TRBOnet Enterprise/PLUS

Extended Range Direct Mode

Deployment Guide

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Contents

1 Introduction

1.1 About This Document

The information in this guide is intended for administrators setting up evaluation and proof-of-concept deployments of MOTOTRBO Dispatch over IP solutions. This document describes the steps required to configure communication with a MOTOTRBO Extended Range Direct Mode (ERDM) system.

For more comprehensive information on the Neocom TRBOnet family of radio network software tools, refer to the Documentation section of our web site.

1.2 About TRBOnet

TRBOnet is a suite of professional applications for MOTOTRBO digital two-way radio networks. TRBOnet manages voice and data communication paths across network endpoints. It provides a unified graphical dispatcher workbench interface for the entire range of workforce fleet management tasks.

1.3 Contacts

Region	Phone	Email & Support
EMEA	+44 203 608 0598	info@trbonet.com — general and commercial inquiries
Americas	+1 872 222 8726	support@trbonet.com — technical support
APAC	+61 28 607 8325	http://kb.trbonet.com — online knowledge base

2 System Components

2.1 TRBOnet Enterprise/Plus

The TRBOnet software consists of several modules which enable you to build enterprise dispatch solutions of different levels of complexity and redundancy. The first step in implementing the best solution is determining the topology for the customer's system; then identifying the combination of modules to implement the best customer solution.

2.2 IP Connection (Wireline Connection)

TRBOnet Server can be connected to a two-way radio system via an IP connection creating a direct communications path for all voice and data information between them. The topologies can be in the form of a LAN, WAN, or VLAN and/or any combination thereof.

2.3 Wireless Connection (Control Stations)

If TRBOnet Server doesn't have an IP connection to the radio system, it can be connected via a control station (also known as control radio or donor radio).

3 System Description

The Extended Range Direct Mode system utilizes a time division duplex repeater that receives a direct mode transmission and repeats it 90 ms later. This system's primary purpose is to extend direct mode range while utilizing a single frequency.

A radio initiates a transmission as it does in direct mode and can receive transmissions directly from a radio or from the repeater. At the beginning of reception, the radio selects the best signal. Therefore, direct mode operation is still supported in the absence of the repeater without having to change channels. When receiving directly from a radio, the receiving radio displays the talkaround icon. When receiving from the repeater, the receiving radio does not display the talkaround icon.

Extended Range Direct Mode is a single site conventional mode solution that supports the following features:

- Voice Calls (Group, Individual and All)
- IP Data (Unconfirmed Group, Unconfirmed Individual and Confirmed Individual)
- Control (Radio Check, Radio Inhibit and Uninhibit, Remote Monitor, and Call Alert)
- Privacy (Basic, Enhanced, and AES)
- Restricted Access to System (RAS)
- Voice Transmitter Interrupt
- NAI wireline interface for voice and control for 3rd Party Voice and Control Applications
- MNIS Wireline Data gateway for MSI and 3rd Party Data Applications
- Remote Repeater Programming
- RDAC
- Analog CWID and FCC Level 1 Monitoring

3.1 Interactions between ERDM Radios and Direct Mode Radios

If both Direct Mode radios and Extended Range Direct Mode radios are programmed with the same frequency, color code, and talk group, they are able to communicate with each other in direct mode. However, in the presence of the Extended Range Direct Mode repeater, there is an imbalance in range that is dependent upon the receiving radio.

The repeater re-transmits either the Direct Mode radio's transmission or the Extended Range Direct Mode radio's transmission. However, only the Extended Range Direct Mode radio is able to receive the repeater's transmission. Because a Direct Mode radio does not receive the repeater's transmission,

there is an imbalance in coverage. Therefore, it is recommended that Direct Mode and Extended Range Direct Mode radios are not used to communicate with each other in the presence of the Extended Range Direct Mode repeater.

3.2 Licensing

A software license is required in the repeater for this feature to be operational. However, license is not required in the radio.

3.3 System Topologies

There are two possible topologies when using the MOTOTRBO Extended Range Direct Mode system with TRBOnet software.

3.3.1 IP Connection to Repeater

This topology is used when TRBOnet Server has an IP connection to the repeater. Note the use of NAI Voice and NAI Data in this configuration.
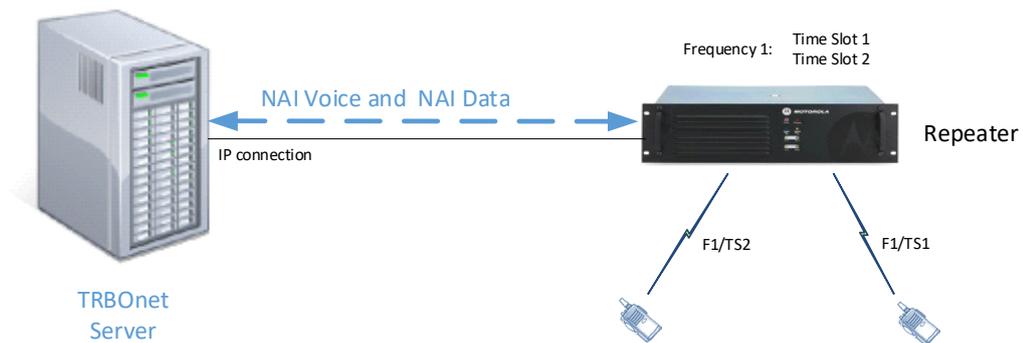
Figure 1: IP Connection to the repeater

