RG-1000e Gateway Installation and Configuration Guide

November 2021

Revision History

Revision	Description	Date
2.2	The fourth release of the document. Added a schematic for the generic I/O connection cable (LAPP cable) in Pin Numberings and Interface Cable Schematics.	November 2021
2.1	The third release of the document. Updated the recommended Rx Audio settings in the following sections: • Audio Rx • Radio 1(2) Port Configuration Samples and its subsections.	September 2021
2.0	The second release of the document. Added: • RG-1000e Gateway Power Supply Requirements • Configuring Remote Access to RG-1000e Gateway • Configuring Power Supply from Control Station Modified: • General Information: updated the list of supported control stations. • RG-1000e Customer Programming Software (CPS RG-1000e) and its subsections: multiple updates and improvements. • Control Stations Configuration and its subsections: screenshots changed to MOTOTRBO CPS 2.0. • Configuring SmartPTT Radioserver Settings and its subsections: updated to match SmartPTT 9.9. • Radio 1(2) Port Configuration Samples and its subsections: updated recommended Rx Audio settings. • Various enhancements.	September 2021
1.0	The initial release of the document.	March 2020

Contents

About This Document

This user guide describes the purpose, characteristics, functioning principles, setup and configuration of RG-1000e Gateway. This guide is intended for engineers responsible for installation and maintenance of SmartPTT dispatch system and MOTOTRBO equipment.

It is assumed that users responsible for setting up RG-1000e Gateway are familiar with the following:

- The principles of building IP networks and radio networks.
- SmartPTT software developed by Elcomplus.

WARNING
Read this guide before you start using RG-1000e. Improper testing, operation, maintenance, installation, alteration, modification, or adjustment will void RG-1000e Gateway warranty.

Disclaimer

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1 General Information

RG-1000e Gateway is used in SmartPTT dispatch systems to provide remote control for MOTOTRBO control station(s) or radios through SmartPTT Radioserver (hereafter referred to as radioserver) in the corporate IP network or on the Internet. It must be used with the following MOTOTRBO Radios:

- EMEA region: DM46**e, DM44**e, DM46**, DM44**, DM2600
- APAC region: XiR M86**i, XiR M86**, XiR M6660
- NA region: XPR 55**e, XPR 55**, XPR 53**, XPR 2500
- LATAM region: DGM 8500e, DGM 5500e, DGM 8000e, DGM 5000e, DEM500

RG-1000e Gateway can be used for connecting any radios to SmartPTT Radioserver or SmartPTT Express Server to provide basic voice exchange between dispatch consoles and talkgroups of the connected radio networks (I/O mode).

RG-1000e Gateways interact with SmartPTT Radioserver or SmartPTT Express Server that is used for controlling radios connected to RG-1000e Gateway. For establishing IP network connection, RG-1000e Gateway is equipped with the 10BASE-T/100BASE-TX Ethernet interface with cable type autodetection. To provide interaction between the system components, RG-1000e Gateway and Radioserver are assigned static IP addresses and TCP and UDP/RTP port numbers. They are used for sending radio control commands and audio transmissions from the dispatch console.

RG-1000e Gateway can be used in the following cases:

- As a remote dispatcher's workplace outstation in digital networks without repeaters (Direct Mode communication).
- In conventional or trunked MOTOTRBO networks where direct IP connection to repeaters is unavailable.
- In conventional or trunked non-MOTOTRBO networks where RG-1000e Gateway is connected to control stations and/or repeaters using GPIO lines.

RG-1000e Gateway offers the following advantages:

- You can organize a dispatch system in networks where direct connection of the dispatch system to MOTOTRBO repeaters via IP network is unavailable.
- You do not have to install the radioserver in close proximity to the control stations within the radio network coverage area.
- You can avoid interference and induced noise between control stations located close to each other.

When planning the system, account for packet delivery delay in the IP network that leads to a corresponding delay in radio responses to control commands and voice calls.

1.1 Technical Specifications

RG-1000e Gateway technical specifications are listed in the tables below.

Network interface parameters

Connector	8P8C
Standard	10BASE-T (IEEE 802.3) / 100BASE-TX (IEEE 802.3u)
Supported TCP/IP protocols	UDP, ICMP, IPv4, ARP
Operation mode (auto-selection)	Transmission rate: 10/100 Mbps
	Operation mode: duplex/half-duplex
	Cable type: Auto-MDI/MDI-X

Radio interface parameters

Number of ports for radio connections	Two ports (can be used simultaneously and independently from each other)
Voice ADC-DAC conversion	768 kbps (48 kHz x 16 bits) PCM, duplex
Frequency band of voice channel	20–3600 Hz
VoIP codec	64 kbps (G711 A-Law/Mu-Law), 128 kbps (PCM linear)
Transport protocol of control channel	UDP and TCP
Required bandwidth for control channel	~15 kbps for each IP connection
Transport protocol of voice channel	UDP and RTP
Required bandwidth for VoIP channel	~128 kbps for each IP connection using G711 A-Law/Mu-Law codec, ~256 kbps for each IP connection using PCM linear VoIP codec
Time delay/latency (radioserver <-> RG-1000e)	Up to 1250 ms one way (2500 ms two way)

Support of radio operation modes

MOTOTRBO radio models	EMEA region: DM46**e, DM44**e, DM46**, DM44**, DM2600

	APAC region: XiR M86**i, XiR M86**, XiR M6660 NA region: XPR 55**e, XPR 55**, XPR 53**, XPR 2500 LATAM region: DGM 8500e, DGM 5500e, DGM 8000e, DGM 5000e, DEM500
Radio operation modes	Digital Mototrbo / Analog MOTOTRBO mode I/O mode (connection to any radios/repeaters over GPIO lines; only talkgroup voice exchange; data transmission and call metadata unavailable) Bridge mode (without using SmartPTT)
MOTOTRBO network topologies	Talkaround mode Single repeater Multisite conventional network (IP Site Connect) Single site trunked network (Capacity Plus) Multisite trunked network (Linked Capacity Plus, Capacity Max)

Power supply

Supply voltage	11–15 VDC, power can be supplied via Power socket and/or Radio1/Radio2 socket
Power consumption	200 mA or less

Design

Dimensions	180 x 144 x 30 mm
Ethernet connector	8P8C (8 pins)
Radio connector	3M 10126-*** jack (26 pins)
Power connector	Phoenix Con PTSM 0.5-3 (3 pins)
Audio connector	Phoenix Con PTSM 0.5-2 (2 pins)
PC connector	USB mini-B jack (4 pins)

Protective earth	M4 screw

Operating conditions

Operating temperature range	–20 to +60 °C (–4 to 140 °F)
Relative humidity	Up to 85 % at 30 °C (86 °F)
Operating hours	24/7

Control terminal

Interface port local	USB 1.0 (12 MBps), Device port
Remote network connection (requires RG-1000e firmware R3.0 or later)	8P8C, 10BASE-T (IEEE 802.3) / 100BASE-TX (IEEE 802.3u), UDP, ICMP, IPv4, ARP
Software	RG-1000e Customer Programming Software (CPS RG-1000e)

1.2 Delivery Set

The RG-1000e Gateway delivery set includes the following components:

- RG-1000e Gateway — 1 pcs
- FTP5E cable, 2 m (6.56 ft) — 1 pcs
- DC power cable — 1 pcs
- Mounting kit:
  - bracket — 2 pcs
  - M3x6 screw — 4 pcs
  - M5x10 screw — 2 pcs
- USB cable A-miniB, 1 m — 1 pcs.

Radio interface cables are purchased separately. For information on prices and availability of radio interface cables, contact Elcomplus LLC representatives in your region.

1.3 RG-1000e Gateway Sockets and Indicators

This section describes the front and rear panels of RG-1000e Gateway, as well as their buttons, sockets and indicators.

RG-1000e Gateway Front Panel

Fig. 1. RG-1000e Gateway Front Panel

On the front panel, the following buttons and indicators are available:

POWER

The power on/off button.

RADIO 1, RADIO 2

LEDs that indicate the status of the corresponding radio interface:

- Constantly on—the interface is locked for one of the following reasons:
  - The radio is not ready (for example, it has no power supply or the radio is turned off).
  - Connection to IP channels is not established.
- Flashing at one-second intervals—the interface is ready, but the control terminal is not connected to the IP channel.
- Off—the interface is ready, at least one control terminal is connected.
- Flashing—data transmission through the interface is in progress.

LINK

LED that indicates the status of the Ethernet link:

- Flashing at one-second intervals—waiting for connection.
- Constantly on—Ethernet connection is established.

RG-1000e Gateway Rear Panel

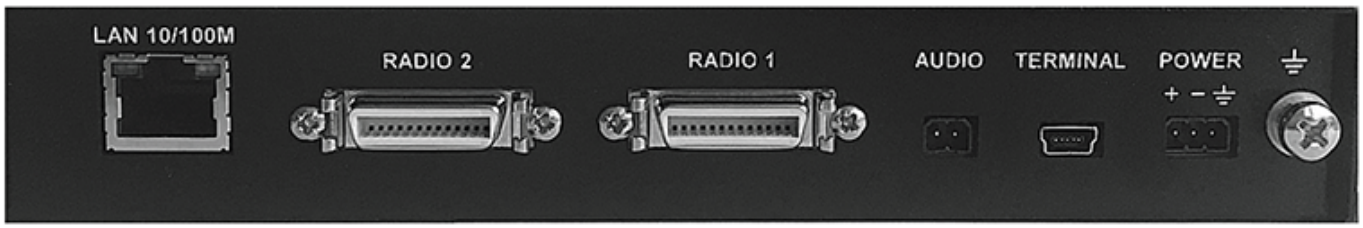


Fig. 2. RG-1000e Gateway Rear Panel

On the back panel, the following sockets are available:

LAN 10/100M

Ethernet socket for connection to the IP network. The socket has a green and a yellow indicators. Their behavior indicates the following statuses:

- Both indicators are off—Ethernet connection is not established.
- Green indicator is constantly on or flashing—Ethernet connection is established.
- Yellow indicator is constantly on—duplex mode is active.
- Yellow indicator is off—half-duplex mode is active.

AUDIO

Socket for an external audio recorder.

RADIO 1, RADIO 2

Sockets for control station connection. For information on pin numbering, see Pin Numberings and Interface Cable Schematics.

TERMINAL

USB Mini Type-B socket for connecting to a PC and configuring RG-1000e Gateway.

POWER

Power supply socket (11-15 VDC).

GND (⏚)

Grounding screw (M4).

2 Examples of RG-1000e Use

This chapter provides a brief overview of the modes of operation that RG-1000e Gateway supports. It also provides diagrams of possible radio network topologies built using RG-1000e Gateway.

2.1 Conventional Mode

The figures below show examples of building a system using control stations in Conventional Mode. In these examples, RG-1000e Gateway manages two control stations that operate on their individual frequency channels and can be programmed to operate in digital or analog mode.

For purposes of working with both time slots of the repeater simultaneously, the examples in this section show two control stations. One of them is programmed to operate on the first time slot and the other on the second. If dispatchers need to operate on more than two frequency channels simultaneously, more RG-1000e Gateways can be connected to the radioserver.

In digital mode, control stations can receive data from subscribers (ARS, GPS, TMS, etc.), transmit control commands to subscribers, and send and receive voice. In analog mode, control stations support only voice exchange with subscribers.

Control stations can be programmed to operate on multiple channels. They can switch to the desired channel on command from a dispatch console.

To transmit and receive subscriber voice calls, control stations must belong to the same talkgroups as the subscribers.

Private calls between subscribers will not be received by control stations and consequently will not be transmitted to the radioserver and dispatch consoles.

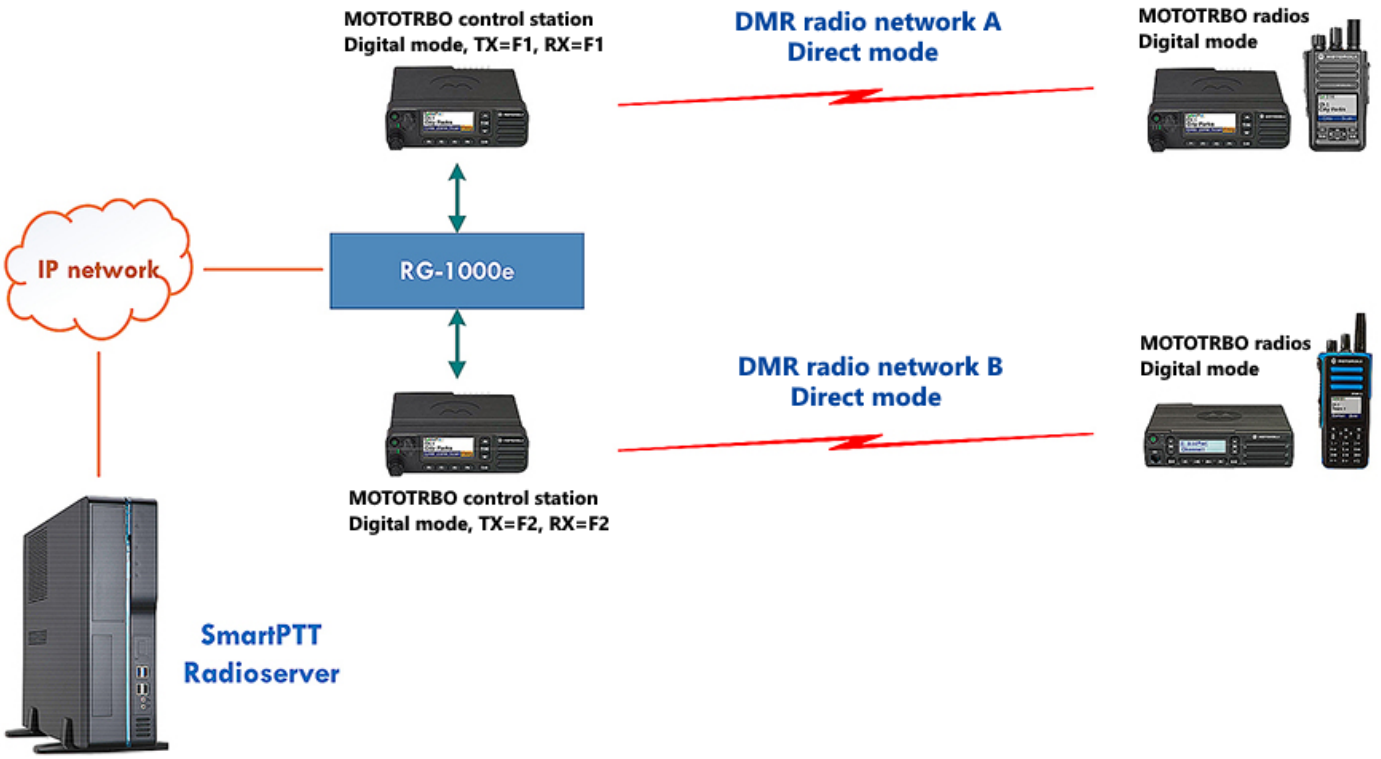


Fig. 3. Conventional Mode (Digital)

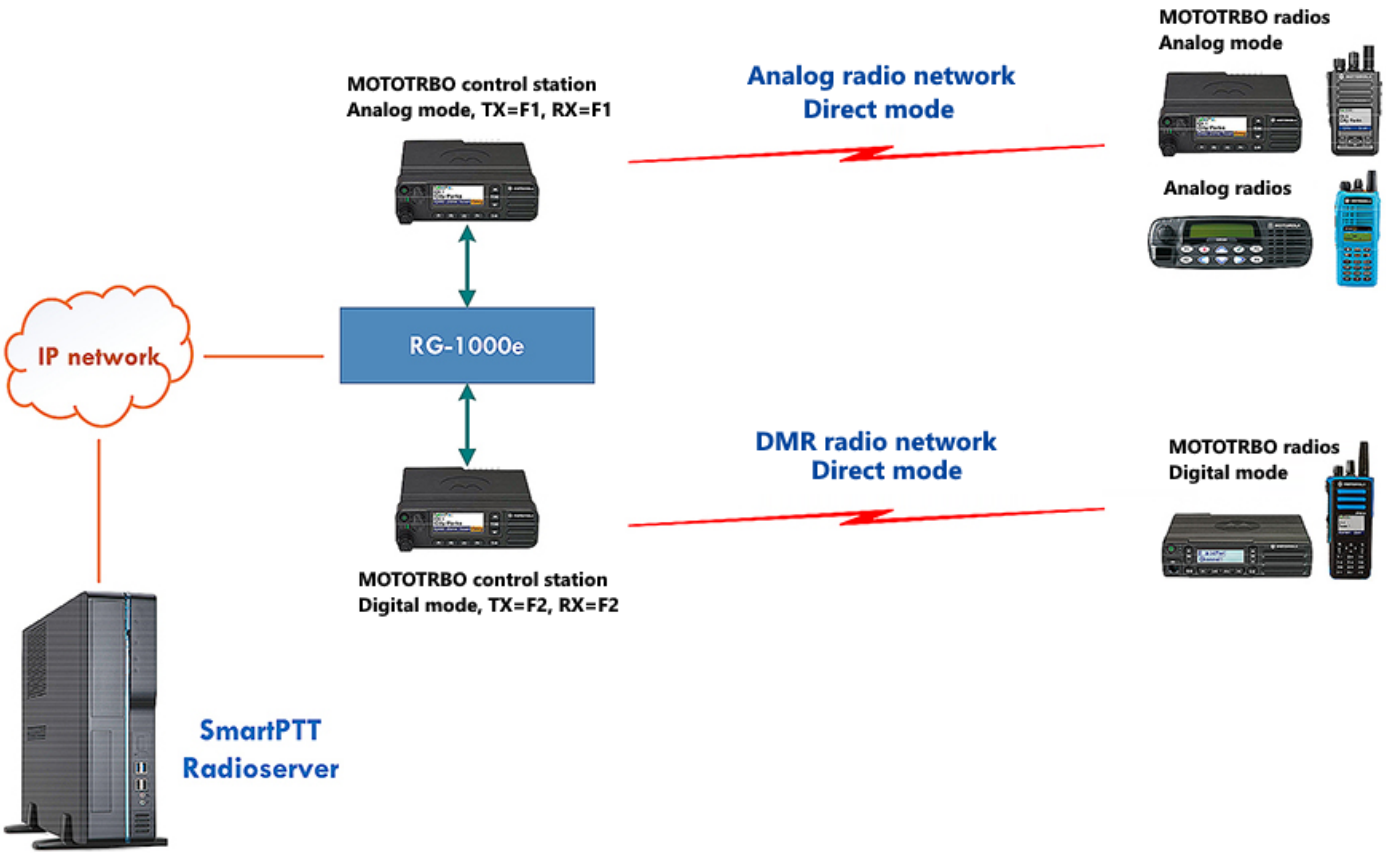


Fig. 4. Conventional Mode (Digital + Analog)

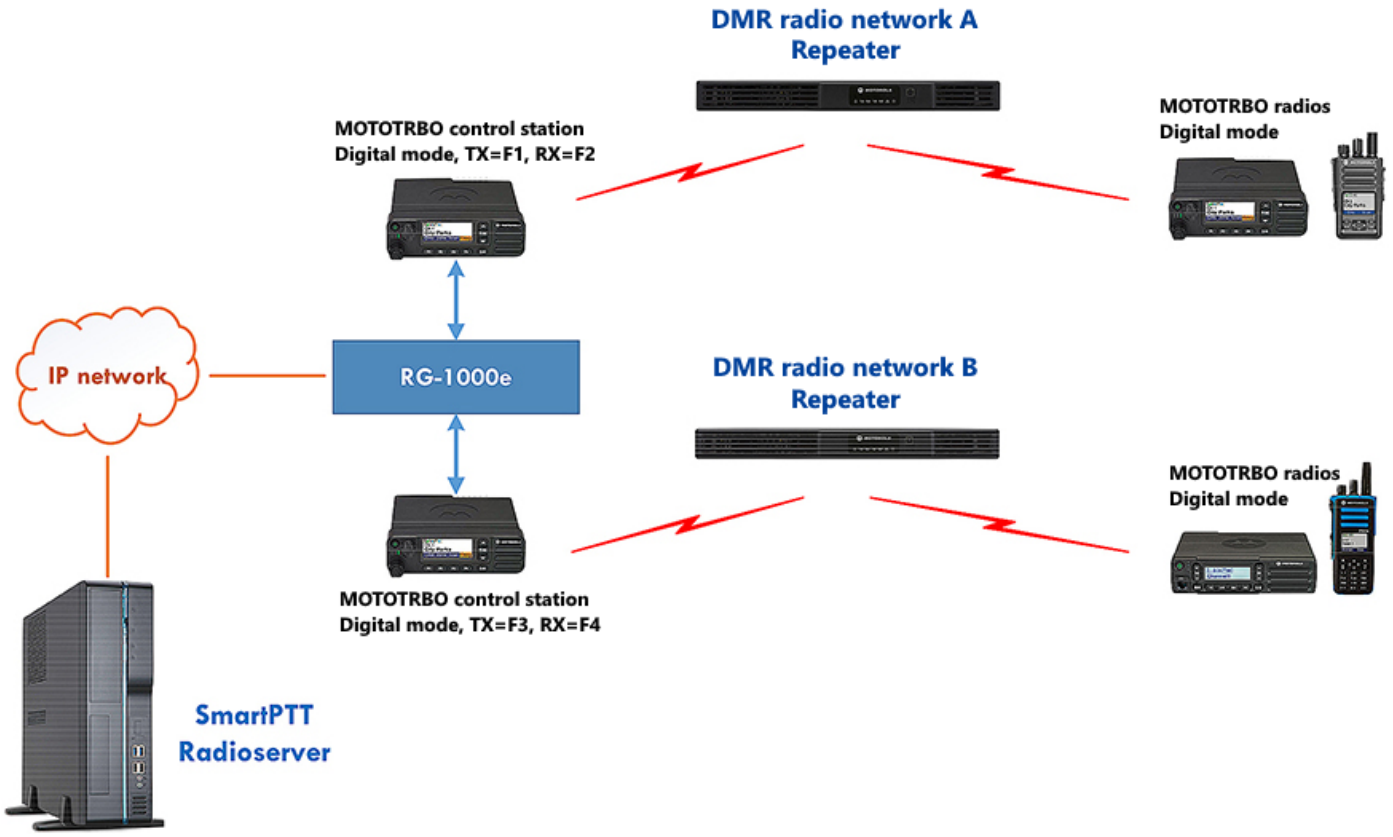


Fig. 5. Conventional Mode Repeater Example 1

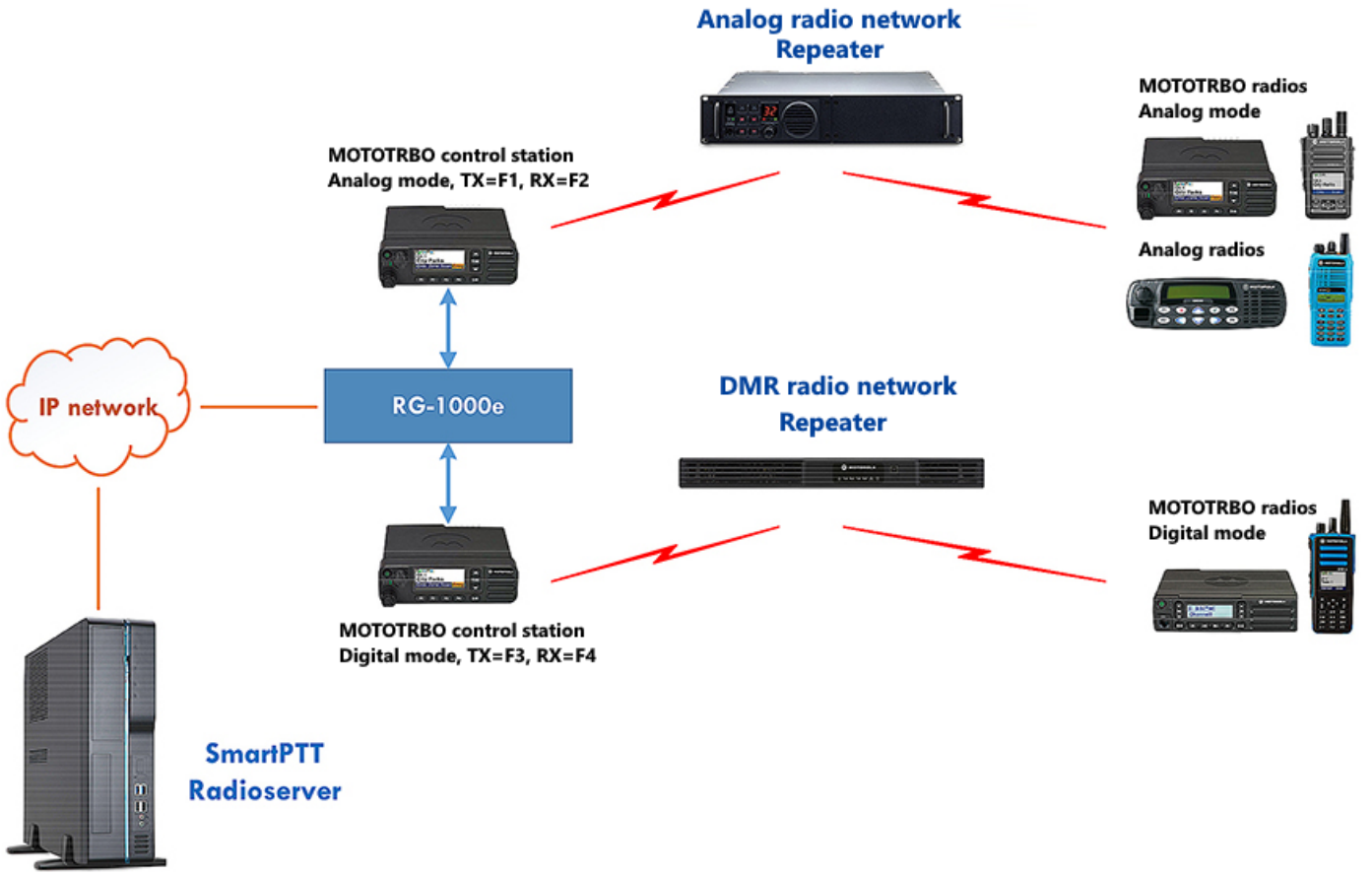


Fig. 6. Conventional Mode Repeater Example 2

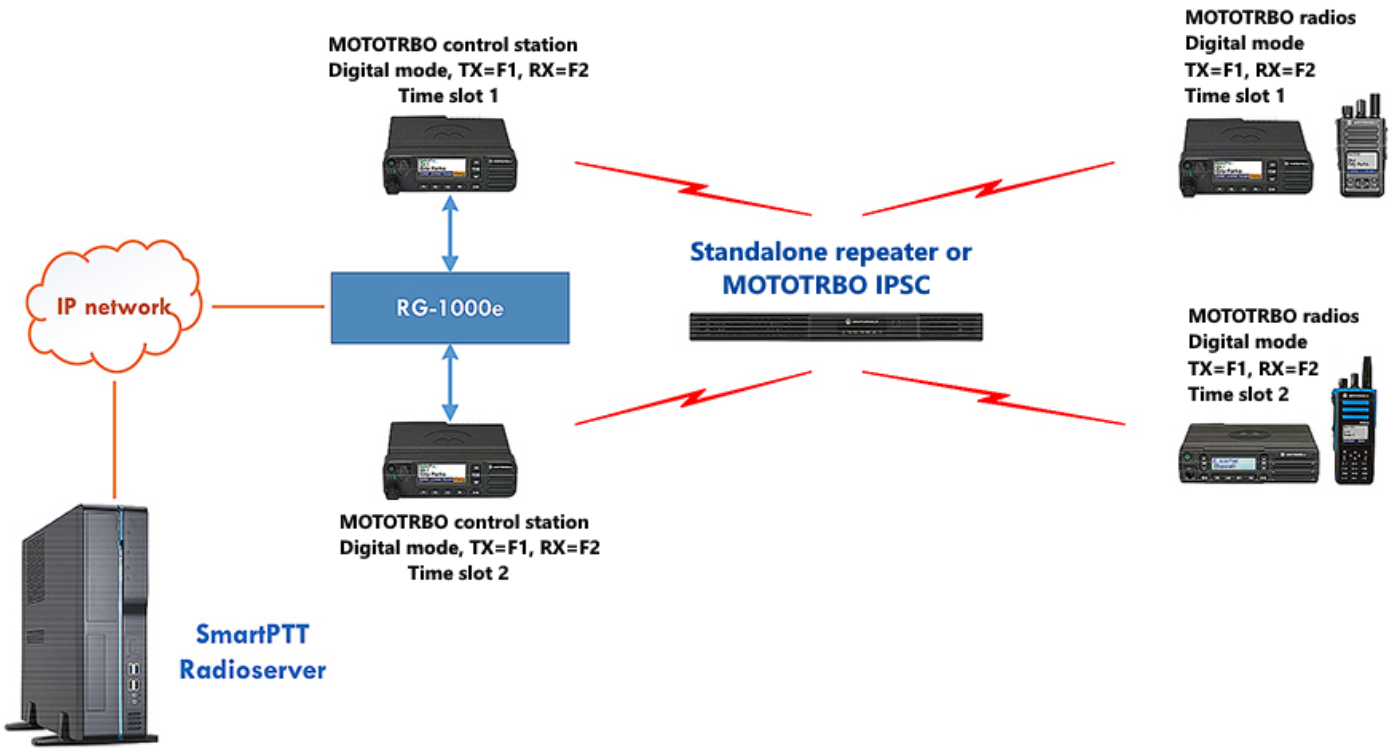


Fig. 7. Conventional Mode Repeater Example 3

For more information on control station capabilities and configuration, see "System Topologies" in *MOTOTRBO System Planner.* For additional information on SmartPTT configuration, see *SmartPTT Installation and Configuration Guide*.

2.2 I/O Mode

In I/O mode, RG-1000e Gateway can be used for connection of any radios to SmartPTT Radioserver or SmartPTT Express Server. Mobile radios and/or repeaters (analog or digital) are connected to RG-1000e Gateway using five wires: PTT, CSQ, RX Audio, TX Audio, and GND. The I/O Mode provides **only** voice exchange between dispatch consoles and talkgroups of the connected radio networks.

The figures below show examples of using RG-1000e Gateway with various control stations.

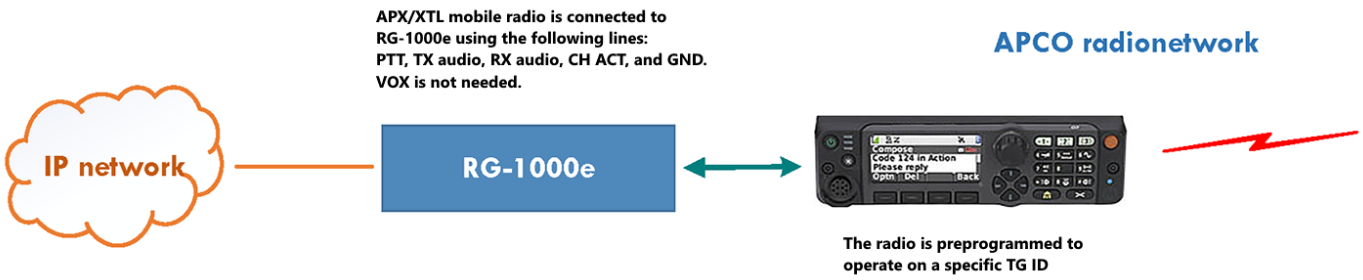


Fig. 8. Motorola APX/XTL Radio Connection to RG-1000e

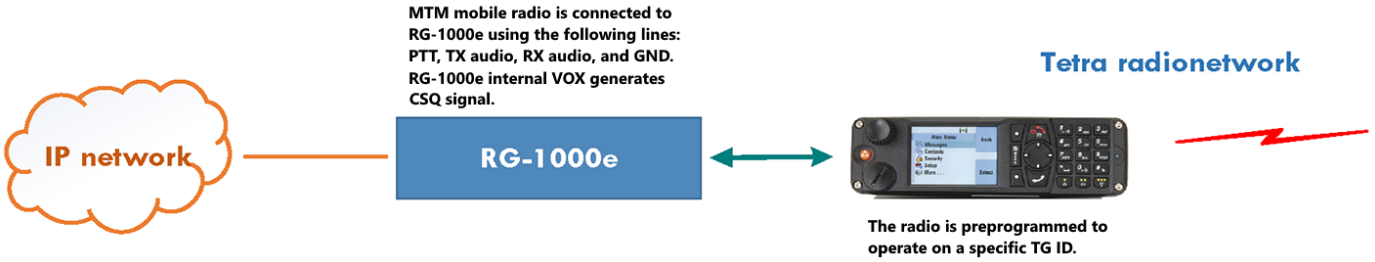


Fig. 9. Motorola MTM Radio Connection to RG-1000e

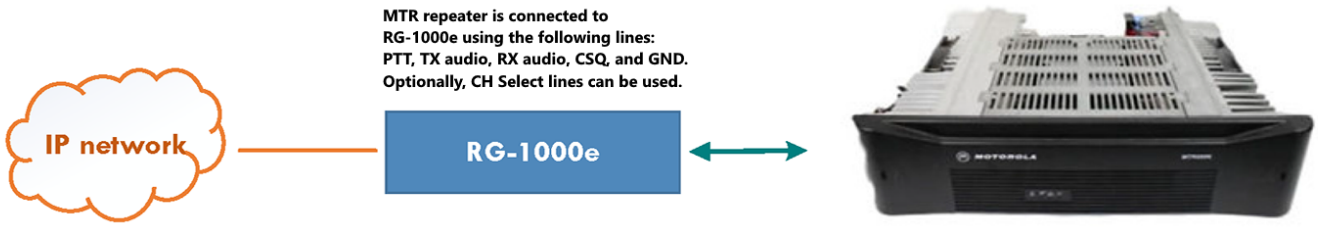


Fig. 10. Motorola MTR2000 Repeater Connection to RG-1000e

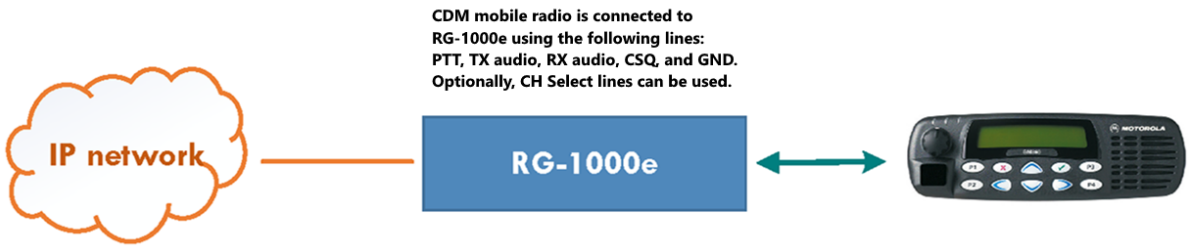


Fig. 11. Motorola CDM/GM/PRO Mobile Radio Connection to RG-1000e

If a connected control station does not have an output CSQ/COR/TG-Detect/PL-Detect signal line, you can use RG-1000e Gateway built-in RX VOX for generating the CSQ signal. For example, this option is useful for connection of MTM5*** radios that are not equipped with a CSQ output signal line.

2.3 Bridge Mode

RG-1000e Gateway Bridge Mode can be used for interconnecting multiple radios and/or repeaters into a radio network. It creates a simple "geographically distributed" repeater. In Bridge Mode, mobile radios and/or repeaters (analog or digital) are connected to RG-1000e Gateway using five wires: PTT, CSQ, RX Audio, TX Audio and GND.

Bridge Mode does not support any signaling systems (CTCSS, DQS, MDC1200, QT, Select V, DMR, dPMR) and does not use digital links (USB, RS-232) to exchange commands with radios/repeaters. The connected radios/repeaters can use signaling within their radio systems, but the signaling commands cannot be transmitted over RG-1000e Gateway.

In Bridge Mode, RG-1000e Gateways communicate with each other directly via IP networks, creating transparent links for audio streams and PTT/CSQ commands. Dispatch software does not take part in this process. The following figure shows how RG-1000e Gateway can be used in Bridge Mode:

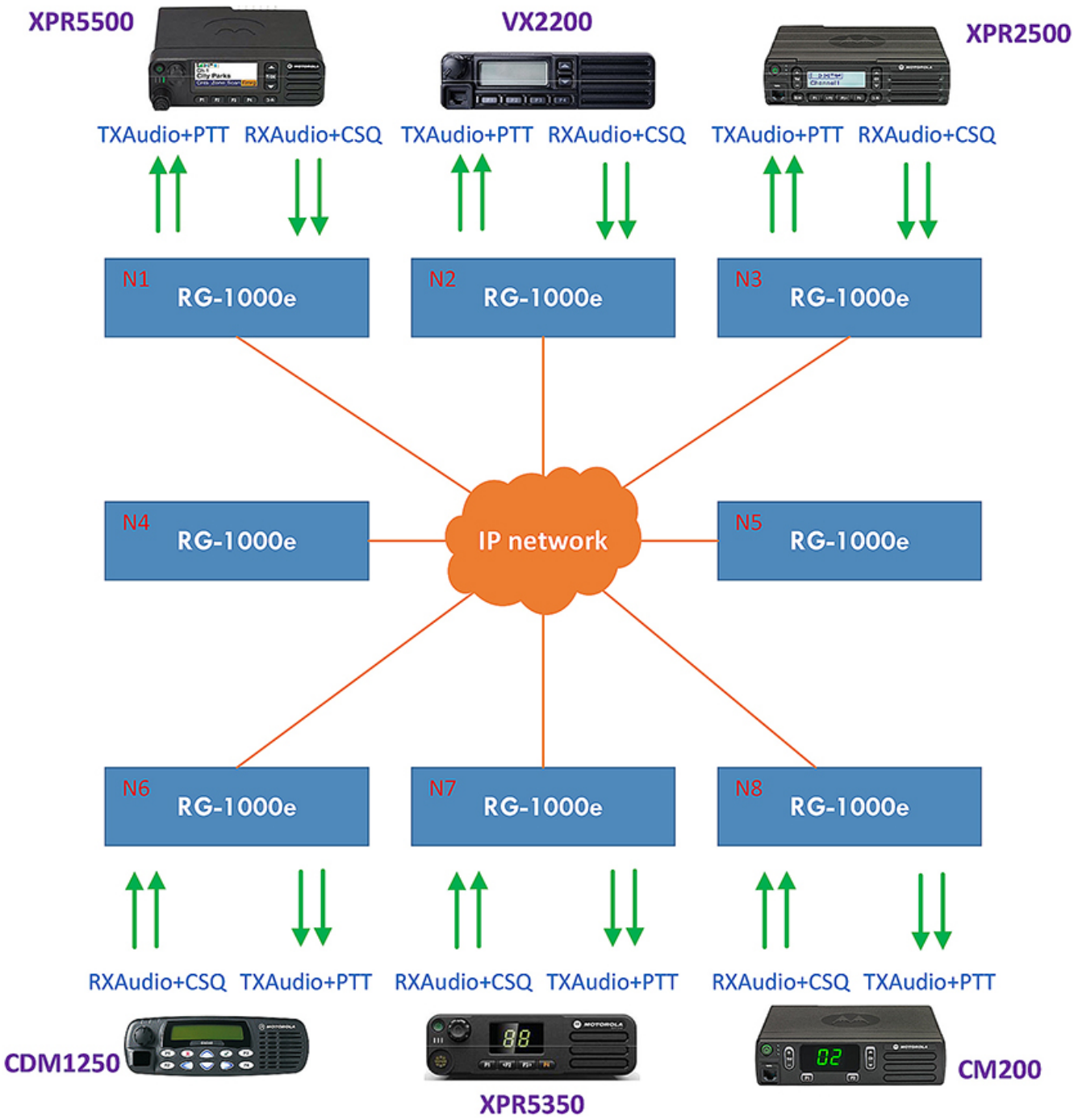


Fig. 12. An 8-node Network with 8 RG-1000e Gateways in Bridge Mode ("Star" Topology)

3 Installation and Connection

This chapter describes the necessary preparations that must be performed before connecting and configuring RG-1000e Gateway and provides instructions on the gateway's installation and first start configuration.

WARNING
Failure to comply with the requirements described here may cause damage to the gateway and will void its warranty. Read this chapter carefully before installing RG-1000e Gateway.

3.1 RG-1000e Gateway Power Supply Requirements

RG-1000e Gateway can receive power in one of the following ways:

- Directly from a DC power supply unit with a voltage of 10.5–15.5 V (13.8 VDC optimum) via the POWER port.
- From the connected control stations via RADIO 1 and/or RADIO 2 port(s).

Supplying power to RG-1000e Gateway via the POWER port is the recommended option. Receiving power from a control station is possible, but it is only supported for a limited selection of radios, namely, MOTOTRBO radios, Motorola MTM5400, MTM5500, and MTM800. **Do not** use it with an unsupported radio. In any case, it is recommended to use a single power supply unit for the gateway and its control stations.

Starting with firmware version 3.0, RG-1000e Gateway supports remote configuration and remote firmware update via IP network. To ensure reliable and stable access to RG-1000e Gateway, it is strongly recommended to supply power via the POWER port regardless of the possibility to receive power from control stations.

Whichever power supply option is chosen, at first start, RG-1000e Gateway can only receive power via the POWER port. For it to receive power from the connected control stations, the feature must first be enabled in RG-1000e Gateway configuration. For details, see RG-1000e Gateway First Start.

RG-1000e Gateway power supply requirements are provided in the table below.

An individual power supply unit for RG-1000e	load current 2–3 A
A power supply unit for RG-1000e and one control station	load current 15 A
A power supply unit for RG-1000e and two control stations	load current 30 A

WARNING
Make sure that RG-1000e Gateway power supply arrangement complies with the safety requirements described below.

- Do not supply voltage greater than 15.5 VDC to RG-1000e.
- Connect the GND terminal (pin) of RG-1000e to protective earth.
- Ensure that the negative leads of radios' power cables are securely connected to the power supply unit. Their accidental disconnection may damage RG-1000e.

- If RG-1000e and control stations receive power from independent power supply units, the negative leads of all power supply cables must be interconnected using copper wire with cross-section no less than 2 mm^2 (14 AWG).

Important
When using digital control stations, take the measures described below to eliminate or minimize chopping noise.

- Make power cables as short as possible, ideally, 0.5–0.7 m (1.6–2.3 ft).
- Set the radios' TX power level to the minimum required level. It is preferable to set TX power level at 5 W and use a high-gain (6–8 dBd) outdoor antenna, rather than set TX power level at 25–45 W and use an antenna with a gain of 2–3 dBd.
- If two digital control stations are used, place them next to each other and connect their cases/mounts with a thick wire.

3.2 RG-1000e Gateway Installation

Before installing RG-1000e Gateway, inspect the delivery set to examine it for mechanical damage to the gateway, cables, and mounting elements. Before connecting control stations, it is required to program RG-1000e Gateway operation mode. Only the interface cable from the delivery set can be used for control station connection. For details, see RG-1000e Gateway First Start.

RG-1000e Gateway can be placed on its rubber feet or can be attached to any vertical or horizontal surface. For rigid mounting to surfaces, use the brackets from the delivery set. A radio can be fixed on the upper cover with a standard radio bracket.

External parts must be mounted on RG-1000e Gateway case with the screws from the delivery set only. Longer screws may damage the board or its elements. For information on the allowed places for installing the mounting elements on RG-1000e Gateway case, see Mounting Elements.

It is strongly recommended that a shielded Ethernet cable is used for RG-1000e Gateway network connection. The cable should be grounded via a patch panel or socket with a grounding pin connected to protective earth.

WARNING
Do not use Ethernet cables installed outdoors. Only indoor Ethernet cables are allowed.

At first start, only USB connection to RG-1000e is possible. In order to connect to the gateway over Ethernet, an IP channel needs to be configured for that purpose. For details, see Configuring Remote Access to RG-1000e Gateway.

3.3 RG-1000e Gateway First Start

Follow the procedure to perform RG-1000e Gateway first-time configuration, installation, connection, and start.

Prerequisites:

- Allocate a static IP address that RG-1000e will use.
- Download Zadig softool (no installation is required).
- Ensure that RG-1000e Gateway is powered down and no devices are connected to it.

Procedure:

1. Using the power cable from the delivery set, connect RG-1000e Gateway to an external power supply via POWER socket.

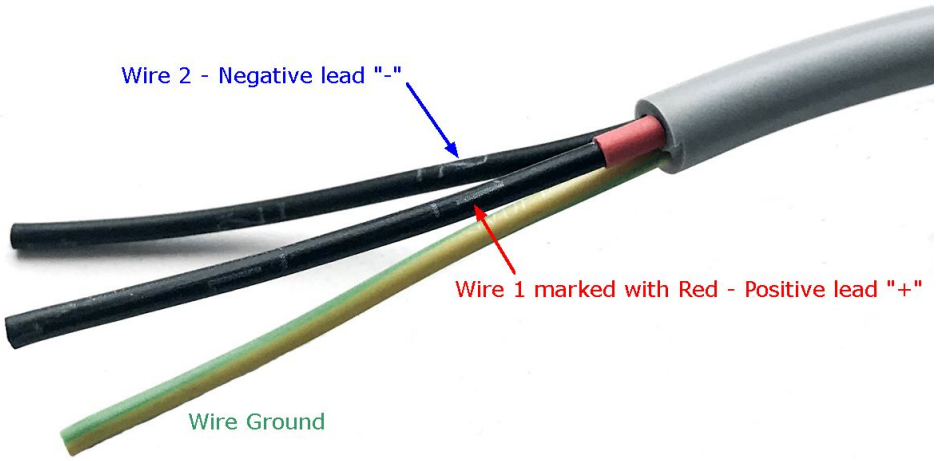


Fig. 13. RG-1000e Gateway Power Cable Schematic

NOTE
It is possible to build your own power cable. For details, see Making a Power Cable for RG-1000e Gateway.

2. Turn on the power supply unit and then turn on RG-1000e Gateway using the POWER button on its front panel.
3. Connect RG-1000e Gateway to a computer with installed CPS RG-1000e using the USB A-miniB cable from the delivery set.

WARNING
Before plugging in RG-1000e, ensure that the PC and the gateway are connected to a common ground or one of them is not grounded. Otherwise, the USB port may be damaged.

4. Install RG-1000e driver:
    a. Open Windows Device Manager. You should see an unidentified device (should be *TMS320VC5506*).

b. Run Zadig softool.

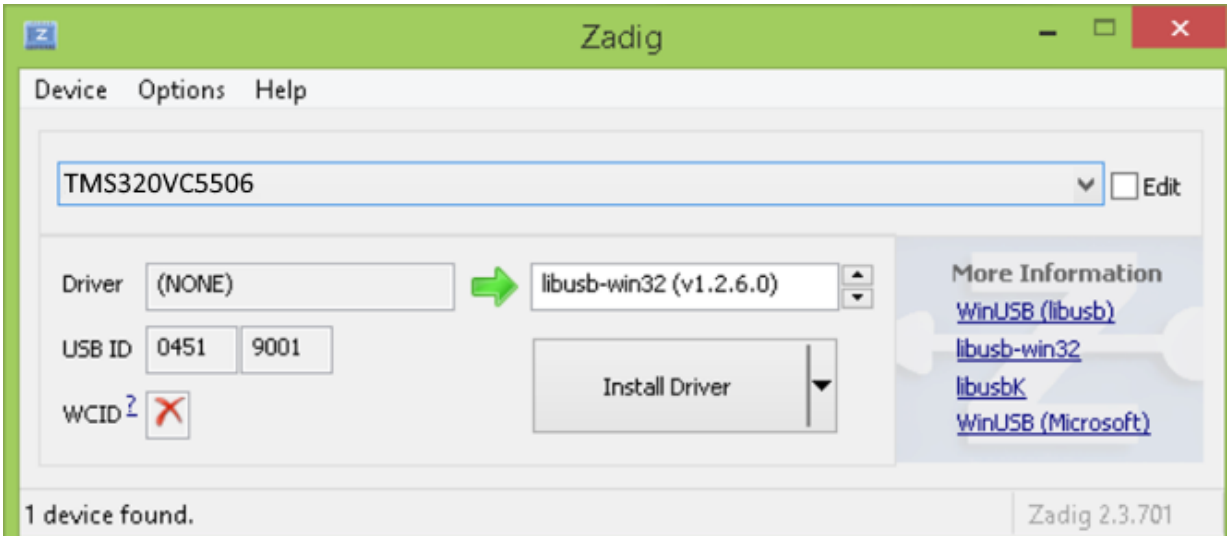


Fig. 14. RG-1000e Gateway Driver Installation

c. In Zadig softool, from the list of devices, select the unidentified device.

d. Set the driver to be installed to *libusb-win32 (v1.2.6.0)*.

e. Click **Install Driver**.

f. In Device Manager, check that the device is displayed under *libusb-win32 devices* with no warning/error indication.

