnet mask	255.255.255.0	255.255.255.0
Gateway	192.168.0.254	192.168.100.254

## 10 Internal event code list of Multi-channel Receiver RM10

When receiver controlled circuits are changed, the Receiver creates and sends messages about events to the monitoring software.

Sheet 5. Internal event code list

Alarm Event code	Restore Event code	Events description
E 752 99 000	R 752 99 000	CSD or SMS communication with a transmission device has been lost/restored
E 762 99 000	R 762 99 000	Communication with a transmission device in TCP/IP or UDP/IP protocols has been lost/restored
E 742 99 000	-	No connection through inputs In1 and In2
E 704 99 000	-	Mass loss of connection with transmission devices (more than 10 modules per second)
-	R 764 99 000	Mass restore of connection with transmission devices in TCP/IP and UDP/IP protocols
-	R 754 99 000	Mass restore of GSM connection with transmission devices
E 732 99 001	R 732 99 001	Communication with Wide Area Network (WAN) has been lost/restored
E 753 99 000	R 753 99 000	Connection with GSM Modem has been lost/restored
E 751 99 000	R 751 99 000	GSM Modem connection to a GSM network has been lost/restored
E 733 99 001	R 733 99 001	Ethernet cable is disconnected/connected to the WAN socket
E 713 99 001	R 713 99 001	No <i>heartbeat</i> signal from the monitoring software / <i>heartbeat</i> is restored
E 712 99 001	R 712 99 001	Receiver is disconnected from power supply main / ~110 – 240 V power supply is restored
-	R 313 99 000	Receiver is rebooted
-	R 305 99 000	Receiver has started