3.3.2 Connection via Control Station

This topology is used when TRBOnet Server doesn't have an IP connection to the repeater. In this case, it can be connected via a control station (also known as control radio or donor radio).
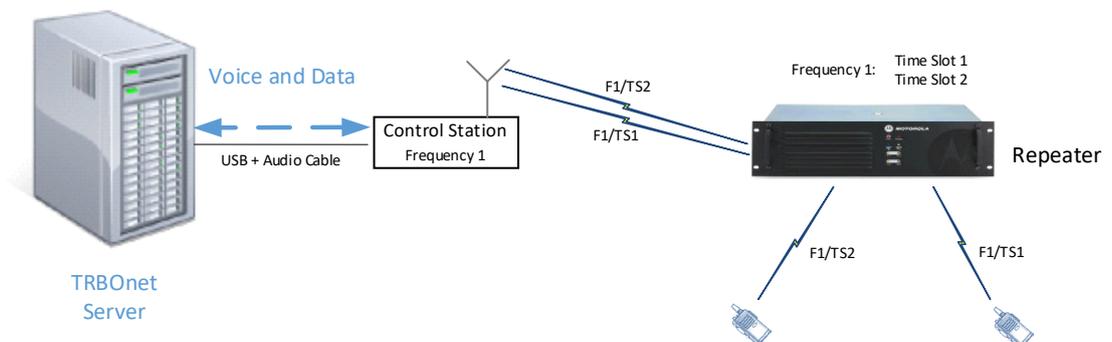
Figure 2: Wireless connection to the repeater

4   Configuring MOTOTRBO Equipment

This section describes how to configure MOTOTRBO equipment, such as repeaters, control stations and subscriber radios, using MOTOTRBO Customer Programming Software (CPS).

- Launch MOTOTRBO CPS.
- On the menu bar, select **View > Expert**.

4.1   Configuring a Repeater

This section describes how to configure a repeater to be used in an ERDM system.

- Connect your repeater to the PC via a programming cable (USB).
- Click the **Read** button on the toolbar.

4.1.1   General Settings

- In the **Set Categories** pane, select **General > General Settings**.
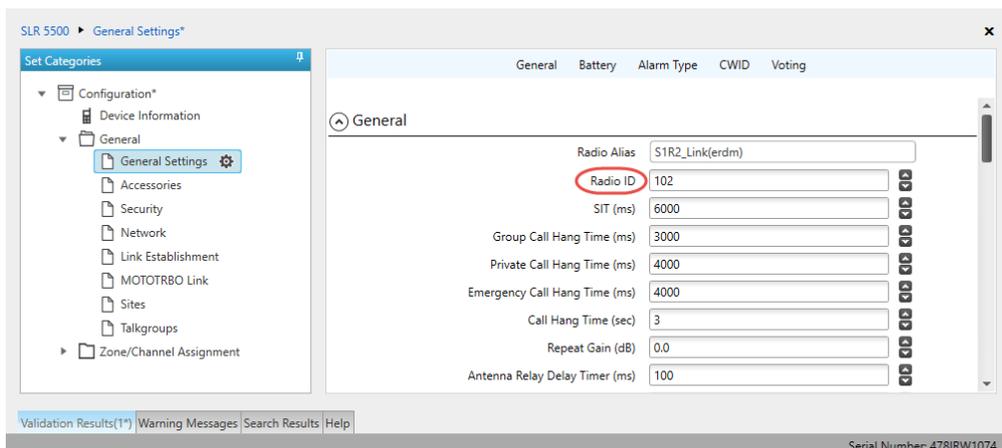
- In the right pane, specify the **Radio ID** of the repeater. This must be a unique Peer ID among the repeaters in a radio system and also not in conflict with any other third party application Peer ID. The recommended range is from 1 to 255.