5. Run CPS RG-1000e and configure RG-1000e Gateway Ethernet parameters. For details, see Configuring Remote Access to RG-1000e Gateway.

6. *(Optional)* If you plan for RG-1000e Gateway to receive power from control stations, enable the corresponding feature. For details, see Configuring Power Supply from Control Station.

7. Turn off RG-1000e Gateway using the POWER button on its front panel.

8. Install RG-1000e Gateway in its dedicated location. For details, see RG-1000e Gateway Installation.

9. Connect the Ethernet cable and the control stations to RG-1000e Gateway.

10. Connect power cables and antennas to the control stations.

11. Turn on the power supply of RG-1000e Gateway and the control stations.

12. Turn on the control stations and RG-1000e Gateway.

13. Check the LEDs on the front panel of RG-1000e Gateway. If the LINK LED is constantly on and at least one RADIO LED is off or flashing, the installation and configuration have been successfully completed.

3.4 Configuring Remote Access to RG-1000e Gateway

Follow the procedure to configure access to RG-1000e Gateway over Ethernet.

Prerequisites:

- Run CPS RG-1000e.
- Connect RG-1000e Gateway to the computer via USB.

- Install RG-1000e driver. For details, see RG-1000e Gateway First Start.
- Determine the IP address, Subnet Mask and Gateway that RG-1000e will be using.

Procedure:

1. In CPS RG-1000e, from the **Tasks** menu, select **Connect to gateway**.
   The gateway connection dialog appears.

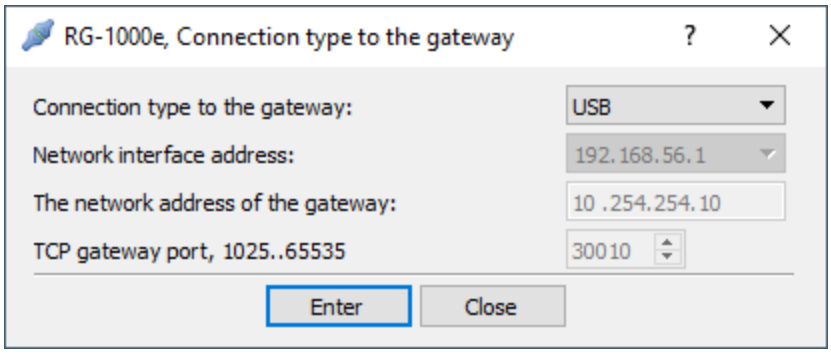


Fig. 15. Gateway Connection Dialog

2. From the **Connection type to the gateway** list, select *USB*, and then click **Enter**.
3. On the **RG-1000e** panel on the left, expand **Tasks**, and then double-click **Read**.
4. Expand **Network**, and then double-click **IP Channel 8**.

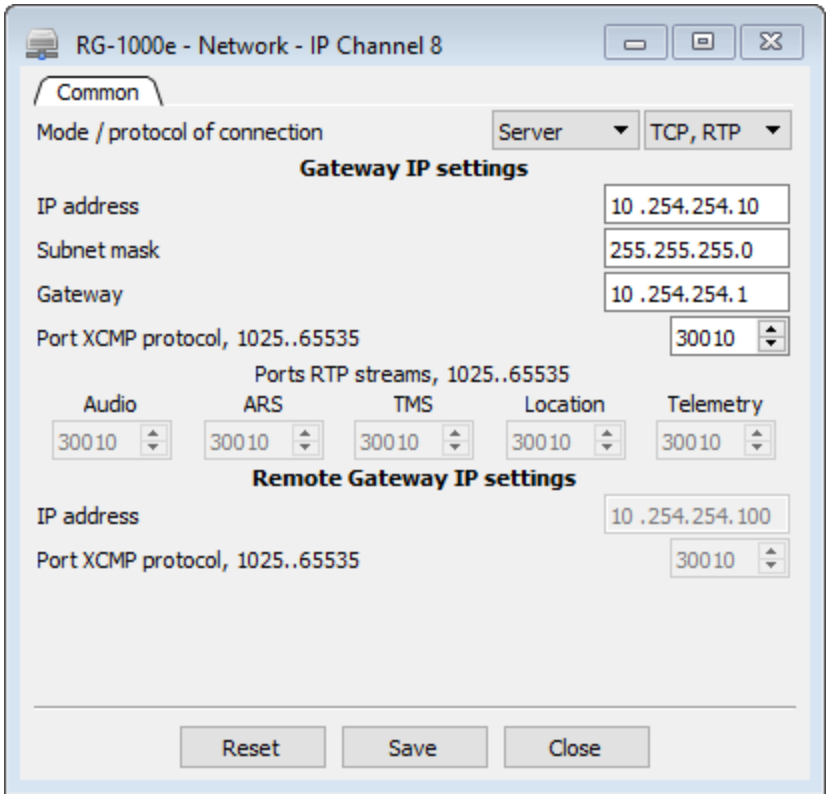


Fig. 16. IP Channel for Remote Access

5. In the **IP Channel 8** window, perform the following actions:
   a. From the **Mode / protocol of connection** lists, select *Server* and *TCP, RTP*.
   b. In the **Gateway IP settings** area, type RG-1000e **IP address**, **Subnet mask** and **Gateway**.

c. In the **Port XCMP protocol** field, enter the desired port number for remote access to RG-1000e.

NOTE
It is recommended to use the default port number *30010* because remote monitoring of audio signals via RG-1000e CPS is only possible on this port.

d. At the bottom of the window, click **Save**.

6. On the **RG-1000e** panel, under **Network**, double-click **Mux**.

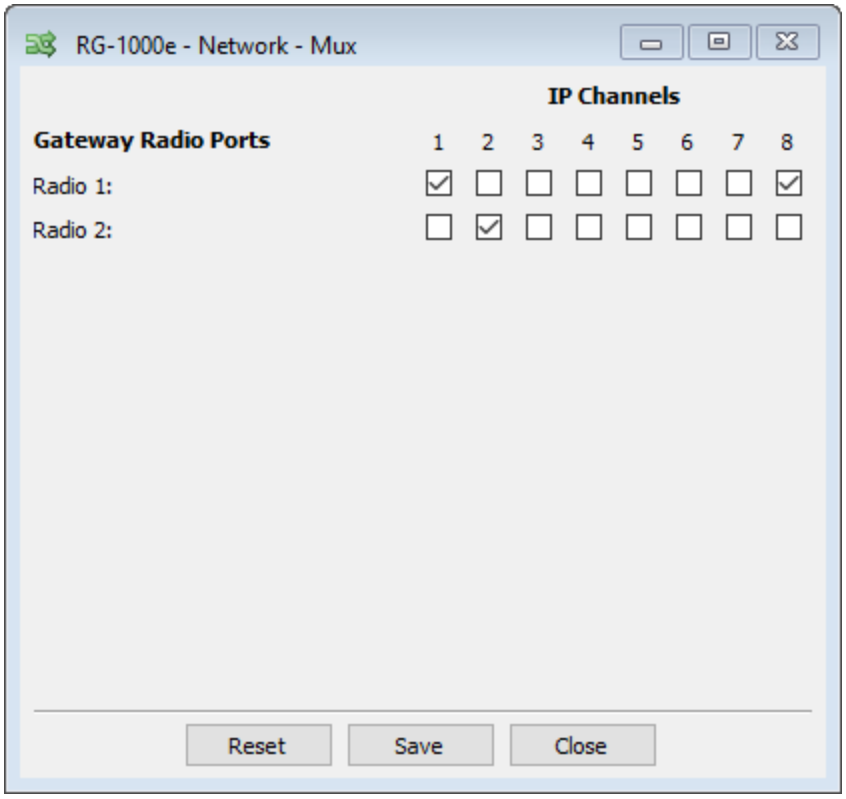


Fig. 17. Mux Window

7. In the **Mux** window, perform the following actions:

a. In column **8**, select one of the check boxes.

b. At the bottom of the window, click **Save**.

8. From the **Tasks** menu, select **Write**.

Important
After modifying RG-1000e configuration, reboot the gateway by clicking **Tasks → Reboot**.

3.5 Configuring Power Supply from Control Station

Follow the procedure to to configure RG-1000e Gateway power supply from a control station connected to it.

Prerequisites:

- Run CPS RG-1000e.
- Connect RG-1000e Gateway to the computer via USB.
- Install RG-1000e driver. For details, see RG-1000e Gateway First Start.

Procedure:

1. In CPS RG-1000e, from the **Tasks** menu, select **Connect to gateway**.
   The gateway connection dialog appears.

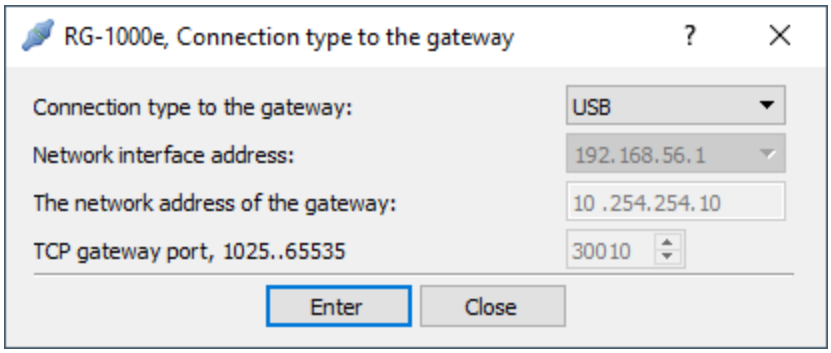


Fig. 18. Gateway Connection Dialog

2. From the **Connection type to the gateway** list, select *USB*, and then click **Enter**.
3. On the **RG-1000e** panel on the left, expand **Radio 1** or **Radio 2**, and then click **Settings**.

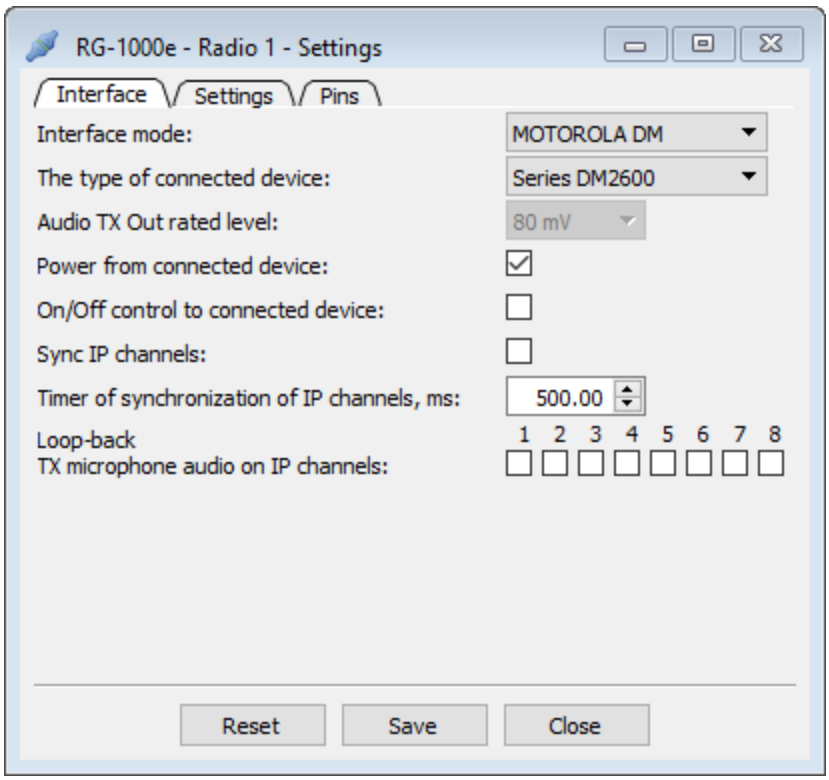


Fig. 19. Radio Settings

4. In the **Settings** window, select the **Power from connected device** check box.
5. At the bottom of the window, click **Save**.
6. From the **Tasks** menu, select **Write**.

Important
After modifying RG-1000e configuration, reboot the gateway by selecting **Reboot** from the **Tasks** menu.

4 RG-1000e Customer Programming Software (CPS RG-1000e)

CPS RG-1000e is a software tool that provides the ability to perform the following actions:

- Connect to RG-1000e Gateway via USB or Ethernet.
- Read, display, modify, and write the configuration of the connected RG-1000e Gateway.
- Update and recover RG-1000e Gateway firmware.
- View statistics of RG-1000e Gateway operation and monitor its activity in real time.

CPS RG-1000e is designed for operation in Windows XP, Windows 7, Windows 8/8.1, Windows 10. It does not require installation. In order to use CPS RG-1000e, copy the Program folder from the unpacked distribution kit to the desired PC and run the CPS RG-1000e executable file.

CPS RG-1000e can access RG-1000e Gateway via USB or via Ethernet. For details, see RG-1000e Gateway First Start and Configuring Remote Access to RG-1000e Gateway.

RG-1000e Gateway configurations can be saved as MCD files and loaded from such files. This makes it easier to manage multiple RG-1000e Gateways or keep multiple configuration variants saved.

This document describes CPS RG-1000e version 3.0.1. Other versions may have differences. To find out your CPS RG-1000e version, in the **Help** menu, click **About CPS**.

Important
CPS RG-1000e version must match that of the gateway firmware. For information on checking RG-1000e Gateway version, see Info.
If the versions do not match, obtain another version of CPS RG-1000e or update RG-1000e Gateway firmware. Contact SmartPTT Technical Support Center for further information and assistance.

4.1 CPS RG-1000e Interface

CPS RG-1000e interface consists of the main area where configuration windows can be opened, the Toolbar and the Menu Bar at the top of the window, the **Reports** panel at the bottom, and the **RG-1000e** panel on the left. All panels can be repositioned or hidden.

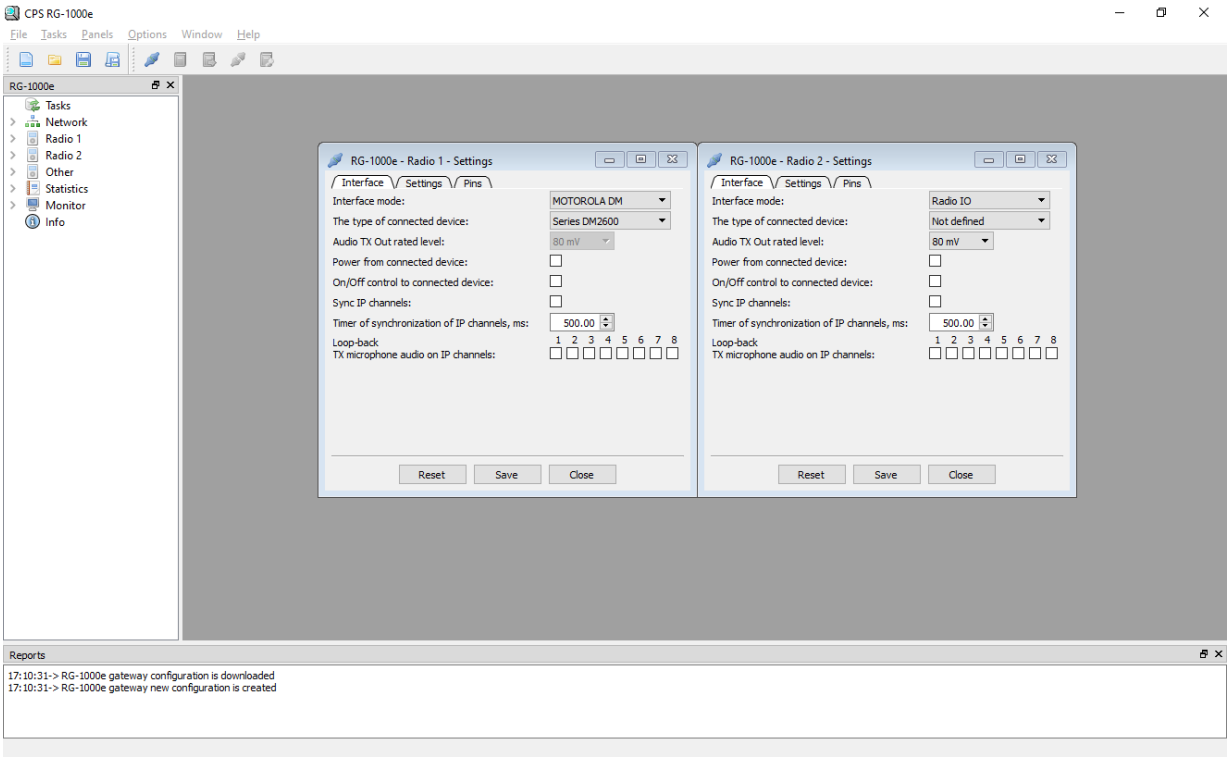


Fig. 20. CPS RG-1000e Interface

Toolbar

The Toolbar is available at the top of CPS RG-1000e window. It provides the **File** and **Tasks** panels.

The **File** panel provides the following elements:

Create ( )

Creates a new configuration with default settings.

Open ( )

Opens configuration from an MCD file.

Save ( )

Saves configuration to the original file.

Save as ( )

Saves configuration to a separate file.

You can also perform these actions via the **File** menu.

The **Tasks** panel provides the following elements:

Connect to gateway ( )

Opens RG-1000e Gateway connection dialog.

Read ( )

Reads configuration from the connected RG-1000e Gateway.

Write ( )

Writes configuration to the connected RG-1000e Gateway.

Reboot ( )

Reboots the connected RG-1000e Gateway.

Write firmware ( )

Updates firmware of the connected RG-1000e Gateway.

Reports Panel

The **Reports** panel is available at the bottom of the CPS RG-1000e main window. It displays messages about system events such as gateway connection or operations with configuration files.

RG-1000e Panel

The **RG-1000e** panel is available on the left of the CPS RG-1000e main window. After a configuration is read from the connected gateway, loaded from an MCD file, or newly created, it is displayed on this panel in a tree structure. Related settings are grouped under parent nodes that can be expanded or collapsed. Double-click a node to open the corresponding settings window.

The **RG-1000e** panel also provides the ability to view statistics of RG-1000e Gateway use, monitor audio input/output through the control stations, and view information about RG-1000e Gateway hardware and firmware.

For detailed information on CPS RG-1000e features, see the sections below.

4.2 Network

The **Network** node provides the ability to configure the connection between RG-1000e Gateway and remote devices (such as radioservers and other RG-1000e gateways).

To connect RG-1000e Gateway to remote devices, you must configure its IP channels. For each IP channel, you must specify a network interface, mode, and protocol of connection. Then you must assign IP channels to control stations. Remote devices use the configured interface to connect to RG-1000e Gateway and control stations.

To assign IP channels to the RG-1000e Gateway physical ports, select the desired check boxes in the **Network — Mux** window. RG-1000e Gateway provides the ability to use up to two configured IP channels for control stations, and assign another IP channel for remote access to the gateway itself. You can use more IP channels to configure the star topology.

To configure the RG-1000e Gateway LAN port, specify the desired parameters in the **Network — Driver** window. To configure parameters based on the cable type, specify the standard, mode, and the cable length. You also can configure the system to automatically select the most productive transmission mode.

4.2.1 IP channel

In the **Network — IP Channel <number>** window, you can configure IP address, XCMP port, mode and protocol of connection, and data transmission ports.

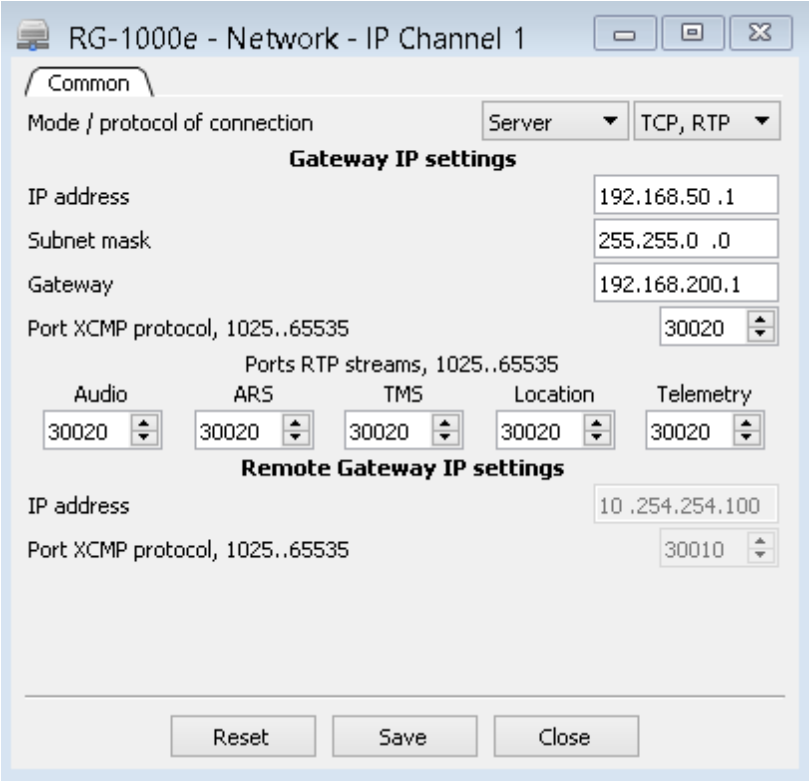


Fig. 21. The Network — IP Channel Window

The **Network — IP Channel <number>** window provides the following elements:

Mode / protocol of connection

Provides the lists to select the connection mode and protocol:

- The *Server* option activates the server mode for the IP channel. In the server mode, RG-1000e Gateway accepts external connections.
  To create a connection, the client device must use the IP address and XCMP protocol port of this IP channel.
- The *Client* option activates the client mode for the IP channel. In the client mode, RG-1000e Gateway initiates connection to a remote device that acts as a server.
  To use the client mode, you must enter the IP address and XCMP protocol port of the server device in the **Remote Gateway IP settings** area.
- The *TCP, RTP* option uses the TCP and RTP protocols to transmit commands, audio, and other data. If this option is selected, you must enter port numbers in the **Ports RTP streams** area.
- The *M270:LCP* option uses the LCP protocol to transmit commands and audio.

Important
Do not select the LCP protocol.

The **Gateway IP settings** area provides the following elements:

IP address

The gateway IP address to be used as part of this IP channel.

Subnet mask

The gateway subnet mask.

Gateway

The default gateway.

Important

The **Gateway** field can not be empty.

Port XCMP protocol

The UDP/TCP port which is used to transmit control commands between RG-1000e Gateway and the remote device.

Important

You can configure two IP channels with identical IP addresses, but their XCMP ports must be different.

NOTE

It is recommended to use *30010* port for remote connections, as it is the only port which supports real-time monitoring.

The **Ports RTP streams** area provides the ability to enter port numbers for data transmission. It is recommended to use the same port number for all fields in the **Ports RTP streams** area.

The **Ports RTP streams** area consists of ports for data transmission between RG-1000e Gateway and remote devices. The area provides the following elements:

Audio

The port for audio transmissions which uses RTP streams.

ARS

The port which transmits data about registration of radio users in the network.

TMS

The port for text message exchange.

Location

The port for location data transmission (GPS).

Telemetry

The port for telemetry data and commands transmission.

The **Remote Gateway IP settings** area is available only in *Client* mode and provides the following elements:

IP address

The IP address of the external device that acts as the server (receives connections from RG-1000e Gateway).

Port XCMP protocol

The UDP/TCP port which is used to transmit control commands.

Reset

Resets values to default.

Save

Saves changes and closes the window.

Close

Closes the window without saving changes.

4.2.2 Mux

The **Network — Mux** window provides the ability to assign the configured IP channels to the gateway radio ports. The IP channels which are not assigned to any gateway are considered as switched off, and they are not used by RG-1000e Gateway.

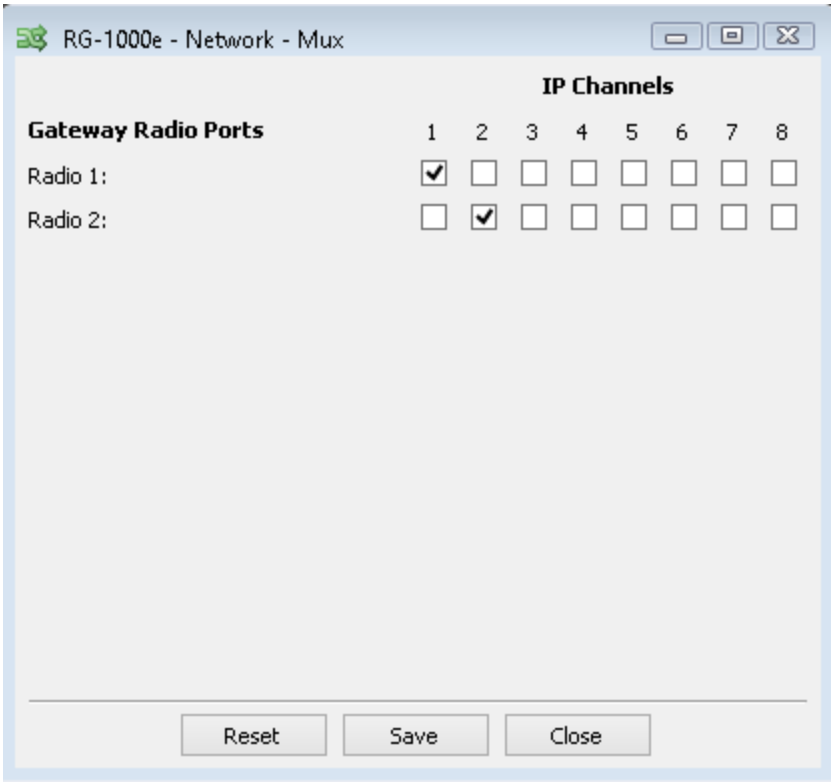


Fig. 22. The Network — Mux Window

The **Network — Mux** window provides the check boxes to assign the configured IP channels to the gateway radio ports:

Gateway Radio Ports

Physical ports of RG-1000e Gateway.

IP Channels

Network interfaces of RG-1000e Gateway that can be configured in the **Network — IP Channel <Channel_Number>** window.

NOTE

You can assign up to two configured IP channels to external devices and use one more IP channel for a remote connection. The additional IP channels can be used for the star topology configuration.

Reset

Resets values to default.

Save

Saves changes and closes the window.

Close

Closes the window without saving changes.

4.2.3 Driver

The **Network — Driver** window provides the ability to configure the RG-1000e Gateway LAN port.

NOTE

In most cases, the default settings in this window should be left unchanged.

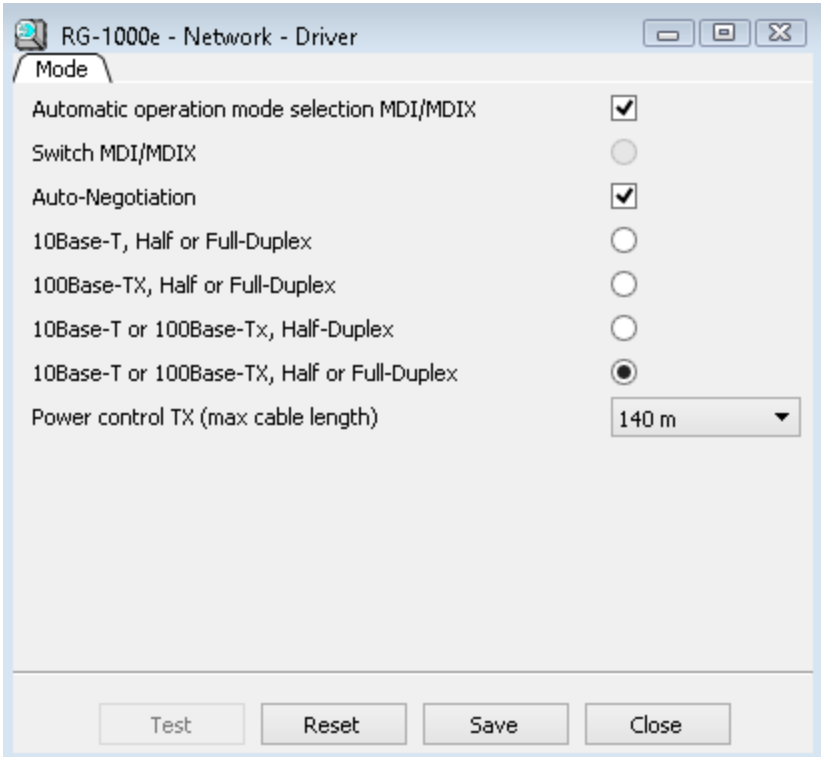


Fig. 23. The Network — Driver Window

The **Network — Driver** window provides the following elements:

Automatic operation mode selection MDI/MDIX

Enables automatic detection of the cable type: straight-through or crossover (MDI/MDX).

Switch MDI/MDX

If selected, the mode switches based on the cable type.

Auto-Negotiation

Enables the auto-negotiation feature which provides the ability for two connected devices to automatically select the most productive transmission mode.

If selected, the following options are available:

- The **10Base-T, Half or Full-Duplex** option uses the 10Base-T standard and half or full-duplex mode.
- The **100Base-TX, Half or Full-Duplex** option uses the 100Base-TX standard and half or full-duplex mode.
- The **10Base-T or 100Base-TX, Half-Duplex** option uses the 10Base-T standard and half-duplex mode.

- The **10Base-T or 100Base-TX, Half or Full-Duplex** option uses the 10Base-T or 100Base-TX and half or full-duplex mode.

If the **Auto-Negotiation** check box is cleared, the following options are available:

- The **10Base-T, Half-Duplex** option uses the 10Base-T standard and half-duplex mode.
- The **10Base-T, Full-Duplex** option uses the 10Base-T standard and full-duplex mode.
- The **100Base-TX, Half-Duplex** option uses the 100Base-TX standard and half-duplex mode.
- The **100Base-TX, Full-Duplex** option uses the 100Base-TX standard and full-duplex mode.

Power control TX (max cable length)

Provides the list of maximum cable lengths.

NOTE

The Ethernet interface of RG-1000e Gateway can interfere with transmissions at some radio frequencies. To prevent interference, you can change the power of Ethernet transmission using the **Power control TX (max cable length)** list.
Power reduction alleviates the Ethernet cable interference but may result in a higher number of errors during Ethernet packet reception. The compatibility and reliability of the network equipment operation must be tested after the power reduction.

Important

The selection of the *5 m* option is recommended only in a few cases with control over the reception and transmission of Ethernet packets.

4.3 Radio 1&2

The **Radio 1** and **Radio 2** nodes provide the ability to configure the interaction between RG-1000e Gateway and the control stations connected to it over its physical ports.

The subnodes of the **Radio 1** and **Radio 2** nodes are identical and correspond to the RADIO 1 and RADIO 2 physical ports respectively.

The sections below describe the settings available in the subnodes of **Radio 1** and **Radio 2**.
For information on the recommended settings for different radios and modes of operation, see Radio 1(2) Port Configuration Samples.

4.3.1 Settings

The **Settings** window provides the ability to configure the control station's mode of operation and the assignment of the connecting cable's pins.

The window has three tabs. The **Interface** tab provides basic control station interface settings.

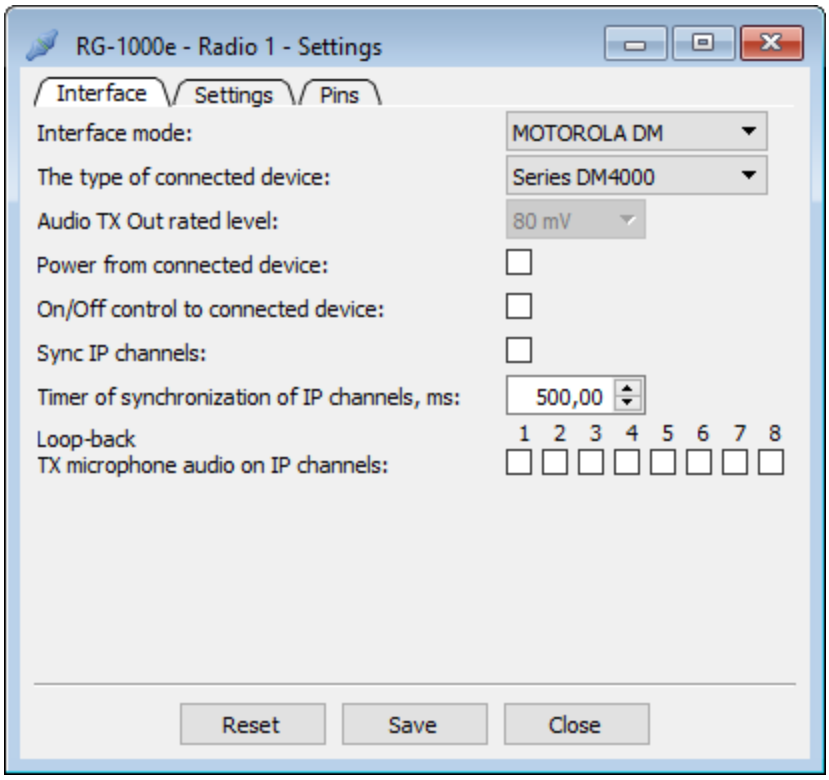


Fig. 24. Settings Window, Interface Tab

The **Interface** tab provides the following elements:

Interface mode

Determines RG-1000e Gateway's mode of operation with this RADIO port. The following modes are available:

- *Disable*. RG-1000e Gateway does not use the port.
- *Transit audio*. Create a constant connection between gateways to transmit only audio.
- *Radio IO*. RG-1000e Gateway uses four wires to transmit/receive audio and PTT/CSQ signals to/from the control station. In this mode, any radio can be connected to RG-1000e Gateway, but only voice exchange is supported.
- *Bridge*. Provides the ability to transmit audio and discrete signals between gateways. When an input carrier detect signal is received, an output press PTT signal is sent.
- *Motorola GM*. This mode is no longer supported.
- *Motorola DM*. RG-1000e Gateway uses a USB port to work with a MOTOTRBO mobile radio in digital mode. Voice exchange, ARS, GPS, TMS, and telemetry features are supported.

The type of connected device

Determines the type (series) of the control station.

Audio TX Out rated level

The nominal signal level for TX audio (from RG-1000e Gateway to the control station). In most cases, the default value should be left unchanged.

Power from connected device

If selected, RG-1000e Gateway will receive power from the control station.

WARNING

Power supply misconfiguration may damage RG-1000e Gateway and will void its warranty. For details, see RG-1000e Gateway Power Supply Requirements.

On/Off control to connected device

If selected, RG-1000e Gateway will be able to turn on/off the control station on command from a remote device.

WARNING

Do not select this option together with the **Power from connected device** option. If IP connection between RG-1000e Gateway and SmartPTT Radioserver is lost, or SmartPTT Radioserver is stopped, RG-1000e Gateway will send the command to turn off the control station and thus will be left without power supply.

Sync IP channels

Timer waiting for confirmation that commands were accepted on the remote gateway. This parameter is not applied to SmartPTT. It can be used for the *Transit audio* and *Bridge* modes.

Timer of synchronization of IP channels, ms

The interval between IP channel synchronizations.

Loop-back TX microphone audio on IP channels

When working with SmartPTT, clear all check boxes.

The **Settings** tab provides advanced control station interface settings. The available settings depend on the selected Interface mode.

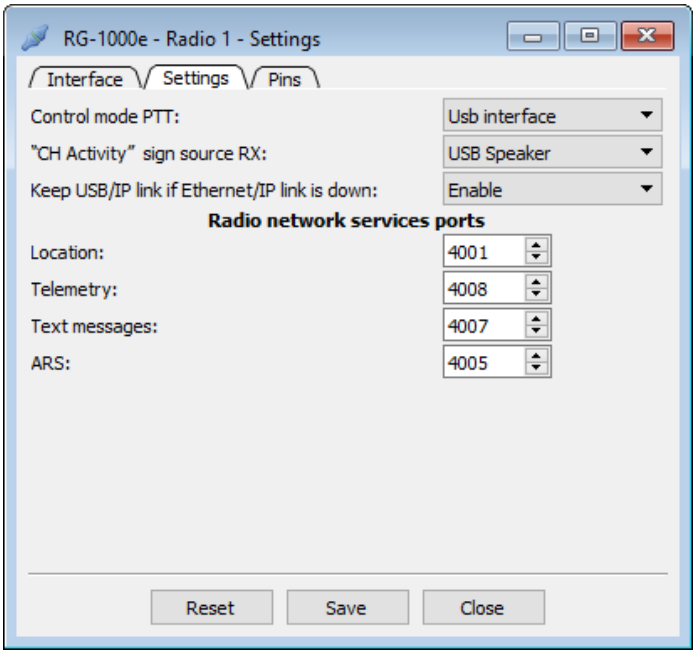


Fig. 25. Settings Tab for Motorola DM Mode

For *Motorola DM* mode, the **Settings** tab provides the following elements:

Control mode PTT

Determines how RG-1000e Gateway will transmit the PTT signal to the control station. The following options are available:

- *Discrete output*. The PTT signal is transmitted via a discrete line.
- *USB interface*. The PTT signal is transmitted via the USB interface. This is the recommended option.

"CH Activity" sign source RX

Determines the criteria for recognizing incoming voice transmissions from the control station. The following options are available:

- *Off*. RG-1000e Gateway constantly streams audio from the control station.

Important
Do not select this option.

- *USB Speaker*. RG-1000e Gateway streams audio from the control station when it receives the USB Speaker Open/Close broadcast instruction.
  This is the most reliable way to recognize incoming voice transmissions in the *Motorola DM* mode.
- *CSQ*. RG-1000e Gateway streams audio from the control station when receiving signal on the pin assigned as *Input, signal CSQ/COR*.
- *VOX*. RG-1000e Gateway streams audio from the control station if the gateway's internal VOX detects voice activity on the control station.
  For information on VOX configuration, see Audio coder Rx.
- *CSQ | VOX*. RG-1000e Gateway streams audio from the control station if either the *CSQ* or the *VOX* criterion is met.
- *CSQ & VOX*. RG-1000e Gateway streams audio from the control station if both the *CSQ* and the *VOX* criteria are met.

Keep USB/IP link if Ethernet/IP link is down

If the *Enabled* option is selected (recommended), RG-1000e Gateway will maintain its connection to the control station when Ethernet connection is lost.

Radio network services ports

The four fields in this area provide the ability to configure the UDP port numbers used for data exchange with the control station. The port numbers must be the same as those set in the control station codeplug and SmartPTT Radioserver configuration.

Important
When working with SmartPTT Radioserver, always set the **Location** port to *4001*.

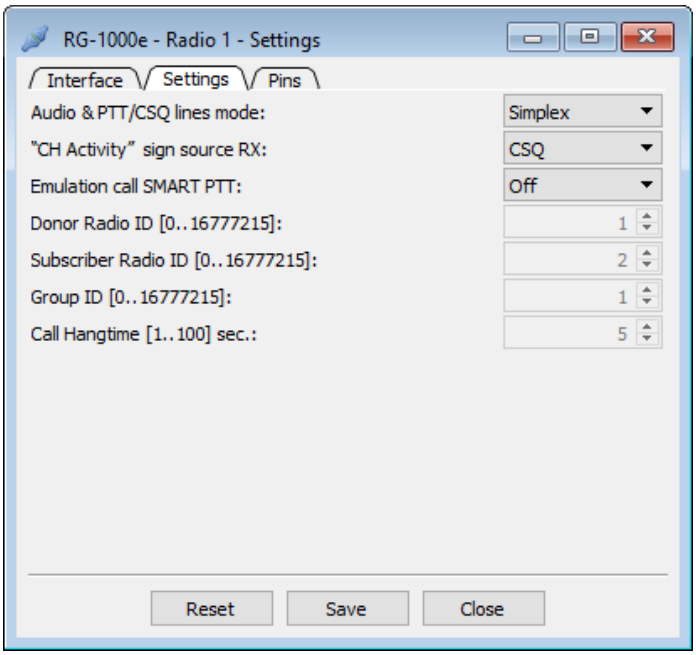


Fig. 26. Settings Tab for Radio IO Mode

For *Radio IO* mode, the **Settings** tab provides the following elements:

Audio & PTT/CSQ lines mode

Provides the ability to select the mode of voice exchange with the control station. The following options are available:

- *Simplex*. Voice calls through the control station are performed in half-duplex mode. This is the recommended option.
- *Duplex*. Voice calls through the control station are performed in full-duplex mode.

NOTE

SmartPTT does not support full duplex calls.

"CH Activity" sign source RX

Determines the criteria for recognizing incoming voice transmissions from the control station. The following options are available:

- *Off*. RG-1000e Gateway constantly streams audio from the control station.

Important

Do not select this option.

- *CSQ*. RG-1000e Gateway streams audio from the control station when receiving signal on the pin assigned as *"CH Activity" sign source CSQ/COR*.
- *VOX*. RG-1000e Gateway streams audio from the control station if the gateway's internal VOX detects voice activity on the control station.
  For information on VOX configuration, see Audio coder Rx.
- *CSQ | VOX*. RG-1000e Gateway streams audio from the control station if either the *CSQ* or the *VOX* criterion is met.

- *CSQ & VOX*. RG-1000e Gateway streams audio from the control station if both the *CSQ* and the *VOX* criteria are met.

NOTE

When you use RG-1000e Gateway in the *Radio IO* mode with control stations that do not have the CSQ/COR/PL Detect/TG Detect input signal on their accessory port, you can use the gateway's internal VOX to detect incoming voice transmissions.

Rx VOX can not be used for audio signals that were received from the radio demodulator.

Rx VOX can only be used for audio signals that were cleared from noise and are taken from the radio after they were processed using the noise squelch.

If possible, use the common linear audio signal on the radio accessory port. You can also use audio signals from the radio speaker pins. In such case, it is recommended to fix the radio speaker volume.

Emulation call SMART PTT

Must not be used.

The **Pins** tab provides the ability to configure how the connection cable pins are used for the control station.

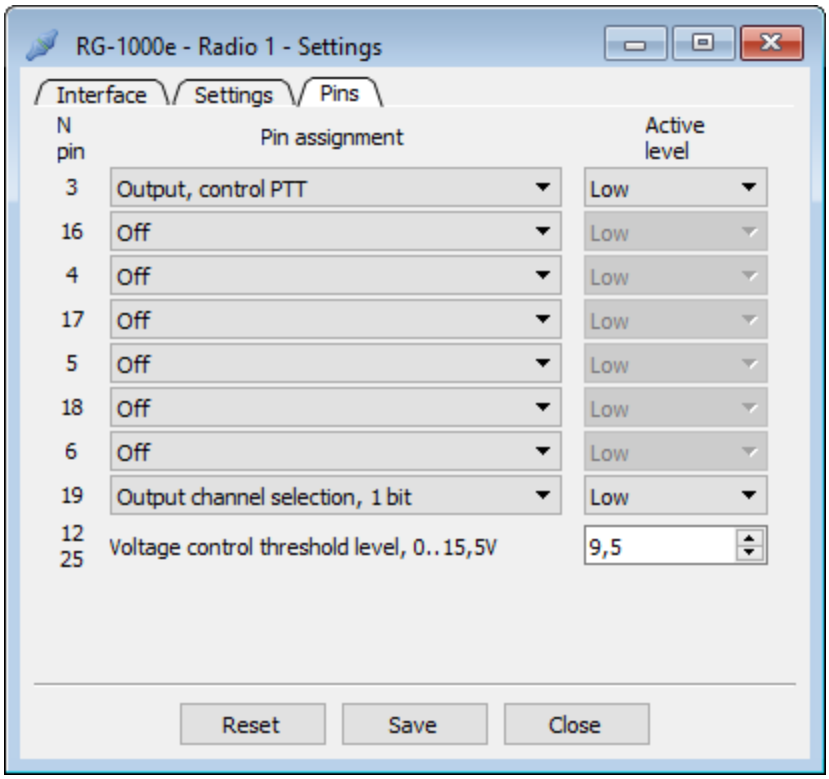


Fig. 27. Pins Tab

The **Pins** tab is arranged as a table with the following columns:

N pin

Pin number.

Pin assignment

Provides a list of functions that can be assigned to the pin. The availability of options depends on the pin number and the selected Interface mode. The following options are available:

Option	Available in modes	Description
Disable	All	The pin is not used.
Output, control PTT	All	The pin is used to signal the control station that there is an outgoing voice transmission.
Input, signal CSQ/COR	Motorola DM	The pin is used to receive a signal from the control station that there is an incoming voice transmission.
"CH Activity" sign source CSQ/COR	Radio IO	The pin is used to receive a signal from the control station that there is an incoming voice transmission.
Output channel selection, <bit number> bit	Radio IO	The pin is used to send a channel selection command to the control station. RG-1000e Gateway supports the selection of up to 63 channels. Therefore, up to 5 pins are required to transmit the desired channel number in binary format. The corresponding lines must also be configured in the control station codeplug. **Important** In *Radio IO* mode, at least one pin must be configured for channel selection even if the function will not be used. In such case, it is recommended to set Pin 19 to *Output channel selection, 1 bit*.

Active level

Voltage level (*High* or *Low*) that will be considered pin activity.

At the bottom of the window the following buttons are available:

Reset

Resets values to default.

Save

Saves changes and closes the window.

Close

Closes the window without saving changes.

4.3.2 Audio Rx

The **Audio Rx** window provides the ability to configure RG-1000e Gateway's audio inputs for the control station.

RG-1000e Gateway has two audio inputs. Input 1 is a balanced/unbalanced line input that is meant to be connected to the controls station's Rx audio output. Input 2 is an unbalanced input with an external attenuator and an additional amplifier. It is meant to be connected to atypical audio sources.

The window has two tabs. The **Input** tab provides audio input settings.

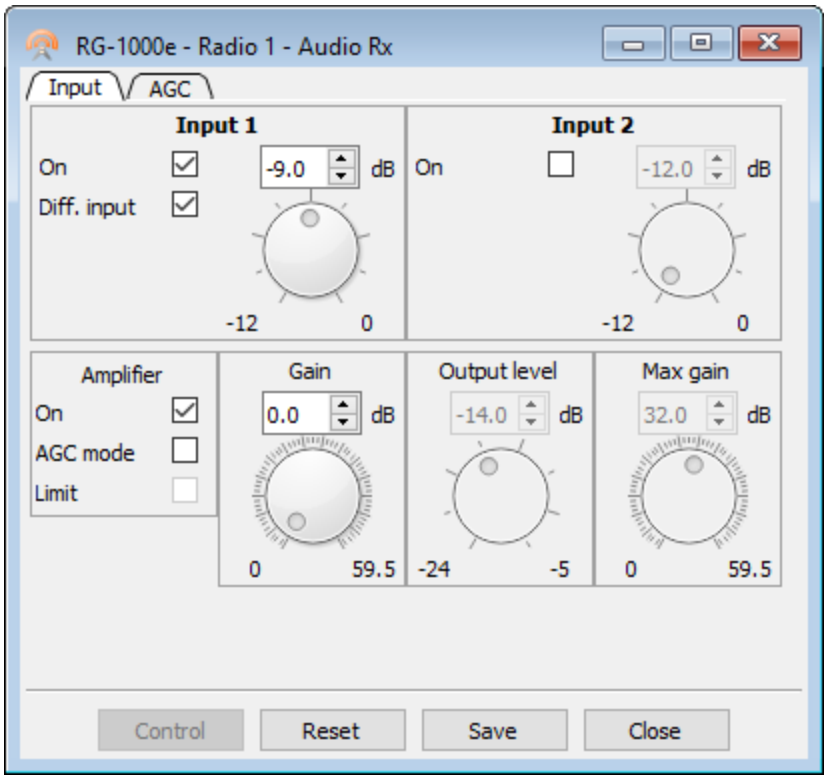


Fig. 28. Audio Rx Window, Input Tab

NOTE

The settings on the screenshot above are recommended for MOTOTRBO mobile radios and other radios that have Rx Audio output level around 330 mV RMS.

Elements on the **Input** tab are grouped in six areas.

The **Input 1** area provides the ability to configure the standard balanced/unbalanced line input. The area provides the following elements:

On

If the check box is selected, RG-1000e Gateway will use this input to receive audio from the control station.

Attenuator

The recommended value is *-9.0* dB.

Diff. input

If the check box is selected, the input will work as a differential input (recommended).

The **Input 2** area provides the ability to configure the unbalanced input with an external attenuator and an additional amplifier. The area provides the following elements:

On

If the check box is selected, RG-1000e Gateway will use this input to receive audio from the control station.

Attenuator

The recommended value is *0* dB.

The **Amplifier** area provides the ability to configure input signal amplification. The area provides the following elements:

On

If the check box is selected, audio from the control station will be amplified.

The field in the **Gain** area provides the ability to specify the desired amplifier gain. It is active only if the **On** check box in the **Amplifier** area is selected and the **AGC mode** check box is cleared.

NOTE

For information about the Automatic Gain Control feature configuration, submit a request to the SmartPTT Technical Support Center.

At the bottom of the window, the following buttons are available:

Control

Forces sending the audio to the recorder port regardless the state of the selected conditions. Must not be used.

Reset

Resets values to default.

Save

Saves changes and closes the window.

Close

Closes the window without saving changes.

4.3.3 Audio coder Rx

The **Audio coder Rx** window provides the ability to configure the voice codec used for incoming audio from the control station and the mechanism for detecting incoming voice transmissions.

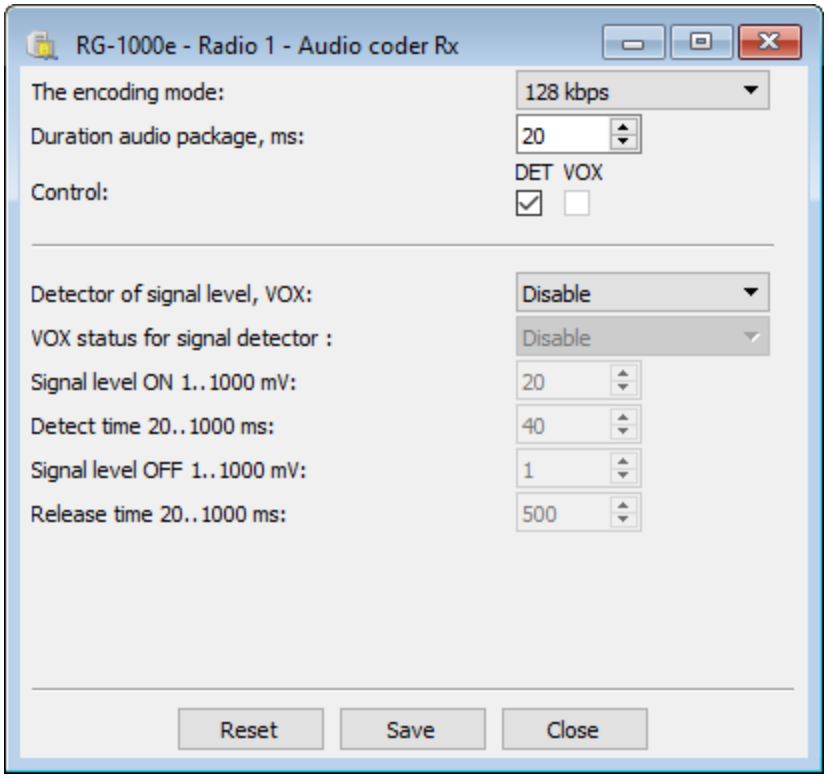


Fig. 29. Audio coder Rx Window

The **Audio coder Rx** window provides the following elements:

The encoding mode

Provides the ability to select the voice codec to be used for incoming audio from the control station. The following options are available:

- *Disable*. Disables stream transmission to the network.
- *6.0-18.2 kbps*. This option must not be used with SmartPTT. It can be used for the *Transit audio* and *Bridge* modes.
- *A-Law 64 kbps*. The G.711 codec using the A-law algorithm.
- *Mu-Law 64 kbps*. The G.711 codec using the Mu-law algorithm.
- *128 kbps*. Linear PCM codec. It is recommended to use this option.

Duration audio package

The length of audio packets. The recommended setting is *20*.

Control

Provides the ability to select the condition for detecting incoming audio. Two check boxes are available:

- **DET**. RG-1000e Gateway sends an audio signal to the network when the carrier detect signal is received. This mode is used to reduce the network traffic volume. It is recommended to select this check box.

Important

If you select this check box, you must also configure RG-1000e Gateway in the following way:
In Motorola DM mode, in the **Settings** window, select *USB Speaker*. For details, see Settings.
In Radio IO mode, on the **Pins** tab, you must select the *"CH Activity" sign source CSQ/COR* option for one of the pins, and then connect this pin to the corresponding control station pin. For details, see Settings.

- **VOX**. RG-1000e Gateway sends an audio signal to the network when the voice activity detection triggers.

WARNING

If the **DET** and **VOX** check boxes are cleared, the audio processing is continuous.

Detector of signal level, VOX

Provides the list to enable or disable the RX VOX signal level detector. Two options are available: *Enable* and *Disable*.

VOX status for signal detector

Provides the list to enable or disable the VOX status for the detector of RX VOX signal level. For details, see Settings.

Two options are available: *Enable* and *Disable*.

Signal level ON

Threshold audio level. If the signal level is higher than the threshold, RG-1000e Gateway treats it as incoming voice.

Detect time

Time from the detection of signal higher than the value in the **Signal level ON** field. If the signal is higher than this value during the time specified in the **Detect time** field, the gateway detects incoming transmission.

Signal level OFF

If the audio signal level is lower than the value in this field, RG-1000e Gateway registers that there is no incoming voice.

NOTE

It is recommended to use the 3:1 ratio for the **Signal level ON** and **Signal level OFF** fields.

Release time

Time without the signal with the level higher than the value in the **Signal level OFF** field. If the signal is lower than this value during the time specified in the **Release time** field, the gateway detects no incoming transmission. The minimum recommended value is *500*.

Reset

Resets values to default.

Save

Saves changes and closes the window.

Close

Closes the window without saving changes.

4.3.4 Audio Tx

The **Audio Tx** window provides the ability to define audio output parameters.

To open the **Audio Tx** window, expand the **Radio <number>** node, and then double-click **Audio Tx**.

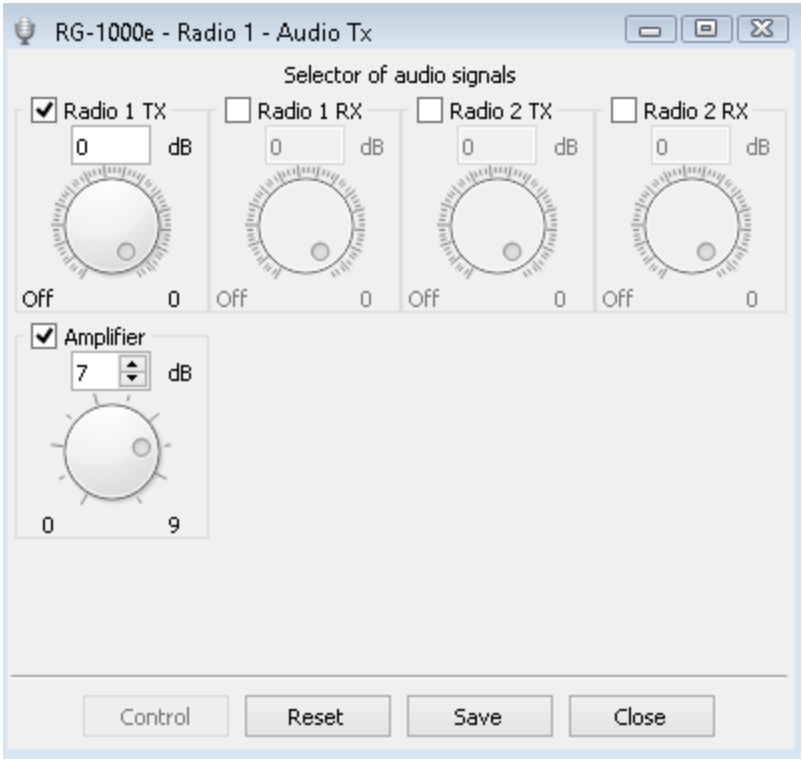


Fig. 30. Audio Tx Window

The window provides the ability to select the source of outgoing audio for control station. The level of signals can be adjusted using knobs in the range from -78,3 to 0 dB. In most cases, you can keep default settings.

The **Audio Tx** window provides the following elements:

Radio 1 RX

Sends an incoming audio signal from the Radio 1.

Radio 1 TX

Sends an outgoing audio signal from the Radio 1.

Radio 2 RX

Sends an incoming audio signal from the Radio 2.

Radio 2 TX

Sends an outgoing audio signal from the Radio 2.

Amplifier

Amplifies an audio signal in the range from 0 to 9 dB.

NOTE

For most radios, including MOTOTRBO, it is recommended to use 0 dB values for all audio channel signals and 7 dB for the amplifier.

Control

Forces sending the audio to the recorder port regardless the state of the selected conditions. Must not be used.

Reset

Resets values to default.

Save

Saves changes and closes the window.

Close

Closes the window without saving changes.

4.3.5 Audio TxH

The **Audio TxH** window provides the ability to define audio output parameters with high output signal level.

To open the **Audio TxH** window, expand the **Radio <number>** node, and then double-click **Audio TxH**.

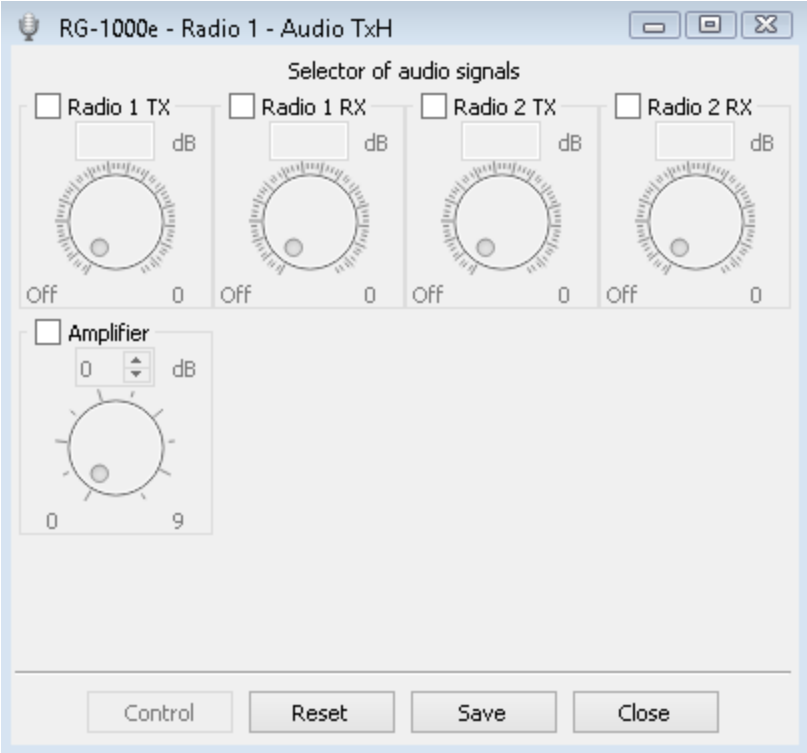


Fig. 31. Audio TxH Window

The window provides the ability to select the source of outgoing audio for control station. The level of signals can be adjusted using knobs in the range from -78,3 to 0 dB. In most cases, you can keep default settings.

The **Radio <radio_number> — Audio TxH** window provides the following elements:

Radio 1 RX

Sends an incoming audio signal from the Radio 1.

Radio 1 TX

Sends an outgoing audio signal from the Radio 1.

Radio 2 RX

Sends an incoming audio signal from the Radio 2.

Radio 2 TX

Sends an outgoing audio signal from the Radio 2.

Amplifier

Amplifies an audio signal in the range from 0 to 9 dB.

NOTE

For regular MOTOTRBO and other radio operations, keep all boxes unchecked.

Control

Forces sending the audio to the recorder port regardless the state of the selected conditions. Must not be used.

Reset

Resets values to default.

Save

Saves changes and closes the window.

Close

Closes the window without saving changes.

4.3.6 Encoder audio L-b

NOTE

This window settings do not apply to interoperability of RG-1000e Gateway and SmartPTT Radioserver. You must leave the default values.

4.4 Other

The **Other** node provides the ability to configure RG-1000e Gateway settings that associated with audio transmission and recording.

In case of the considerable sound delays or interruptions, you may need to change audio decoder parameters in the **Other — Audio decoders TX** window.

RG-1000e Gateway settings for recorder connection are available in the **Other — Recorder** window.

4.4.1 Audio decoder Tx

In the **Other — Audio decoders TX** window, you can configure buffer settings for outgoing audio on the specific channel. Buffering makes the system more robust and provides the ability to transmit a continuous sequence of data even if the stream interrupts. The bigger the buffer size is, the higher the chances that the system will handle all emergencies. A large size of the buffer mitigates jitter, but it makes the buffering process slower. As a result, the sound may be delayed.

To open the **Audio decoders TX** window, expand the **Other** node, expand the list of channels under the **Audio decoders TX** node, and then double click the desired channel.

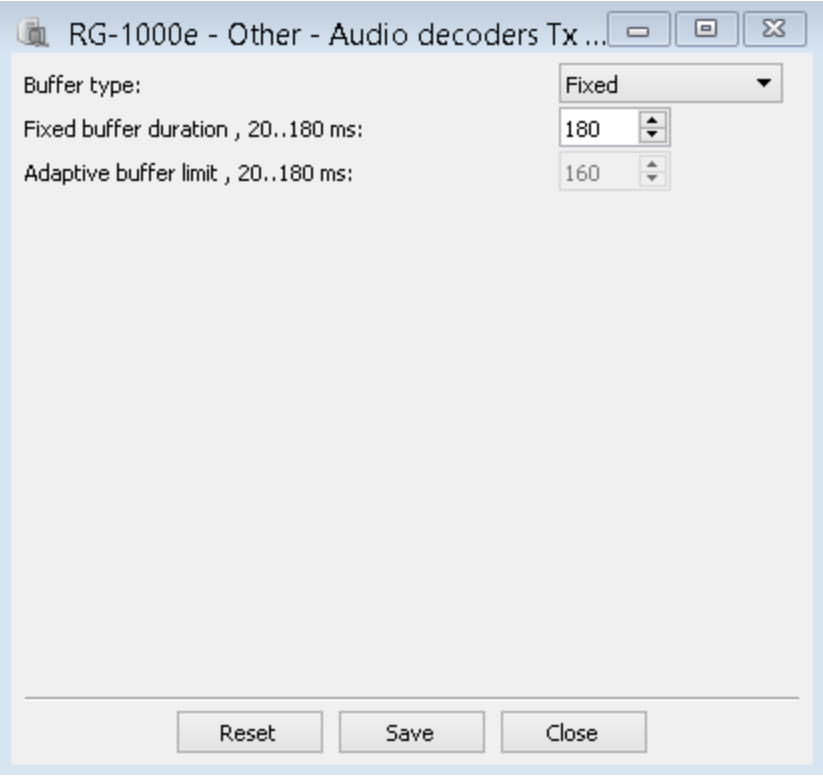


Fig. 32. The Audio decoders TX Window

The **Audio decoders TX** window provides the following elements:

Buffer type

Provides the list of buffer control modes:

- The *Fixed* mode provides the ability to configure a fixed buffer duration.
- The *Adaptive* mode adapts to jitter during packet transmission from server to gateway within the specified buffer limit.

Fixed buffer duration

The duration of buffering in milliseconds in the Fixed buffer control mode. You can enter values from 20 to 180 in increments of 20 milliseconds. The recommended value is 3–4 times bigger than maximum packet jitter value in the network.

Adaptive buffer limit

The maximum duration of buffering in milliseconds in the Adaptive buffer control mode. The recommended value is *160*.

Reset

Resets values to default.

Save

Saves changes and closes the window.

Close

Closes the window without saving changes.

4.4.2 Recorder

The **Recorder** window provides parameters and controls to manage audio transmission to an external recorder.

NOTE

These settings have no impact on RG-1000e Gateway and radioserver compatibility. They must be configured only in case of third-party recorders connection to RG-1000e Gateway.

To open the **Recorder** window, expand the **Other** node, and then double-click the **Recorder** node.

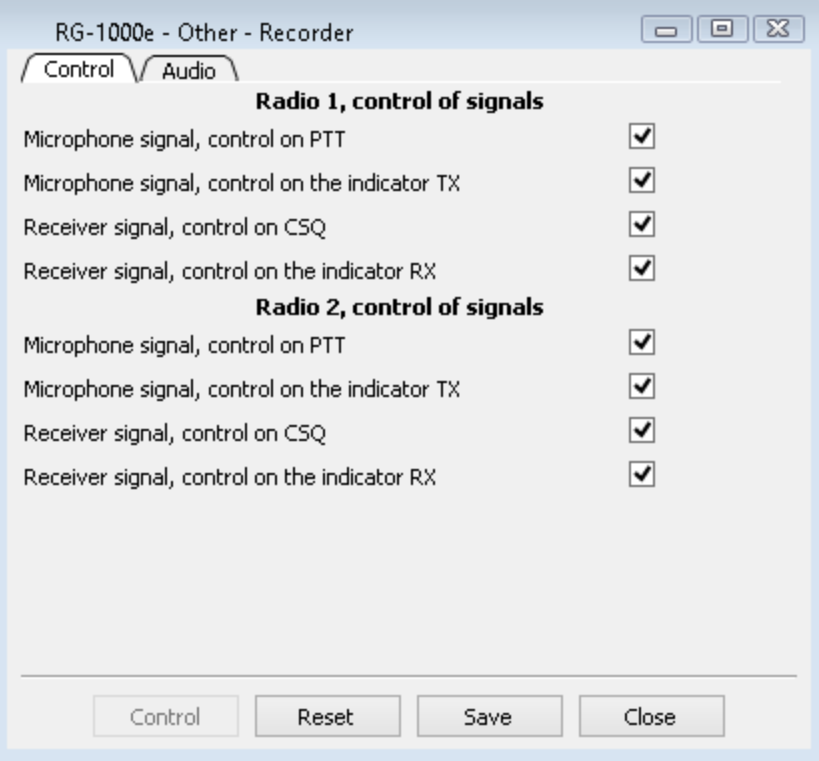


Fig. 33. The Recorder Window, Control Tab

The window consists of the **Control** and **Audio** tabs. The **Control** tab provides selection of the digital signals that trigger audio recording. The **Control** tab provides the following elements:

Microphone signal, control on PTT

Sends microphone signal to the recorder port on PTT signal.

Microphone signal, control on the indicator TX

Sends microphone signal to the recorder port when the control station's transmitter activates.

Receiver signal, control on CSQ

Sends receiver signal to the recorder port when receiving CSQ/COR signal from the control station.

Receiver signal, control on the indicator RX

Sends receiver signal to the recorder port when the control station's receiver activates.

NOTE

To record signals from Radio 1, select all desired check boxes under **Radio 1, control of signals**. To record signals from Radio 2, select all desired check boxes under **Radio 2, control of signals**.

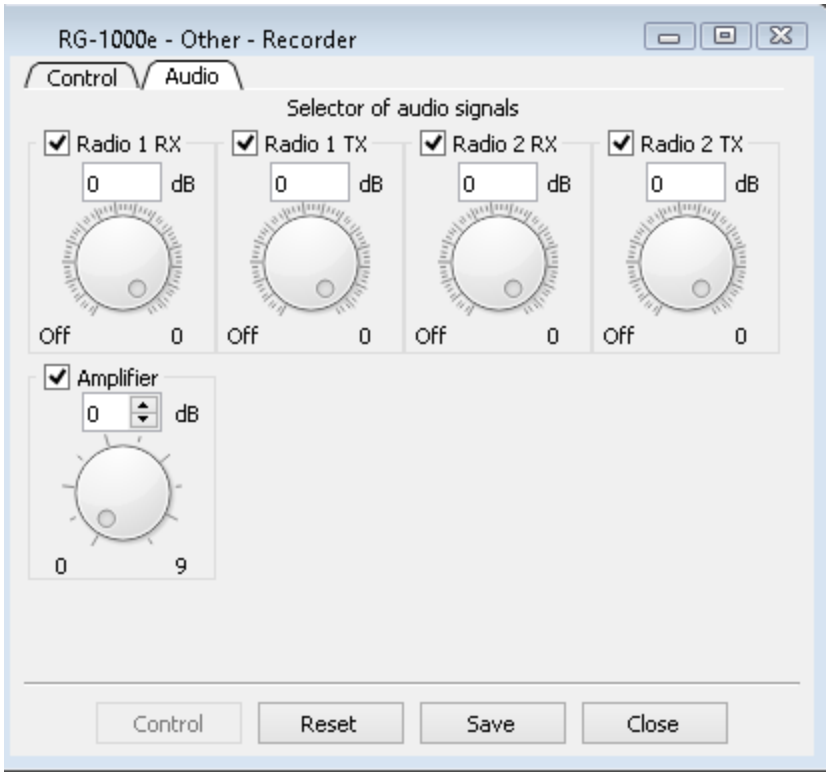


Fig. 34. The Recorder Window, Audio Tab

The **Audio** tab provides the **Selector of Audio Signals** that go to the recorder ports and an amplifier. The Selector's signals can be set in the diapason of –78,3 to 0 dB using knobs or typing the desired value in the fields. The **Audio** tab provides the following elements:

Radio 1/2 RX/TX

Select the check box to record the corresponding transmissions. In the field below the check box, enter the desired signal level in dB. The signal from RG-1000e Gateway to the recorder will be attenuated accordingly.

Amplifier

If enabled, amplifies all selected signals. The field below the check box provides the ability to amplify audio signals in the range from 0 to 9 dB.

NOTE

On the **Audio** tab, it is recommended to keep default values: *0* dB.

At the bottom of the window the following buttons are available:

Control

Forces sending the audio to the recorder port regardless of the state of the selected conditions. Must not be used.

Reset

Resets values to default.

Save

Saves changes and closes the window.

Close

Closes the window without saving changes.

4.5 Statistics

The **Statistics** node provides the ability to display statistic data for the following components:

- RG-1000e Gateway
- Radio and control terminal interface connections
- Network interface
- IP channels

To start or stop receiving data from RG-1000e Gateway, in the corresponding statistics window, click **Start** or **Stop**. The data is refreshed with 1-second intervals.

When statistic counter overflows, it resets to default values and starts counting again. To reset counters, click **Reset** in the statistic data window.

4.5.1 Common

The **Statistics — Common** window provides information on the RG-1000e Gateway processors and its network interface.

To open the **Statistics — Common** window, expand the **Statistics** node, and then double-click the **Common** node. To display statistics, click **Start**.

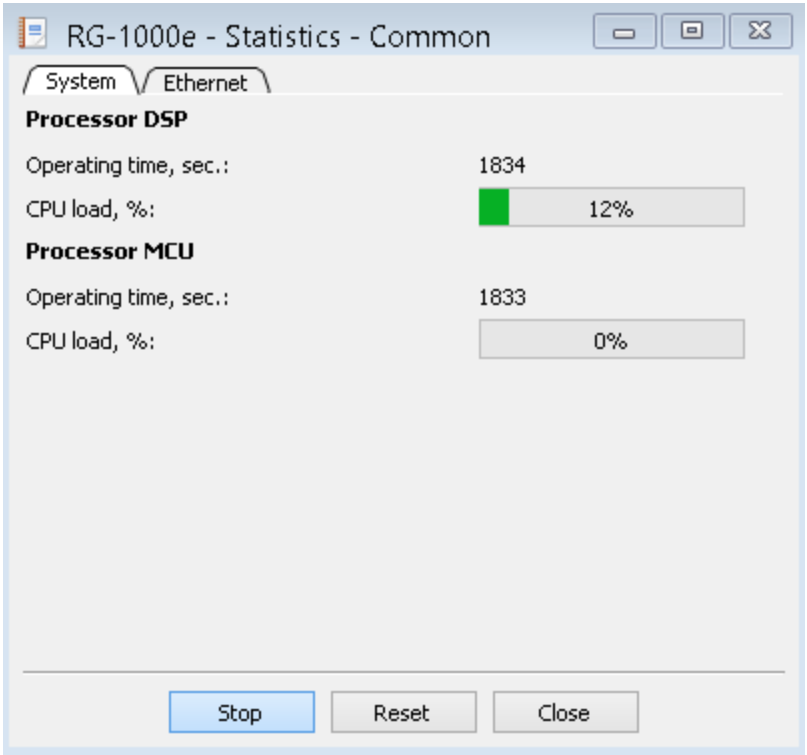


Fig. 35. The Statistics — Common Window, System Tab

The window consists of the **System** and **Ethernet** tabs. The **System** tab provides the following information on the digital signal processor (DSP) and microcontroller unit (MCU) load:

Operating time

Time from the moment DSP/MCU was launched in seconds.

CPU load

Visual representation of the DSP/MCU load in percentage points.

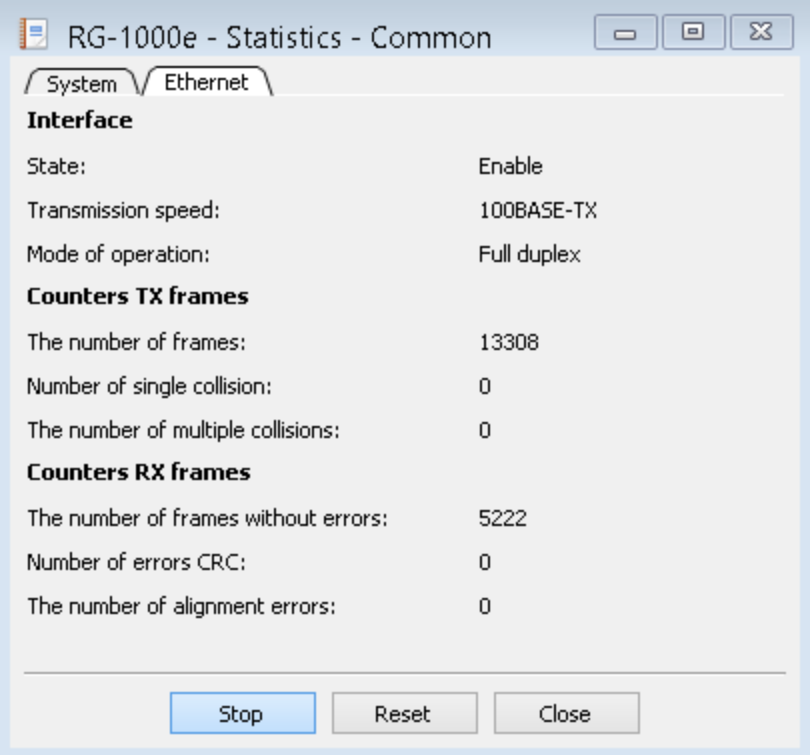


Fig. 36. The Statistics — Common Window, Ethernet Tab

The **Ethernet** tab provides the following information on Ethernet connection:

State

Connection state.

Transmission speed

Data transmission standard and speed. If the 10BASE-T standard is used, the transmission speed is up to 10 Mbit/s. If the 100BASE-TX standard is used, the transmission speed is up to 100 Mbit/s.

Mode of operation

Mode of data transmission using Ethernet: full duplex or half duplex.

The number of frames

Counter of outgoing transmission frames since data collection started.

Number of single collision

Number of single collisions (when the first frame transmission failed, but the second try was successful).

The number of multiple collisions

Number of multiple collisions (when successful frame transmission was preceded by several fails).

The number of frames without errors

Number of frames transmitted without errors.

The number of errors CRC

Number of errors associated with check sum failure.

The number of alignment errors

Number of errors associated with an odd number of octets in frames received.

At the bottom of the window the following buttons are available:

Start/Stop

Starts/stops collection of statistics.

Reset

Resets values to default.

Close

Closes the window.

4.5.2 Radio

The **Statistics — Radio <Radio_Number>** window provides information on radio operation.

To open the **Statistics — Radio <Radio_Number>**, expand the **Statistics** node and double-click the desired radio. To display statistics, click **Start**.

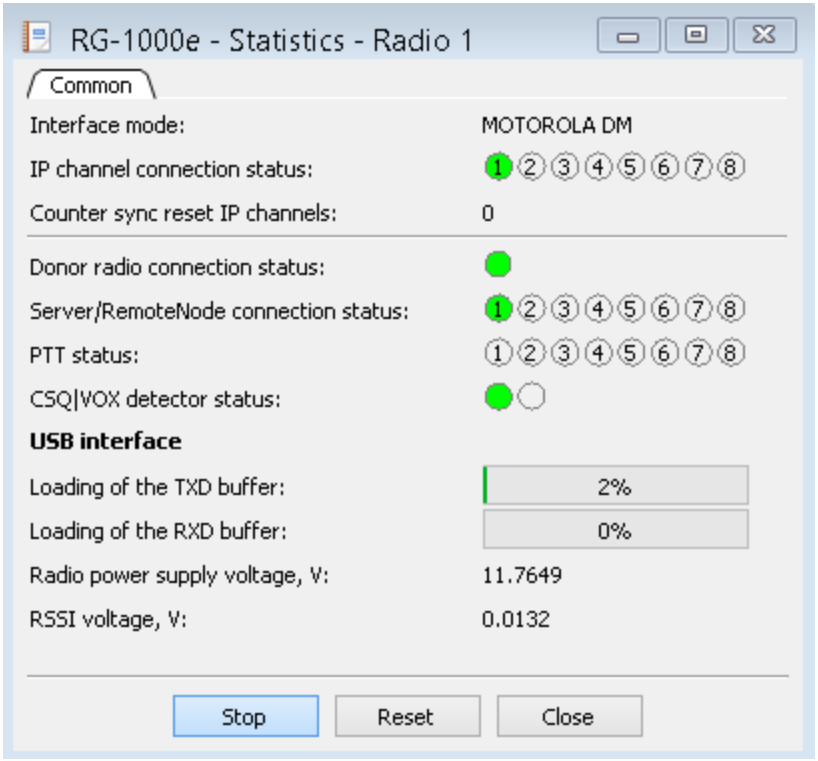


Fig. 37. The Statistics — Radio 1 Window

The **Statistics — Radio <Radio_Number>** window provides the following information:

Interface mode

Current interface mode used for the selected radio port.

IP channel connection status

Displays network connection between RG-1000e Gateway and radioserver using one of IP channels.

Counter sync reset IP channels

Number of IP channels syncronization resets.

Donor radio connection status

Displays if there is a connection to the control station. If the connection is active, the indicator is green.

Server/RemoteNode connection status

Displays connection between RG-1000e Gateway and radioserver on one of IP channels.

PTT status

Indicates PTT signal from the radioserver on one of the IP channels.

CSQ|VOX detector status

Displays if the control station generates CSQ or VOX signal. The corresponding indicator is highlighted depending on the type of the transmitted signal.

Loading of the TXD buffer

Visual representation of the transmitted data buffer in percentage points.

Loading of the RXD buffer

Visual representation of the received data buffer in percentage points.

Radio power supply voltage

Radio power supply in volts.

RSSI voltage

Signal strength level in volts.

Start/Stop

Starts/stops collection of statistics.

Reset

Resets values to default.

Close

Closes the window.

4.5.3 Network

The **Statistics — Network** window provides the following information:

- Network interface driver report
- ARP, IP, UDP network protocols report
- Report on transmitted and received data for radio interfaces

To open the **Statistics — Network** window, expand the **Statistics** node, and then double-click **Network**. To display statistics, click **Start**.

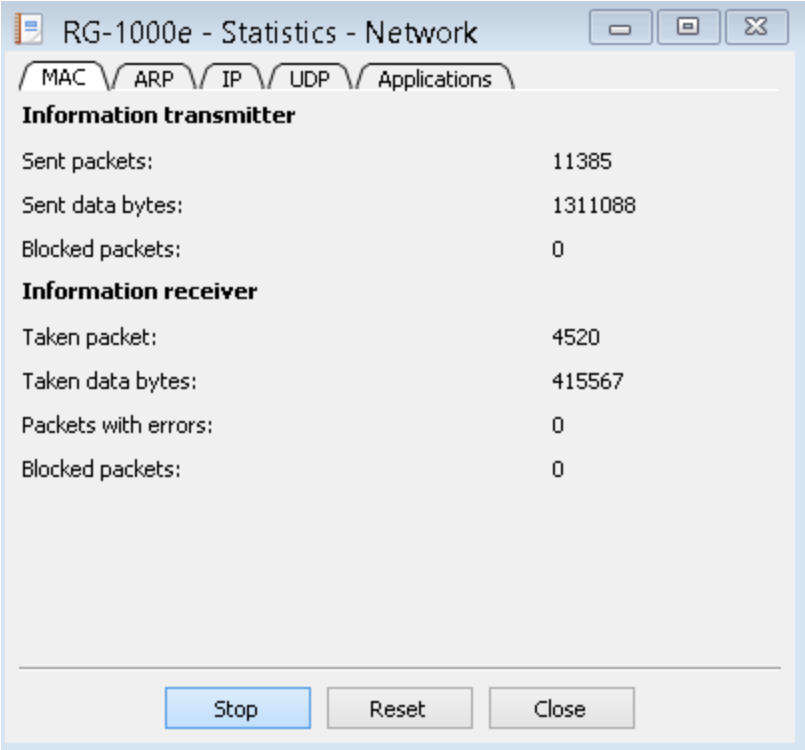


Fig. 38. The Statistics — Network Window, MAC Tab

The window consists of the **MAC**, **ARP**, **IP**, **UDP**, and **Applications** tab. The **MAC**, **IP**, and **UDP** tabs provide the following information:

Sent packets
Number of sent packets.

Sent data bytes
Amount of sent data in bytes.

Blocked packets
Number of transmitter packets that were blocked. The parameter is only available on the **MAC** tab.

Taken packet
Number of received packets.

Taken data bytes
Amount of received data in bytes.

Packets with errors
Number of packets with errors.

Blocked packets
Number of receiver packets that were blocked.

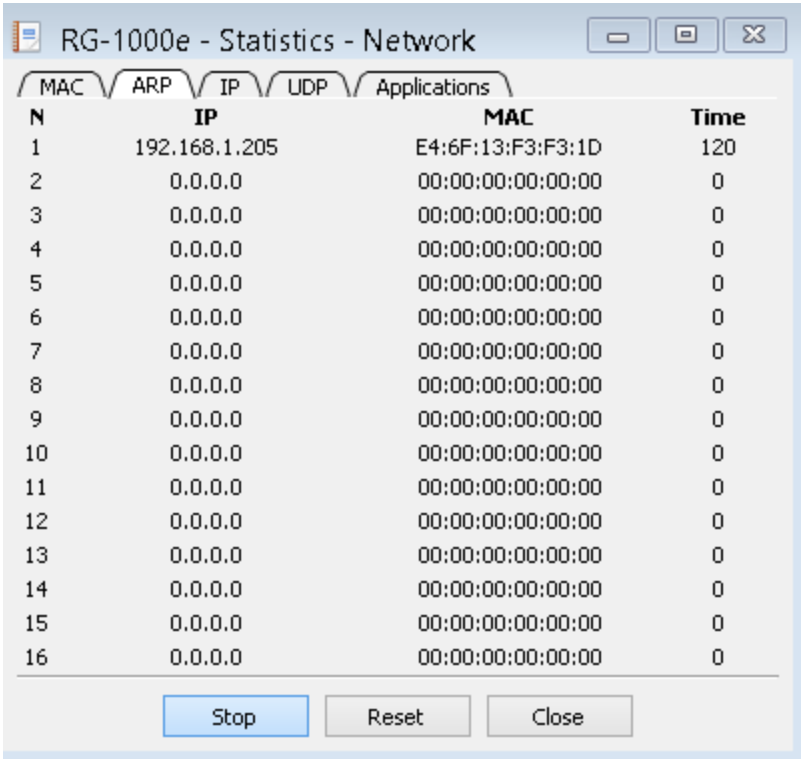


Fig. 39. The Statistics — Network Window, ARP Tab

The **ARP** tab provides the ARP table of IP- and MAC-addresses.

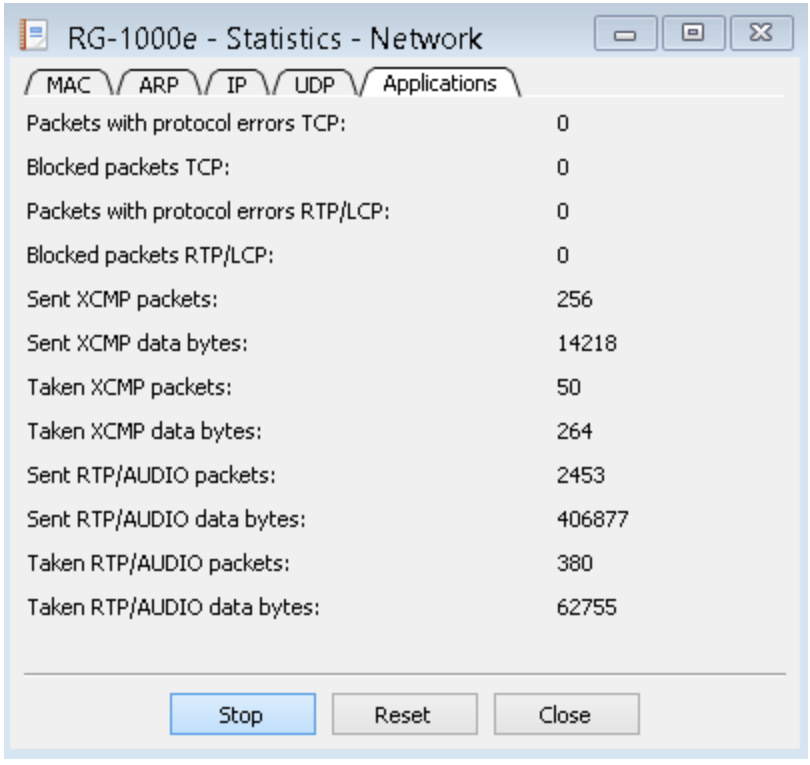


Fig. 40. The Statistics — Network Window, Applications Tab

The **Applications** tab provides the following information on received and sent control station data:

Packets with protocol errors TCP

Number of transmitted packets with a TCP protocol error.

Blocked packets TCP

Number of blocked TCP packets.

Packets with protocol errors RTP/LCP

Number of transmitted packets with the RTP/LCP protocol error.

Blocked packets RTP/LCP

Number of blocked RTP/LCP packets.

Sent XCMP packets

Number of packets sent using the XCMP protocol.

Sent XCMP data bytes

Amount of data sent using the XCMP protocol in bytes.

Sent RTP/AUDIO packets

Number of packets sent using the RTP/AUDIO port.

Sent RTP/AUDIO data bytes

Amount of data sent using the RTP/AUDIO port in bytes.

Taken RTP/AUDIO packets

Number of packets received using the RTP/AUDIO port.

Taken RTP/AUDIO data bytes

Amount of data received using the RTP/AUDIO port in bytes.

At the bottom of the window, the following buttons are available:

Start/Stop

Starts/stops collection of statistics.

Reset

Resets values to default.

Close

Closes the window.

4.5.4 IP channel

The **Statistics — IP Channel <Channel_Number>** window provides information on the corresponding IP channel operation, for example, TCP protocol data, numbers of RTP streams, and information on packets number sent and received by various services.

To open the **Statistics — IP Channel <Channel_Number>** window, expand the **Statistics** node and double-click the desired channel. To display statistics, click **Start**.

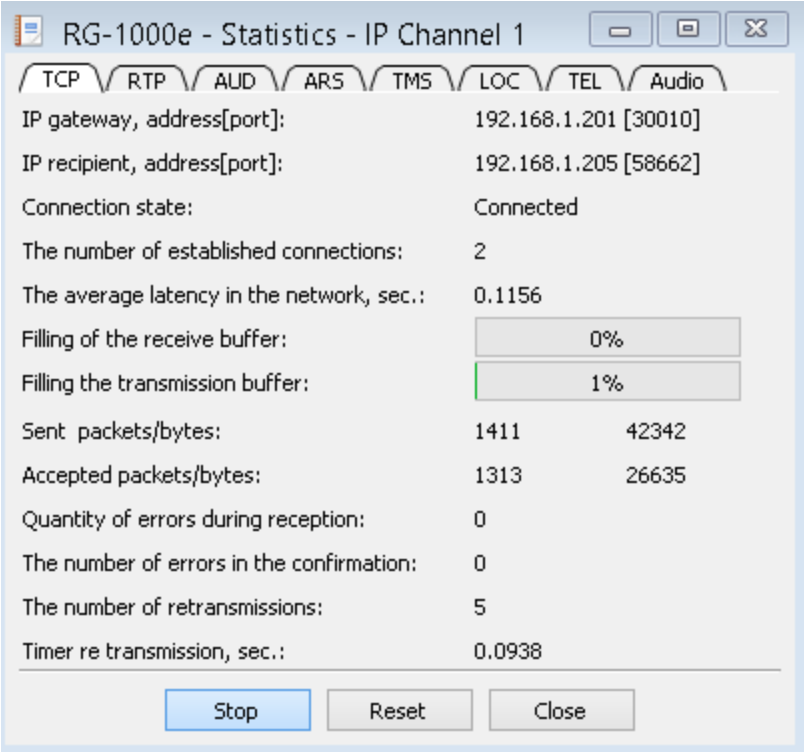


Fig. 41. The Statistics — IP Channel Window, TCP Tab

The window consists of the **TCP**, **RTP**, **AUD**, **ARS**, **TMS**, **LOC**, **TEL**, and **Audio** tabs. The **TCP** tab provides the following information:

IP gateway address[port]

RG-1000e Gateway IP address and XCMP port number.

IP recipient address[port]

Radioserver IP address and port number that are used for RG-1000e Gateway connection.

Connection state

RG-1000e Gateway and radioserver connection state information.

The number of established connections

Number of currently established connections with radioserver.

The average latency in the network

Average time spent to send a packet and confirm its delivery.

Filling of the receive buffer

Visual representation of how full the received audio buffer is (in percents).

Filling the transmission buffer

Visual representation of how full the transmitted audio buffer is (in percents).

Sent packets/bytes

Number of sent packets and their total size in bytes.

Accepted packets/bytes

Number and amount of received packets.

Quantity of errors during reception

Number of data acquisition errors.

The number of errors in the confirmation

Number of confirmation errors.

The number of retransmissions

Number of attempts to transmit data.

Timer retransmission

Data retransmission timer.

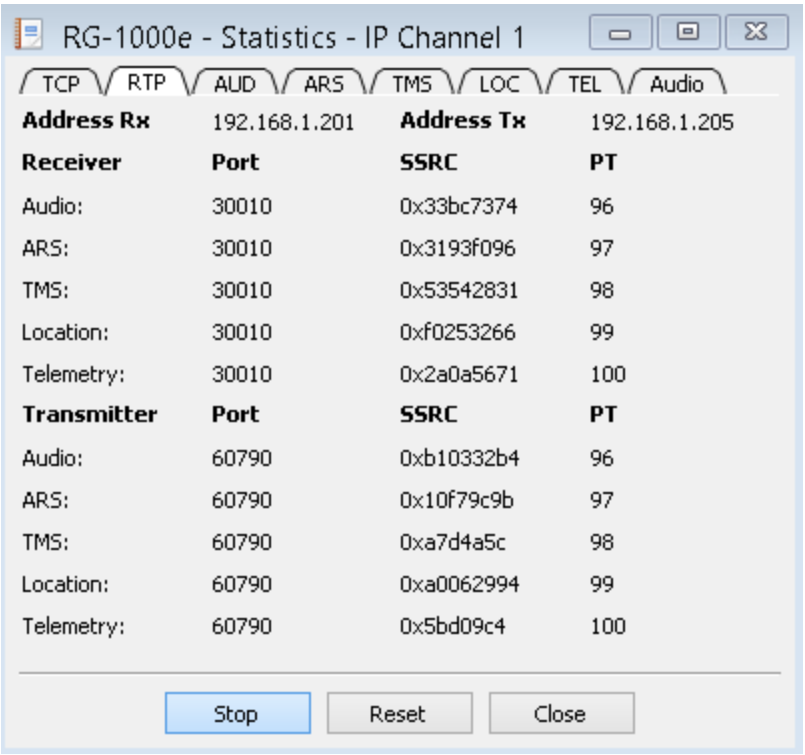


Fig. 42. The Statistics — IP Channel Window, RTP Tab

The **RTP** tab provides the following information:

Address Rx

Recipient's IP address.

Address Tx

Source IP address.

The **RTP Session Table** that consists of the following columns:

- The *Receiver/Transmitter* column provides the port types.
- The *Port* column provides the receiver or transmitter port numbers.
- The *SSRC* column provides identifier of the RTP stream source.
- The *PT* (payload type) column provides the identifiers of the RTP stream content.

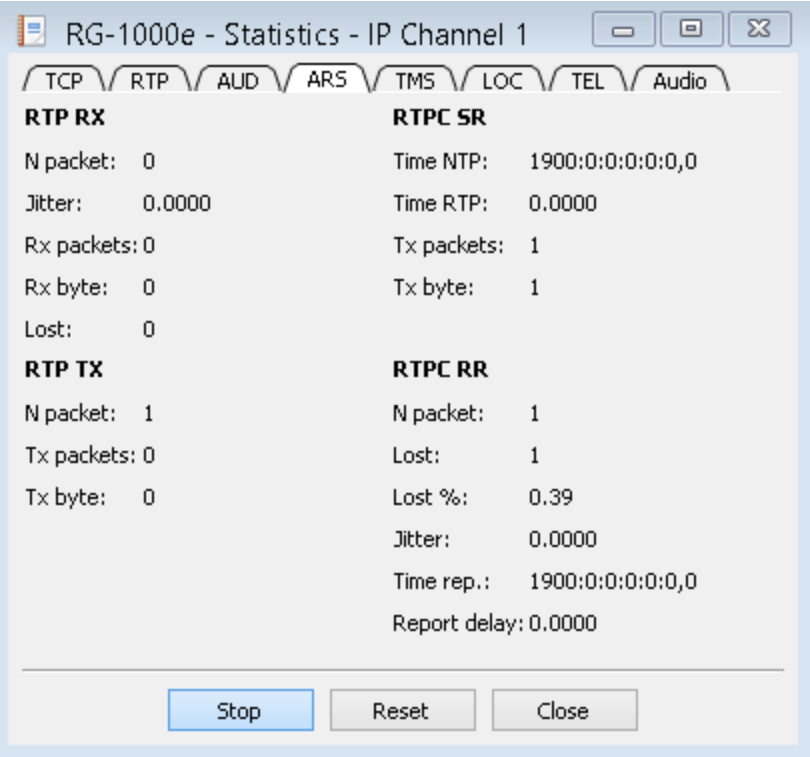


Fig. 43. The Statistics — IP Channel Window, ARS Tab

The **AUD**, **ARS**, **TMS**, **LOC**, and **TEL** tabs provides information on data sent and received by ports.

Under the **RTP RX** title the following information on real-time data acquisition is available:

- The **N packet** element displays the packet number.
- The **Jitter** element displays the jitter measurement.
- The **Rx packets** element displays the number of received packets.
- The **Rx byte** element displays the amount of received data in bytes.
- The **Lost** element displays the number of lost packets.

Under the **RTP TX** title the following information on real-time data transmission is available:

- The **N packet** element displays the packet number.
- The **Tx packets** element displays the number of transmitted packets.
- The **Tx byte** element displays the amount of transmitted data in bytes.

Under the **RTPC SR** title the following information on transmitter report about RTP packets sent is available:

- The **Time NTP** element displays the NTP timestamp.
- The **Time RTP** element displays the RTP timestamp.
- The **Tx packets** element displays the number of transmitted packets.
- The **Tx byte** element displays the amount of transmitted data in bytes.

Under the **RTPC RR** title the following information on receiver report about RTP packets received is available:

- The **N packet** element displays the packet number.

- The **Lost** element displays the number of lost packets.
- The **Lost %** element displays the ratio of data lost.
- The **Jitter** element displays the jitter measurement.
- The **Time rep.** element displays the report timestamp.
- The **Report delay** element displays the report delay time.