4.1.2   Network

- In the **Set Categories** pane, select **General > Network**.
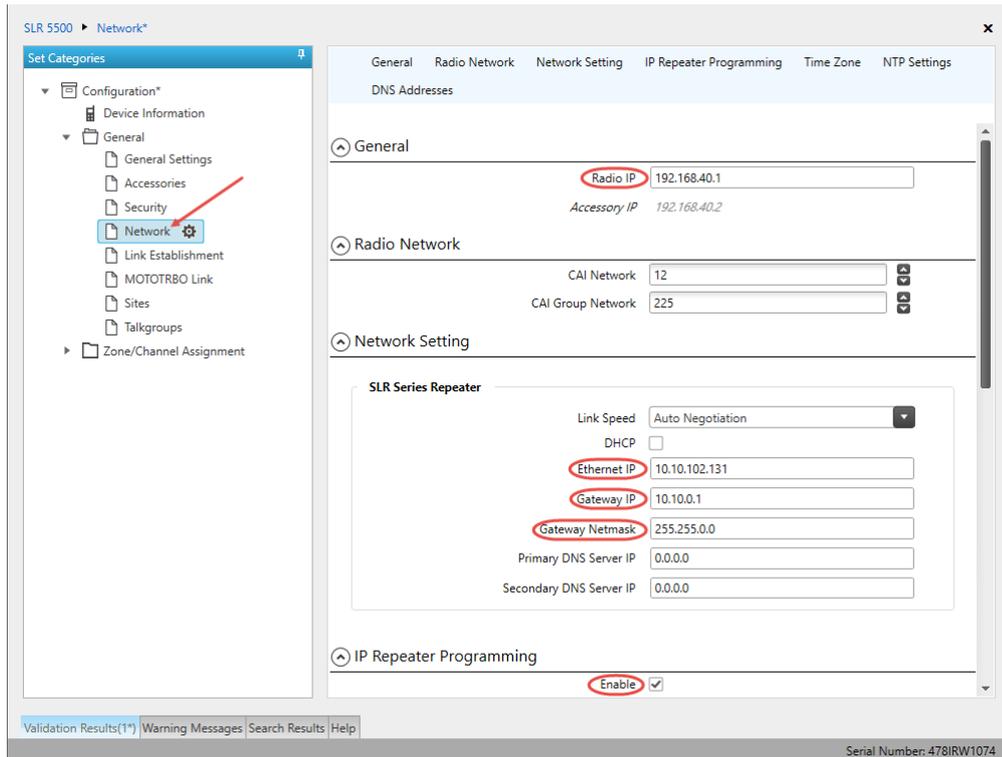
- In the right pane, specify the following parameters:
    - **Radio IP**
      This is the IP address used by the repeater to communicate with the PC (using the USB connection) and has to be unique. To avoid conflicts in case there are several stations connected with USB, you can change the third octet of the address.

    Network Setting

    If your radio system is on a private network, specify the following network parameters:

    - **Ethernet IP**
      This is the LAN address of the repeater that can be obtained from your network details; the last octet of the IP address must be unique for the system's local network.

    - **Gateway IP**
      This is the address of an upstream system (router). If a router exists, specify its LAN address here.

    - **Gateway Netmask**
      Set the Subnet Mask, for example, `255.255.255.0` or `255.255.0.0` depending on the subnet.

    IP repeater Programming

    - **Enable**
      Select this checkbox to provide the ability to remotely program the repeater.

4.1.3 Link Establishment

- In the **Set Categories** pane, select **General > Link Establishment**.
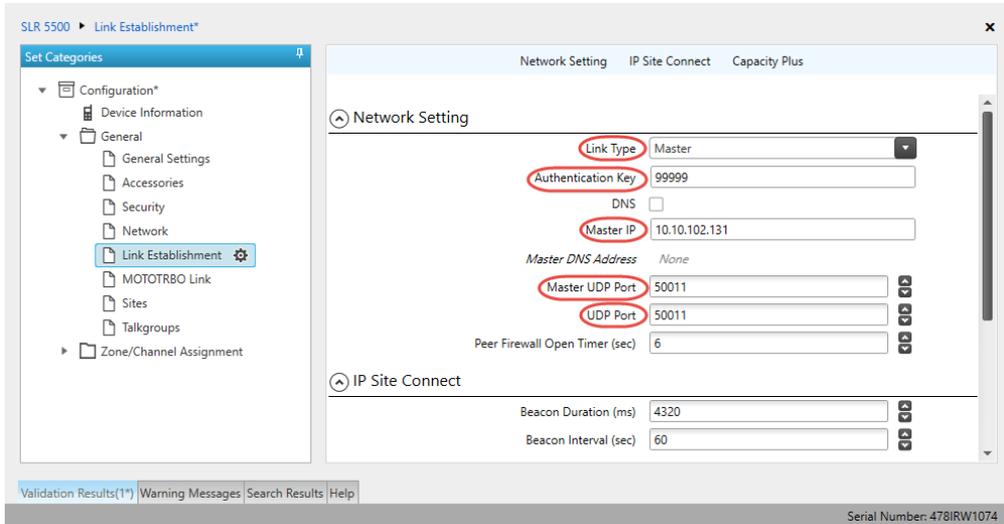
- In the right pane, specify the following parameters:

  - **Link Type**
    From the drop-down list, select **Master** if you are configuring a master repeater, or **Peer** if you are configuring a peer repeater.

  - **Authentication Key**
    Specify the authentication key that can optionally be used to access the repeater.

  - **Master IP**
    Enter the Ethernet IP address of the master repeater.

  - **Master UDP Port**
    Enter the UDP port number of the master repeater.

  - **UDP Port**
    Enter the UDP port number of this repeater. If you are configuring a master repeater, set this value the same as that for **Master UDP Port**.