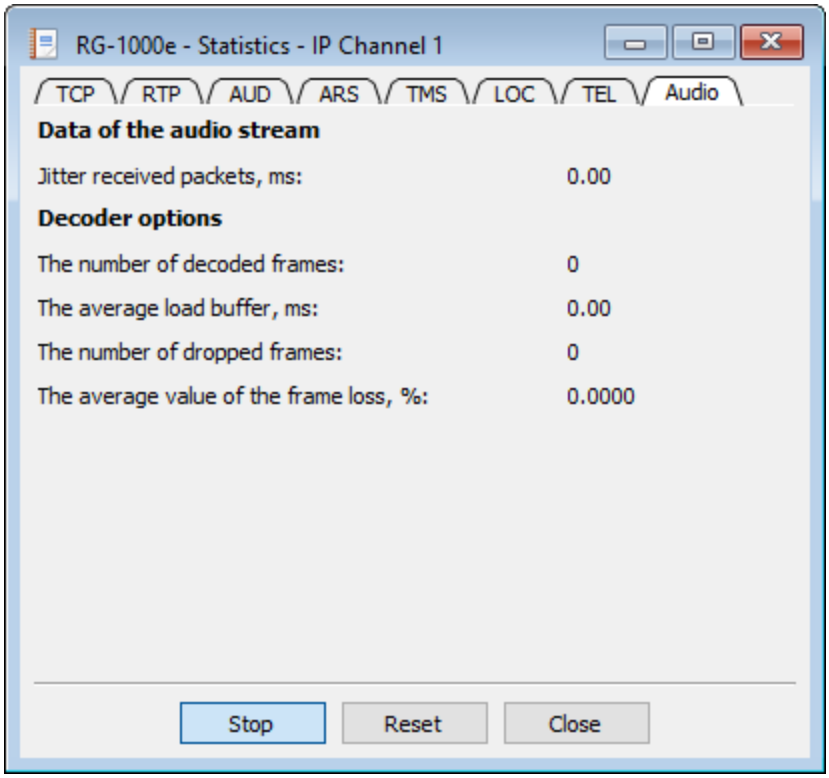


Fig. 44. The Statistics — IP Channel Window, Audio Tab

The **Audio** tab provides the following information:

Jitter received packets

Jitter measurement in seconds.

The number of decoded frames

Number of frames decoded during the audio transmission.

The average load buffer

Average decoder buffer load in milliseconds.

The number of droped frames

Number of frames lost during transmission.

The average value of frame loss

Average number of frames lost during audio transmission.

At the bottom of the window the following buttons are available:

Start/Stop

Starts/stops collection of statistics.

Reset

Resets values to default.

Close

Closes the window.

4.6 Monitor

The **Monitor** window provides the ability to view input and output oscillograms for audio signals of the RG-1000e Gateway interfaces. The oscillograms are displayed in real time at 8 kHz sampling frequency.

To open the **Monitor** window, double click the desired audio input or output under the **Monitor** node on the **RG-1000e** panel. To display an oscillogram, click **Start**.

NOTE

It is recommended to use the default values for the number of samples and scales.

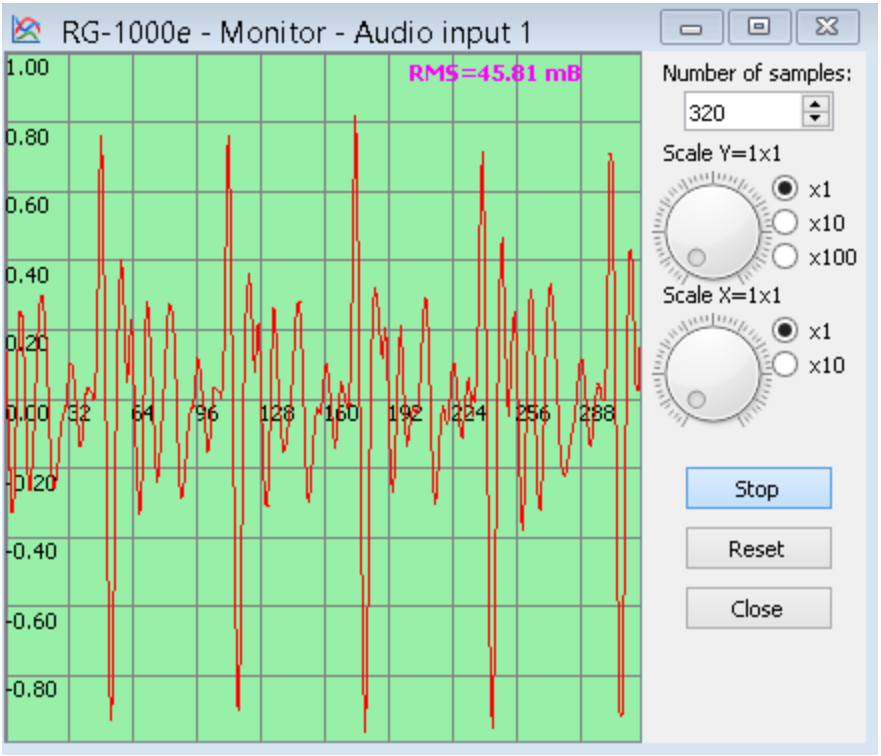


Fig. 45. The Monitor — Audio Window

The **Monitor** window provides the following elements:

Number of samples

Number of samples on the X axis.

Scale Y=1x1

Scale of Y axis in arbitrary units.

Scale X=1x1

Scale of X axis in arbitrary units.

NOTE

Maximum scale value for the X and Y axes is 0 dbFS of numeric scale.

Start/Stop

Starts/stops the oscillogram display.

Reset

Resets values to default.

Close

Closes the window.

4.7 Info

The **Info** window contains RG-1000e Gateway model description, serial number, and numbers of processor software versions. When **To edit description text** check box is selected, you can type the additional information in the field below.

To open the **Info** window, double-click **Info** on the **RG-1000e** panel.

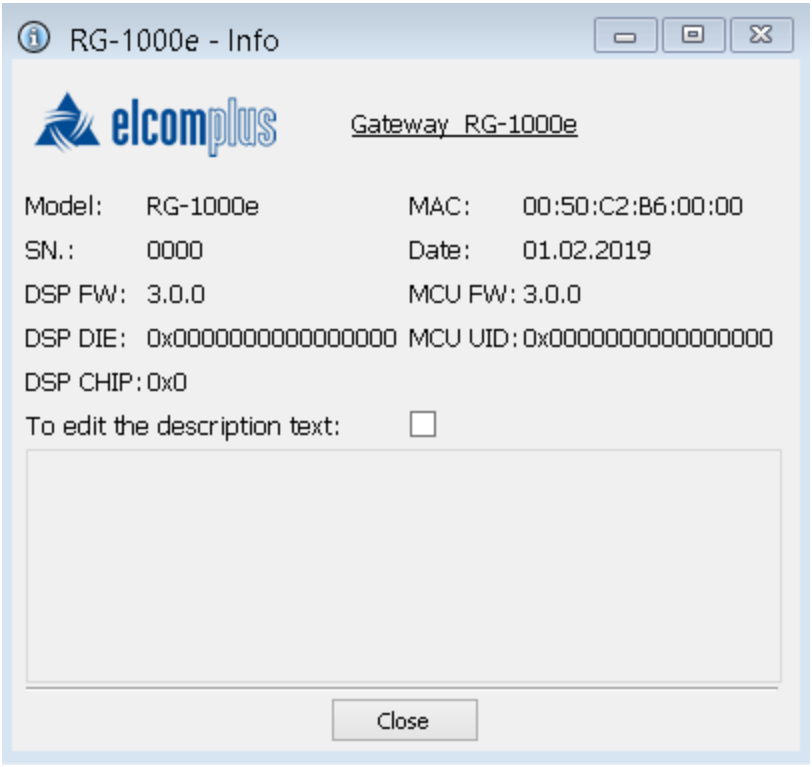


Fig. 46. The Info Window

5 Control Stations Configuration

This section describes configuration of the settings that are directly related to the interaction with RG-1000e Gateway in the codeplugs of the following control stations:

- MOTOTRBO radios. For details, see MOTOTRBO Radios.
- TETRA radios. For details, see TETRA Radios.
- CDM/PRO Series and GM140/GM160 mobile radios. For details, see CDM/PRO/GM140/GM160 Radios.
- GM340/GM360 mobile radios. For details, see GM340/GM360 Radios.
- DR 3000 / XPR 8300 / XPR 8400 / XiR R8200 repeaters (analog mode). For details, see Repeaters (Analog Mode).

5.1 MOTOTRBO Radios

Follow the procedure to configure the codeplug settings of the MOTOTRBO radio required for its connection to RG-1000e Gateway in the MOTOROLA DM interface mode.

NOTE
The procedure is for MOTOTRBO CPS 2.0 using a DM4601e codeplug.

Prerequisites:

- Ensure that the firmware version of the MOTOTRBO radio connected to RG-1000e Gateway is not lower than R02.40.10.
- Start MOTOTRBO CPS and open the desired MOTOTRBO radio codeplug.

Procedure:

1. Open **General** → **Accessories**.

2. In the **General** area, configure the radio accessory connector modes:

   a. From the **RX Audio Type** list, select *Filtered Squelch*.

   b. From the **Cable Type**, select *Rear PC & Audio*.

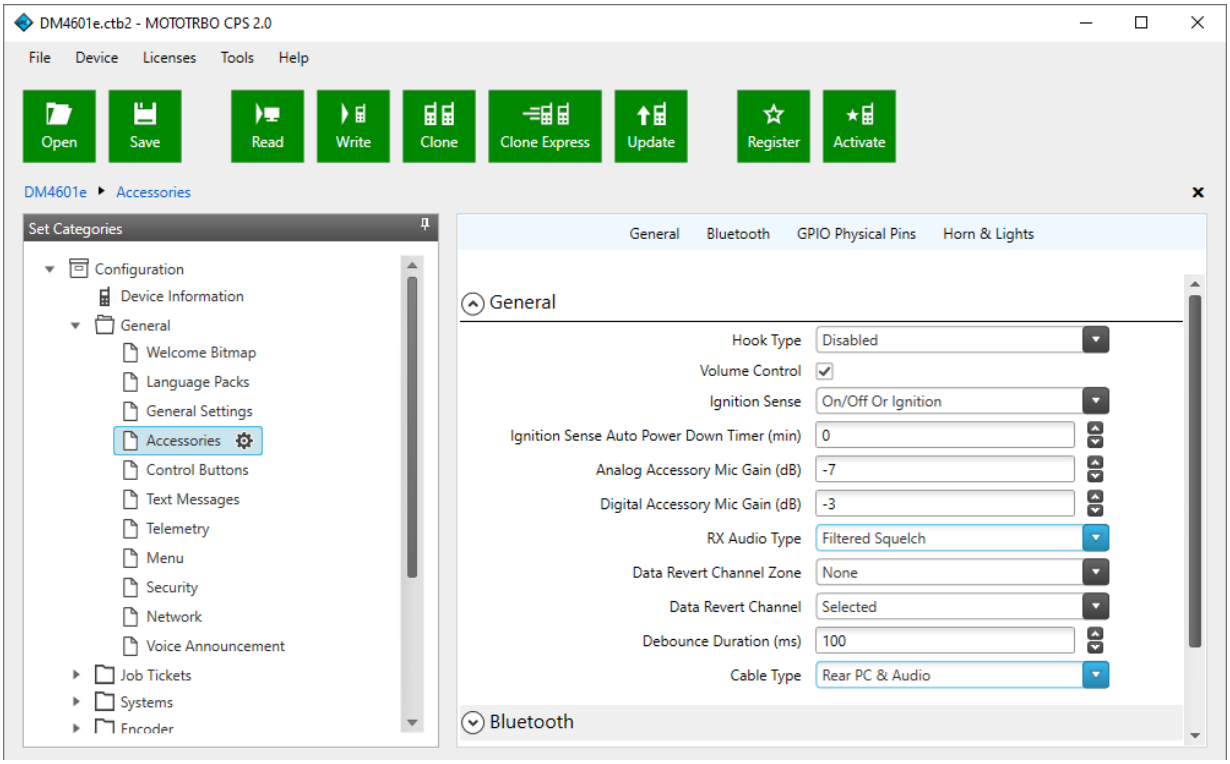


Fig. 47. MOTOTRBO Radio Accessory Connector Modes Configuring

3. In the **GPIO Physical Pins** area, for the **GPIO1** entry, from the **Feature** list, select *Ext Mic PTT*, and then, from the **Active Level** list, select *Low*.

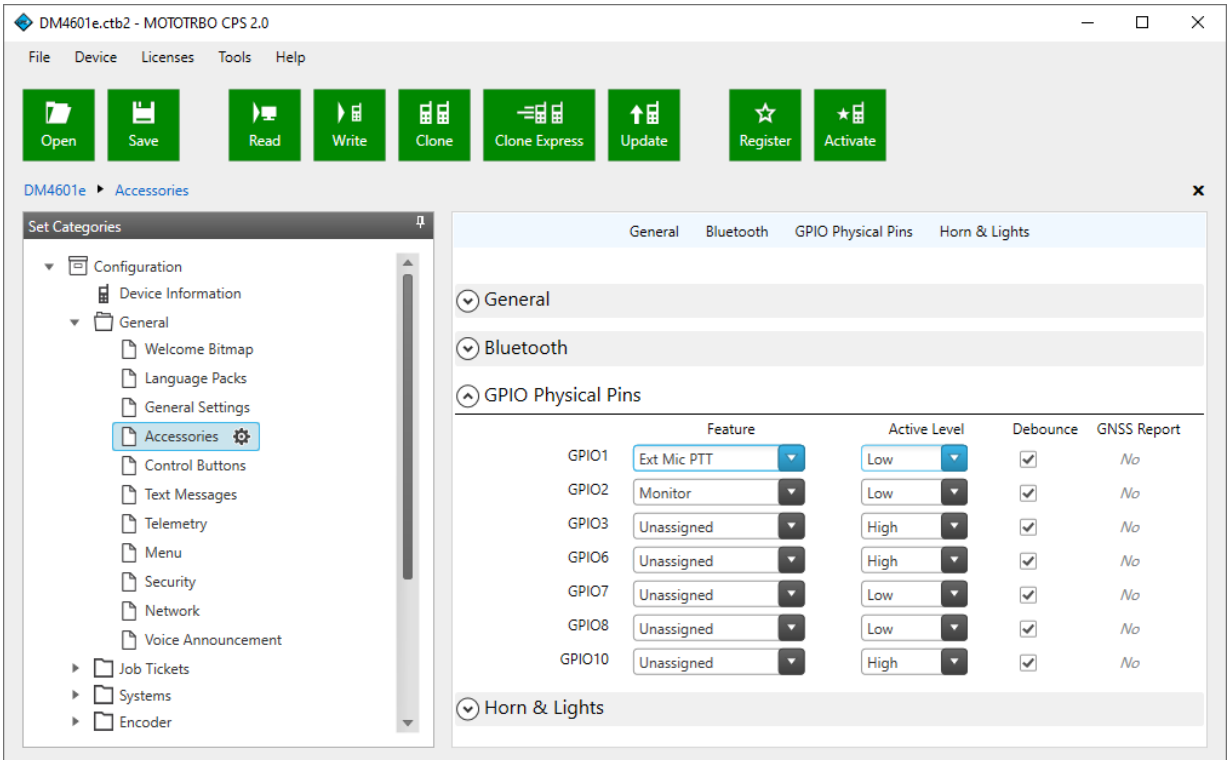


Fig. 48. MOTOTRBO Radio Accessory Connector Pin Configuring

4. Open the **Network** tab.
5. In the **Radio Network** area, configure the following settings:
   a. In the **Telemetry UDP Port** field, enter the desired number of the port used for telemetry data acquisition and remote control commands.
   b. From the **Forward to PC** list, select *Via USB*.

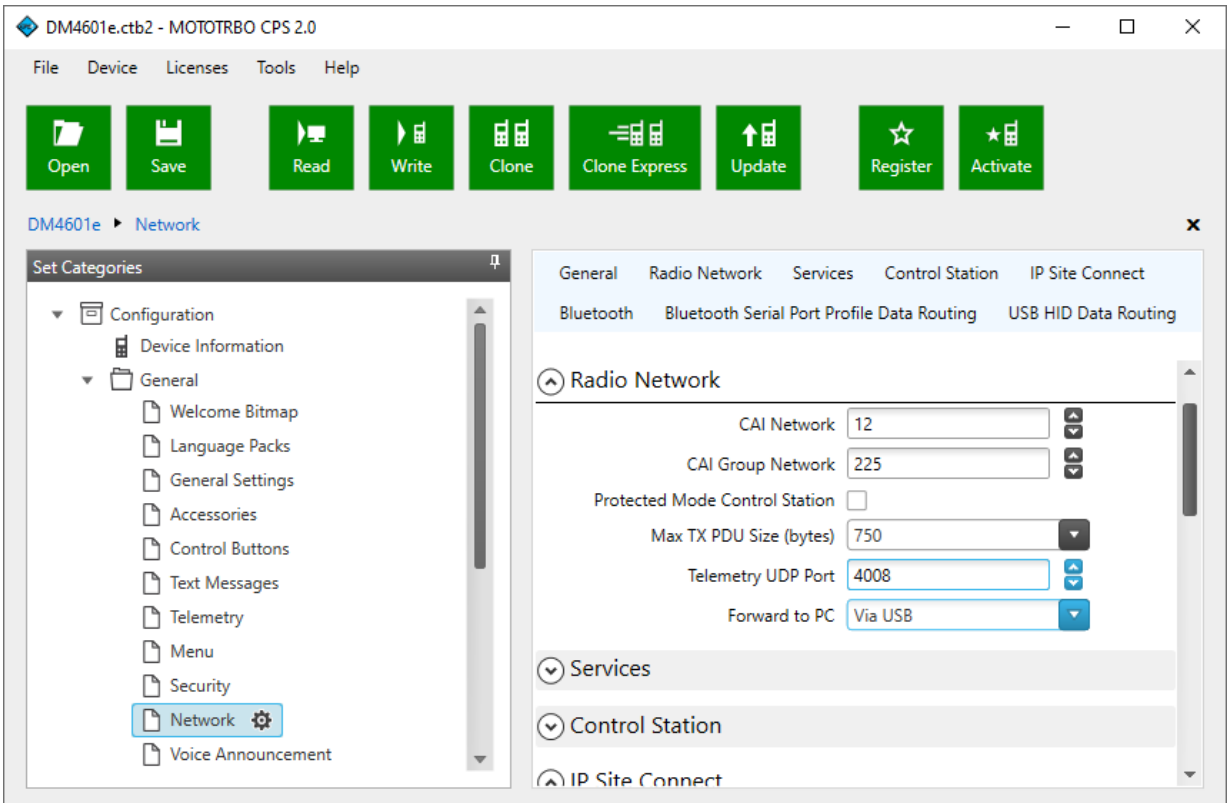


Fig. 49. Radio Network Settings Configuring

6. In the **Services** area, configure the radio services:

   a. In the **ARS UDP Port** field, enter the desired number of the port used for receiving information about the presence of radios in the control station coverage zone.

   b. In the **TMS UDP Port** field, enter the desired number of the port used to support text messages.

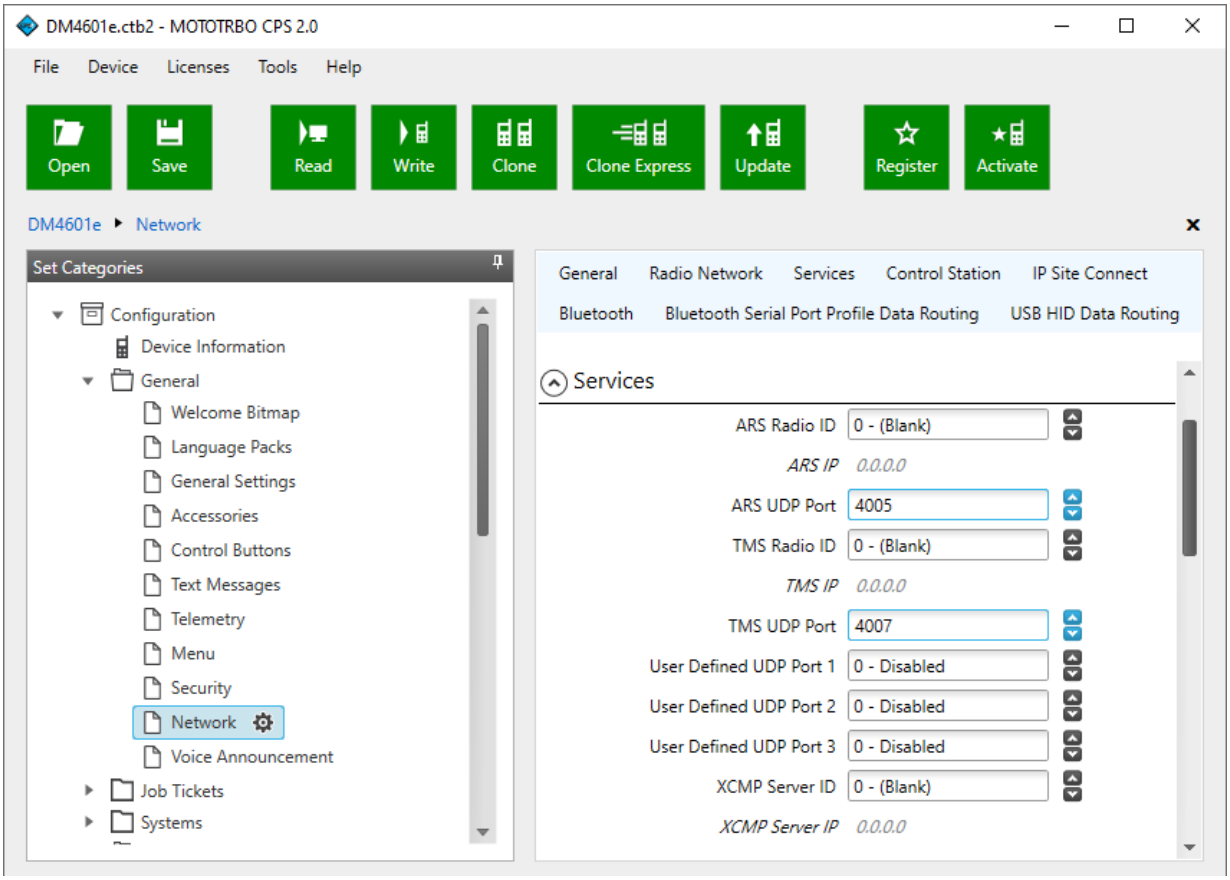


Fig. 50. Radio Services Configuring

7. In the **Control Station** area, in the **Location Server UDP Port** field, enter the desired number of the port used to support location services.

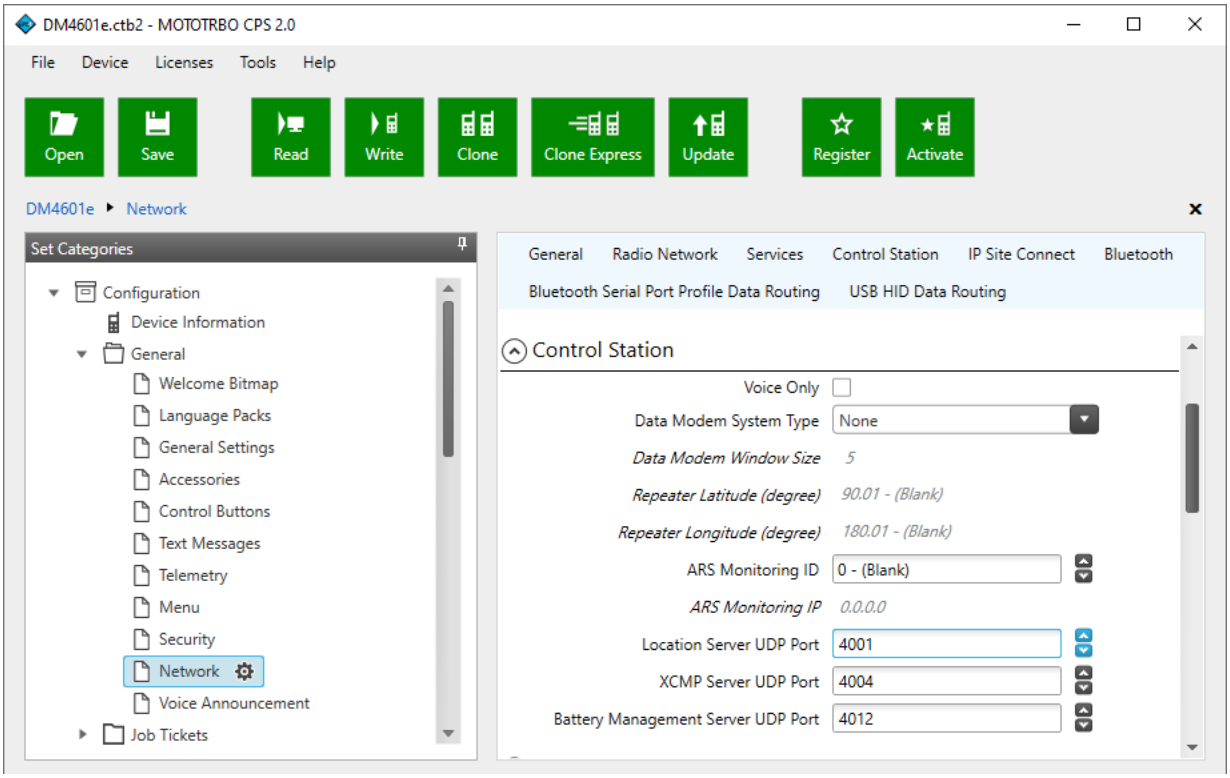


Fig. 51. Location Server Port Configuring

8. To save changes, at the top of the MOTOTRBO CPS window, click **Save**.

Postrequisites:

Specify the set telemetry, ARS, TMS, and location port numbers in the corresponding fields on the **Settings** tab of the CPS RG-1000e **Settings** window. For details, see Settings.

5.2 TETRA Radios

Follow the procedure to configure the codeplug settings of the TETRA radio required for its connection to RG-1000e Gateway in the I/O mode.

NOTE
The procedure is for Tetra CPS Plus 7.4 using an MTM5400 codeplug.

Prerequisites:

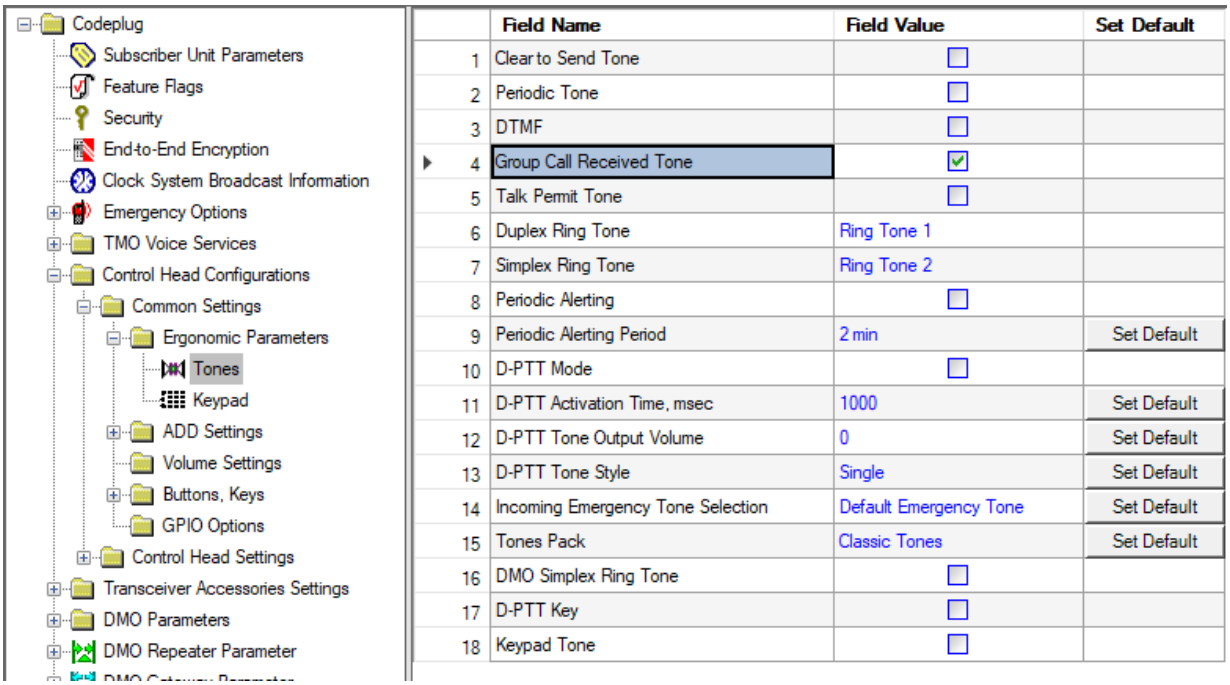
Start Tetra CPS and open the desired TETRA radio codeplug.

Procedure:

1. Configure tones:

   a. Open **Control Head Configurations** → **Common Settings** → **Ergonomic Parameters** → **Tones**.

   b. Select the **Group Call Received Tone** check box and clear all other check boxes.



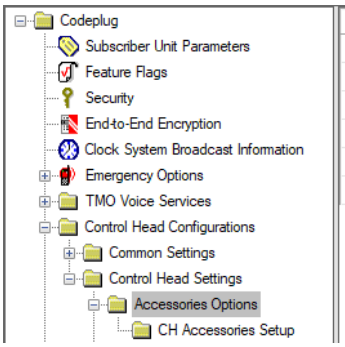
	Field Name	Field Value	Set Default
1	Clear to Send Tone	☐	
2	Periodic Tone	☐	
3	DTMF	☐	
4	Group Call Received Tone	☑	
5	Talk Permit Tone	☐	
6	Duplex Ring Tone	Ring Tone 1	
7	Simplex Ring Tone	Ring Tone 2	
8	Periodic Alerting	☐	
9	Periodic Alerting Period	2 min	Set Default
10	D-PTT Mode	☐	
11	D-PTT Activation Time, msec	1000	Set Default
12	D-PTT Tone Output Volume	0	Set Default
13	D-PTT Tone Style	Single	Set Default
14	Incoming Emergency Tone Selection	Default Emergency Tone	Set Default
15	Tones Pack	Classic Tones	Set Default
16	DMO Simplex Ring Tone	☐	
17	D-PTT Key	☐	
18	Keypad Tone	☐	

Fig. 52. Tones Configuring

2. Configure the radio accessory connector:

   a. Open **Control Head Configurations** → **Control Head Settings** → **Accessories Options**.

   b. For the **Active Accessory Selection** entry, from the **Field Value** list, select *Control Head Accessory*.



	Field Name	Field Value	Set Default
1	Active Accessory Selection	Control Head Accessory	Set Default
2	Upper PTT	Disabled	
3	Telephone Handset Enable External Speaker on Hook for Group Mode	Enabled	Set Default
4	Telephone Handset Enable External Speaker on Hook for Private Mode	Enabled	Set Default
5	Preferred Emergency Accry - Control Head	Last Active Mic	Set Default
6	Preferred Output Audio for FDPC	Speaker	Set Default

Fig. 53. MTM Radio Accessory Connector Configuring

3. Specify the audio output level:

   a. Open the **Transceiver Accessories Settings** tab.

   b. For the **Rx Audio Line Output Type** entry, from the **Field Value** list, select *0dBr Point*.

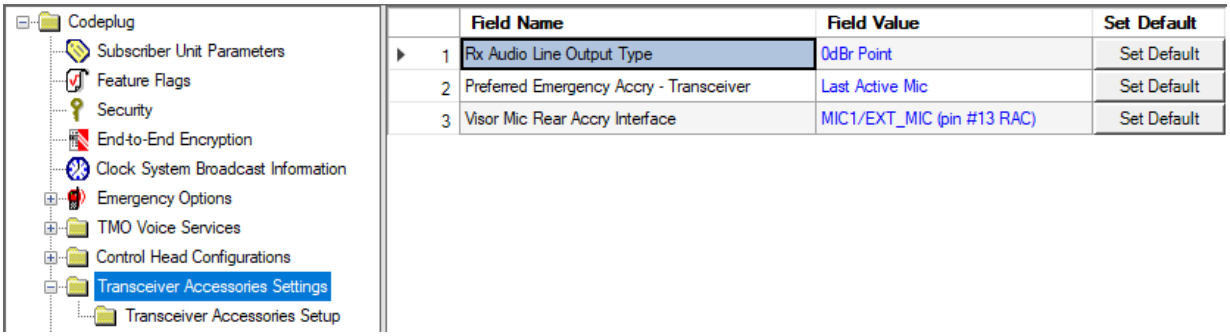


Fig. 54. Audio Output Level Configuring

4. Specify the accessory connector mode:

   a. Open **Transceiver Accessories Settings** → **Transceiver Accessories Setup**.

   b. For the **Line In Rear Accry** entry, from the **Field Value** list, select *LINE-IN*.

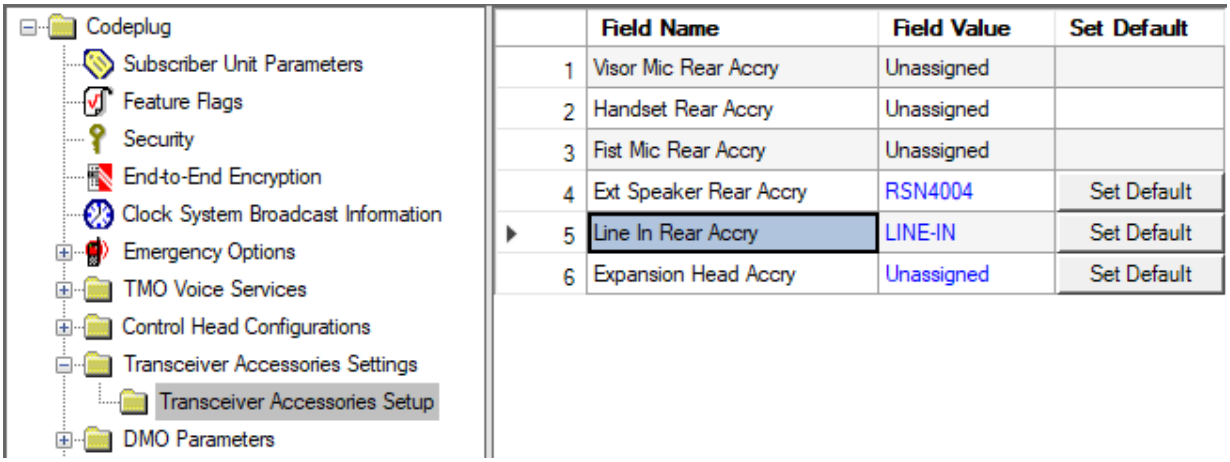
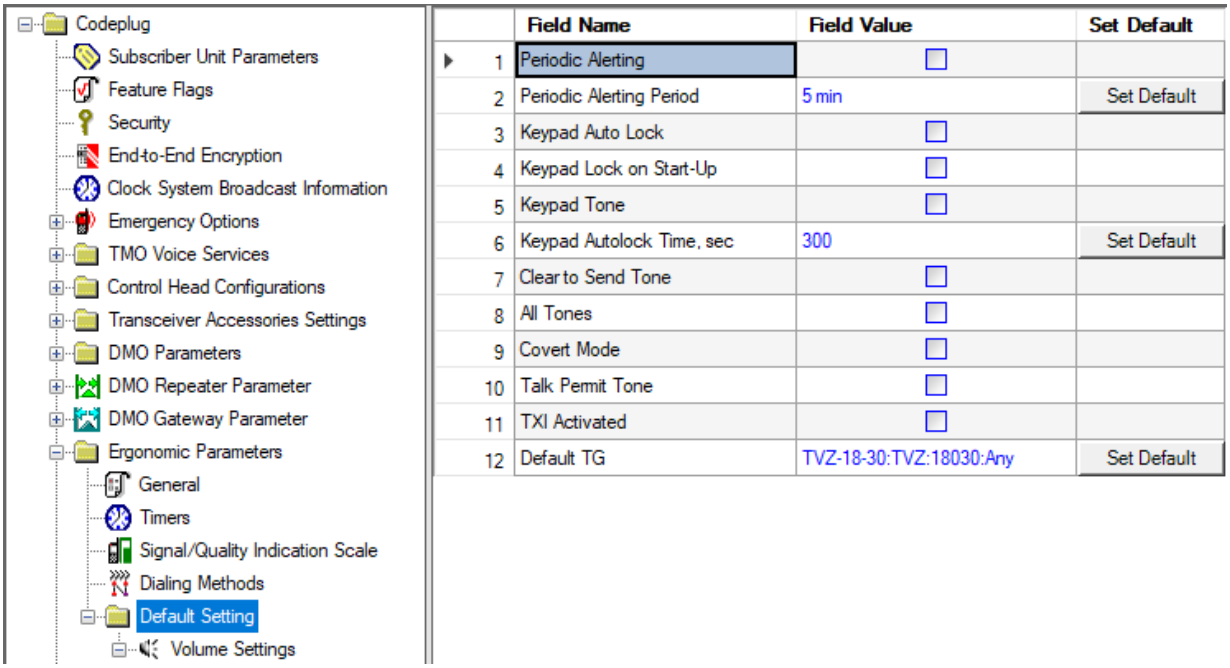


Fig. 55. MTM Radio Accessory Connector Mode Configuring

5. Configure ergonomic parameters:

   a. Open **Ergonomic Parameters** → **Default Setting**.

   b. Set parameters as shown in the figure below.
   The **Default TG** value will depend on your system.



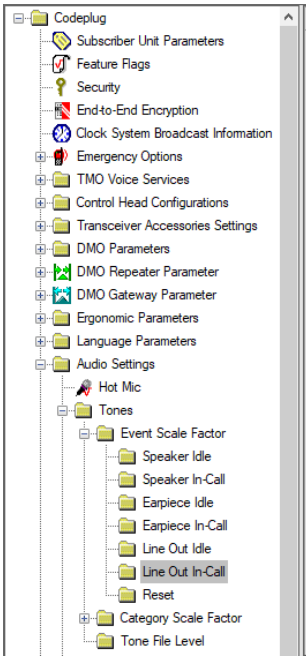
	Field Name	Field Value	Set Default
1	Periodic Alerting	☐	
2	Periodic Alerting Period	5 min	Set Default
3	Keypad Auto Lock	☐	
4	Keypad Lock on Start-Up	☐	
5	Keypad Tone	☐	
6	Keypad Autolock Time, sec	300	Set Default
7	Clear to Send Tone	☐	
8	All Tones	☐	
9	Covert Mode	☐	
10	Talk Permit Tone	☐	
11	TXI Activated	☐	
12	Default TG	TVZ-18-30:TVZ:18030:Any	Set Default

Fig. 56. Ergonomic Parameters Configuring

6. Configure group call notification settings:

   a. Open **Audio Settings** → **Tones** → **Event Scale Factor** → **Line Out In-Call**.

   b. For the **Group Call Received** event, in the **Scale Factor** column, enter *-20*, and then, in the **Total Level** column, enter *-26*.



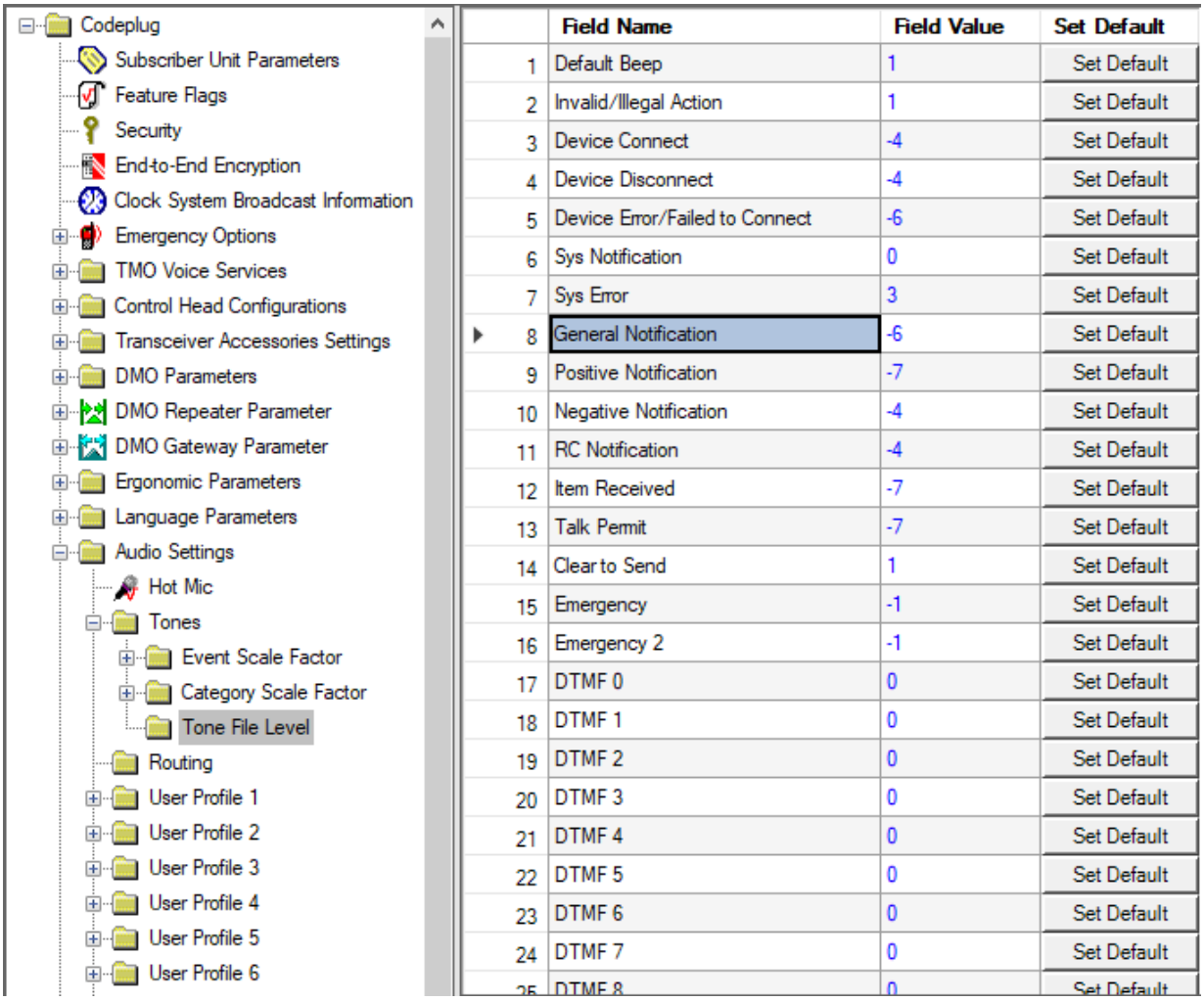
	Tone Name	Event	Category	Scale Factor	Total Level	Reset Entry
10	Invalid/Illegal Action	Required Service is Unavailable	Alert	-20	-19	Reset Entry
11	Device Connect	Dual CH	Alert	-20	-24	Reset Entry
13	Device Connect	USB/Charger Connect	Alert	-20	-24	Reset Entry
14	Device Disconnect	Single CH	Alert	-20	-24	Reset Entry
15	Device Disconnect	USB/Charger Disconnect	Alert	-20	-24	Reset Entry
16	Device Error/Failed to Connect	Dual CH Error (link failed)	Alert	-20	-26	Reset Entry
17	Sys Notification	In Service after DMO	Alert	-20	-20	Reset Entry
18	Sys Notification	Back to Home Network	Alert	-20	-20	Reset Entry
19	Sys Notification	Coverage Restored	Alert	-20	-20	Reset Entry
20	Sys Notification	Individual Call Hold	Alert	-20	-20	Reset Entry
21	Sys Error	Out of Range	Alert	-20	-17	Reset Entry
22	Sys Error	Call Disconnected	Alert	-20	-17	Reset Entry
23	Sys Error	Coverage Low	Alert	-20	-17	Reset Entry
24	Sys Error	System Congestion	Alert	-20	-17	Reset Entry
25	Sys Error	Call Disconnected by System	Alert	-20	-17	Reset Entry
26	Sys Error	GW Mode Override	Alert	-20	-17	Reset Entry
27	Sys Error	Individual Call Transferred	Alert	-20	-17	Reset Entry
28	General Notification	In Local Site Trunking	Alert	-20	-26	Reset Entry
29	General Notification	TXI Mode	Alert	-20	-26	Reset Entry
30	General Notification	Group Call Received	Alert	-20	-26	Reset Entry
31	General Notification	DMO Different Call Source	Alert	-20	-26	Reset Entry
32	General Notification	Ongoing ETE Provisioning	Alert	-20	-26	Reset Entry
33	General Notification	Call Waiting	Alert	-20	-26	Reset Entry
34	General Notification	Encryption Enable/Disable	Alert	-20	-26	Reset Entry
35	General Notification	Clear Call	Alert	-20	-26	Reset Entry

Fig. 57. Group Call Notification Configuring

7. Configure general notifications:

   a. Open **Audio Settings** → **Tones** → **Tone File Level**.

   b. For the **General Notification** entry, in the **Field Value** column, enter *-6*.



	Field Name	Field Value	Set Default
1	Default Beep	1	Set Default
2	Invalid/Illegal Action	1	Set Default
3	Device Connect	-4	Set Default
4	Device Disconnect	-4	Set Default
5	Device Error/Failed to Connect	-6	Set Default
6	Sys Notification	0	Set Default
7	Sys Error	3	Set Default
8	General Notification	-6	Set Default
9	Positive Notification	-7	Set Default
10	Negative Notification	-4	Set Default
11	RC Notification	-4	Set Default
12	Item Received	-7	Set Default
13	Talk Permit	-7	Set Default
14	Clear to Send	1	Set Default
15	Emergency	-1	Set Default
16	Emergency 2	-1	Set Default
17	DTMF 0	0	Set Default
18	DTMF 1	0	Set Default
19	DTMF 2	0	Set Default
20	DTMF 3	0	Set Default
21	DTMF 4	0	Set Default
22	DTMF 5	0	Set Default
23	DTMF 6	0	Set Default
24	DTMF 7	0	Set Default
25	DTMF 8	0	Set Default

Fig. 58. General Notification Configuring

8. Disable the call recorder output:

   a. Open **Audio Settings** → **Routing**.

   b. For the **Call Recorder Output** entry, from the **Field Value** list, select *Disabled*.

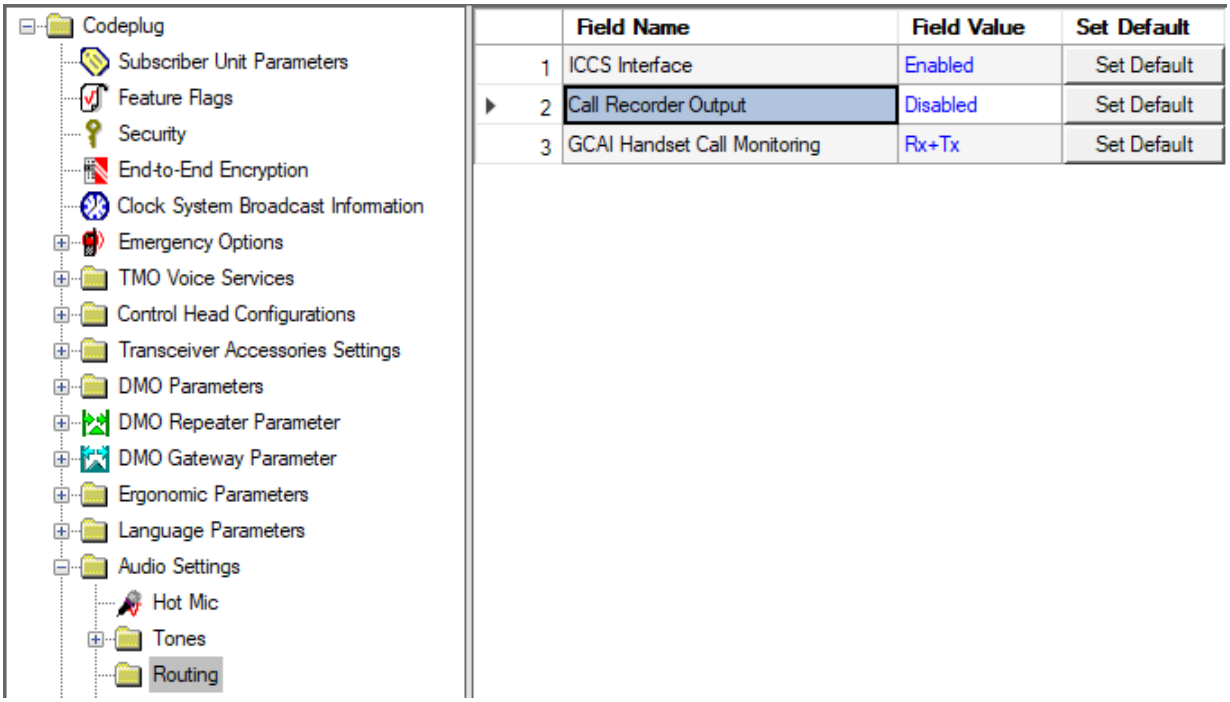


Fig. 59. Call Recorder Output Configuring

9. To save changes, at the top of the Tetra CPS window, click **Save**.

5.3 CDM/PRO/GM140/GM160 Radios

Follow the procedure to configure the codeplug settings of the CDM Series, PRO Series, GM140 or GM160 radio required for its connection to RG-1000e Gateway in the I/O mode.

Prerequisites:

- Start Professional Radio CPS and open the desired radio codeplug.
- Determine the necessity of the radio channel switching.