4.1.4 Channel

- In the **Set Categories** pane, select **Zone/Channel Assignment**.
- In the right pane, click the plus sign button to add a zone.
- In the **Set Categories** pane, select the zone you have added.
- In the right pane, click the plus sign button and then choose **Type: Digital**.
- In the right pane, select the channel (for example, named ERDM) you have added and click the pencil button.
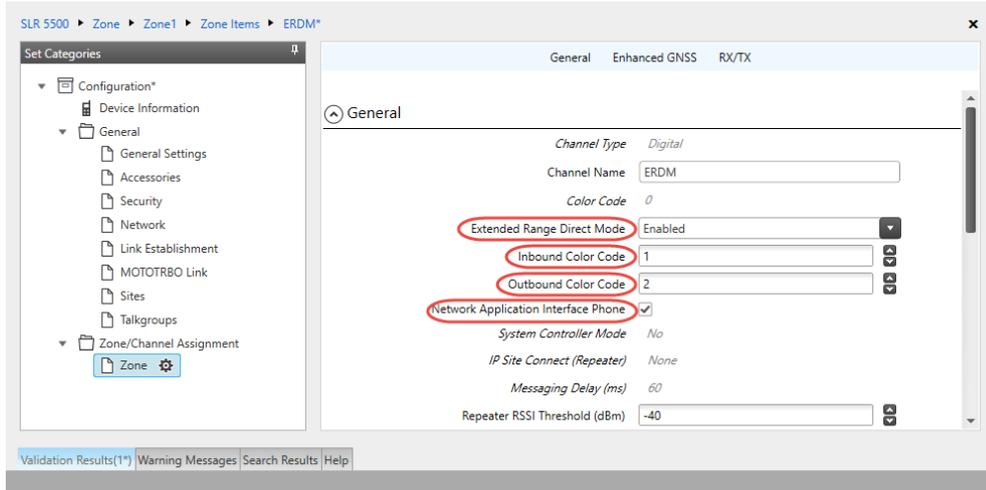
- In the right pane, specify the following channel-related parameters.

  - **Extended Range Direct Mode**
    From the drop-down list, select **Enabled**.

  - **Inbound Color Code** and **Outbound Color Code**
    Use different color codes for the inbound (radio transmission) and outbound (repeater) transmissions.

  - **Network Application Interface Phone**
    Select this option to enable NAI telephony on the repeater's channel.
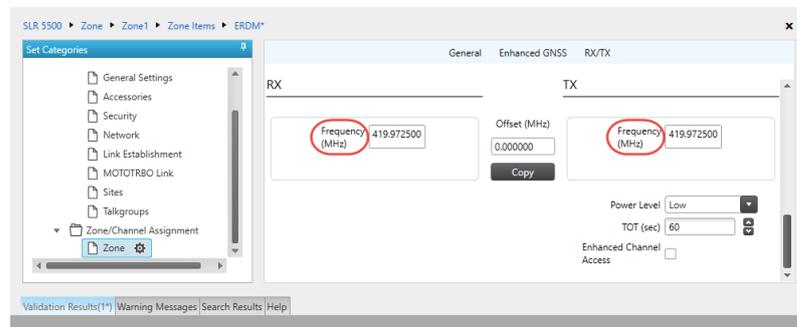
  - Enter the same frequency for **TX Frequency** and **RX Frequency**.

    Note: Make sure that the channel you have added is the first in the list of channels as the repeater will work on the channel which is on top of the list.
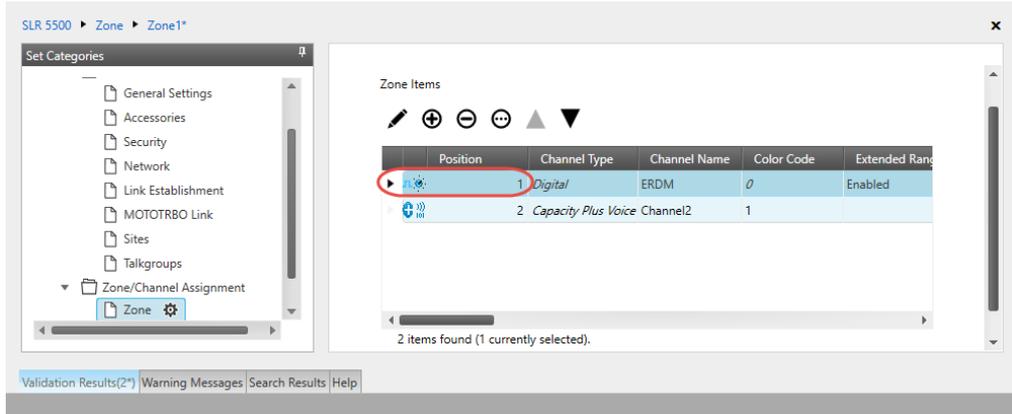
- Once you have finished configuring the desired repeater parameters, click the **Write** button on the toolbar.

4.2 Configuring a Control Station

This section describes how to configure the radio to be used as a control station in an ERDM system. Control stations are used in the scheme depicted in Figure 2.

- Connect your radio to the PC via a programming cable.
- Turn on the radio.
- Click the **Read** button on the toolbar.
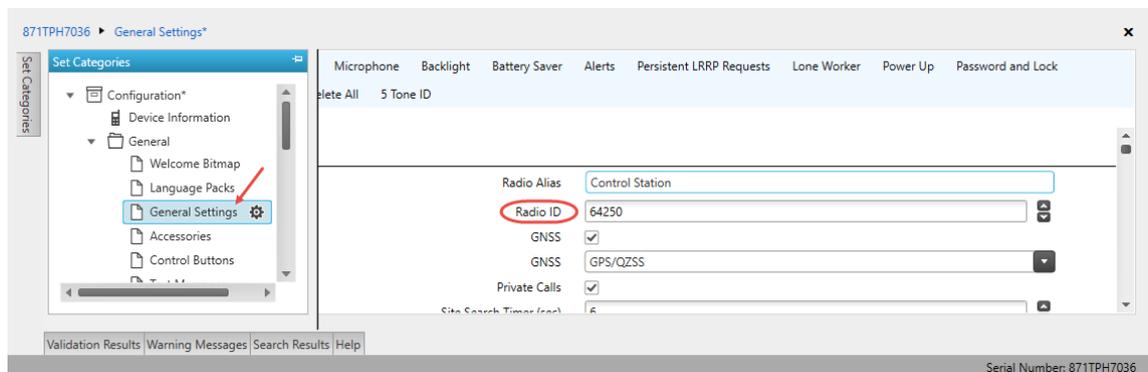
4.2.1 General Settings

- In the **Set Categories** pane, select **General > General Settings**.
- In the right pane, specify the following:
  - **Radio ID**
    Enter the Radio ID of the control station. The default value is **64250**.

    Note: This value will then be used as the control station's **Radio ID** when connecting a control station to the TRBOnet Server. See section 5.1.2, Adding a Control Station.

4.2.2 Network

- In the **Set Categories** pane, select **General > Network**.

- In the right pane, specify the following parameters:

  - **Radio IP**
    This is the IP address used by the radio to communicate with the PC (using the USB connection) and has to be unique. To avoid conflicts in case there are several stations connected with USB, you can change the third octet of the address.

  - **Accessory IP**
    This is the IP address that is given to the PC by the radio that is connected to it.

    > Note: This value will then be used as the control station's **IP Address** when connecting a control station to the TRBOnet Server. See section 5.1.2, Adding a Control Station.

4 Configuring MOTOTRBO Equipment

- **Forward to PC**
  From the drop-down list, select **Via USB**.

4.2.3   Contacts

- In the **Set Categories** pane, select **Contacts > Contacts**.
- In the right pane, click the plus sign button, then click **Digital** and choose the call type.
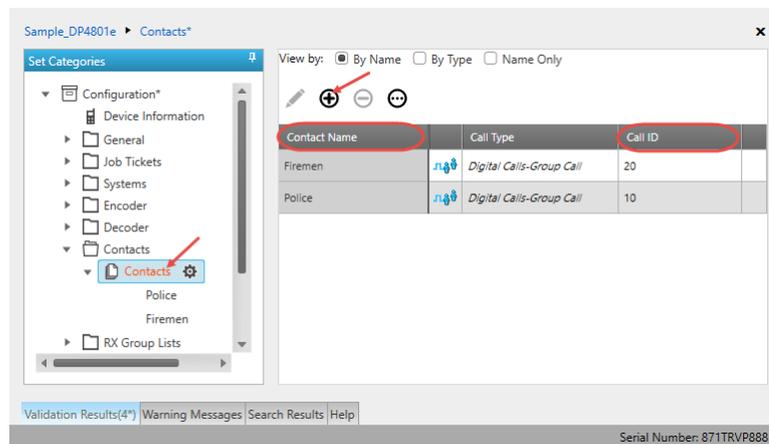
- Enter the **Contact Name** and **Call ID** for the contacts you have added.

4.2.4   RX Group Lists

- In the **Set Categories** pane, select **RX Group Lists > Digital RX Group List**.
- In the right pane, click the plus sign button and add the corresponding group list.
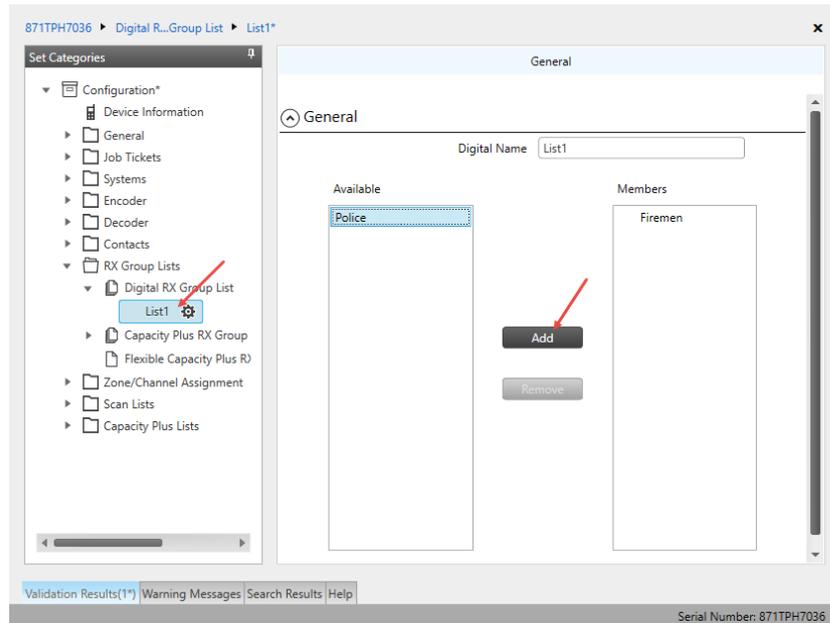
- In the left pane, select the group you have added.