Procedure:

1. In the **Tree View** window, double-click **Radio Configuration**.
   The **Radio Configuration** window appears.
2. In the opened window, open the **Accessory Configuration** tab.

3. Configure the radio accessory connector:

   a. In the **Debounce Duration (ms)** field, enter *100*.

   b. From the **Rx Audio Type** list, select *Flat Audio*.

   c. From the **Ext. PTT Audio Source** list, select *Ext Mic Audio*.

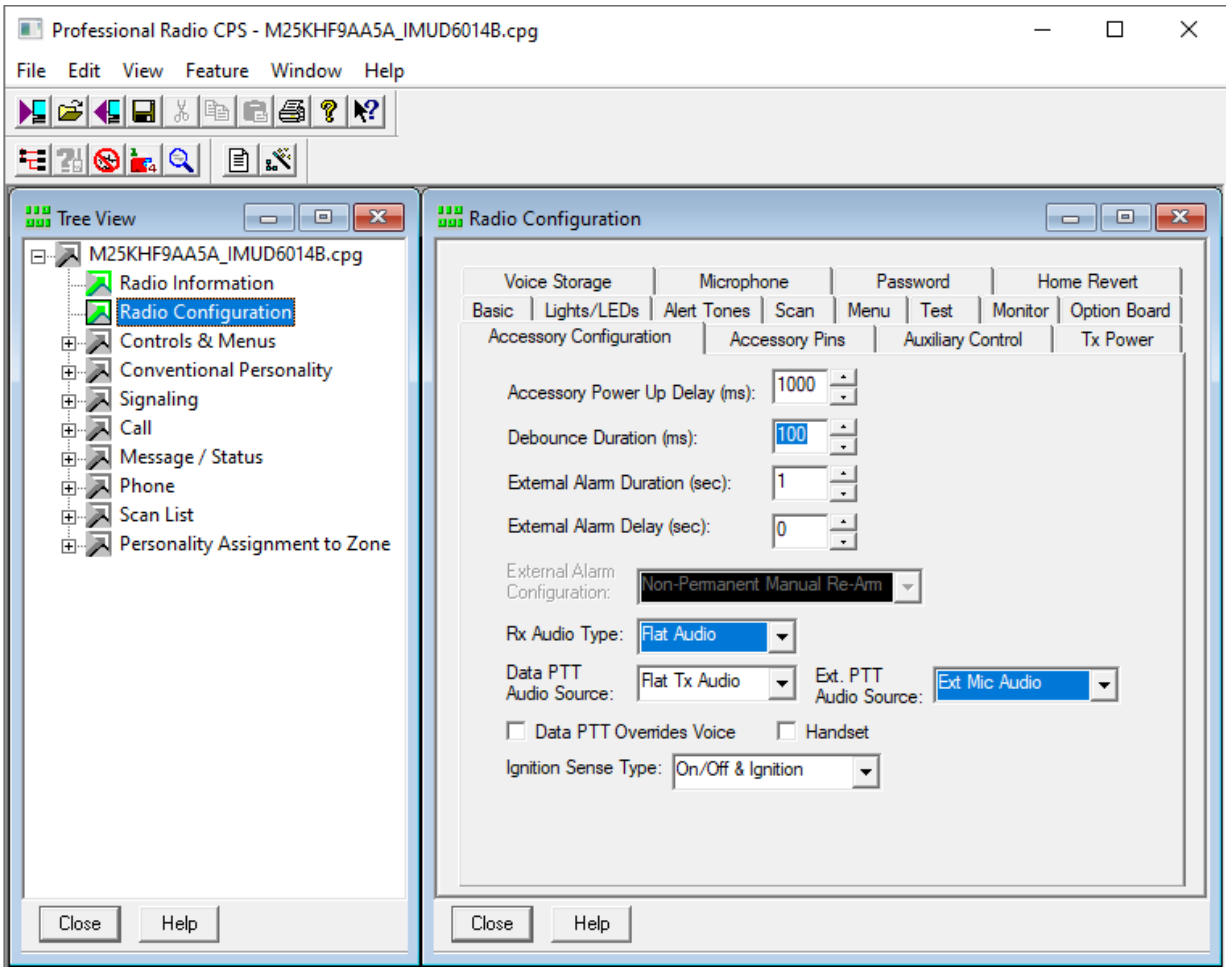


Fig. 60. CDM/PRO/GM140/GM160 Radio Accessory Connector Configuring

4. Open the **Accessory Pins** tab.

5. Configure the radio accessory connector pins:

   a. For the **3** entry, from the **Function Selection (Direction)** list, select *External Mic PTT (Input)*, and then, from the **Active Level** list, select *Low*.

   b. For the **4** entry, from the **Function Selection (Direction)** list, select *PL and CSQ Detect/Talkgroup Detect (Output)*, and then, from the **Active Level** list, select *Low*.

   c. *(Optional)* If channel switching is necessary, for the **6**, **8**, **12**, **14** entries, from the **Function Selection (Direction)** list, select *Channel Select <channel number>*, and then, from the **Active Level** list, select *Low*.

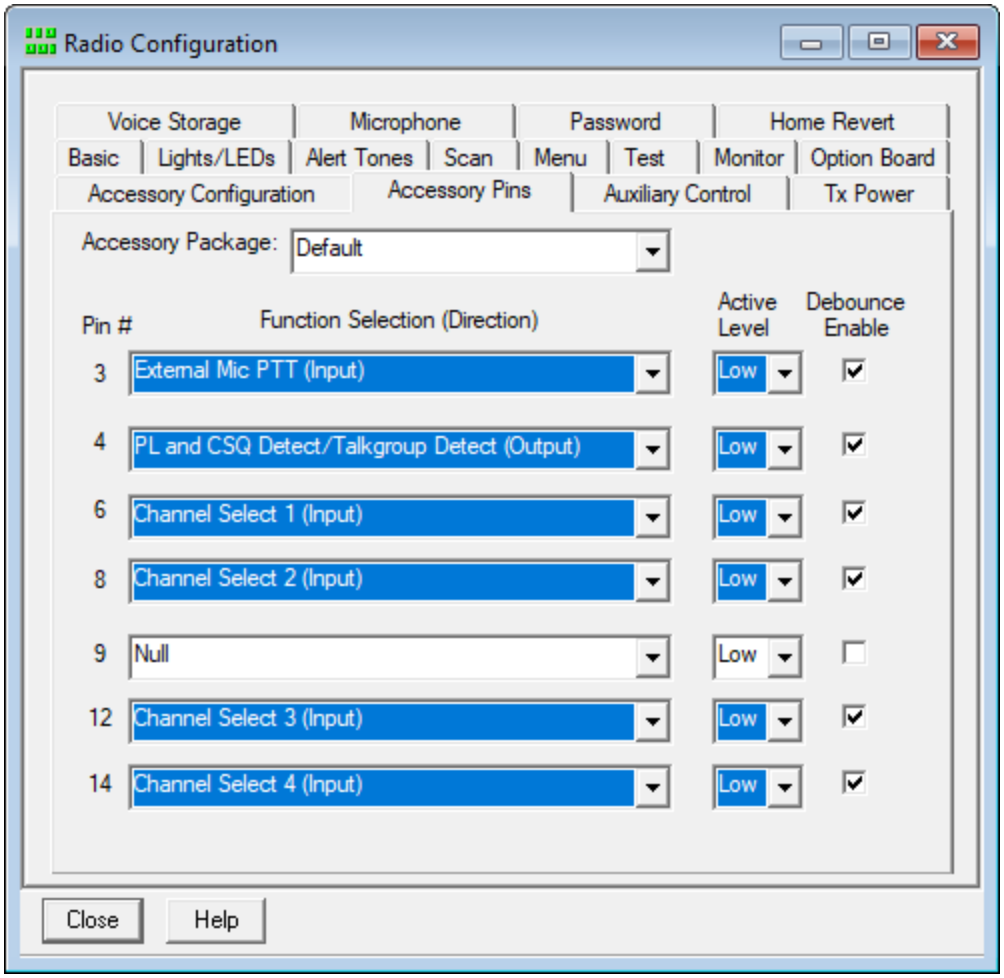


Fig. 61. CDM/PRO/GM140/GM160 Radio Accessory Connector Pins Configuring

6. To save changes, at the top of the CPS window, click **Save**.

5.4 GM340/GM360 Radios

Follow the procedure to configure the codeplug settings of the GM340 or GM360 radio required for its connection to RG-1000e Gateway in the I/O mode.

Prerequisites:

- Start Professional GP300/GM300 Series CPS and open the desired radio codeplug.
- Determine the necessity of the radio channel switching.

Procedure:

1. In the **Tree View** window, select **Per Radio** → **Miscellaneous**.
   The **Per Radio Miscellaneous** window appears.
2. On the **Global** tab, from the **Rx Audio (Accessory Connector)** list, select *Flat Squelched*.

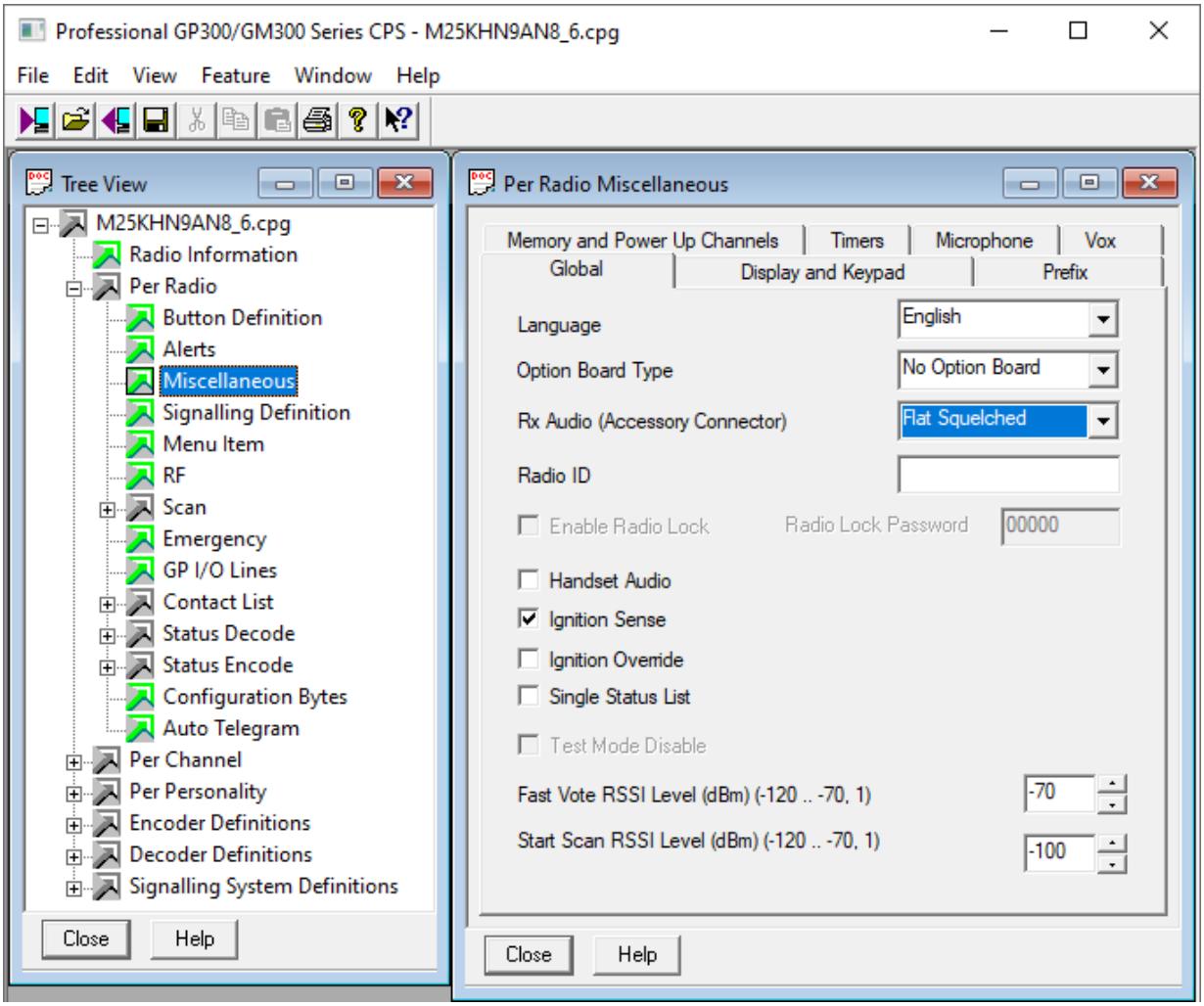


Fig. 62. GM340/GM360 Radio Accessory Connector Configuring

3. Open the **Microphone** tab, and then select the **Accessory Connector Mic. Enable** check box.

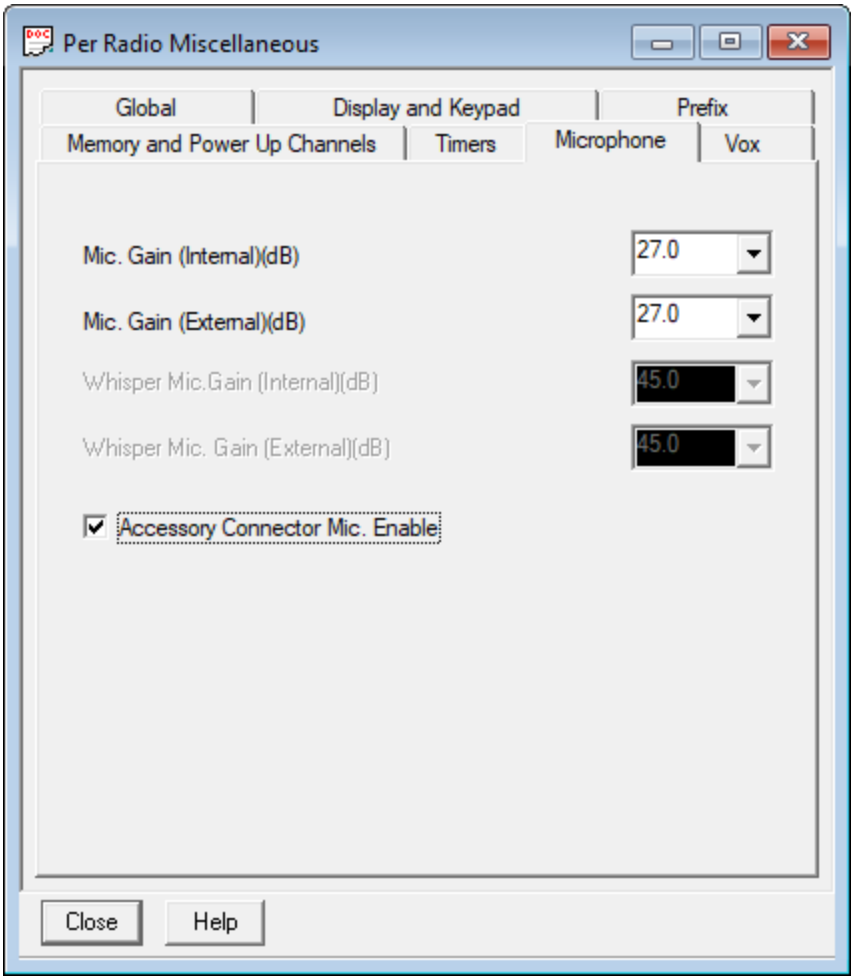


Fig. 63. Accessory Connector Microphone Activating

4. In the **Tree View** window, select **Per Radio** → **GP I/O Lines**.
   The **Per Radio GP I/O Lines** window appears.

5. In the opened window, configure the radio accessory connector lines:

   a. For the **3** entry, from the **Function** list, select *Voice PTT*, and then, from the **Active Level** list, select *Low*.

   b. For the **4** entry, from the **Function** list, select *PL/DPL Detect*, and then, from the **Active Level** list, select *Low*.

   c. In the **Accessory Debounce Duration (ms)** field, enter *100*.

   d. *(Optional)* If channel switching is necessary, for the **6**, **8**, **12**, **14** entries, from the **Function** list, select *Channel Steering*, and then, from the **Active Level** list, select *Low*.

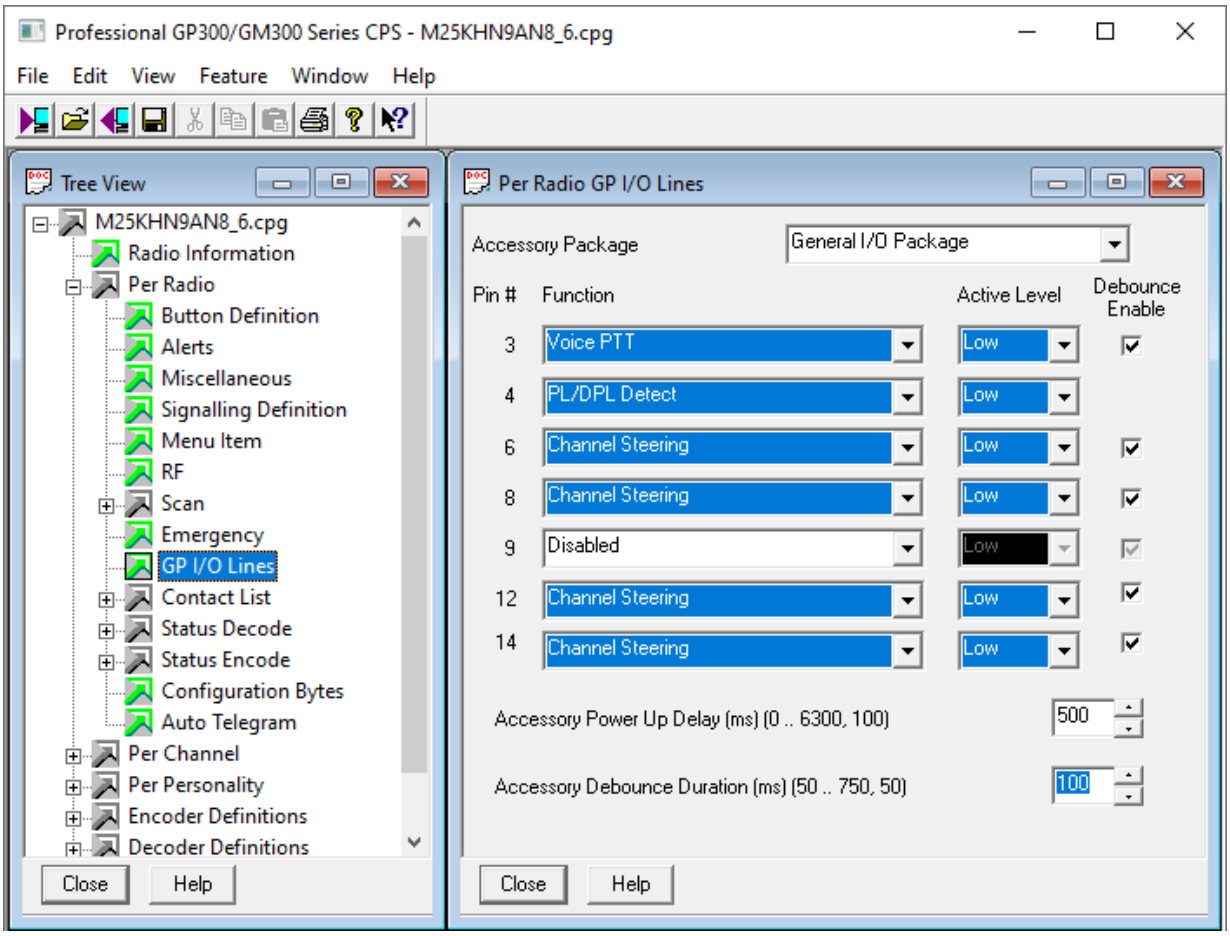


Fig. 64. Radio Accessory Connector Lines Configuring

6. To save changes, at the top of the CPS window, click **Save**.

5.5 Repeaters (Analog Mode)

Follow the procedure to configure the codeplug settings of the DR 3000, XPR 8300, XPR 8400 or XiR R8200 repeater required for its connection to RG-1000e Gateway in the I/O mode.

NOTE
The procedure is for MOTOTRBO CPS 2.0.

Prerequisites:

- Start MOTOTRBO CPS and open the desired repeater codeplug.
- Ensure that the Repeater Mode is set to Analog.

- Determine the necessity of the repeater channel switching.

Procedure:

1. Open **General** → **Accessories**.
2. In the **General** area, configure the repeater accessory connector:
   a. From the **Audio Type** list, select *Filtered Squelch*.
   b. From the **Audio Priority** list, select *External PTT*.
   c. In the **Debounce Duration (ms)** field, enter *100*.

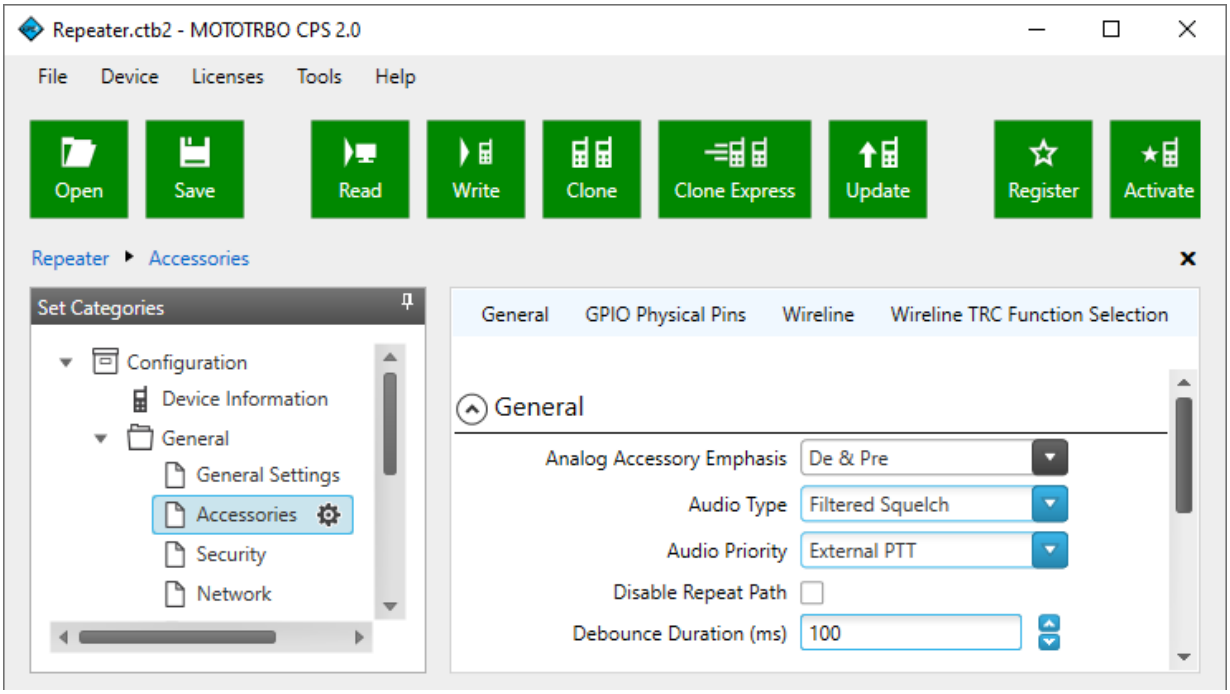


Fig. 65. Repeater Accessory Connector Configuring

3. In the **GPIO Physical Pins** area, configure the repeater accessory connector pins:

   a. For the **GPIO1** entry, from the **Feature** list, select *Ext Mic PTT*, and then, from the **Active Level** list, select *Low*.

   b. For the **GPIO2** entry, from the **Feature** list, select *PL/Talkgroup Detect*, and then, from the **Active Level** list, select *Low*.

   c. *(Optional)* If channel switching is necessary, for the **GPIO3**, **GPIO6**, **GPIO7** entries, from the **Feature** list, select *Channel Select <channel number>*.

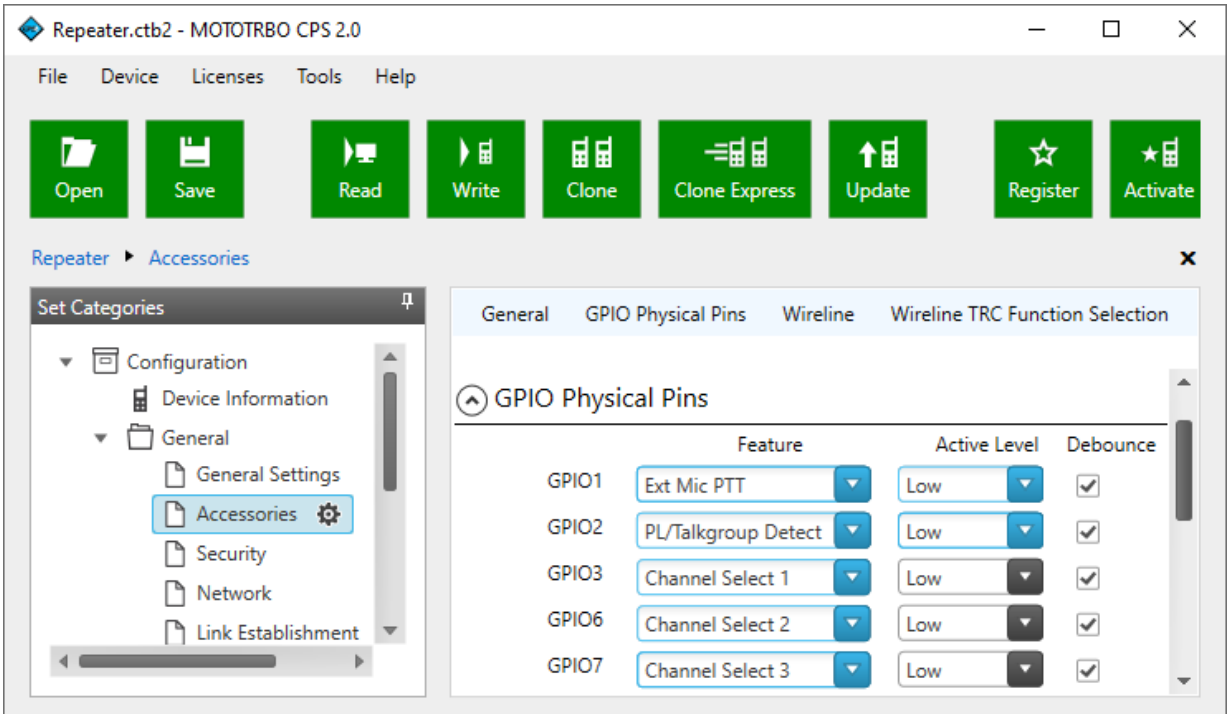


Fig. 66. Repeater Accessory Connector Pins Configuring

4. To save changes, at the top of the MOTOTRBO CPS window, click **Save**.

6 Configuring SmartPTT Radioserver Settings

When using the SmartPTT system, on SmartPTT Radioserver, you need to configure remote control stations connection over the remote gateway. The configuration procedure is different for each type of control stations:

- For information on the remote MOTOTRBO control station connection, see Configuring Remote MOTOTRBO Control Station Connection.
- For information on the remote I/O control station connection, see Configuring Remote I/O Control Station Connection.

Important
To configure and use remote control stations, you must have SmartPTT licenses which allow remote control stations access. For details, see "Licenses" in *SmartPTT Installation and Configuration Guide*.

6.1 Configuring Remote MOTOTRBO Control Station Connection

Follow the procedure to add a new or edit an existing connection to a remote MOTOTRBO control station.

Prerequisites:

- Ensure SmartPTT license allows remote control stations access. For details, see "Licenses" in *SmartPTT Installation and Configuration Guide*.
- From the control station codeplug, obtain the following information:
  - Radio ID, CAI network ID, and CAI Group ID
  - Transmit interruption parameters
  - The format of location data transmission in the control station
- Determine whether SmartPTT Radioserver or RG-1000e Gateway will initiate the connection.
- *(Optional)* If RG-1000e Gateway is configured to act as server, from the RG-1000e Gateway configuration, obtain the IP address and port number configured for the desired control station. For details, see IP channel.
- From the RG-1000e Gateway configuration, obtain control station ports used to receive and transmit various data types. For details, see Settings.
- *(Optional)* Determine SmartPTT Radioserver host ports that will be used to receive different data types from the control station.

Procedure:

1. In Radioserver Configurator, open the **Networks** tab.
2. In the left pane, perform one of the following actions:

To add a remote MOTOTRBO control station to a new gateway,	perform the following actions:

	1. Right-click **Remote Gateways**, and then click **Add → Remote Gateway RG-1000e**. The **<Gateway Name>** node appears. 2. In the right pane, select the **Active** check box. 3. *(Optional)* In the **Name** field, type the gateway name. 4. In the left pane, right-click the **<Gateway Name>** node, point to **Add**, and then select **Remote MOTOTRBO Control Station**.
To add a remote MOTOTRBO control station to an existing gateway,	perform the following actions: 1. Expand the **Remote Gateways** node. 2. Right-click the desired gateway name, point to **Add**, and then select **Remote MOTOTRBO Control Station**.
To edit an existing remote MOTOTRBO control station connection settings,	expand **Remote Gateways** → **<Gateway Name>**, and then click the desired control station.
To delete a remote MOTOTRBO control station connection,	perform the following actions: 1. Expand **Remote Gateways** → **<Gateway Name>**. 2. Right-click the desired control station, and then select **Delete**. 3. Proceed to the last step of the procedure.

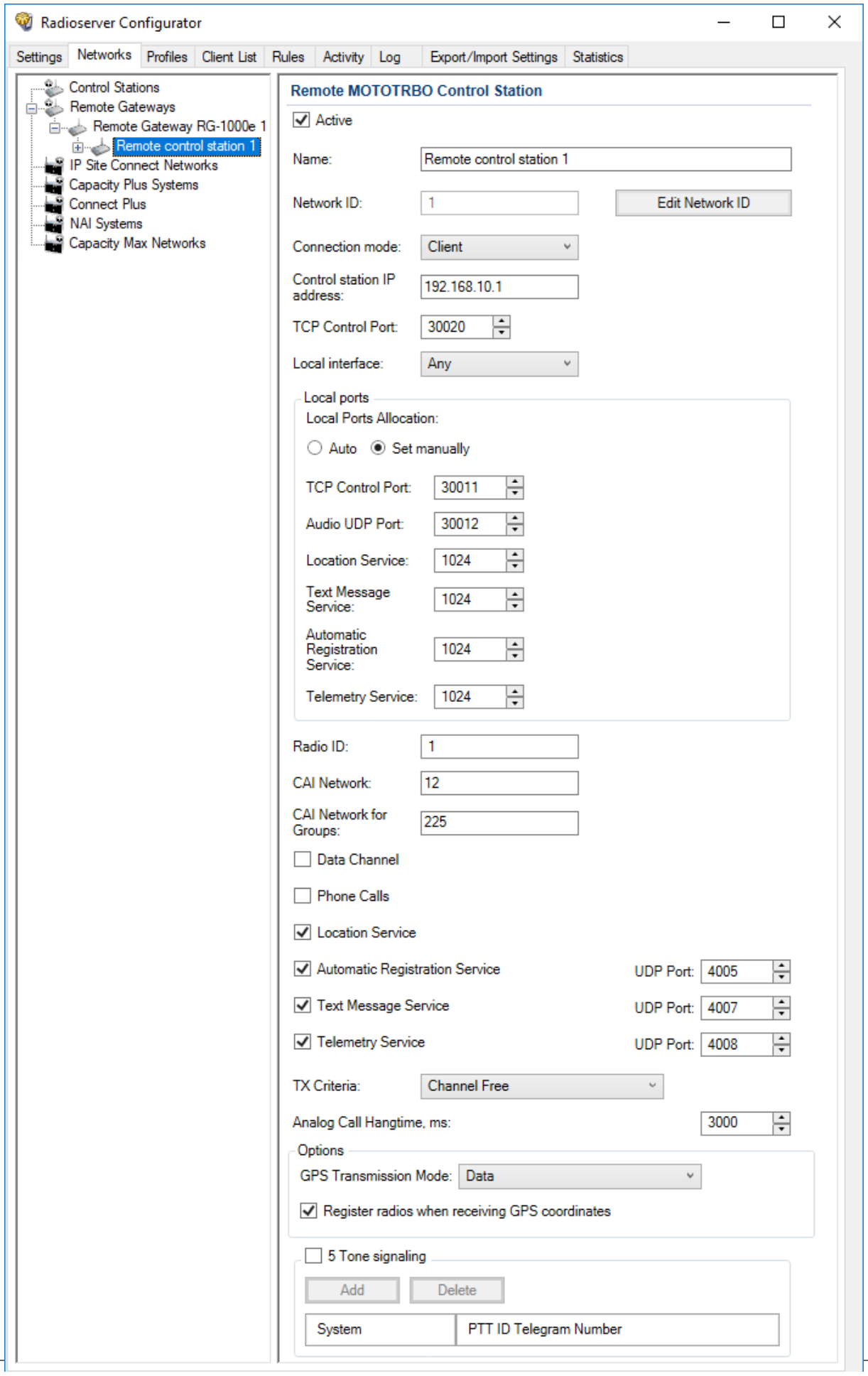


Fig. 67. Remote MOTOTRBO Control Station Parameters

3. In the right pane, select the **Active** check box to unlock control station settings.
4. In the **Name** field, type the control station name.
5. Leave the value in the **Network ID** field unchanged.
6. Configure the connection mode to the control station:

If RG-1000e Gateway is configured to accept SmartPTT connection (acts as a server),	perform the following actions: 1. From the **Connection mode** list, select *Client*. 2. In the **Control station IP address** field, type the RG-1000e Gateway IP address for receiving radioserver connections. 3. In the **TCP Control Port** field, enter the port number to receive radioserver connections. **Important** The IP address and port number in the fields above must match the IP address and port number in the **IP address** and **Port XCMP protocol** fields in the **Gateway IP settings** area of the RG-1000e Gateway configuration. For details, see IP channel.
If RG-1000e Gateway is configured to initiate SmartPTT connection (acts as a client),	perform the following actions: 1. From the **Connection mode** list, select *Server*. 2. In the **Local TCP Control Port** field, enter the SmartPTT Radioserver port number to listen to incoming connections. **Important** The port number in this field must match the port number in the **Port XCMP protocol** field in the **Remote Gateway IP settings** area of the RG-1000e Gateway configuration. For details, see IP channel.

7. From the **Local interface** list, select the desired option:

To use any radioserver IP address for RG-1000e Gateway connection,	select *Any*.
To use a fixed IP address for RG-1000e Gateway connection,	select the desired IP address.

Important
If you select *Server* from the **Connection mode** list, the fixed IP address must match the IP address in the **IP address** field in the **Remote Gateway IP settings** area of the corresponding IP channel in the RG-1000e Gateway configuration.

8. *(Optional)* In the **Local ports** area, set SmartPTT Radioserver host ports for different types of data:

To set local ports automatically,	select *Auto*.
To set specific local port values,	perform the following actions: 1. Select *Set manually*. 2. If available, in the **TCP Control Port** field, enter the port number used to receive commands and service messages from the remote control station, and send commands and service messages to it. 3. In the **Audio UDP Port** field, enter the port number used to receive voice from the remote control station and send dispatcher voice to it. 4. In the **Location Service** field, enter the port number used to receive location updates from radios and send location update requests to them over the remote control station. 5. In the **Text Message Service** field, enter the port number used to receive text messages from radio, and send text messages from dispatchers over the remote control station. 6. In the **Automatic Registration Service** field, enter the port number used to receive presence information on radios within the RF coverage zone of the remote control station. 7. In the **Telemetry Service** field, enter the port number used to receive telemetry data and send telemetry commands.

9. Type the control station identification parameters:
   a. In the **Radio ID** field, type the control station ID in the decimal notation.

Important
Do not assign this ID to a client or radio in any radio network.

b. In the **CAI Network** field, type the ID of the CAI network that is set in the control station codeplug.

c. In the **CAI Network for Groups** field, type the ID of the CAI network for groups that is set in the control station codeplug.

10. If the control station is only used to receive location coordinates from other radios, select the **Data Channel** check box.

NOTE
If the **Data Channel** check box is selected, the call parameters become unavailable.

11. Select the **Phone Calls** check box to allow other radios to receive and initiate phone calls over the control station.

NOTE
To make this feature work correctly, configure radios to interrupt control station transmissions and set a long hangtime in the radio system to which the control station belongs.

12. Configure data transmission over the control station:

To receive location updates from radios,	select the **Location Service** check box. **Important** SmartPTT assumes that the control station always uses the port *4001* to send radios' location updates to SmartPTT Radioserver.
To receive information about radio presence in the network,	perform the following actions: 1. Select the **Automatic Registration Service** check box. 2. To the right of the check box, in the field, enter the port number used to send presence check and receive presence data.
To support text messages and job tickets in the radio network,	perform the following actions: 1. Select the **Text Message Service** check box. 2. To the right of the check box, in the field, enter the port number used to send and receive text messages.
To receive telemetry data and send telemetry commands,	perform the following actions: 1. Select the **Telemetry Service** check box. 2. To the right of the check box, in the field, enter the port number used to send telemetry commands and receive telemetry data.

Important
The port numbers in the **Automatic Registration Service**, **Text Message Service**, and **Telemetry Service** fields must match the port numbers in the **ARS**, **Text messages**, and **Telemetry** fields in the **Radio network services ports** area of the RG-1000e Gateway configuration. For details, see Settings.

13. From the **TX Criteria** list, select one of the following options:

If the control station is configured to transmit only when no other transmissions are detected over the radio channel,	select *Channel Free*.
If the control station is configured to notify other radios on interrupting their transmissions,	select *Tx Interrupt*.
If the control station is configured to completely ignore other transmissions over the radio channel,	select *Always*.

Important
SmartPTT does not support color code for outgoing transmissions.

14. In the **Analog Call Hangtime, ms** field, enter the maximum interval between transmissions over analog channels within one call.
15. From the **GPS Transmission Mode** list, select one of the following options:

If all digital channels support both CSBK data and enhanced GNSS,	select *Enhanced CSBK*.
If all digital channels support CSBK data, but not all of them support Enhanced GNSS,	select *CSBK*.
If digital channels have different settings,	select *Data*.

16. *(Optional)* To allow SmartPTT Radioserver register radios on the control station when it receives their GPS coordinates, select the **Register radios when receiving GPS coordinates** check box.

NOTE
When the **Data Channel** check box is selected, the **Register radios when receiving GPS coordinates** check box becomes automatically selected and unavailable to clear.

17. If you use the control station in analog radio systems with 5 Tone signaling, in the **5 Tone signaling** area, configure 5 Tone telegrams.

NOTE
At the moment, support for 5 Tone signaling in SmartPTT is carried out in a limited mode, therefore you should contact the SmartPTT Technical Support Center regarding the use of 5 Tone signaling.

18. To save changes, at the bottom of the Radioserver Configurator window, click **Save Configuration ( )**.

Postrequisites:

- Configure control station talkgroups. For details, see Configuring Remote MOTOTRBO Control Station Talkgroups.
- Configure control station channels. For details, see Configuring Remote MOTOTRBO Control Station Channels.
- Configure audio settings. For details, see Configuring Remote MOTOTRBO Control Station Audio Settings.
- To apply changes immediately, at the bottom of the Radioserver Configurator window, click **Start ( )** or **Restart ( )**.
- In the firewall software on the radioserver computer, unlock the ports configured for the control station.

6.1.1 Configuring Remote MOTOTRBO Control Station Talkgroups

Follow the procedure to add new or edit existing talkgroups and an All Call entry that will be available to SmartPTT dispatchers.

Prerequisites:

- Configure the remote MOTOTRBO control station connection. For details, see Configuring Remote MOTOTRBO Control Station Connection.
- From the remote control station codeplug, obtain talkgroup IDs. To obtain the information, use the compatible MOTOTRBO CPS application.

Procedure:

1. In Radioserver Configurator, open the **Networks** tab.
2. In the left pane, expand **Remote Gateways** → **<Gateway Name>** → **<Control Station Name>**, and then select **Talkgroups**.
   The list of groups appears in the right pane.

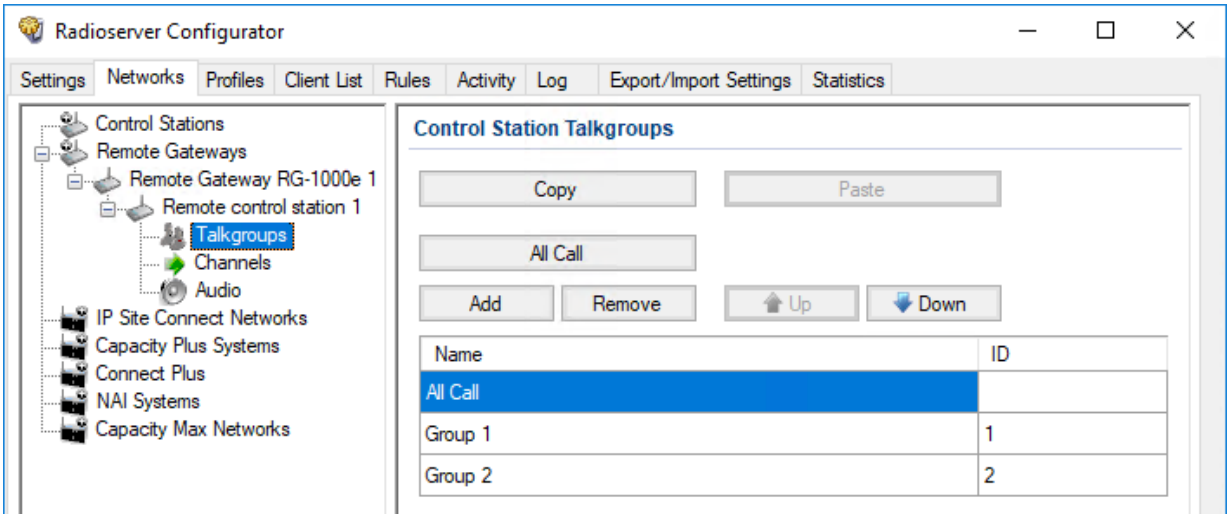


Fig. 68. MOTOTRBO Control Station Talkgroups

3. In the right pane, perform one of the following actions:

To add a new talkgroup,	click **Add**.

To add an All Call entry,	click **All Call**.
To edit an existing entry,	proceed to the next step.
To remove an existing entry,	perform the following actions: 1. Click the desired entry. 2. Click **Remove**. 3. Proceed to the last step of this procedure.

4. For the desired entry in the table, perform the following actions:

   a. In the **Name** column, double-click the current name, and then type the desired name.

NOTE
The entered talkgroup names will be displayed in SmartPTT Dispatcher, SmartPTT Web Client, and SmartPTT Mobile.

   b. In the **ID** column, double-click the current talkgroup ID, and then type the desired ID.

NOTE
For All Call, the ID cell is empty.

5. *(Optional)* Using **Up** and **Down** buttons, reorder entries in the table. The order of talkgroups in Radioserver Configurator determines the order of talkgroups in SmartPTT Dispatcher and SmartPTT Web Client.
6. To save changes, at the bottom of the Radioserver Configurator window, click **Save Configuration ( )**.

Postrequisites:

To apply changes immediately, at the bottom of the Radioserver Configurator window, click **Start ( )** or **Restart ( )**.

6.1.2 Configuring Remote MOTOTRBO Control Station Channels

Follow the procedure to add new or edit existing channels of a remote MOTOTRBO control station.

Prerequisites:

- Configure the remote MOTOTRBO control station connection. For details, see Configuring Remote MOTOTRBO Control Station Connection.
- From the control station codeplug, obtain the following information:
  - List of channels and their identification information (zone IDs and channel IDs).
  - Radio signaling type used on each channel.
  - Channel default contact (talkgroup ID or All Call).

  To obtain the information, use the compatible MOTOTRBO CPS application.

- Ensure that talkgroups and All Call are added to Radioserver Configurator. For details, see Configuring Remote MOTOTRBO Control Station Talkgroups.
- *(Optional)* Ensure that the necessary 5-tone telegrams are added to Radioserver Configurator.

Procedure:

1. In Radioserver Configurator, open the **Networks** tab.
2. In the left pane, expand **Remote Gateways** → **<Gateway Name>** → **<Control Station Name>**, and then select **Channels**.
   The list of channels appears in the right pane.

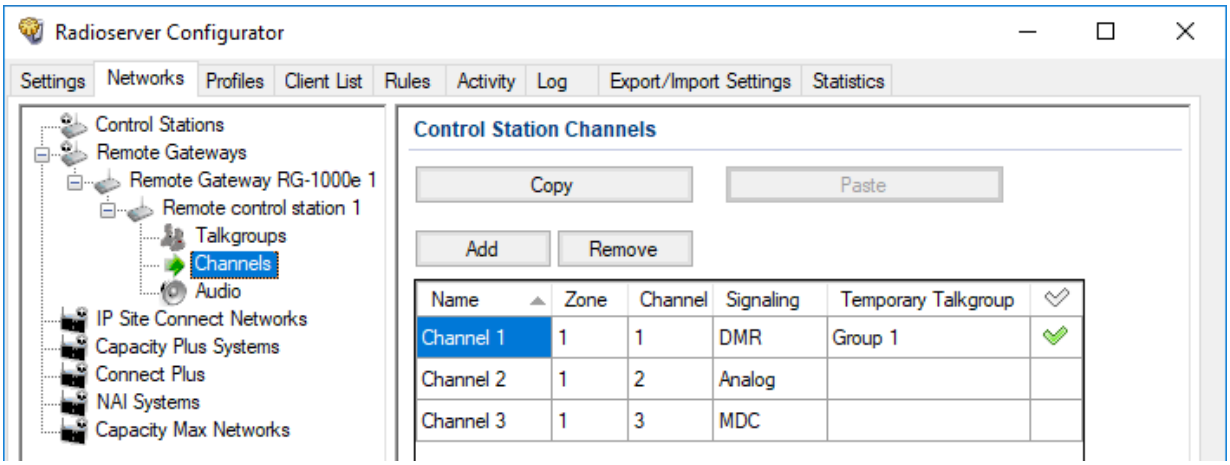


Fig. 69. MOTOTRBO Control Station Channels

3. In the right pane, perform one of the following actions:

To add a new channel,	click **Add**.
To edit an existing entry,	proceed to the next step of the procedure.
To remove an existing channel,	perform the following actions: 1. Click the desired entry. 2. Click **Remove**. 3. Proceed to the last step of this procedure.

4. For the desired entry in the table, perform the following actions:
   a. In the **Name** column, double-click the current channel name, and then type a new name.
   b. In the **Zone** field, double-click the current zone ID, and then type the desired ID.
   c. In the **Channel** column, double-click the current channel ID, and then type the desired ID.
   d. From the list in the **Signaling** column, select the radio signaling used on the radio channel or the desired 5-tone telegram.
   e. From the list in the **Temporary Talkgroup** column, select the talkgroup or All Call that is set as default contact on the channel.

5. After all channels are configured, in the Default Channel ( ) column, select the check box next to the channel that will be selected on the remote control station each time SmartPTT Radioserver is started or restarted.
6. To save changes, at the bottom of the Radioserver Configurator window, click **Save Configuration ( )**.

Postrequisites:

To apply changes immediately, at the bottom of the Radioserver Configurator window, click **Start ( )** or **Restart ( )**.

6.1.3 Configuring Remote MOTOTRBO Control Station Audio Settings

Follow the procedure to edit audio settings required to receive voice from a remote MOTOTRBO control station and send dispatcher voice to it.

Prerequisites:

Configure the remote MOTOTRBO control station connection. For details, see Configuring Remote MOTOTRBO Control Station Connection.

Procedure:

1. In Radioserver Configurator, open the **Networks** tab.
2. In the left pane, expand **Remote Gateways** → **<Gateway Name>** → **<Control Station Name>**, and then select **Audio**.
   The audio settings appear in the right pane.