- In the right pane, in the **Available** list select a group, or multiple groups using the SHIFT key, and click the **Add** button.

  As a result, the group(s) will appear in the **Members** list.

4.2.5 Channel

- In the **Set Categories** pane, select **Zone/Channel Assignment**.

- In the right pane, click the plus sign button to add a zone.

- In the **Set Categories** pane, select the zone you have added.

- In the right pane, click the plus sign button and then choose **Type: Digital**.

- In the right pane, select the channel (for example, named ERDM) you have added and click the pencil button.

- In the right pane, specify the following parameters:

  - **Extended Range Direct Mode**
    From the drop-down list, select **Enabled**.

  - **Inbound Color Code** and **Outbound Color Code**
    Use different color codes for the inbound (radio transmission) and outbound (repeater) transmissions.

    > Note: The **Inbound Color Code** and **Outbound Color Code** must be the same as the corresponding color codes you have specified for the repeater.

  - **Option Board**
    Select this option to enable the option board capability on the channel. The option board must be installed and enabled in the radio otherwise this feature will not function.
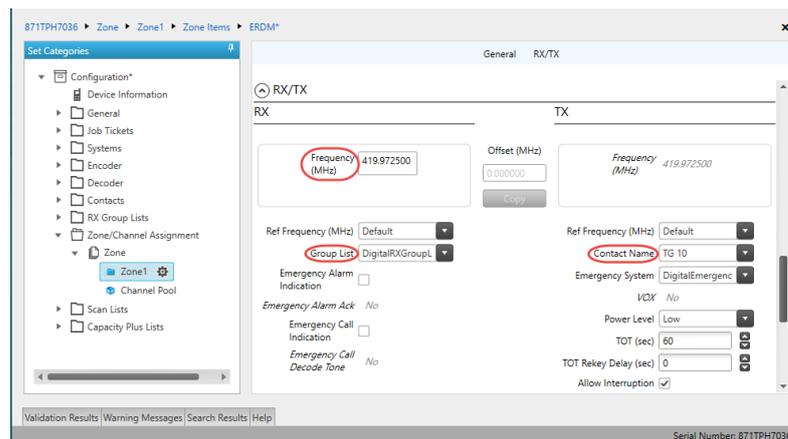
  - In the **RX Frequency** box, set the same radio frequency that you have specified for the repeater.

  - **RX Group List**
    Select the Group list you have specified in section 4.2.4, RX Group Lists.

- **TX Contact Name**
  Select the contact to which a call will be initiated on the channel when pressing the PTT button. The contact is selected from the Contact list you have created in section 4.2.3, Contacts.

- Once you have finished configuring the desired radio parameters, click the **Write** button on the toolbar.

4.3 Configuring a Subscriber Radio

This section describes how to configure a subscriber radio to be used in an ERDM system.

- Connect your radio to the PC via a programming cable.
- Turn on the radio.
- Click the **Read** button on the toolbar.
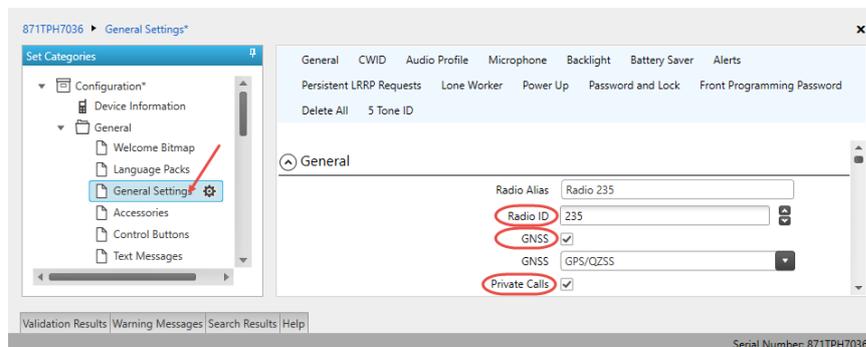
4.3.1 General Settings

- In the **Set Categories** pane, select **General > General Settings**.
- In the right pane, specify the following:
  - **Radio ID**
    Enter the Radio ID of the radio. This ID is used by other radios to contact this radio, for instance, communicating via a private call or text message.
  - **GPS**
    Select this checkbox to track the location of the radio if the radio is equipped with a GPS module.
  - **Private calls**
    Select this checkbox to enable the initiation of a Private Call on a digital channel. When disabled, a prohibit tone will sound when the user tries to initiate a Private Call.