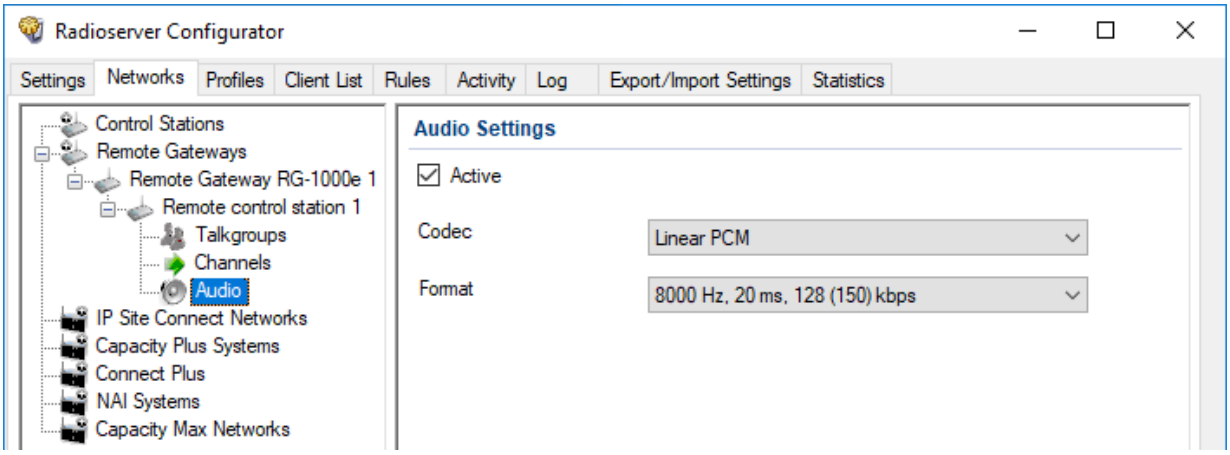


Fig. 70. MOTOTRBO Control Station Audio Settings

3. In the right pane, select the **Active** check box to unlock audio settings.
4. From the **Codec** list, select the desired voice transcoding algorithm.
5. To save changes, at the bottom of the Radioserver Configurator window, click **Save Configuration ( )**.

Postrequisites:

To apply changes immediately, at the bottom of the Radioserver Configurator window, click **Start ( )** or **Restart ( )**.

6.2 Configuring Remote I/O Control Station Connection

Follow the procedure to add a new or edit an existing connection to a remote I/O control station.

Prerequisites:

- Ensure that SmartPTT license allows control station connection over analog interface. For details, see "Licenses" in *SmartPTT Installation and Configuration Guide*.
- Determine whether SmartPTT Radioserver or RG-1000e Gateway will initiate the connection.
- *(Optional)* If RG-1000e Gateway is configured to act as server, from the RG-1000e Gateway configuration file, obtain the IP address and port number configured for the desired control station. For details, see IP channel.
- *(Optional)* From the control station codeplug, obtain the control station serial number.
- *(Optional)* Determine SmartPTT Radioserver host ports that will be used to receive XCMP and audio data from the control station.

Procedure:

1. In Radioserver Configurator, open the **Networks** tab.
2. In the left pane, perform one of the following actions:

To add a remote I/O control station to a new gateway,	perform the following actions: 1. Right-click the **Remote Gateways** node, and then click **Add** → **Remote Gateway RG-1000e**. 2. In the right pane, select the **Active** check box. 3. *(Optional)* In the **Name** field, type the gateway name. 4. In the left pane, right-click the **<Gateway Name>** node, point to **Add**, and then select **Remote I/O Control Station**.
To add a remote I/O control station to an existing gateway,	perform the following actions: 1. Expand the **Remote Gateways** node. 2. Right-click the desired gateway name, point to **Add**, and then select **Remote I/O Control Station**.
To edit an existing remote I/O control station connection settings,	expand **Remote Gateways** → **<Gateway Name>**, and then click the desired control station.
To delete a remote I/O control station connection,	perform the following actions: 1. Expand **Remote Gateways** → **<Gateway Name>**.

2. Right-click the desired control station, and then select **Delete**.
3. Proceed to the last step of the procedure.

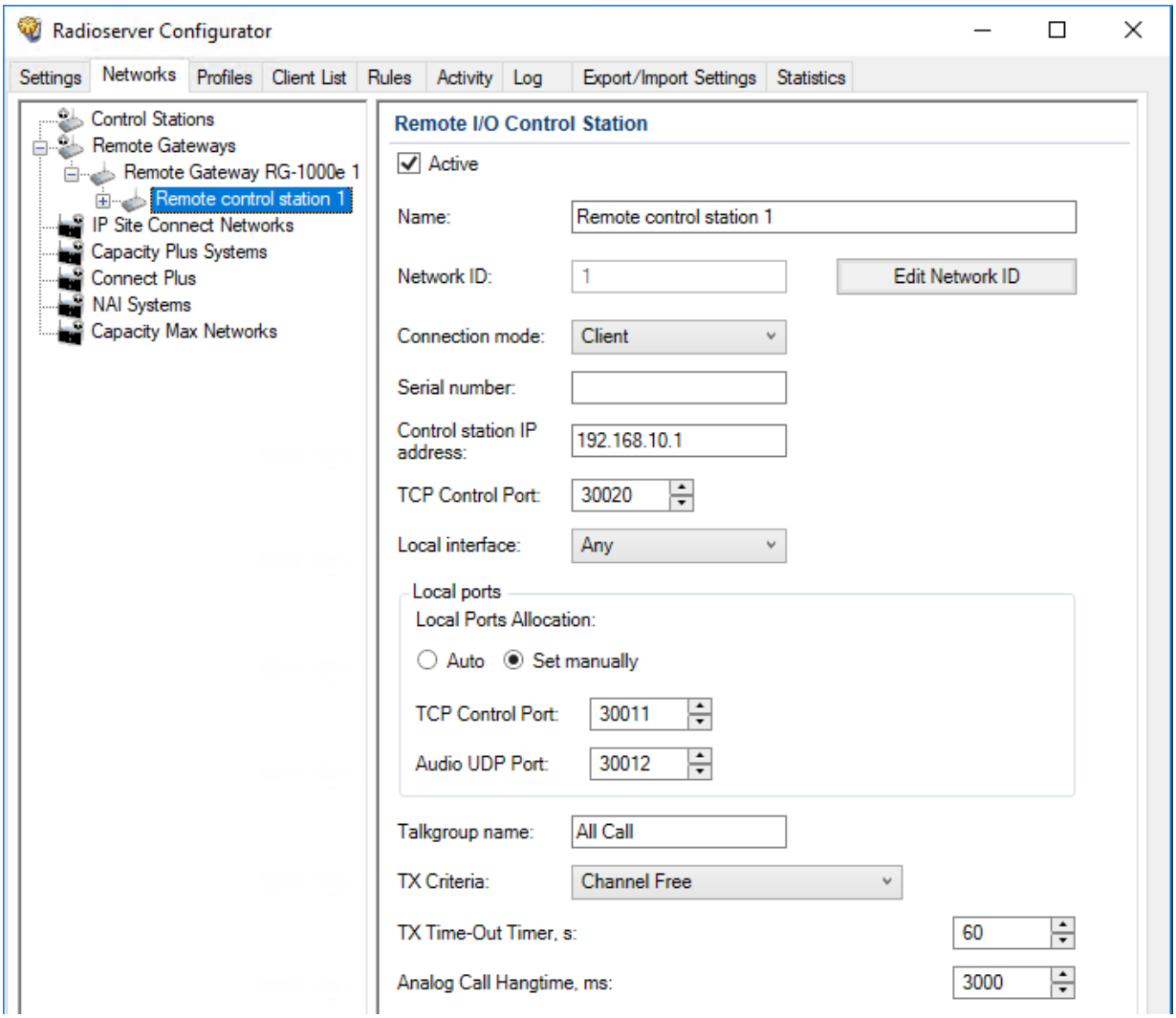


Fig. 71. Remote I/O Control Station Settings

3. In the right pane, select the **Active** check box to unlock control station settings.
4. In the **Name** field, type the control station name.
5. Leave the value in the **Network ID** field unchanged.
6. Configure the connection mode to the control station:

If RG-1000e Gateway is configured to accept SmartPTT connection (acts as a server),	perform the following actions: 1. From the **Connection mode** list, select *Client*. 2. In the **Control station IP address** field, type the radio gateway IP address for receiving radioserver connections.

3. In the **TCP Control Port** field, enter the port number to receive radioserver connections.

Important
The IP address and port number in the fields above must match the IP address and port number in the **IP address** and **Port XCMP protocol** fields in the **Gateway IP settings** area of the RG-1000e Gateway configuration. For details, see IP channel.

If RG-1000e Gateway is configured to initiate SmartPTT connection (acts as a client),	perform the following actions: 1. From the **Connection mode** list, select *Server*. 2. In the **Local TCP Control Port** field, enter the SmartPTT Radioserver port number to listen to incoming connections. **Important** The port number in this field must match the port number in the **Port XCMP protocol** field in the **Remote Gateway IP settings** area of the RG-1000e Gateway configuration. For details, see IP channel.

7. From the **Local Interface** list, select the desired option:

To use any radioserver IP address for the radio gateway connection,	select *Any*.
To use a fixed IP address for the radio gateway connection,	select the desired IP address. **Important** If you select *Server* from the **Connection mode** list, a fixed IP address must match the IP address in the **IP address** field in the **Remote Gateway IP settings** area of the corresponding IP channel in the RG-1000e Gateway configuration.

8. *(Optional)* In the **Local ports** area, set SmartPTT Radioserver host ports for different types of data:

To set local ports automatically,	select *Auto*.
To set specific local port values,	perform the following actions: 1. Select *Set manually*.

2. In the **TCP Control Port** field, enter the port number to use for commands and service messages exchange between the radioserver and the gateway.
3. In the **Audio UDP Port** field, enter the port number to use for voice receiving and transmission.

9. *(Optional)* Configure the following options:
   a. In the **Serial number** field, enter the control station serial number.
   b. In the **Talkgroup name** field, enter the control station talkgroup name.
10. From the **TX Criteria** list, select one of the following options:

If the control station is configured to transmit only when no other transmissions are detected over the radio channel,	select *Channel Free*.
If the control station is configured to completely ignore other transmission over the radio channel,	select *Always*.

Important
SmartPTT does not support color code criteria for outgoing transmissions.

11. In the **TX Time-Out Timer, s** field, enter the maximum duration of voice transmission on the channel.
12. In the **Analog Call Hangtime, ms** field, enter the maximum time interval between transmissions within one call.
13. To save changes, at the bottom of the Radioserver Configurator window, click **Save Configuration ( )**.

Postrequisites:

- Configure control station channels. For details, see Configuring Remote I/O Control Station Channels.
- Configure audio settings. For details, see Configuring Remote I/O Control Station Audio Settings.
- To apply changes immediately, at the bottom of the Radioserver Configurator window, click **Start ( )** or **Restart ( )**.
- In the firewall software on the radioserver computer, unlock the ports configured for the control station.

6.2.1 Configuring Remote I/O Control Station Channels

Follow the procedure to add new or edit existing channels of a remote I/O control station.

Prerequisites:

- Configure the control station connection. For details, see Configuring Remote I/O Control Station Connection.
- Configure the control station GPIO pins to switch channels. For details, see Settings.

- Configure all control station channels in the first zone.
- Determine the default control station channel.

Procedure:

1. In Radioserver Configurator, open the **Networks** tab.
2. In the left pane, expand **Remote Gateways** → **<Gateway Name>** → **<Control Station Name>**, and then select **Channels**.
   The list of channels appears in the right pane.

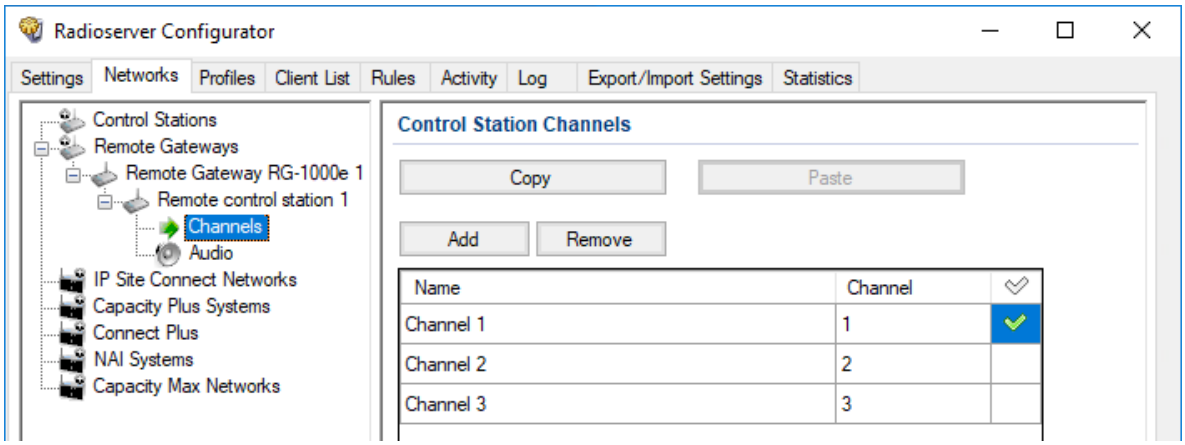


Fig. 72. I/O Control Station Channels

3. In the right pane, perform one of the following actions:

To add a new channel,	click **Add**.
To edit an existing entry,	proceed to the next step of the procedure.
To remove an existing channel,	perform the following actions: 1. Click the desired entry. 2. Click **Remove**. 3. Proceed to the last step of this procedure.

4. For the desired entry in the table, perform the following actions:
   a. In the **Name** column, double-click the current channel name, and then type a new name.
   b. In the **Channel** column, double-click the current channel ID, and then type the desired channel ID.
5. When all channels are added, in the Default Channel ( ) column, select the check box next to the channel that will be selected on the remote control station each time SmartPTT Radioserver is started or restarted.
6. To save changes, at the bottom of the Radioserver Configurator window, click **Save Configuration ( )**.

Postrequisites:

To apply changes immediately, at the bottom of the Radioserver Configurator window, click **Start ( )** or **Restart ( )**.

6.2.2 Configuring Remote I/O Control Station Audio Settings

Follow the procedure to edit audio processing settings required to receive voice from an I/O control station and send dispatcher voice to it.

Prerequisites:

Configure the control station connection. For details, see Configuring Remote I/O Control Station Connection.

Procedure:

1. In Radioserver Configurator, open the **Networks** tab.
2. In the left pane, expand **Remote Gateways** → **<Gateway Name>** → **<Control Station Name>**, and then select **Audio**.
   The audio settings appear in the right pane.

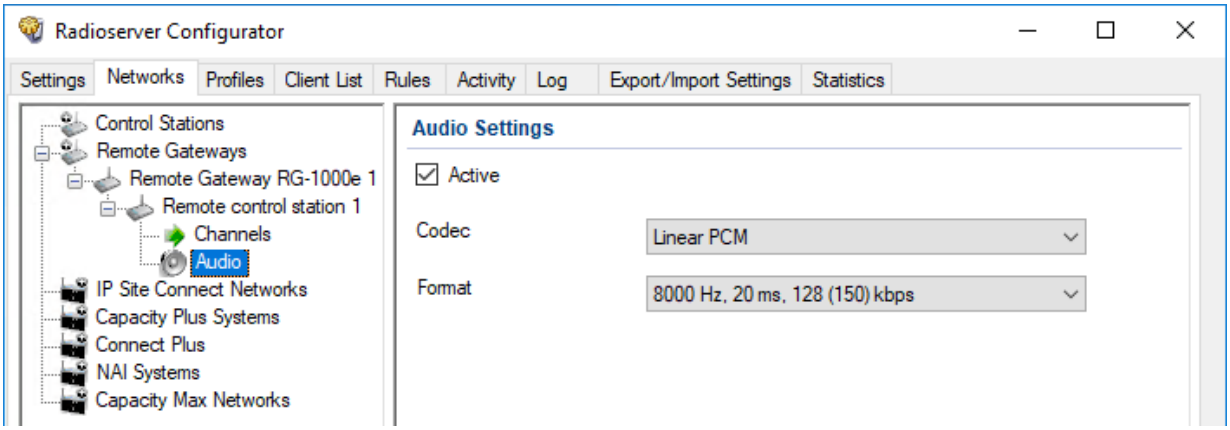


Fig. 73. I/O Control Station Audio Settings

3. In the right pane, select the **Active** check box to unlock audio settings.
4. From the **Codec** list, select the desired voice transcoding algorithm.
5. To save changes, at the bottom of the Radioserver Configurator window, click **Save Configuration ( )**.

Postrequisites:

To apply changes immediately, at the bottom of the Radioserver Configurator window, click **Start ( )** or **Restart ( )**.

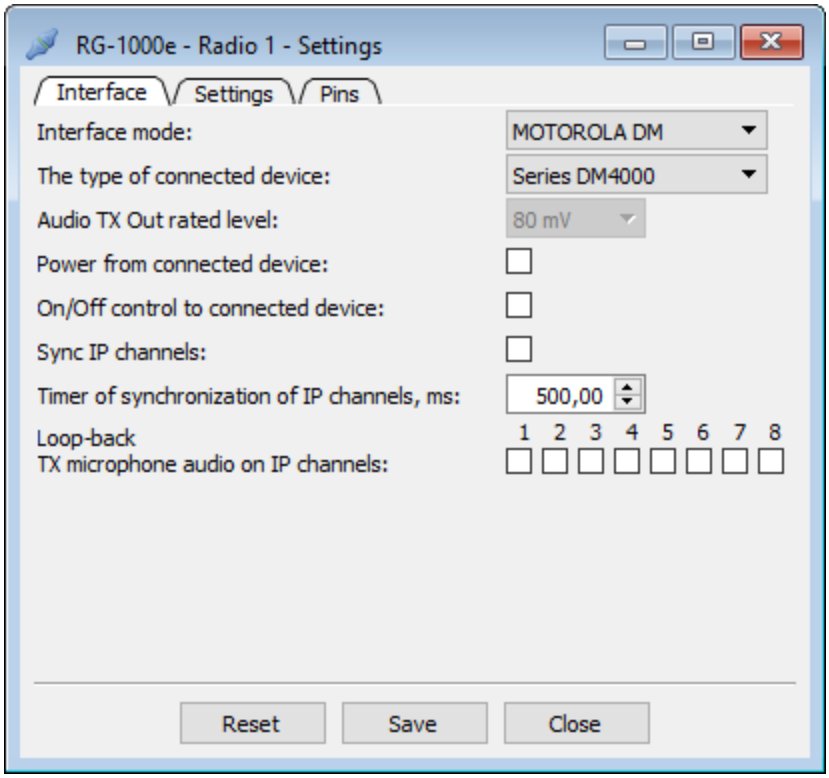
7 Radio 1(2) Port Configuration Samples

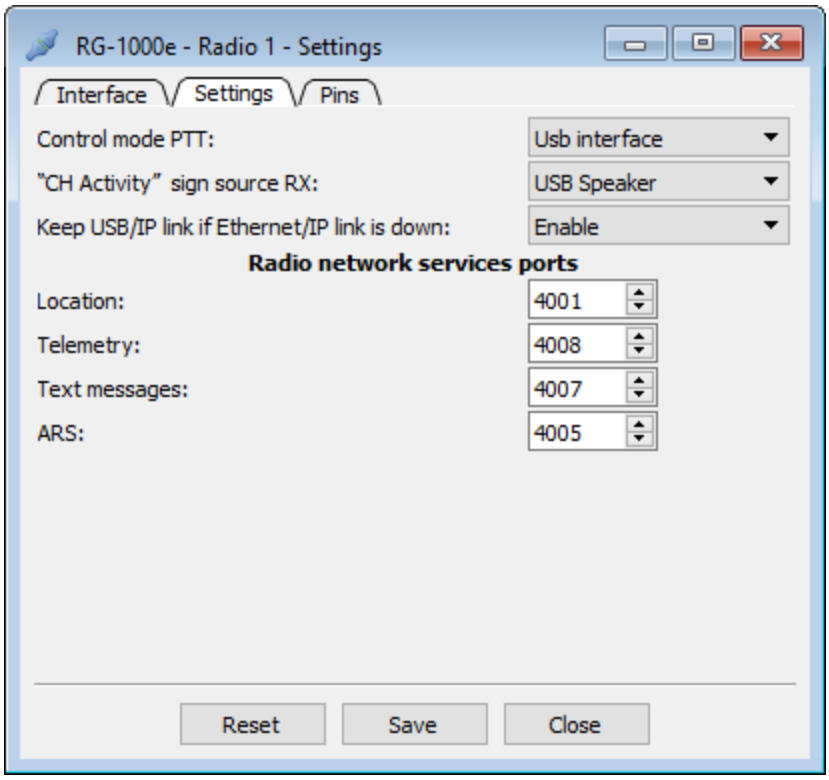
Figures below show Radio 1(2) port settings for RG-1000e interaction with different control stations. It makes RG-1000e deployment process easier and faster. These Radio 1(2) port settings may be considered as recommended. At the same time, settings may vary depending on the project technical requirements.

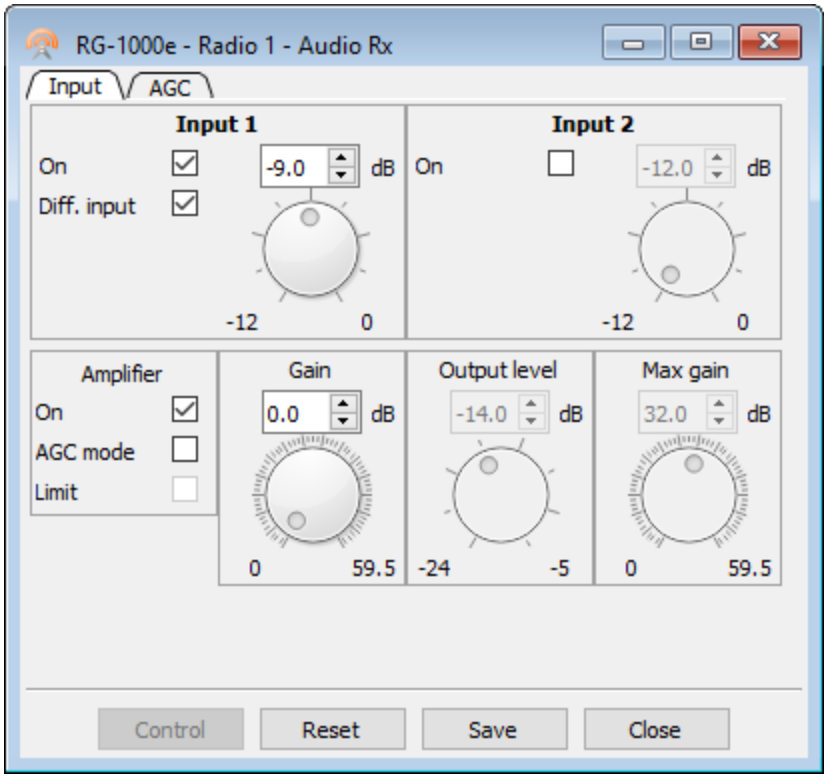
7.1 MOTOTRBO Radios Port Settings

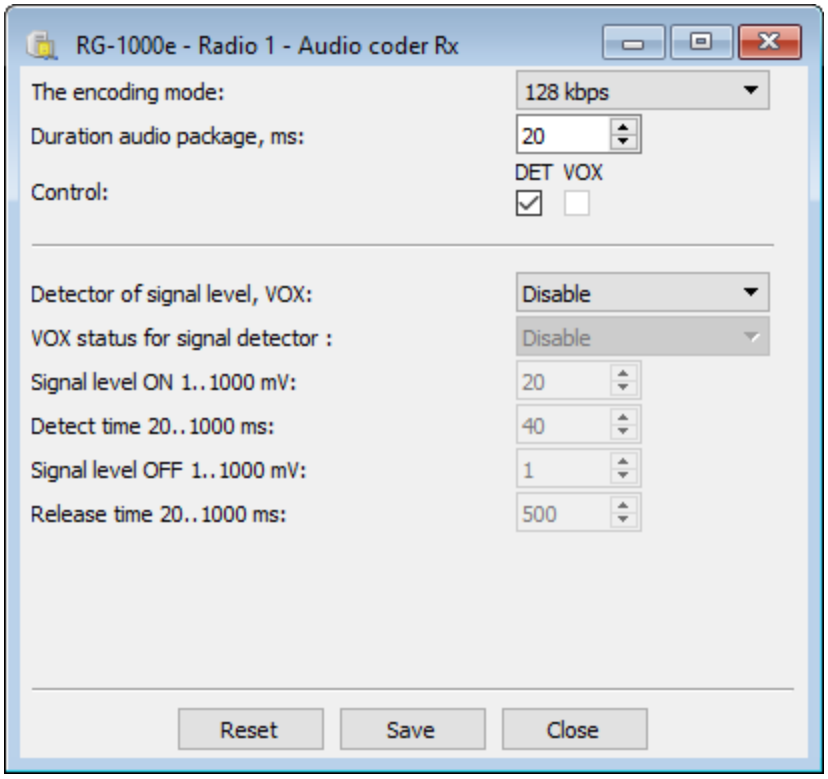
To use MOTOTRBO radios in the SmartPTT system, RG-1000e Gateway must be configured in *MOTOROLA DM* mode. For details, see IP channel.

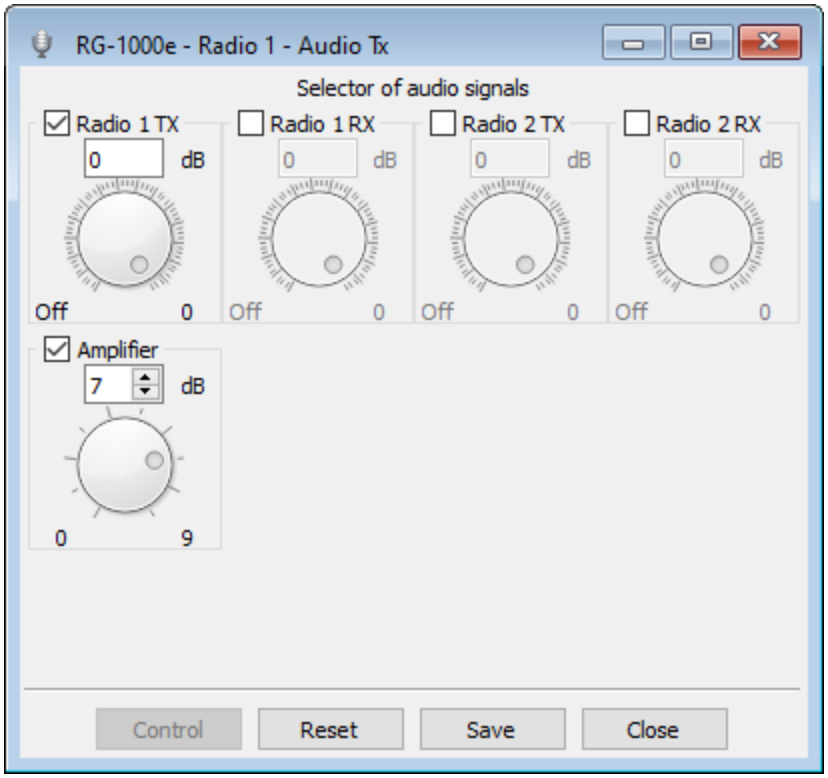
SmartPTT Radioserver must be configured in *Remote MOTOTRBO Control Station* mode. For details, see Settings.

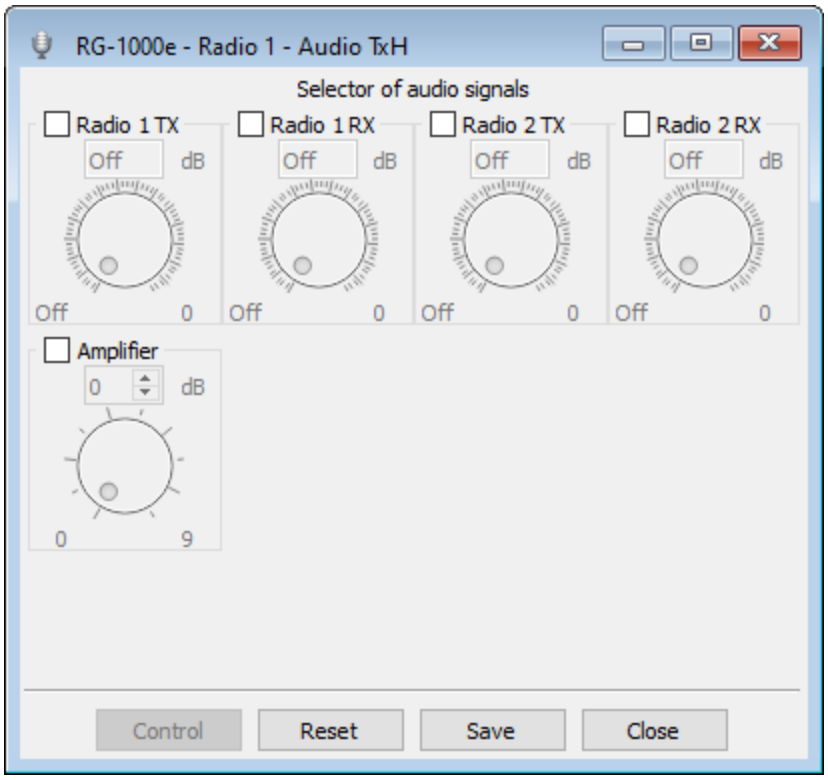


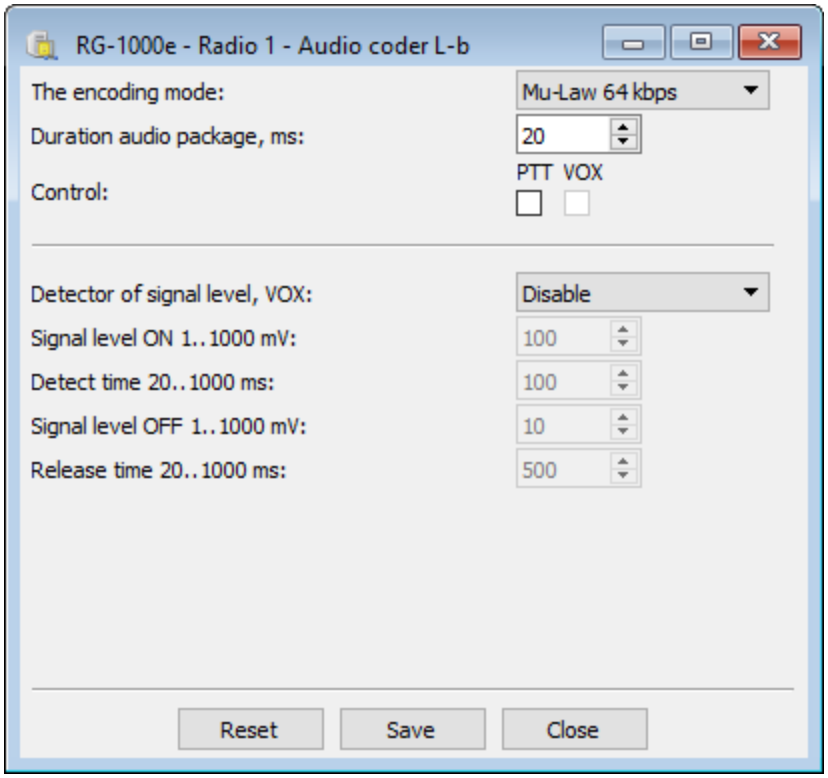

RG-1000e - Radio 1 - Settings
Interface
Settings
Pins
Control mode PTT:
Usb interface
"CH Activity" sign source RX:
USB Speaker
Keep USB/IP link if Ethernet/IP link is down:
Enable
Radio network services ports
Location:
4001
Telemetry:
4008
Text messages:
4007
ARS:
4005
Reset
Save
Close


RG-1000e - Radio 1 - Audio Rx
Input
AGC
Input 1
On
Diff. input
-9.0
dB
-12
0
Input 2
On
-12.0
dB
-12
0
Amplifier
On
AGC mode
Limit
Gain
0.0
dB
0
59.5
Output level
-14.0
dB
-24
-5
Max gain
32.0
dB
0
59.5
Control
Reset
Save
Close


RG-1000e - Radio 1 - Audio coder Rx
The encoding mode:
128 kbps
Duration audio package, ms:
20
Control:
DET VOX
Detector of signal level, VOX:
Disable
VOX status for signal detector :
Disable
Signal level ON 1..1000 mV:
20
Detect time 20..1000 ms:
40
Signal level OFF 1..1000 mV:
1
Release time 20..1000 ms:
500
Reset
Save
Close


RG-1000e - Radio 1 - Audio Tx
Selector of audio signals
Radio 1 TX
Radio 1 RX
Radio 2 TX
Radio 2 RX
0
dB
Off
0
Amplifier
7
dB
0
9
Control
Reset
Save
Close

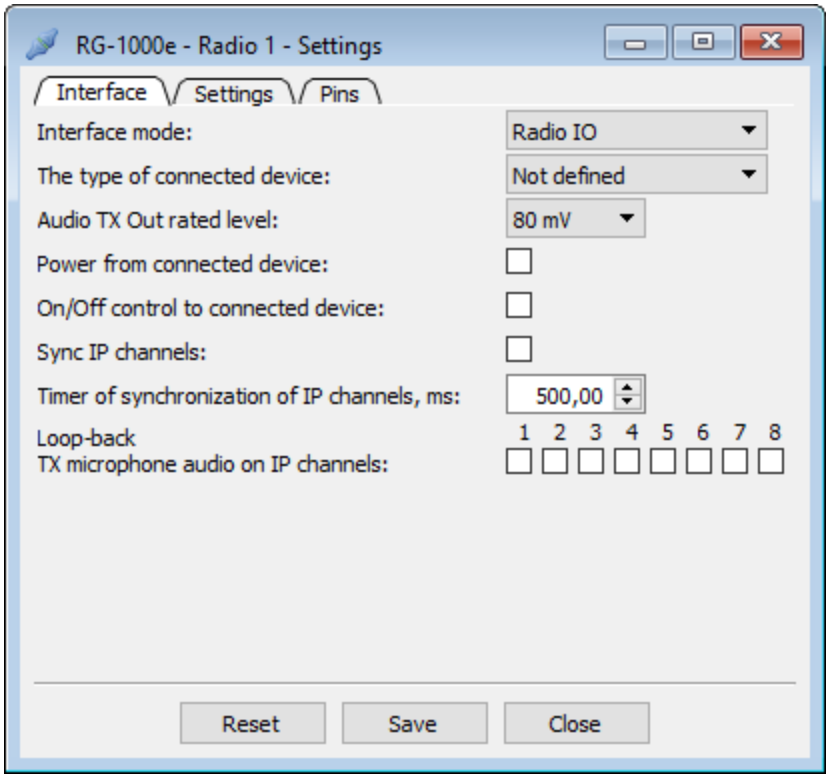

RG-1000e - Radio 1 - Audio TxH
Selector of audio signals
Radio 1 TX
Radio 1 RX
Radio 2 TX
Radio 2 RX
Off
dB
Off
0
Amplifier
0
dB
0
9
Control
Reset
Save
Close

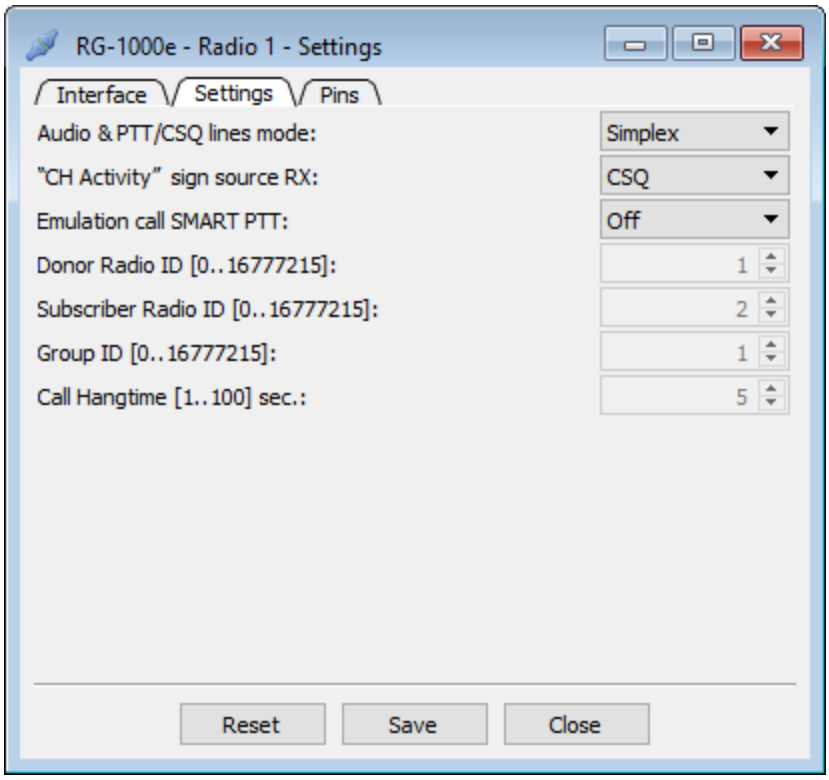

RG-1000e - Radio 1 - Audio coder L-b
The encoding mode:
Mu-Law 64 kbps
Duration audio package, ms:
20
Control:
PTT
VOX
Detector of signal level, VOX:
Disable
Signal level ON 1..1000 mV:
100
Detect time 20..1000 ms:
100
Signal level OFF 1..1000 mV:
10
Release time 20..1000 ms:
500
Reset
Save
Close

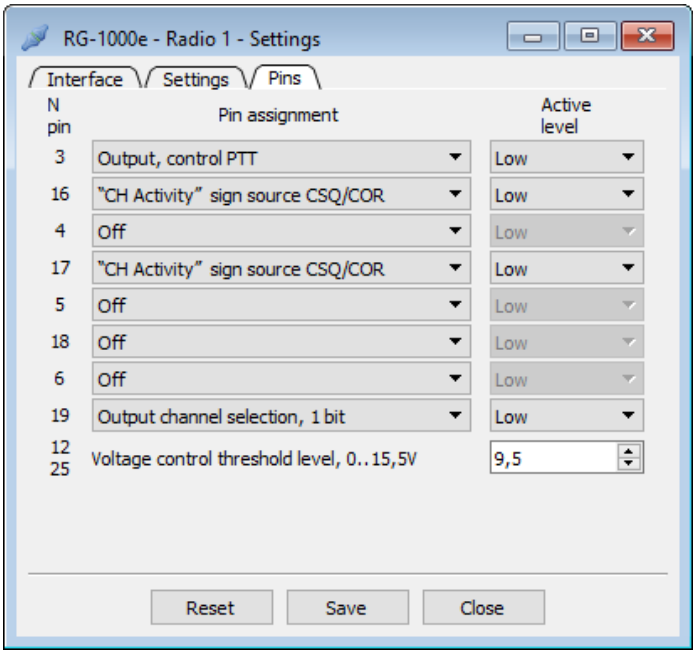
7.2 APX/XTL Radios Port Settings for I/O Mode

To use XTL radios in SmartPTT, RG-1000e Gateway must be configured in *Radio IO* mode. For details, see Settings. SmartPTT Radioserver must be configured in *Remote I/O Control Station* mode. For details, see Configuring Remote I/O Control Station Connection.

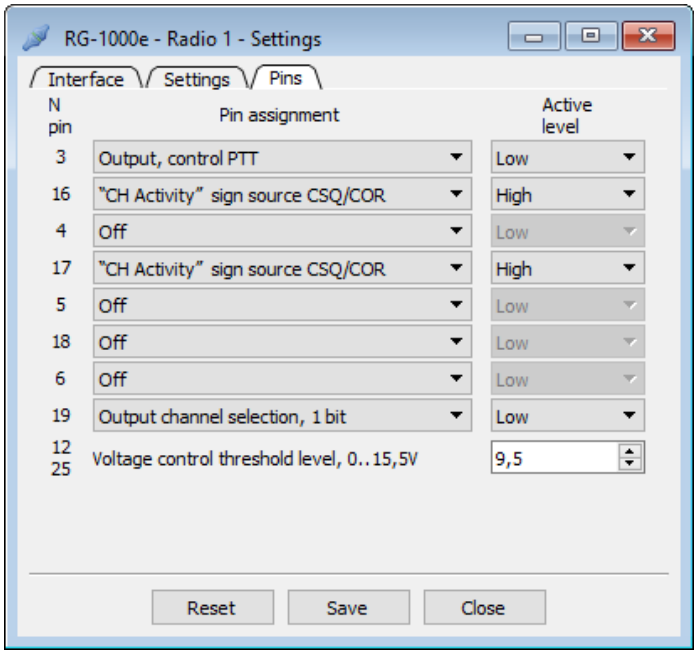
These modes can also be applied to use APX radios. The settings for the APX and XTL radios are the same except for the active level of the *"CH Activity" sign source CSQ/COR* logic signal.



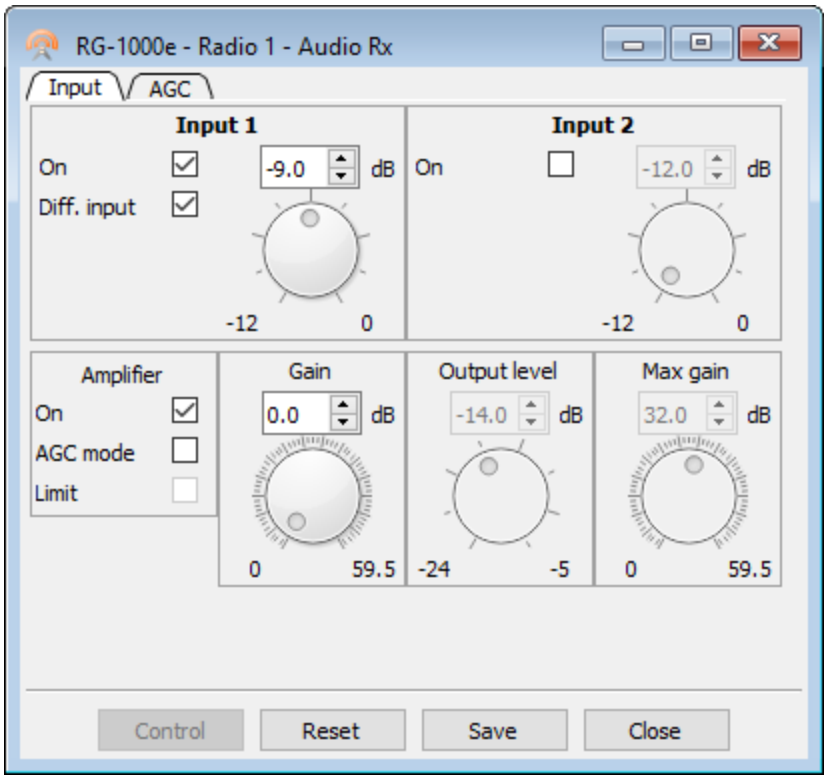


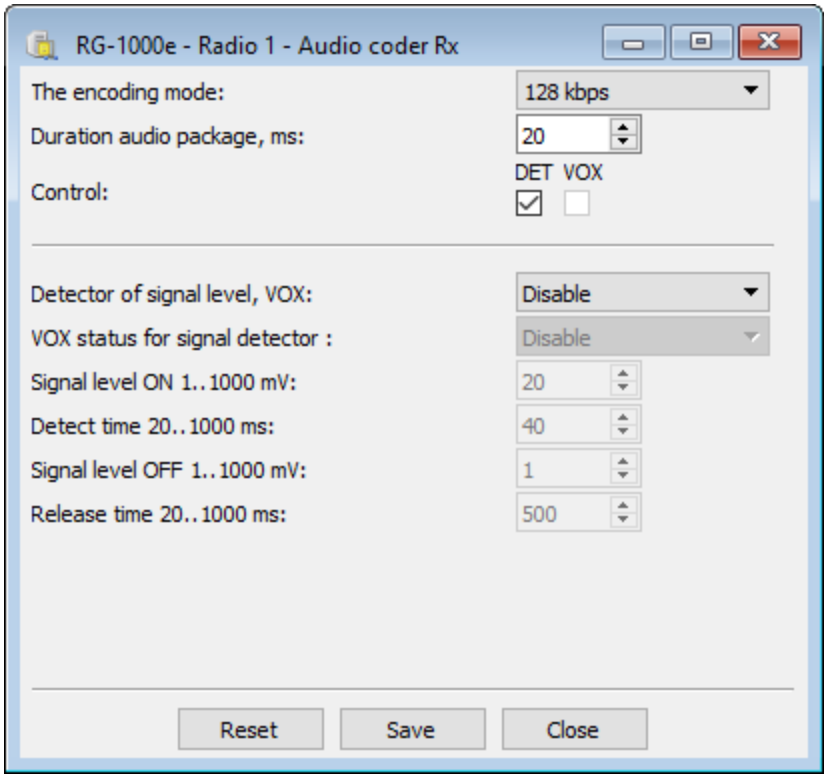


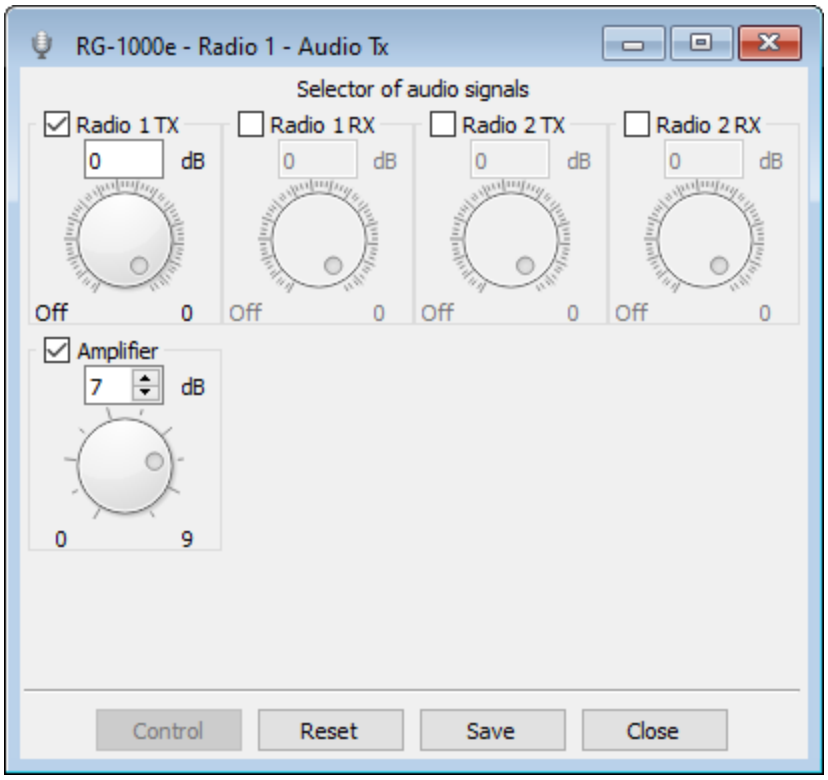
APX Radios Pins Settings

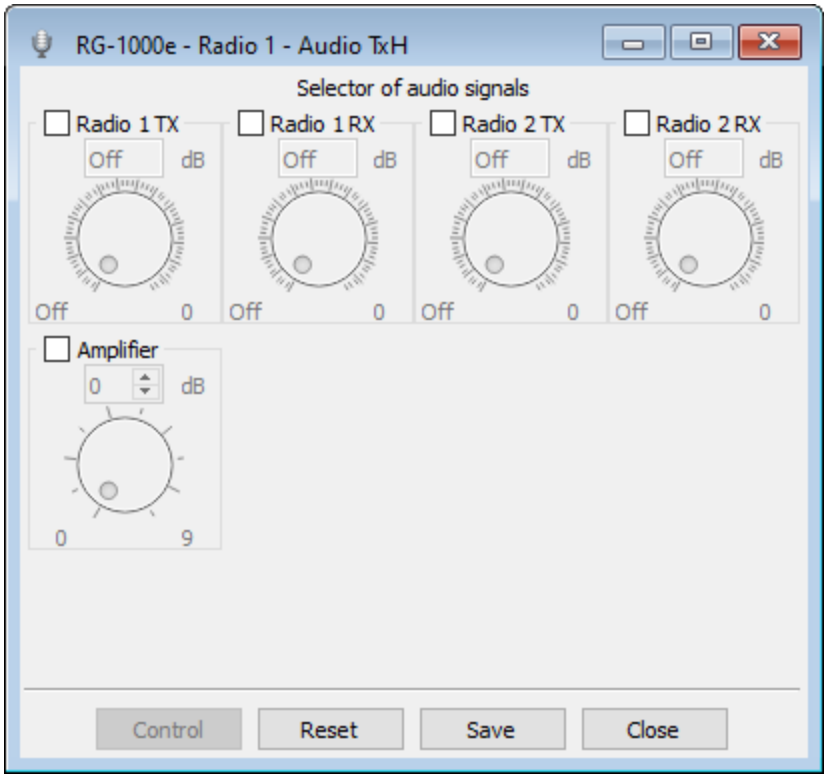


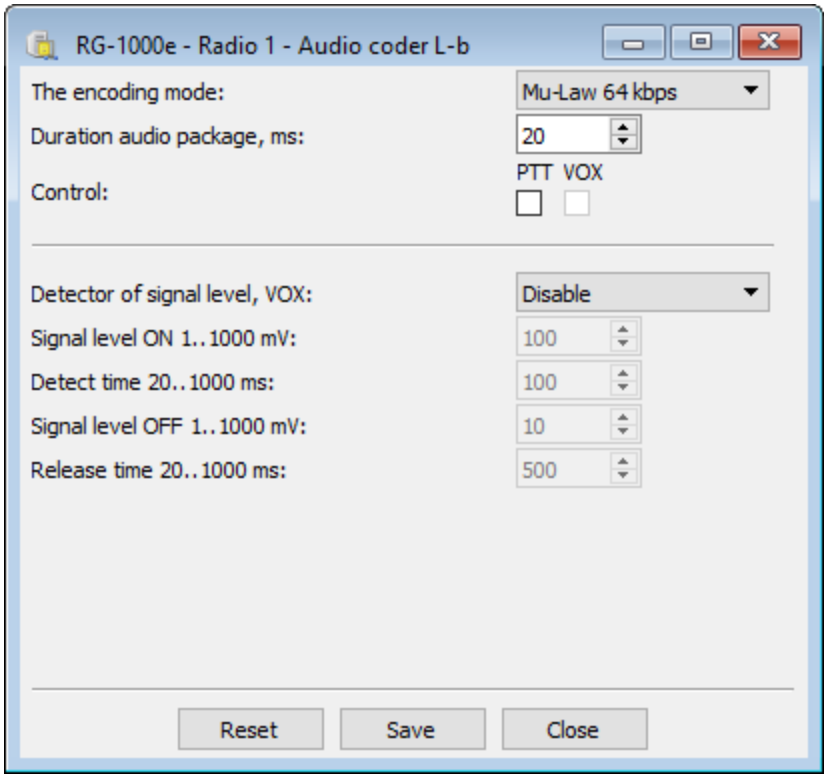
XTL Radios Pins Settings


RG-1000e - Radio 1 - Audio Rx
Input
AGC
Input 1
On
Diff. input
-9.0
dB
-12
0
Input 2
On
-12.0
dB
-12
0
Amplifier
On
AGC mode
Limit
Gain
0.0
dB
0
59.5
Output level
-14.0
dB
-24
-5
Max gain
32.0
dB
0
59.5
Control
Reset
Save
Close