4.3.2 Network

- In the **Set Categories** pane, select **General > Network**.
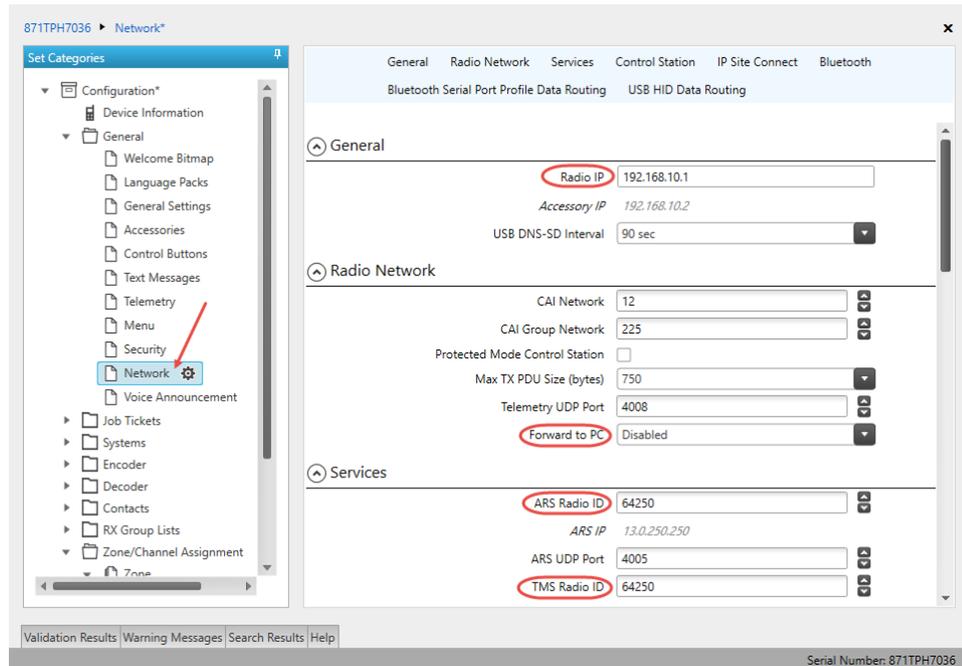
- In the right pane, specify the following parameters.

  - **Radio IP**
    This is the IP address used by the radio to communicate with the PC (using the USB connection) and has to be unique. To avoid conflicts in case there are several stations connected with USB, you can change the third octet of the address.

  - **Forward to PC**
    From the drop-down list, select **Disabled**.

  - **ARS Radio ID**
    Specify the Radio ID of the ARS server.

  - **TMS Radio ID**
    Specify the Radio ID of the TMS server.

    > Note: The **ARS Radio ID** and **TMS Radio ID** must be the same as either **TRBOnet Radio ID** in the Repeater settings if the master repeater is connected to TRBOnet Server via a wireline connection (see section 5.1.1, Adding a Repeater), or **Radio ID** in the Control Station settings if the control station is connected to TRBOnet Server via USB (see section 5.1.2, Adding a Control Station), or **MNIS Application ID**, if MNIS is enabled (see section 4.5, Configuring MOTOTRBO MNIS).
    > The recommended value is **64250** for both parameters.

4.3.3   Contacts

- In the **Set Categories** pane, select **Contacts > Contacts**.
- In the right pane, click the plus sign button, then click **Digital** and choose the call type.
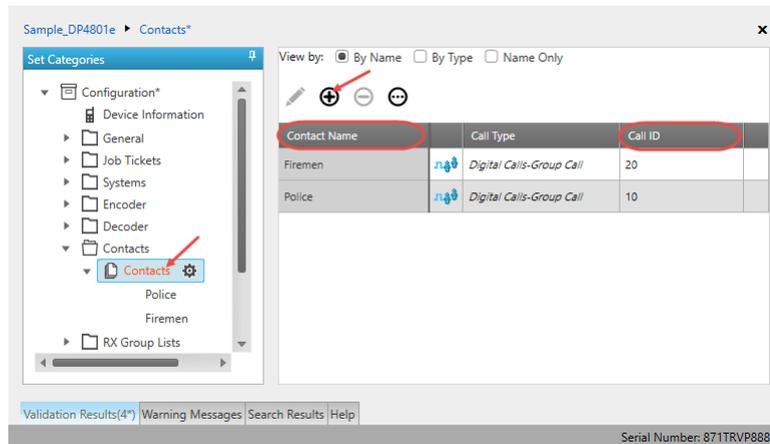
- Enter the **Contact Name** and **Call ID** for the contacts you have added.

4.3.4   RX Group Lists

- In the **Set Categories** pane, select **RX Group Lists > Digital RX Group List**.
- In the right pane, click the plus sign button and add the corresponding group list.

- In the left pane, select the group you have added.
- In the right pane, in the **Available** list select a group, or multiple groups using the SHIFT key, and click the **Add** button.

  As a result, the group(s) will appear in the **Members** list.

4 Configuring MOTOTRBO Equipment

4.3.5   Channel

- In the **Set Categories** pane, select **Zone/Channel Assignment**.
- In the right pane, click the plus sign button to add a zone.
- In the **Set Categories** pane, select the zone you have added.
- In the right pane, click the plus sign button and then choose **Type: Digital**.
- In the right pane, select the channel (for example, named ERDM) you have added and click the pencil button.