RG-1000e - Radio 1 - Audio coder Rx
The encoding mode:
128 kbps
Duration audio package, ms:
20
Control:
DET VOX
Detector of signal level, VOX:
Disable
VOX status for signal detector :
Disable
Signal level ON 1..1000 mV:
20
Detect time 20..1000 ms:
40
Signal level OFF 1..1000 mV:
1
Release time 20..1000 ms:
500
Reset
Save
Close


RG-1000e - Radio 1 - Audio Tx
Selector of audio signals
Radio 1 TX
Radio 1 RX
Radio 2 TX
Radio 2 RX
0
dB
Off
0
Amplifier
7
dB
0
9
Control
Reset
Save
Close

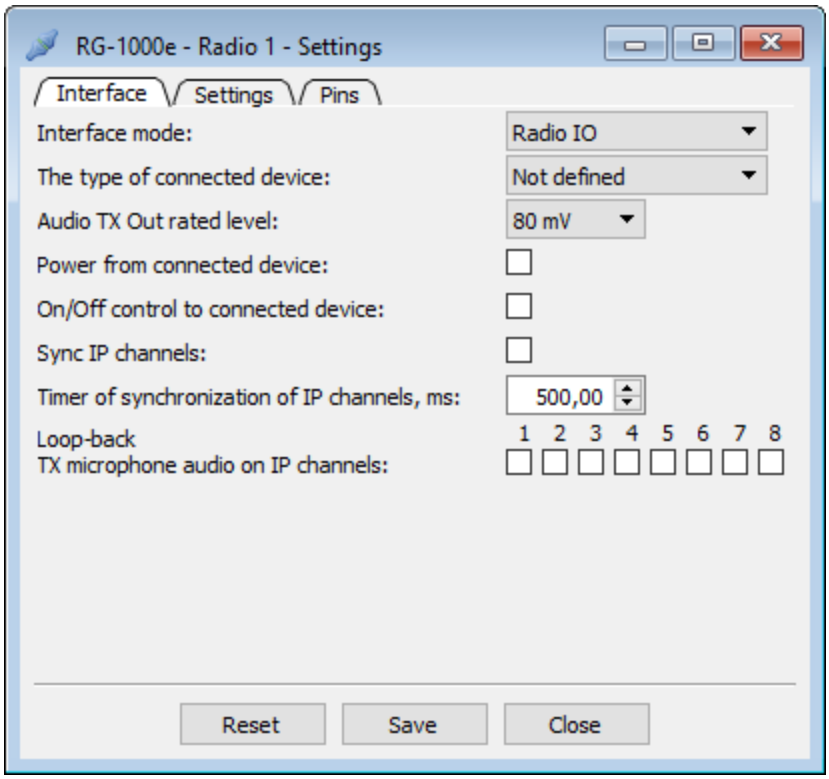

RG-1000e - Radio 1 - Audio TxH
Selector of audio signals
Radio 1 TX
Radio 1 RX
Radio 2 TX
Radio 2 RX
Off
dB
0
9
Amplifier
Control
Reset
Save
Close

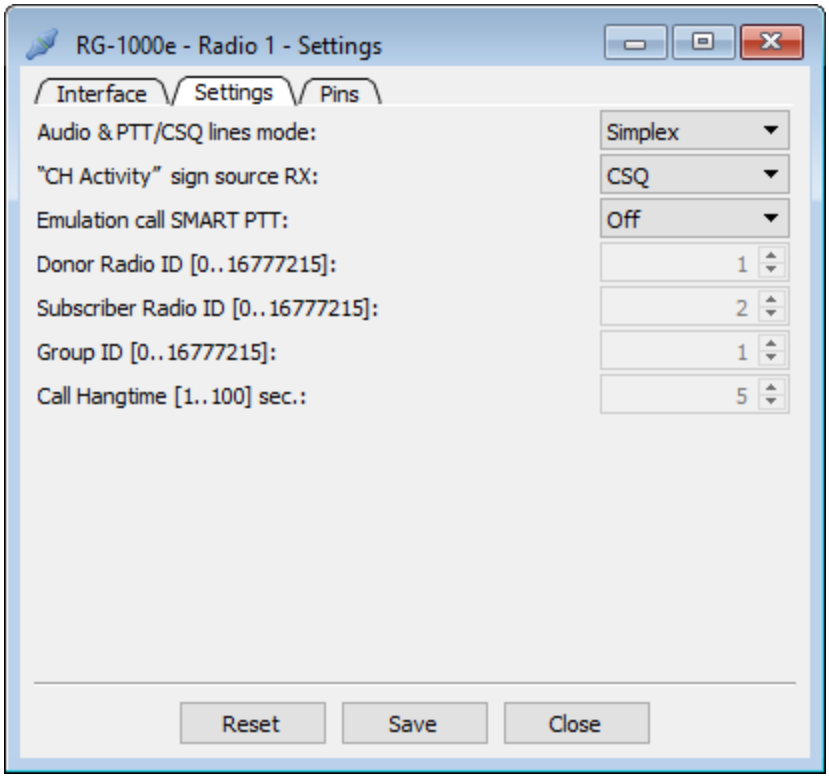


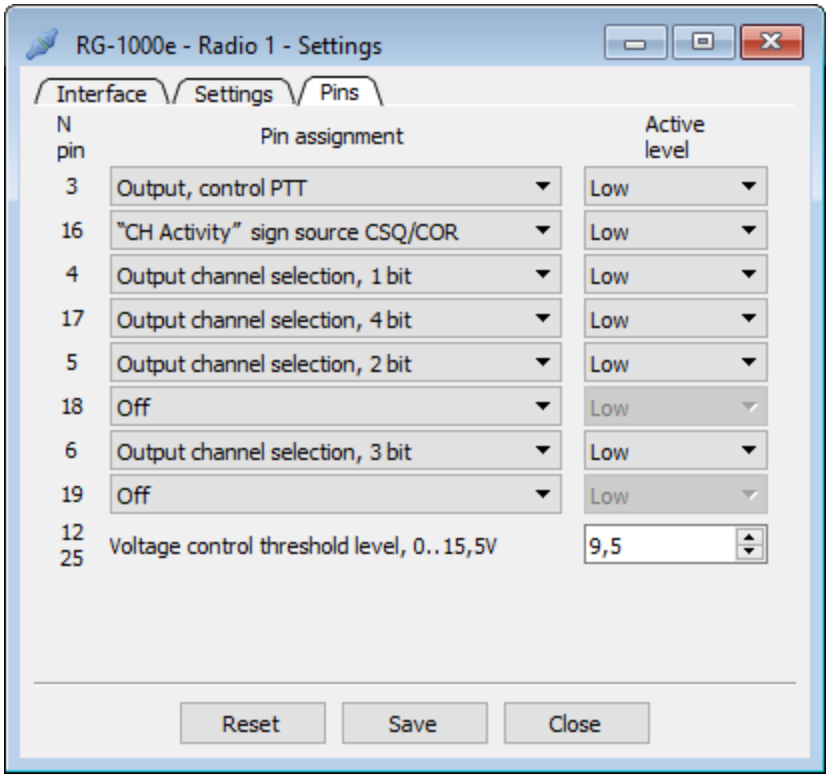
7.3 CDM/GM100/GM300 Radios Port Settings

To use CDM/GM100/GM300 Series radios in the SmartPTT system, RG-1000e Gateway must be configured in *Radio IO* mode. For details, see Settings.

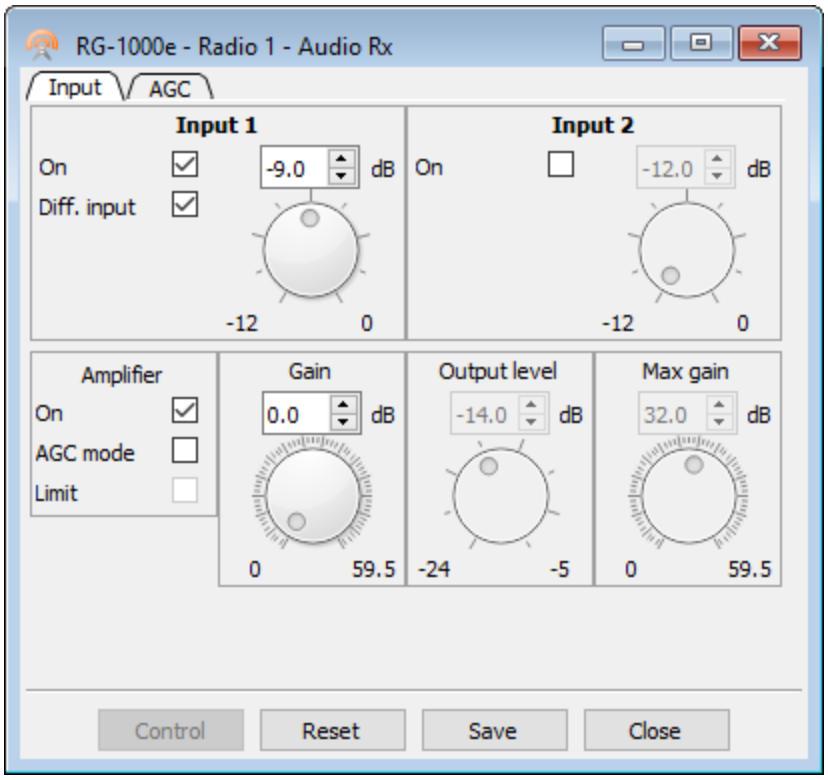
SmartPTT Radioserver must be configured in *Remote I/O Control Station* mode. For details, see Configuring Remote I/O Control Station Connection.

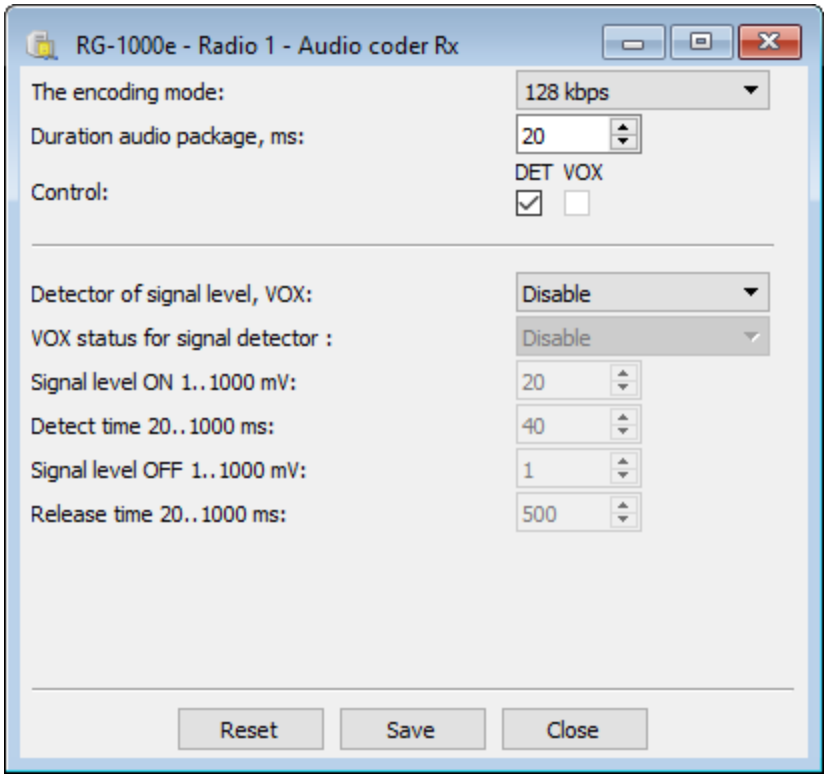


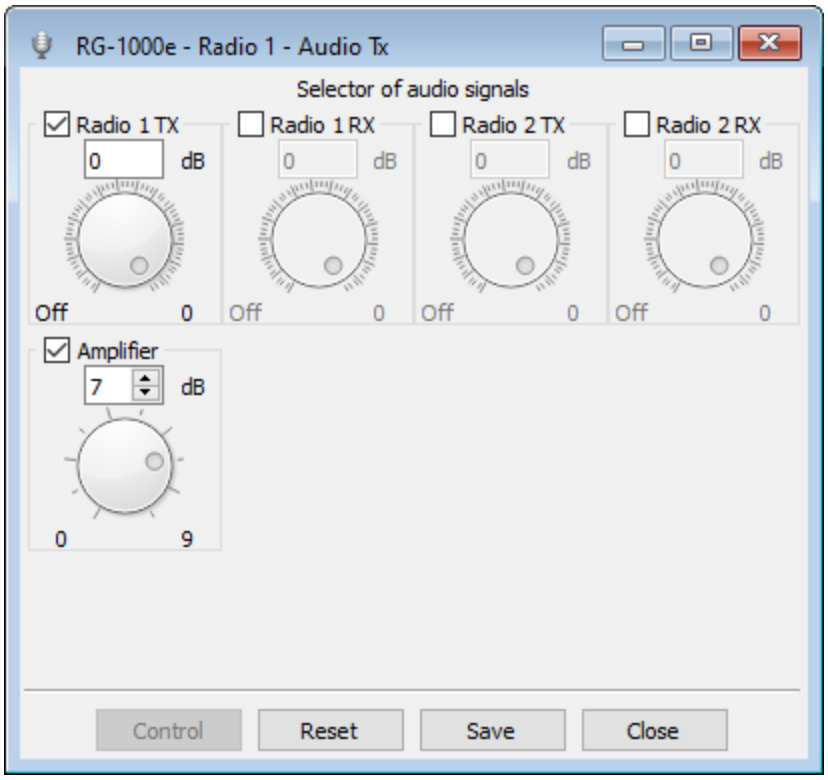


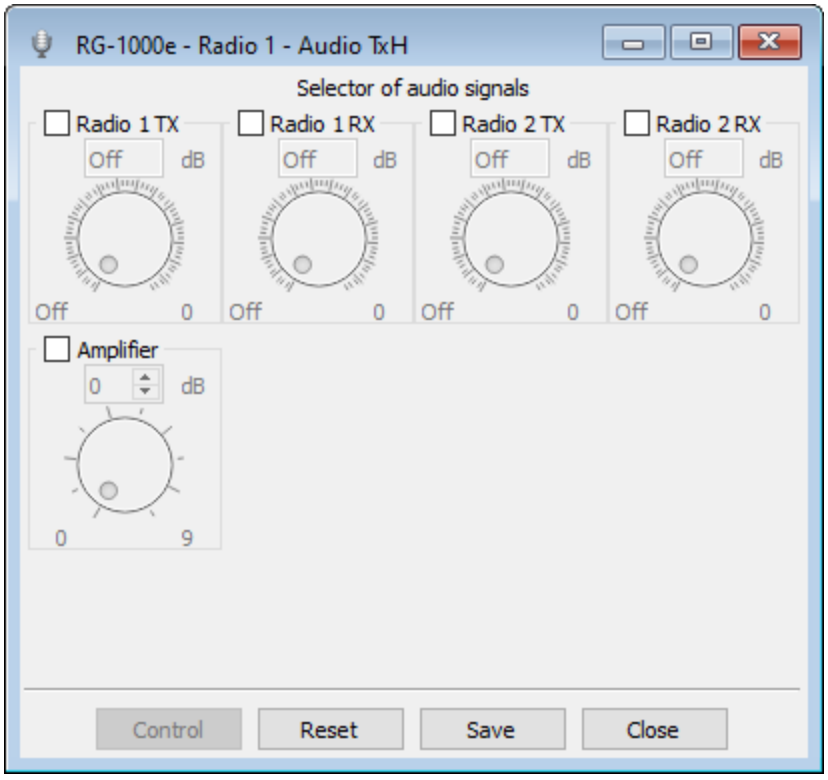


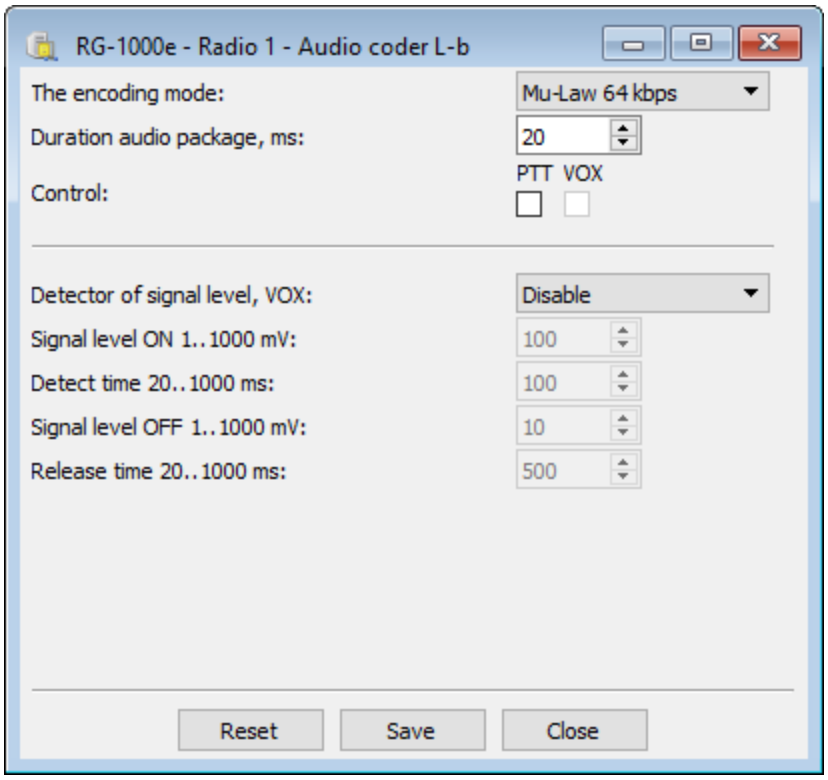
In the **Voltage control threshold level** field, enter *9,5* for SmartPTT version 9.4 or later, and *0* for SmartPTT 9.3.


RG-1000e - Radio 1 - Audio Rx
Input
AGC
Input 1
On
Diff. input
-9.0
dB
-12
0
Input 2
On
-12.0
dB
-12
0
Amplifier
On
AGC mode
Limit
Gain
0.0
dB
0
59.5
Output level
-14.0
dB
-24
-5
Max gain
32.0
dB
0
59.5
Control
Reset
Save
Close


RG-1000e - Radio 1 - Audio coder Rx
The encoding mode:
128 kbps
Duration audio package, ms:
20
Control:
DET
VOX
Detector of signal level, VOX:
Disable
VOX status for signal detector :
Disable
Signal level ON 1..1000 mV:
20
Detect time 20..1000 ms:
40
Signal level OFF 1..1000 mV:
1
Release time 20..1000 ms:
500
Reset
Save
Close


RG-1000e - Radio 1 - Audio Tx
Selector of audio signals
Radio 1 TX
0
dB
Off
0
Radio 1 RX
0
dB
Off
0
Radio 2 TX
0
dB
Off
0
Radio 2 RX
0
dB
Off
0
Amplifier
7
dB
0
9
Control
Reset
Save
Close


RG-1000e - Radio 1 - Audio TxH
Selector of audio signals
Radio 1 TX
Off
dB
Off
0
Radio 1 RX
Off
dB
Off
0
Radio 2 TX
Off
dB
Off
0
Radio 2 RX
Off
dB
Off
0
Amplifier
0
dB
0
9
Control
Reset
Save
Close

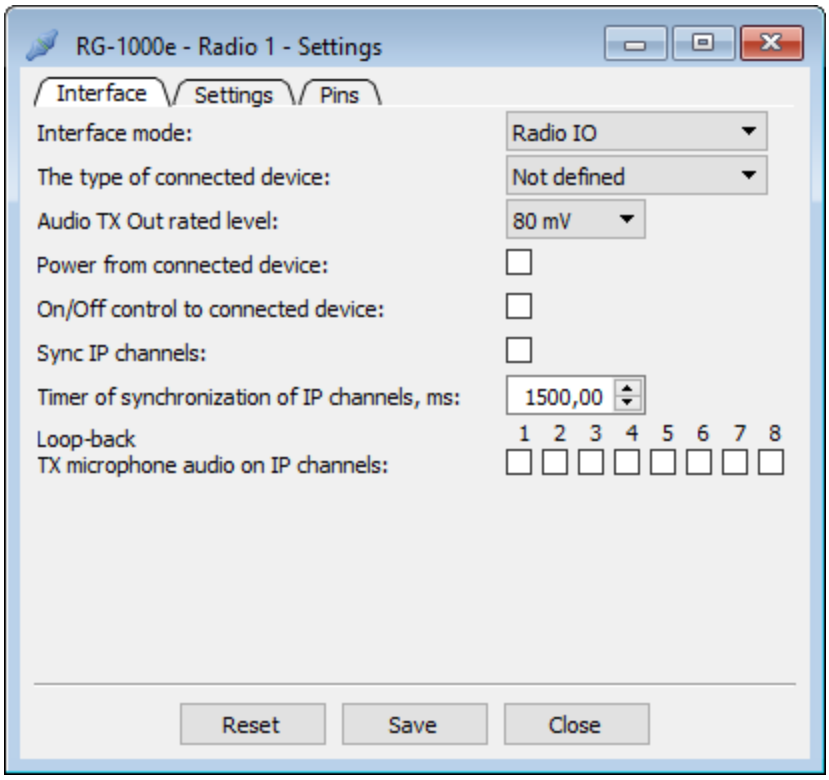


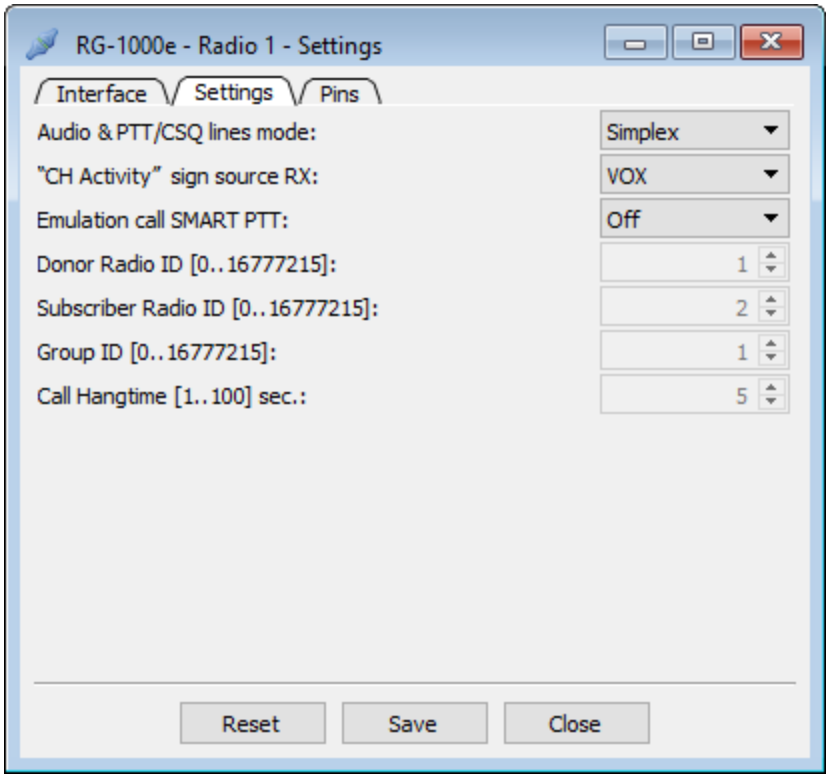
7.4 MTM Radios Port Settings

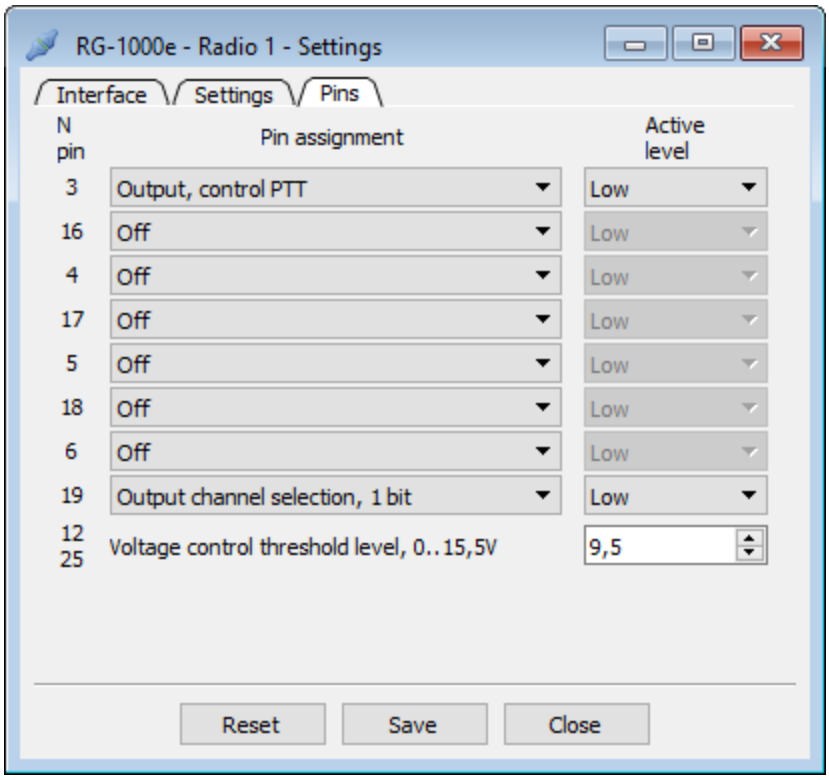
To use MTM radios in the SmartPTT system, RG-1000e Gateway must be configured in *Radio IO* mode. For details, see Settings.

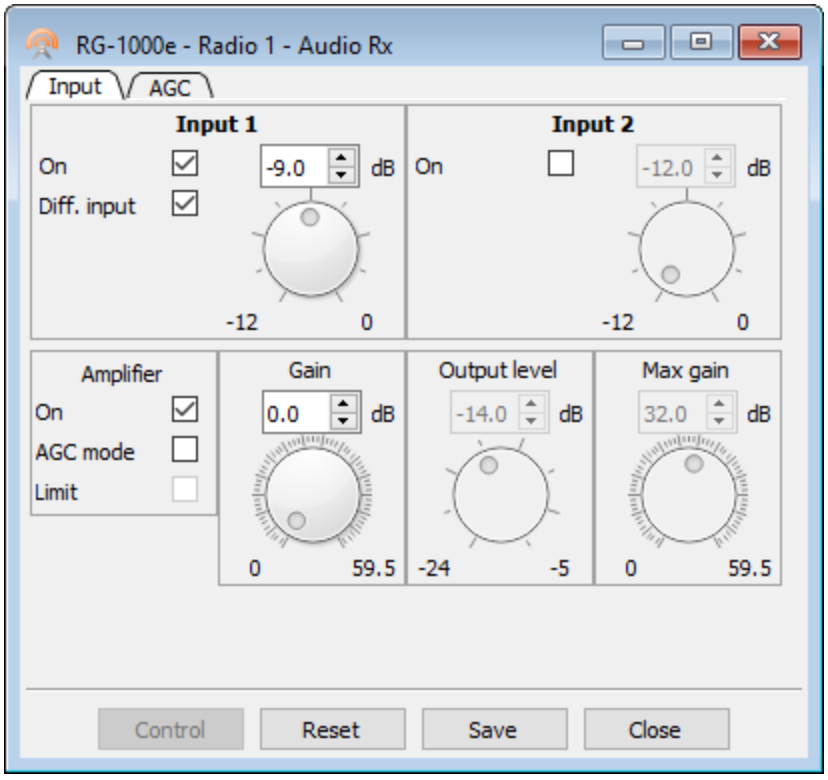
SmartPTT Radioserver must be configured in *Remote I/O Control Station* mode. For details, see Configuring Remote I/O Control Station Connection.

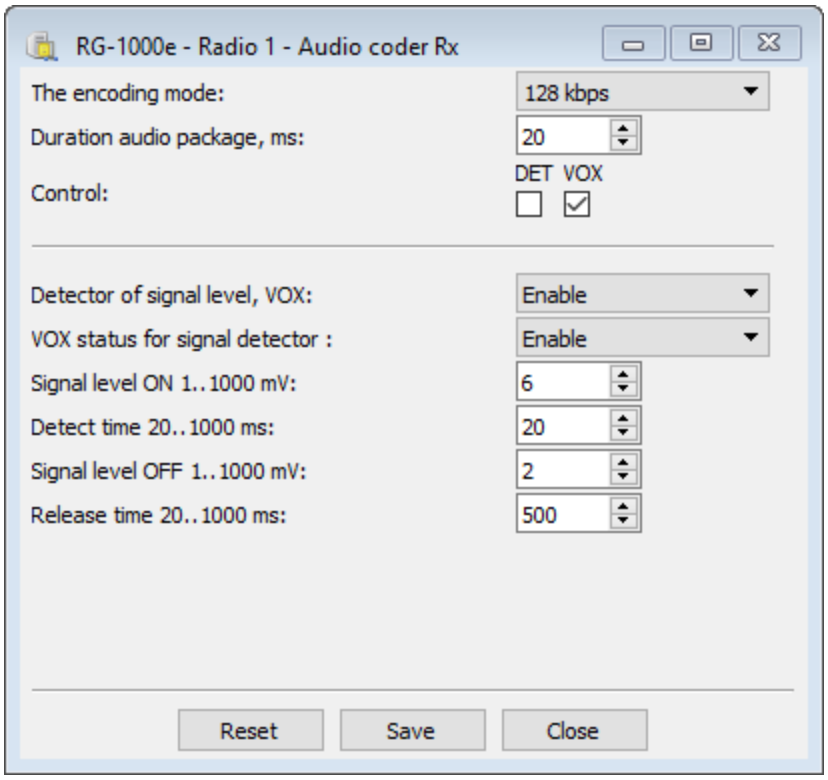
The MTM Series radios do not have a CSQ signal on the accessory connector, therefore it is necessary to use the built-in RG-1000e VOX to generate a CSQ signal.

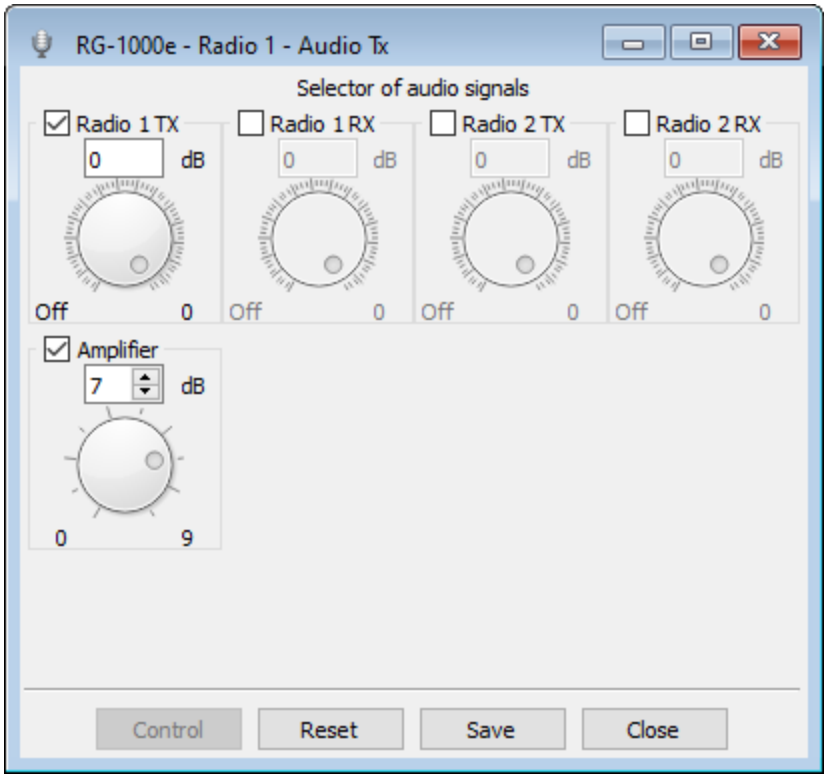

RG-1000e - Radio 1 - Settings
Interface
Settings
Pins
Interface mode:
Radio IO
The type of connected device:
Not defined
Audio TX Out rated level:
80 mV
Power from connected device:
On/Off control to connected device:
Sync IP channels:
Timer of synchronization of IP channels, ms:
1500,00
Loop-back
TX microphone audio on IP channels:
1 2 3 4 5 6 7 8
Reset
Save
Close

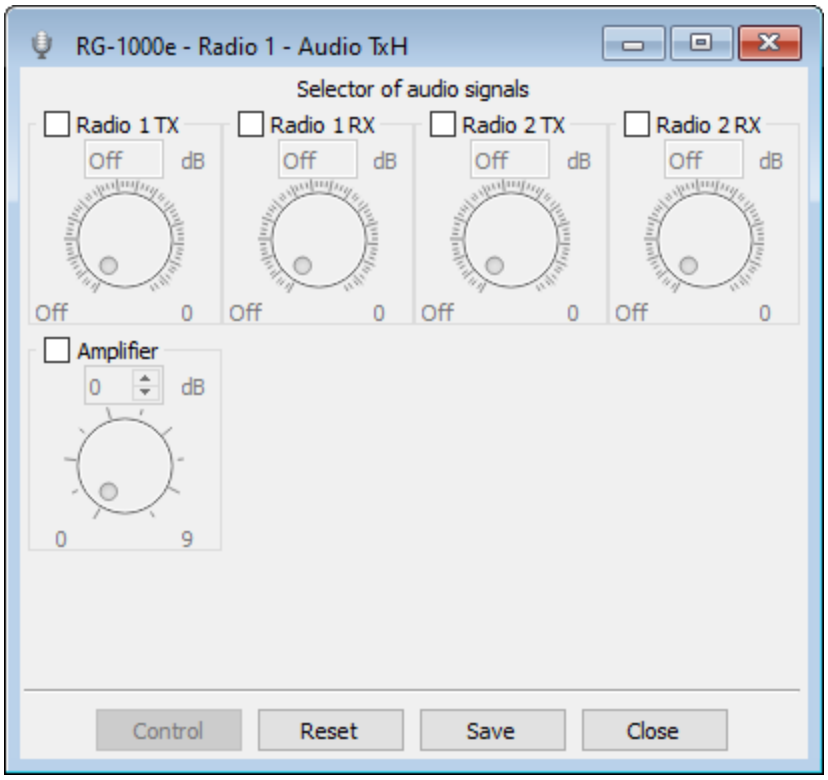

RG-1000e - Radio 1 - Settings
Interface
Settings
Pins
Audio & PTT/CSQ lines mode:
Simplex
"CH Activity" sign source RX:
VOX
Emulation call SMART PTT:
Off
Donor Radio ID [0..16777215]:
1
Subscriber Radio ID [0..16777215]:
2
Group ID [0..16777215]:
1
Call Hangtime [1..100] sec.:
5
Reset
Save
Close

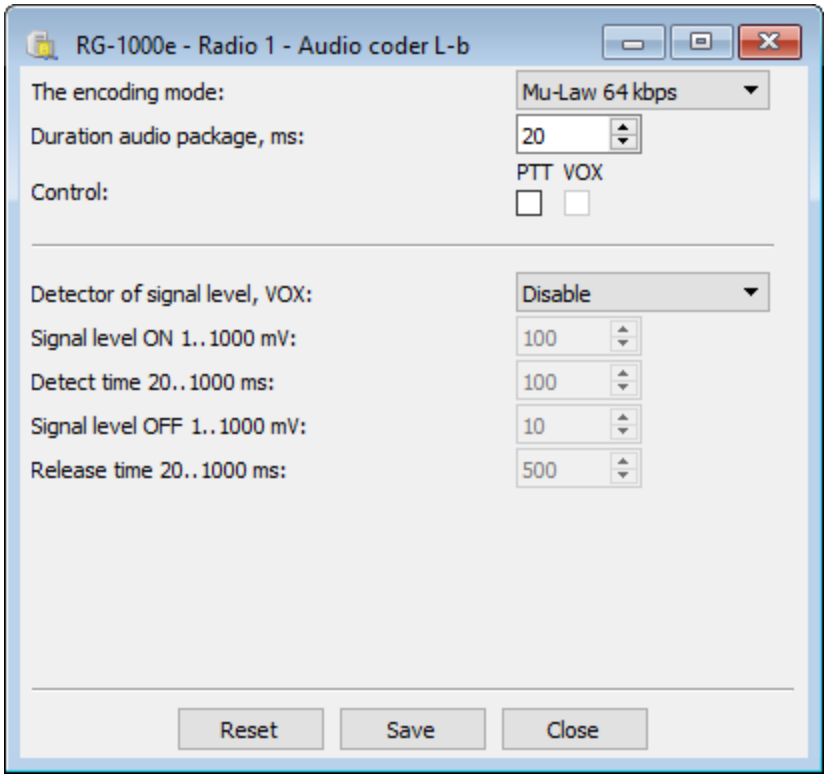

RG-1000e - Radio 1 - Settings
Interface
Settings
Pins
N pin
Pin assignment
Active level
3
Output, control PTT
Low
16
Off
Low
4
Off
Low
17
Off
Low
5
Off
Low
18
Off
Low
6
Off
Low
19
Output channel selection, 1 bit
Low
12 25
Voltage control threshold level, 0..15,5V
9,5
Reset
Save
Close


RG-1000e - Radio 1 - Audio Rx
Input
AGC
Input 1
On
Diff. input
-9.0
dB
-12
0
Input 2
On
-12.0
dB
-12
0
Amplifier
On
AGC mode
Limit
Gain
0.0
dB
0
59.5
Output level
-14.0
dB
-24
-5
Max gain
32.0
dB
0
59.5
Control
Reset
Save
Close


RG-1000e - Radio 1 - Audio coder Rx
The encoding mode:
128 kbps
Duration audio package, ms:
20
Control:
DET VOX
Detector of signal level, VOX:
Enable
VOX status for signal detector :
Enable
Signal level ON 1..1000 mV:
6
Detect time 20..1000 ms:
20
Signal level OFF 1..1000 mV:
2
Release time 20..1000 ms:
500
Reset
Save
Close


RG-1000e - Radio 1 - Audio Tx
Selector of audio signals
Radio 1 TX
Radio 1 RX
Radio 2 TX
Radio 2 RX
0
dB
Off
0
Amplifier
7
dB
0
9
Control
Reset
Save
Close

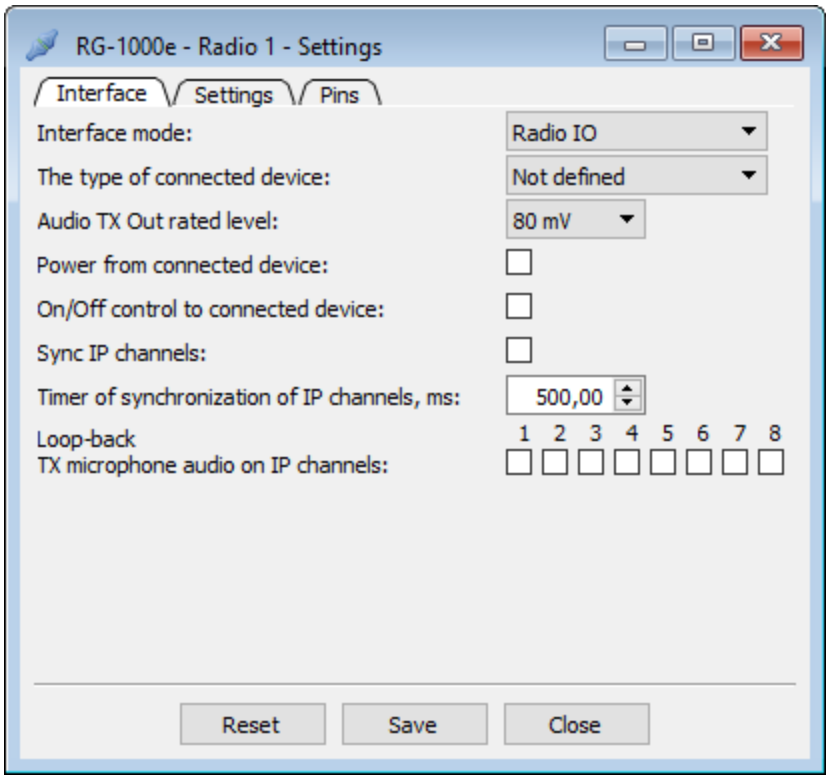

RG-1000e - Radio 1 - Audio TxH
Selector of audio signals
Radio 1 TX
Radio 1 RX
Radio 2 TX
Radio 2 RX
Off
dB
Off
0
Amplifier
0
dB
0
9
Control
Reset
Save
Close

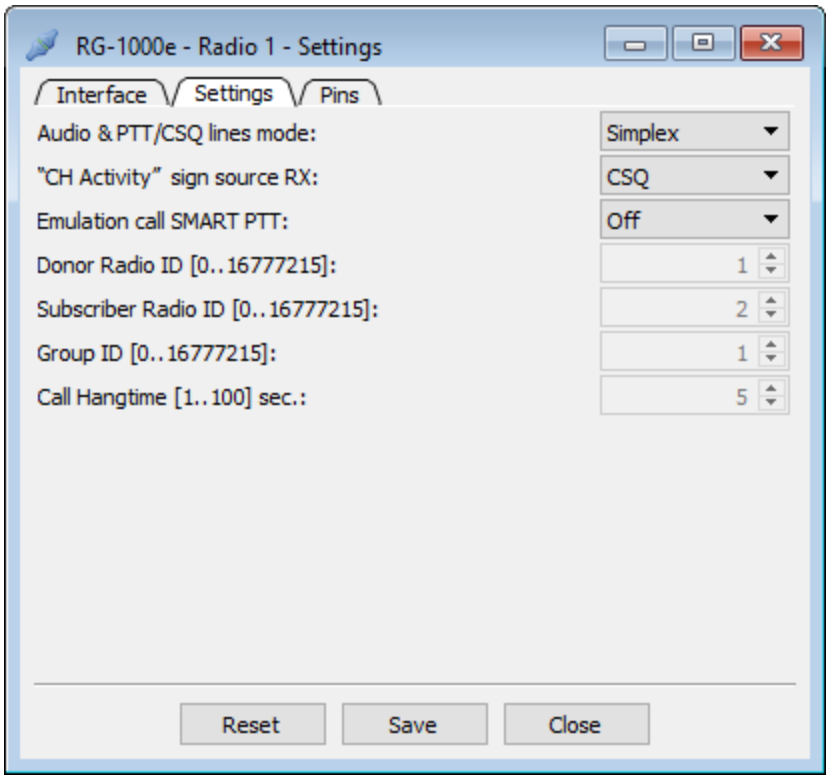

RG-1000e - Radio 1 - Audio coder L-b
The encoding mode:
Mu-Law 64 kbps
Duration audio package, ms:
20
Control:
PTT
VOX
Detector of signal level, VOX:
Disable
Signal level ON 1..1000 mV:
100
Detect time 20..1000 ms:
100
Signal level OFF 1..1000 mV:
10
Release time 20..1000 ms:
500
Reset
Save
Close

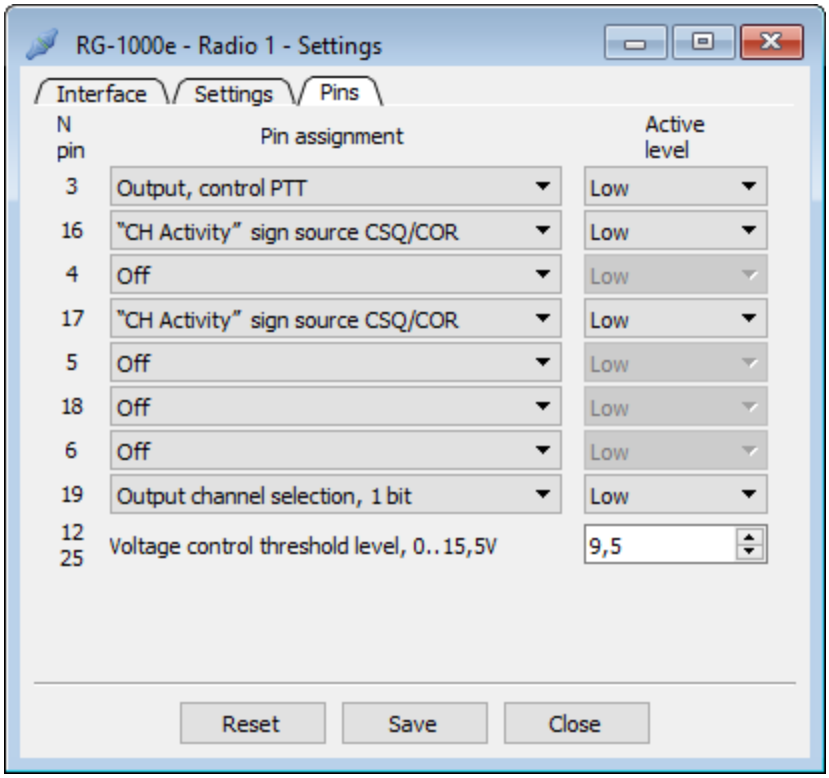
7.5 Repeaters Port Settings

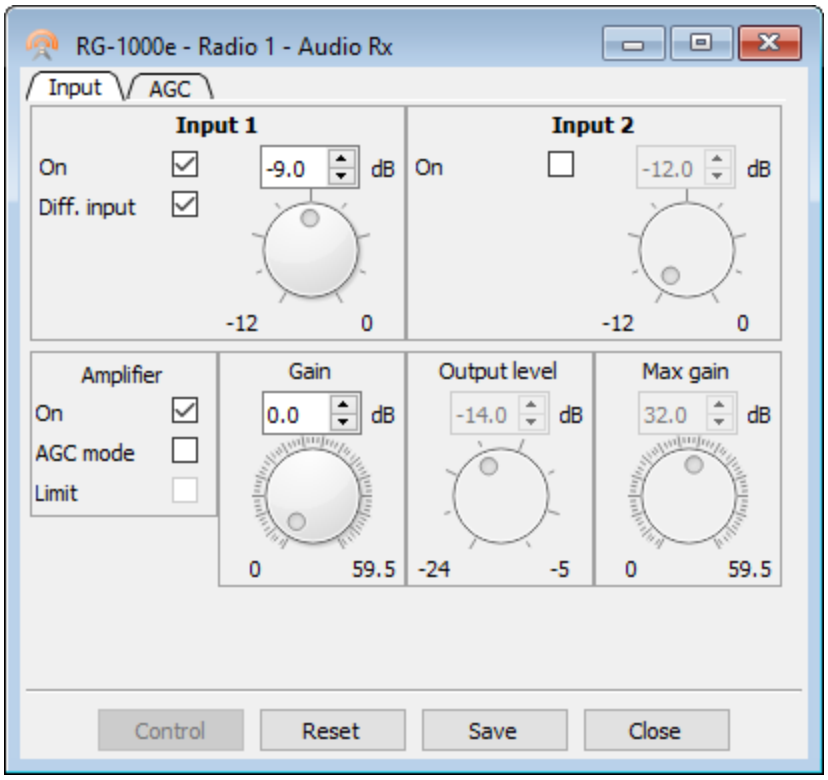
To use DR 3000 / SLR 5500 / XPR 8300 / XPR 8400 / XiR R8200 repeaters in the SmartPTT system, RG-1000e Gateway must be configured in *Radio IO* mode. For details, see Settings.

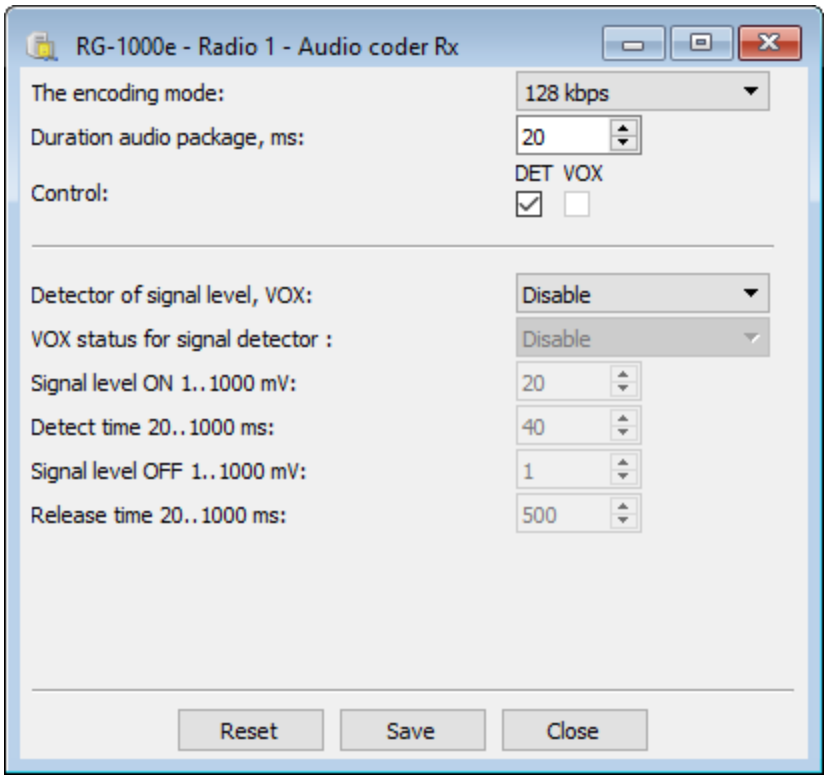
SmartPTT Radioserver must be configured in *Remote I/O Control Station* mode. For details, see Configuring Remote I/O Control Station Connection.

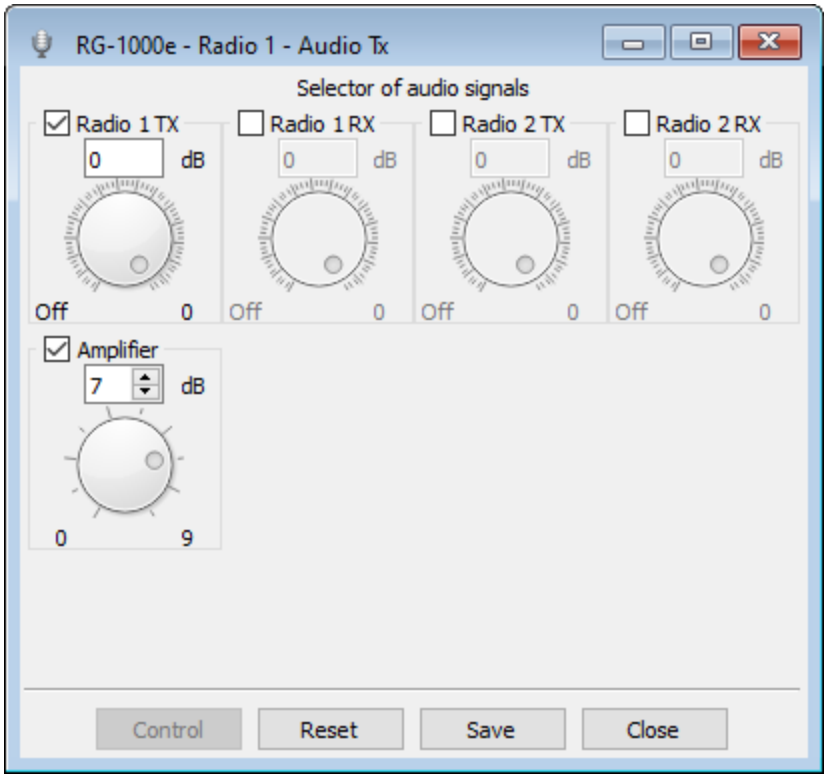


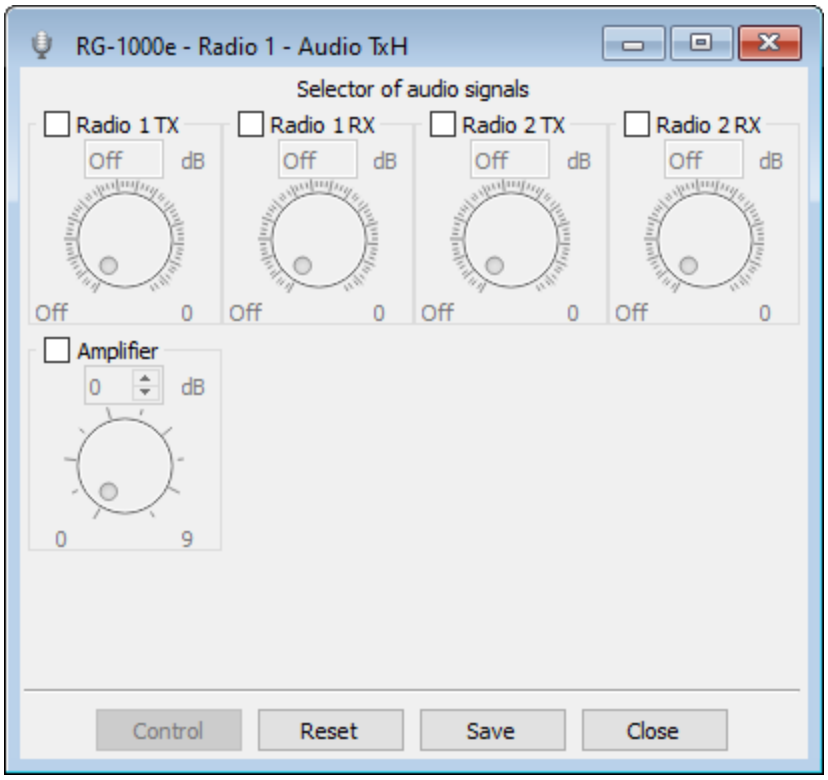


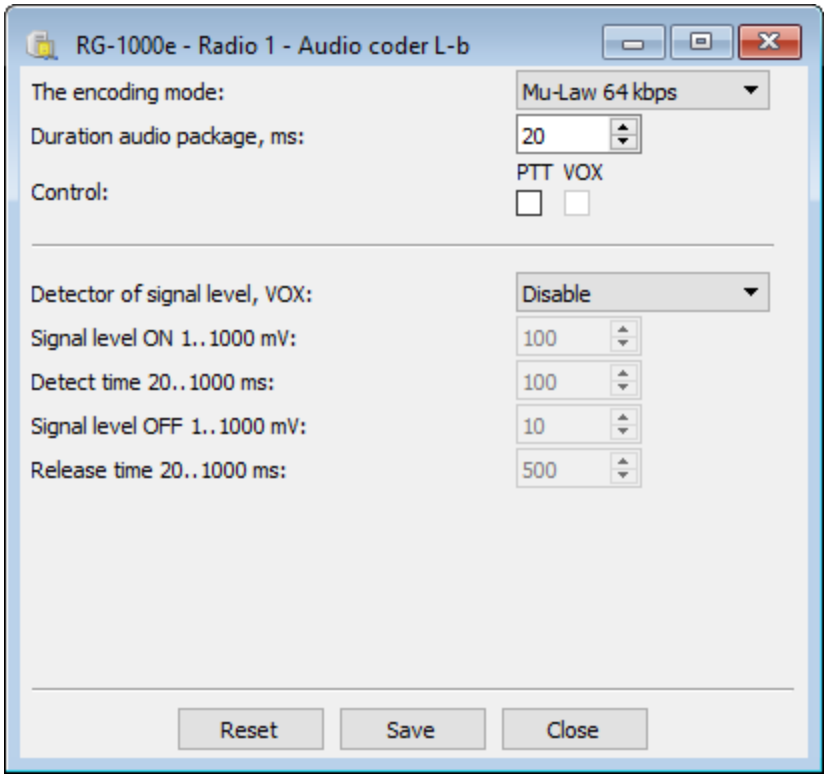

RG-1000e - Radio 1 - Settings
Interface
Settings
Pins
N pin
Pin assignment
Active level
3
Output, control PTT
Low
16
"CH Activity" sign source CSQ/COR
Low
4
Off
Low
17
"CH Activity" sign source CSQ/COR
Low
5
Off
Low
18
Off
Low
6
Off
Low
19
Output channel selection, 1 bit
Low
12 25
Voltage control threshold level, 0..15,5V
9,5
Reset
Save
Close


RG-1000e - Radio 1 - Audio Rx
Input
AGC
Input 1
On
Diff. input
-9.0
dB
-12
0
Input 2
On
-12.0
dB
-12
0
Amplifier
On
AGC mode
Limit
Gain
0.0
dB
0
59.5
Output level
-14.0
dB
-24
-5
Max gain
32.0
dB
0
59.5
Control
Reset
Save
Close


RG-1000e - Radio 1 - Audio coder Rx
The encoding mode:
128 kbps
Duration audio package, ms:
20
Control:
DET VOX
Detector of signal level, VOX:
Disable
VOX status for signal detector :
Disable
Signal level ON 1..1000 mV:
20
Detect time 20..1000 ms:
40
Signal level OFF 1..1000 mV:
1
Release time 20..1000 ms:
500
Reset
Save
Close


RG-1000e - Radio 1 - Audio Tx
Selector of audio signals
Radio 1 TX
Radio 1 RX
Radio 2 TX
Radio 2 RX
0
dB
Off
0
Amplifier
7
dB
0
9
Control
Reset
Save
Close


RG-1000e - Radio 1 - Audio TxH
Selector of audio signals
Radio 1 TX
Radio 1 RX
Radio 2 TX
Radio 2 RX
Off
dB
Off
0
Amplifier
0
dB
0
9
Control
Reset
Save
Close


RG-1000e - Radio 1 - Audio coder L-b
The encoding mode:
Mu-Law 64 kbps
Duration audio package, ms:
20
Control:
PTT
VOX
Detector of signal level, VOX:
Disable
Signal level ON 1..1000 mV:
100
Detect time 20..1000 ms:
100
Signal level OFF 1..1000 mV:
10
Release time 20..1000 ms:
500
Reset
Save
Close

8 Storage and Transportation Requirements

RG-1000e Gateway must be stored at temperatures between +5 and +40 °C (+41 and +104 °F), and relative humidity less than 80 % at the temperature of +25 °C (+77 °F).

The storage area must be free from dust, acid fumes, and corrosive gases.

RG-1000e Gateway can be shipped by any means of transport under the following conditions:

- The temperature must be between –30 and +50 °C (–22 and +122 °F).
- The relative humidity must be less than 95 % at the temperature of +25 °C (+77 °F).
- The equipment must be protected from direct precipitation and dust.

If RG-1000e Gateway is transported by air, it must be stored in a pressurized compartment.

It is prohibited to turn over or throw the package with RG-1000e Gateway during handling and carriage.

9 Manufacturer Warranty

Coverage and Duration

Elcomplus, LLC warrants RG-1000e Gateway against defects in material and workmanship under normal use and service for 1 year from the date of RG-1000e Gateway shipping by Elcomplus, LLC.

Elcomplus, LLC, at its option, will at no charge either repair RG-1000e Gateway (with new or reconditioned parts), replace it (with a new or reconditioned RG-1000e Gateway), or refund the purchase price of RG-1000e Gateway during the warranty period provided it is returned in accordance with the terms of this warranty. Replaced parts or boards are warranted for the balance of the original applicable warranty period. All replaced parts of RG-1000e Gateway will be owned by Elcomplus, LLC.

Elcomplus, LLC extends this express limited warranty to the original end user purchaser only and is not assignable or transferable to any other party. This is the complete warranty for RG-1000e Gateway manufactured by Elcomplus, LLC. Elcomplus, LLC assumes no obligations or liability for additions or modifications to this warranty unless made in writing and signed by an officer of Elcomplus, LLC. Unless made in a separate agreement between Elcomplus, LLC and the original end user purchaser, Elcomplus, LLC does not warrant the installation, maintenance or service of RG-1000e Gateway.

Elcomplus, LLC cannot be responsible in any way for any ancillary equipment not furnished by Elcomplus, LLC which is attached to or used in connection with RG-1000e Gateway, or for operation of RG-1000e Gateway with any ancillary equipment. All such equipment is expressly excluded from this warranty. Due to the fact that each system where RG-1000e Gateway is used is unique, Elcomplus, LLC disclaims liability for range, coverage, or operation of the system as a whole under this warranty.

General Provisions

This warranty sets forth the full extent of Elcomplus, LLC responsibilities regarding RG-1000e Gateway. Repair, replacement or refund of the purchase price, at Elcomplus, LLC option, is the exclusive remedy. THIS WARRANTY IS GIVEN IN LIEU OF ALL OTHER EXPRESS WARRANTIES. IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED TO THE DURATION OF THIS LIMITED WARRANTY. IN NO EVENT SHALL ELCOMPLUS, LLC BE LIABLE FOR DAMAGES IN EXCESS OF THE PURCHASE PRICE OF RG-1000e Gateway, FOR ANY LOSS OF USE, LOSS OF TIME, INCONVENIENCE, COMMERCIAL LOSS, LOST PROFITS OR SAVINGS OR OTHER INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE RG-1000e Gateway, TO THE FULL EXTENT SUCH MAY BE DISCLAIMED BY LAW.

Obtaining Warranty Service

In order to receive warranty service, you must provide the proof of the purchase with the date of the purchase on it and RG-1000e Gateway serial number, and also deliver or send RG-1000e Gateway (transportation and insurance prepaid) to an authorized service center. Elcomplus, LLC will provide warranty service in authorized service centers. Contact the company which sold you RG-1000e Gateway to facilitate obtaining warranty service.

You can contact Elcomplus, LLC representatives at the following phone numbers:

North and South America: +1 786 362 5525

Europe / Africa / Asia Pacific and Middle East: +7 3822 522 511

Conditions not Covered by this Warranty

- Defects or damage caused by using RG-1000e Gateway in any manner other than its normal and customary.
- Defects or damage resulting from misuse, accident or neglect, including but not limited to spills of liquid, etc.
- Defects or damage caused by improper testing, operation, maintenance, installation, alteration, modification, or adjustment.
- Defects or damage of RG-1000e Gateway subjected to unauthorized modification, disassembly or repair (including, without limitation, the addition of equipment not supplied by Elcomplus, LLC to RG-1000e Gateway) which adversely affect the performance of RG-1000e Gateway or interfere with Elcomplus, LLC normal warranty inspection and testing of RG-1000e Gateway to verify any warranty claim.
- Defects or damage of RG-1000e Gateway on which the serial number has been removed or made illegible.
- Defects or damage of RG-1000e Gateway which does not function in accordance with Elcomplus, LLC published specifications due to illegal or unauthorized alteration of the software/firmware.
- Cosmetic damage to RG-1000e Gateway surfaces that does not affect its operation.
- Freight costs for shipping RG-1000e Gateway to the repair depot.

10 Pin Numberings and Interface Cable Schematics

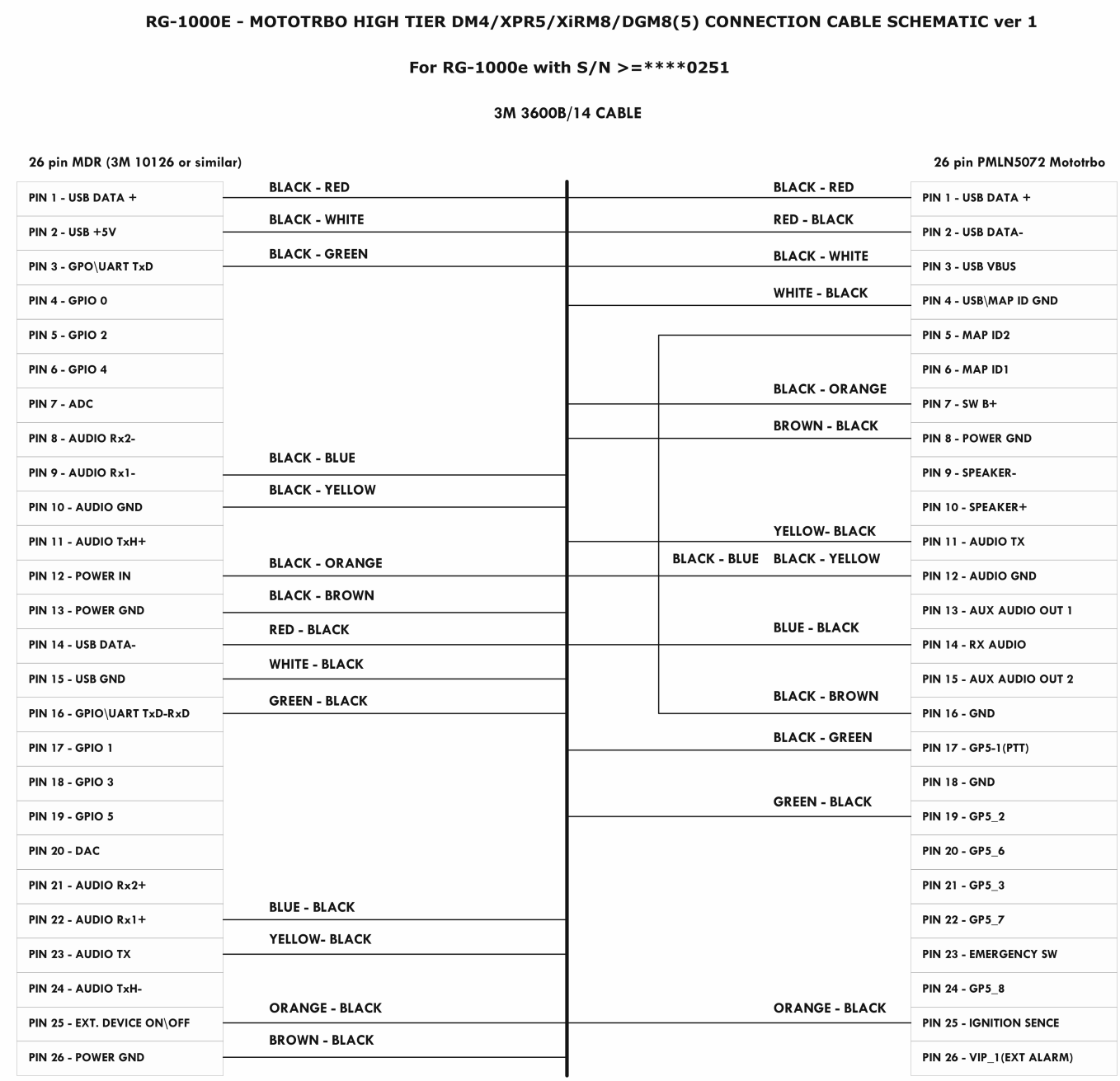


Fig. 74. RG-1000e — MOTOTRBO HIGH TIER Connection Cable Schematic ver 1 (3M Cable)

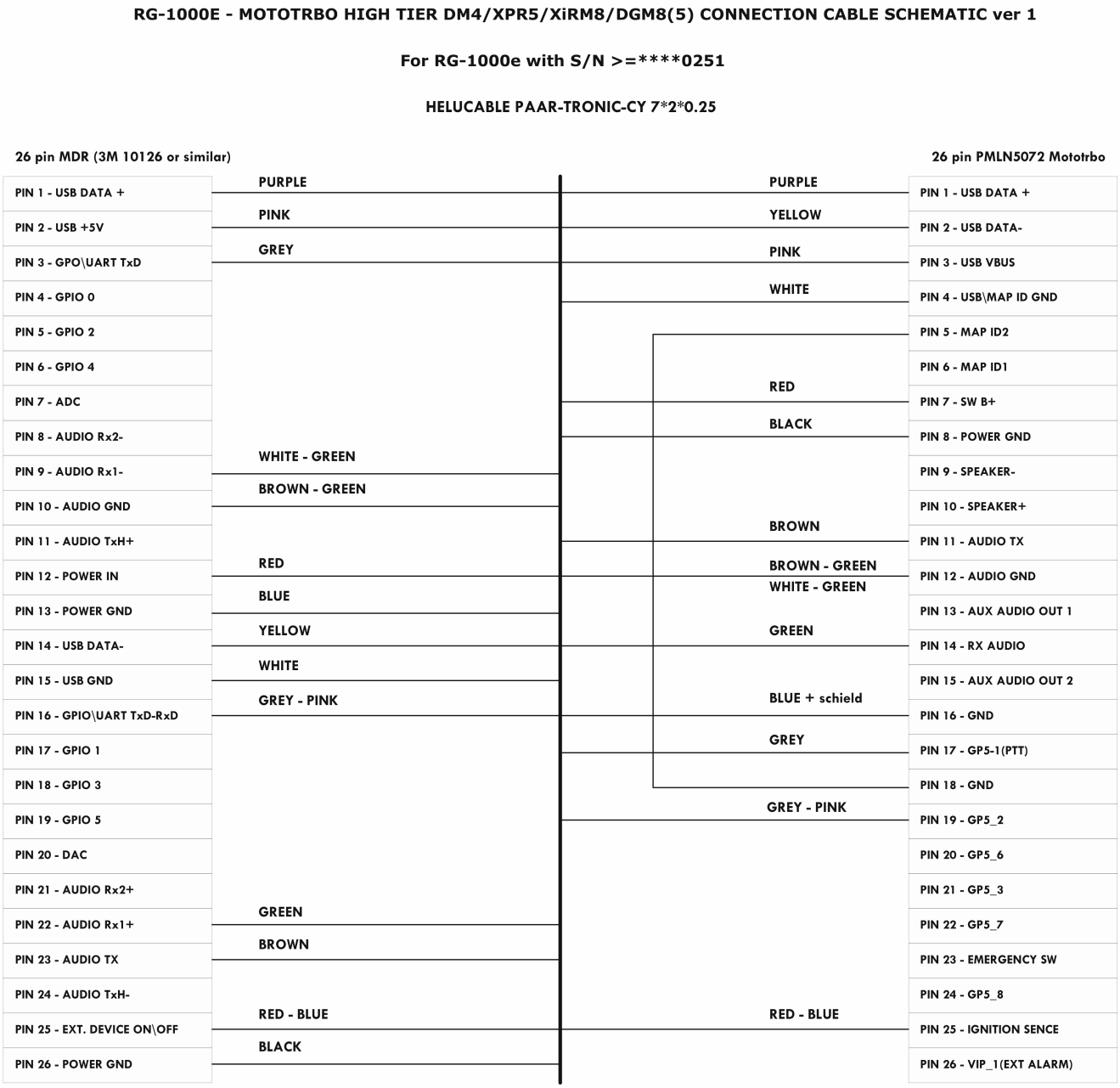


Fig. 75. RG-1000e — MOTOTRBO HIGH TIER Connection Cable Schematic ver 1 (Helucable Cable)

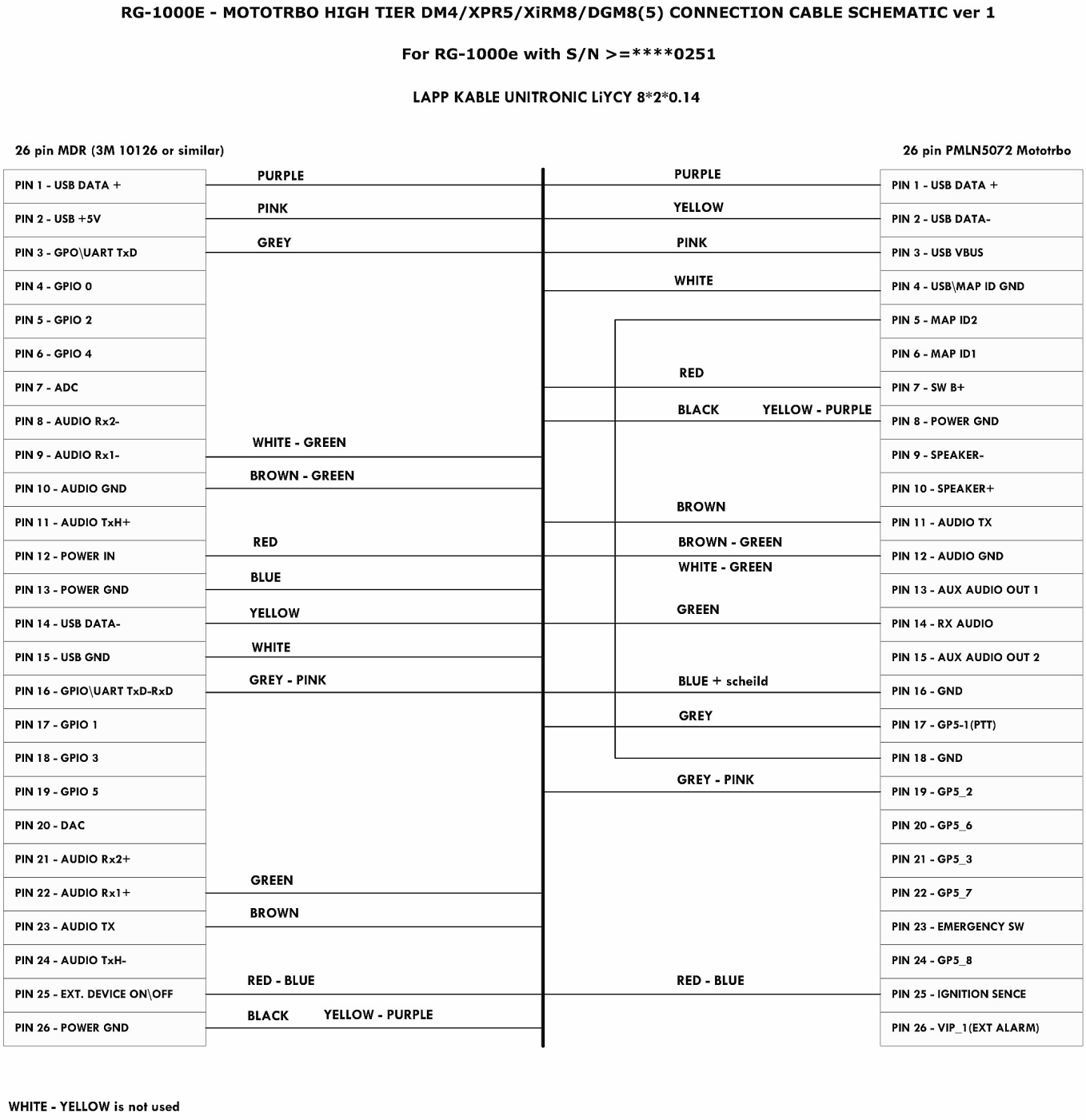


Fig. 76. RG-1000e — MOTOTRBO HIGH TIER Connection Cable Schematic ver 1 (LAPP Cable)

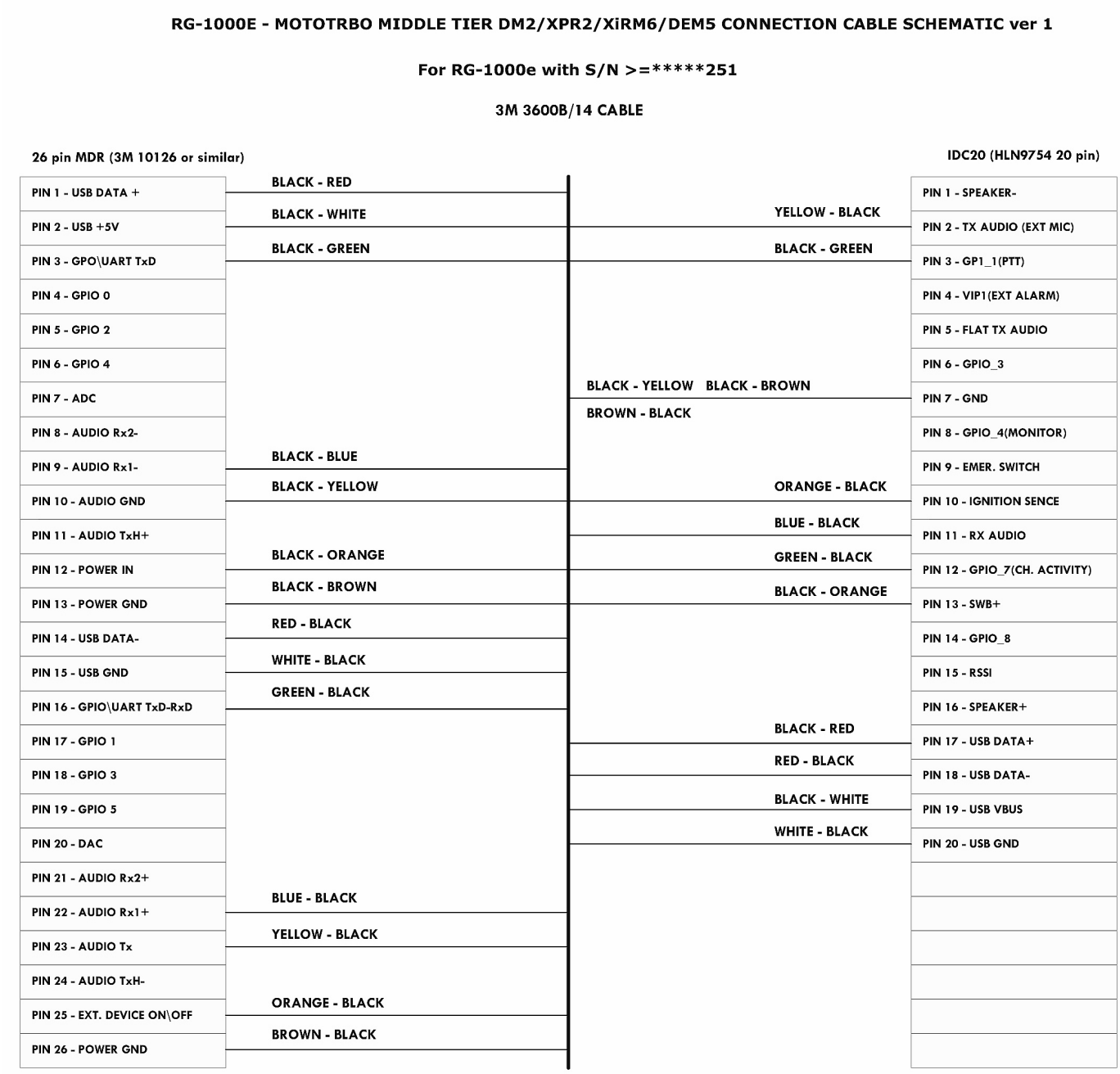


Fig. 77. RG-1000e — MOTOTRBO MIDDLE TIER Connection Cable Schematic ver 1

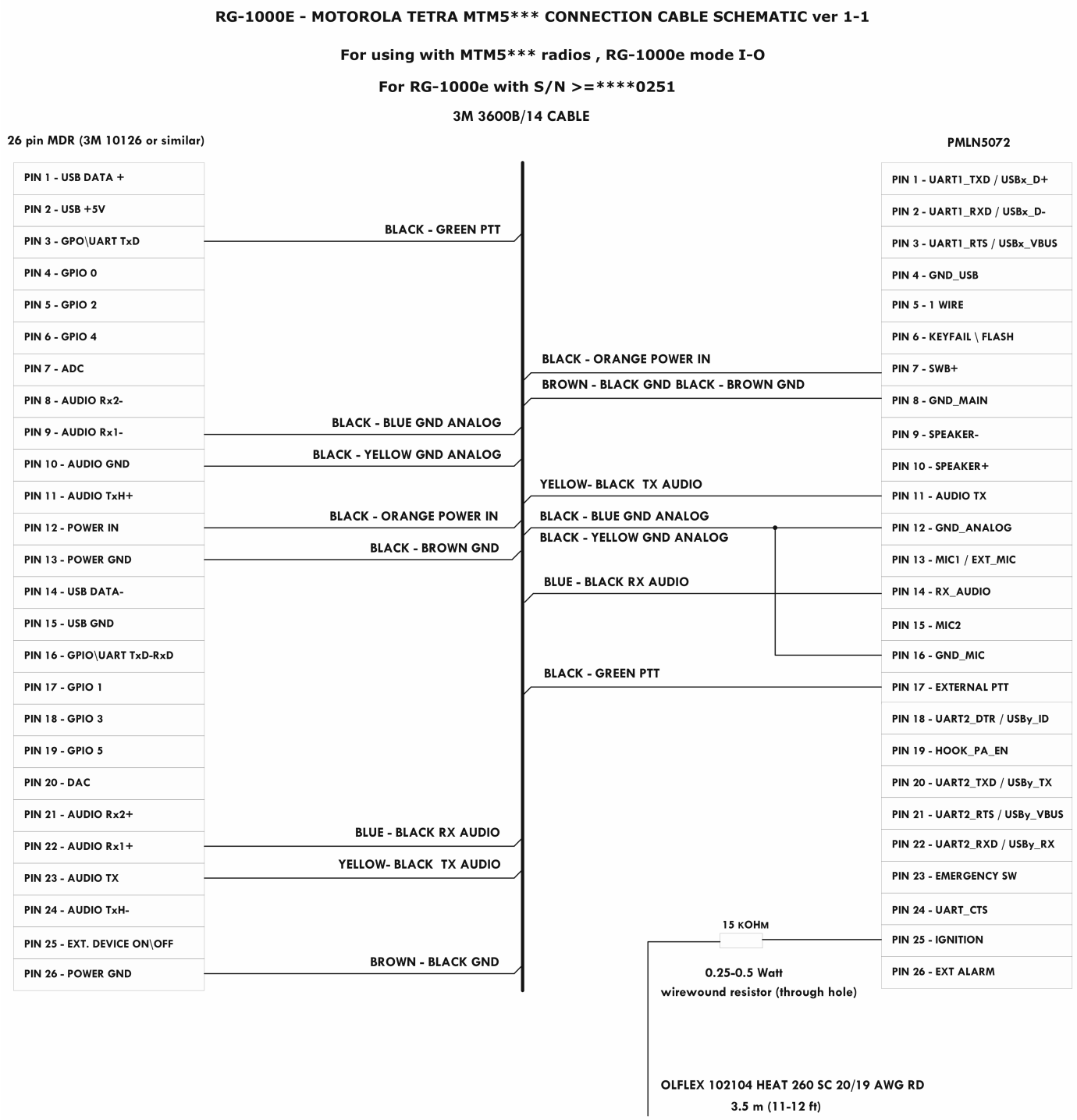


Fig. 78. RG-1000e — MOTOROLA TETRA MTM5*** Connection Cable Schematic ver 1-1

Fig. 79. RG-1000e — MOTOROLA APX/XTL Connection Cable Schematic ver 1-1

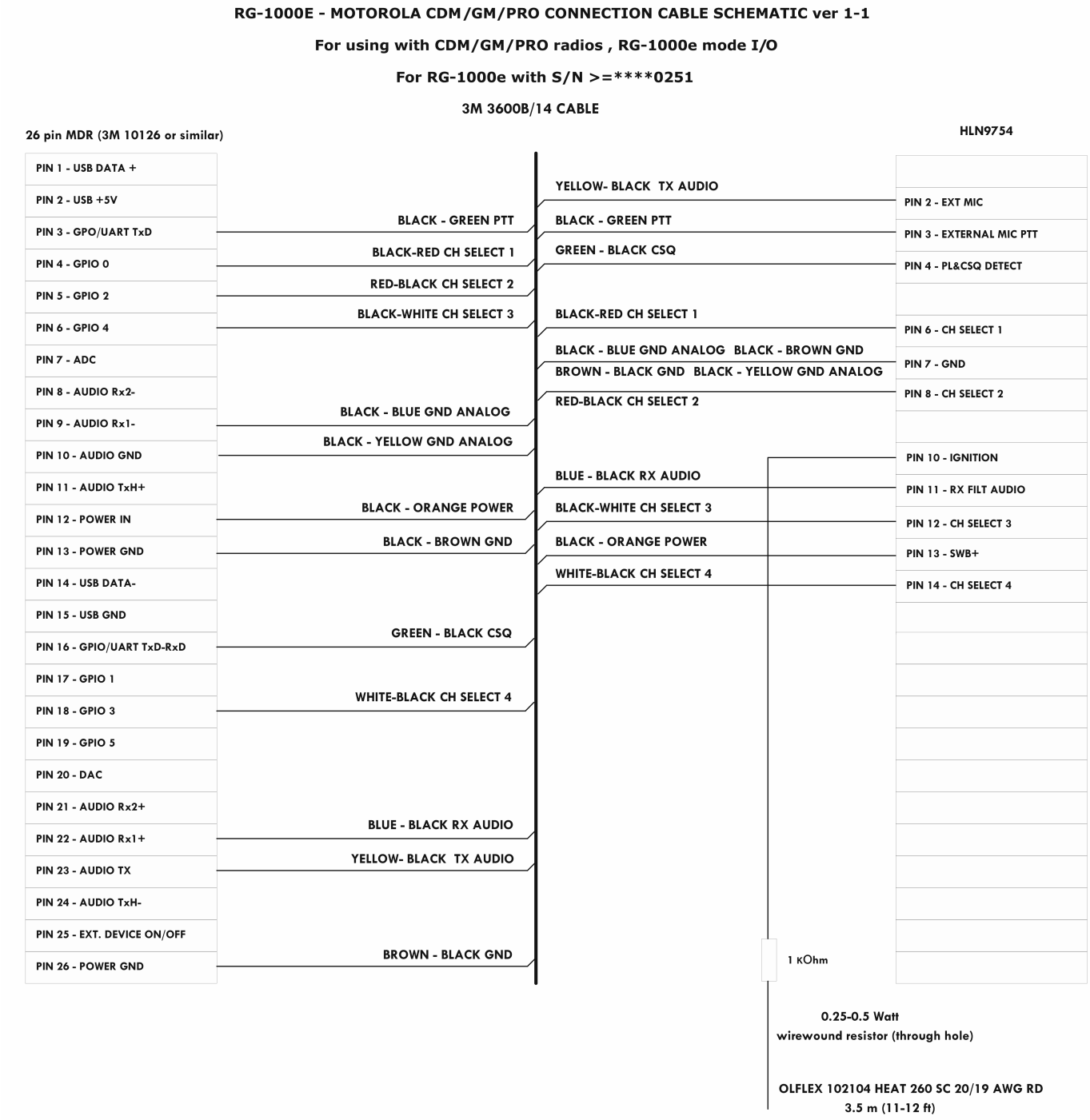


Fig. 80. RG-1000e — MOTOROLA CDM/GM/PRO Connection Cable Schematic ver 1-1

Fig. 81. RG-1000e — Generic I/O Connection Cable Schematic ver 1-1 (3M Cable)

Fig. 82. RG-1000e — Generic I/O Connection Cable Schematic ver 1-1 (LAPP Cable)

11 Mounting Elements

The mounting elements of RG-1000e Gateways and radio bracket are shown in the following figure:

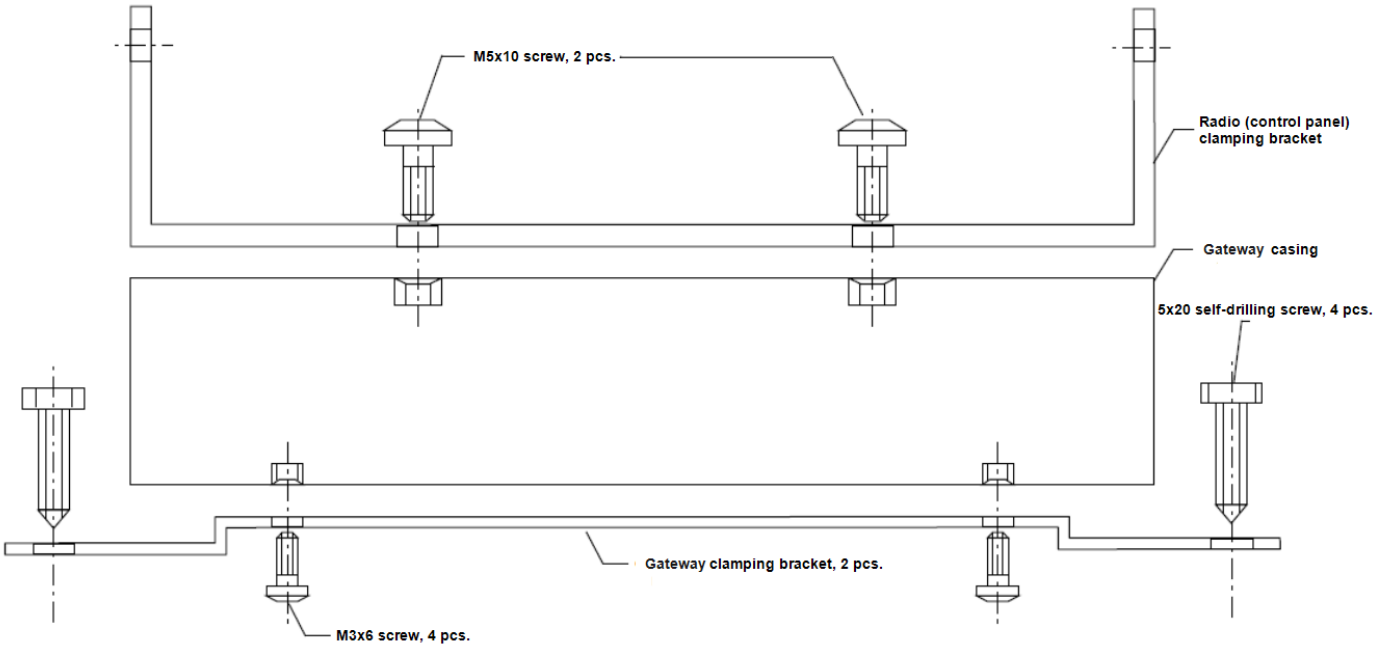


Fig. 83. Mounting Elements of RG-1000e Gateways and the Radio Bracket

The mounting points of RG-1000e Gateway brackets are shown in the following figure:

Fig. 84. Mounting Points of RG-1000e Gateway Brackets

12 Making a Power Cable for RG-1000e Gateway

Follow the procedure to make your own power cable for RG-1000e Gateway connection to an external power supply.

Prerequisites:

To make a power cable for RG-1000e Gateway, obtain the following elements:

- Power connector Phoenix Con PTSM 0.5-3-P 1778845 or similar
- 1 m or any desirable length of 3-wire power cable with the cross-sectional area of conductors 0.4–0.5 mm^2 (21-20AWG)

Procedure:

1. From one end of the power cable, remove 35–40 mm of outer sheath and 20 mm of wire insulation. This cable end must be connected to a power supply unit.
2. From the other end of the power cable, remove 10–12 mm of outer sheath and 5–6 mm of wire insulation. This cable end must be connected to the power connector.
3. Connect the phase wire of the cable to "+" pin, the neutral wire to "-" pin, and the earth wire to GND pin.
   See the Phoenix Con PTSM 0.5-3-P 1778845 power connector schematic and the connection procedure in the figures below.

Fig. 85. Power Connector Pins

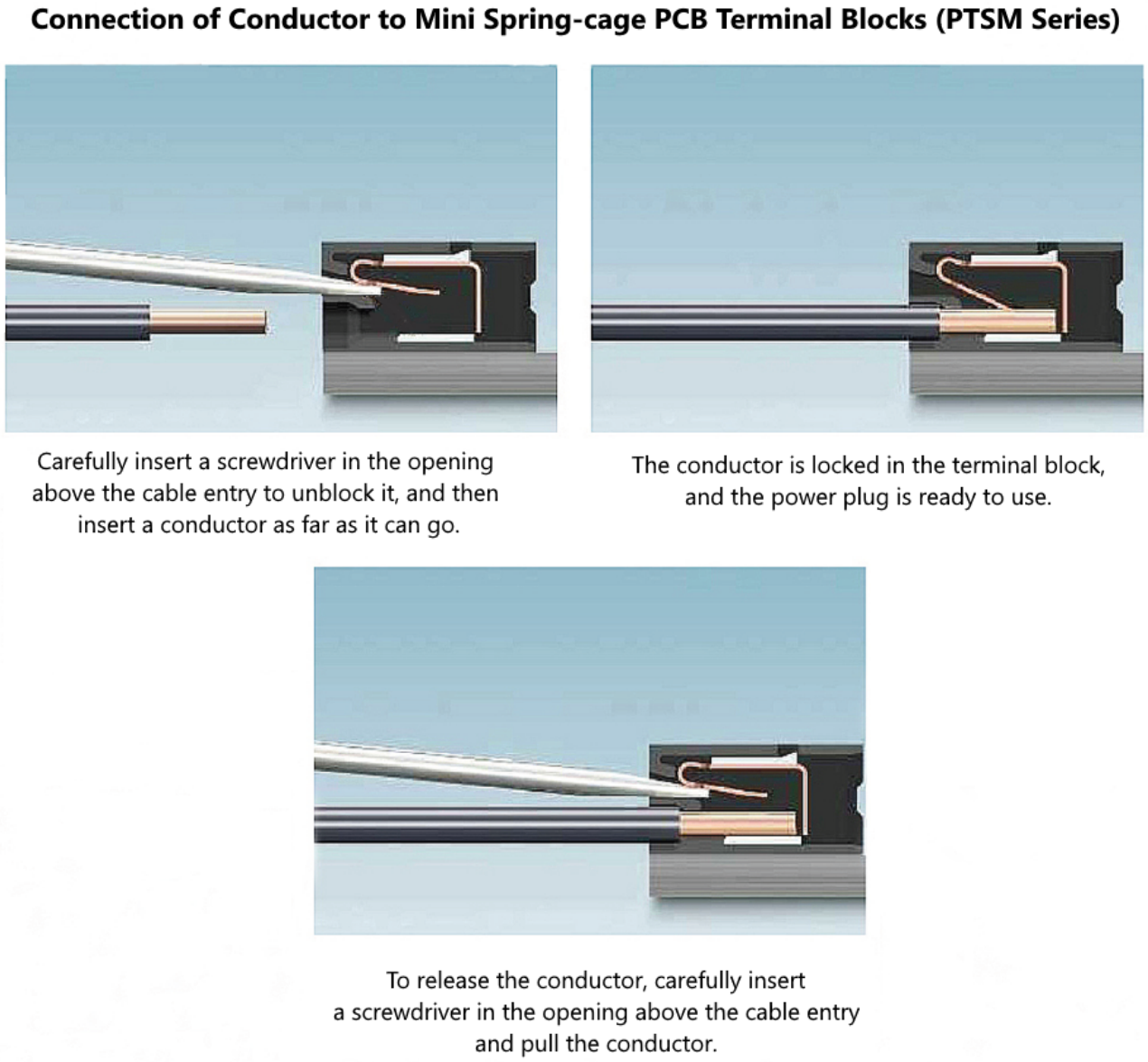


Fig. 86. Connection of Cable Conductor to Phoenix Con PTSM 0.5-3-P 1778845

Contact Information

The document describes the product developed by Elcomplus LLC. The official product website is www.smartptt.com.

For contact information of Elcomplus LLC representatives, see www.smartptt.com/contacts.

Technical Support

Customer support is provided by SmartPTT Technical Support Center. The official website of the Center is support.smartptt.com.

To contact a support engineer, perform one of the following actions:

- Fill in and submit a support request on the website.
- Email a support request to support@smartptt.com.

In America, customer support is also provided by Elcomplus, Inc. To contact support engineers, use the following contact information:

- Phone: +1 786-362-5525
- Email: miami@smartptt.com
- Mailbox: 290 NW 165th St, Ste P-200, 3rd Flr
  Miami, FL, 33169, USA

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