- In the right pane, specify the following parameters:

    - **Extended Range Direct Mode**
      From the drop-down list, select **Enabled**.

    - **Inbound Color Code** and **Outbound Color Code**
      Use different color codes for the inbound (radio transmission) and outbound (repeater) transmissions.

      > Note: The **Inbound Color Code** and **Outbound Color Code** must be the same as the corresponding color codes you have specified for the repeater.

    - **ARS**
      Select **On System Change** to provide the automated registration for the radio.

    - **Option Board**
      Select this option to enable the option board capability on the channel. The option board must be installed and enabled in the radio otherwise this feature will not function.
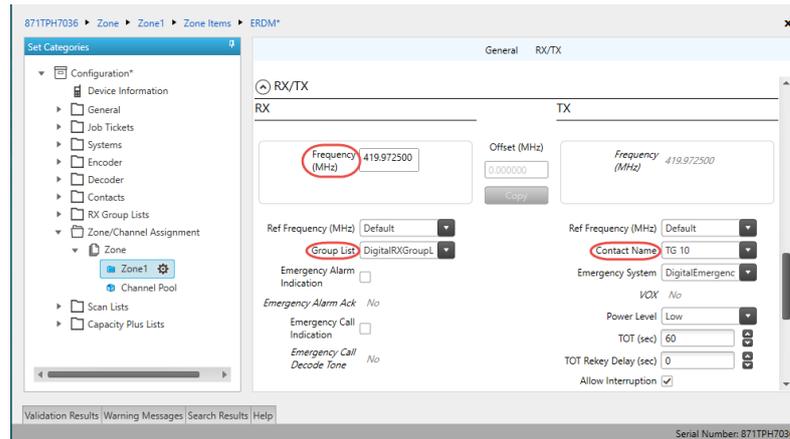
- In the **RX Frequency** box, set the same radio frequency that you have specified for the repeater.

- **RX Group List**
  Select the Group list you have specified in section 4.3.4, RX Group Lists.

- **TX Contact Name**
  Select the contact to which a call will be initiated on the channel when pressing the PTT button. The contact is selected from the Contact list you have created in section 4.3.3, Contacts.

4.4 Configuring MOTOTRBO DDMS

The DDMS, or Device Discovery and Mobility Service is a service for tracking the presence of radio subscribers in the radio network and transmitting the data to the server. The scheme using DDMS is depicted in Figure 1. This section describes how to configure and run MOTOTRBO DDMS service using MOTOTRBO DDMS Administrative Client.

- Launch MOTOTRBO DDMS Administrative Client.
- In the left pane, select **Watcher Settings**.
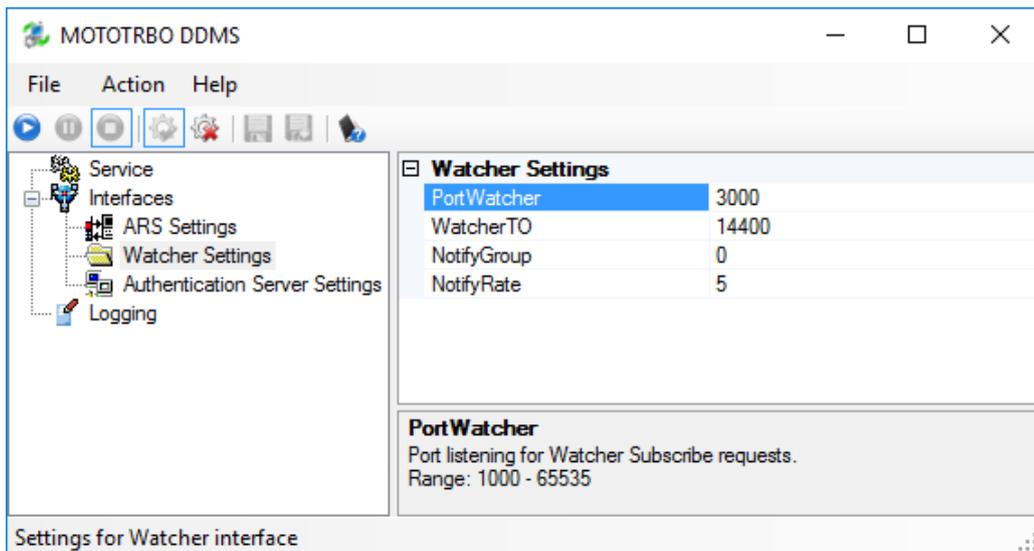
- ▪ **PortWatcher**
  This is the port number for listening TRBOnet Server requests.

  Note: This value will be used when configuring DDMS parameters in section 5.1.1.2, DDMS Service, **Service port**.
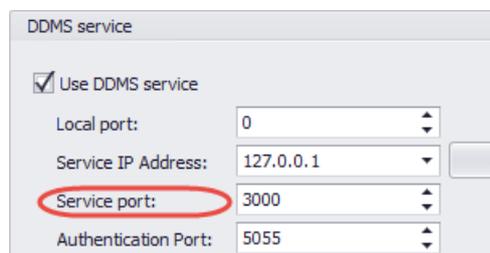
- In the left pane, select **Authentication Server Settings**.
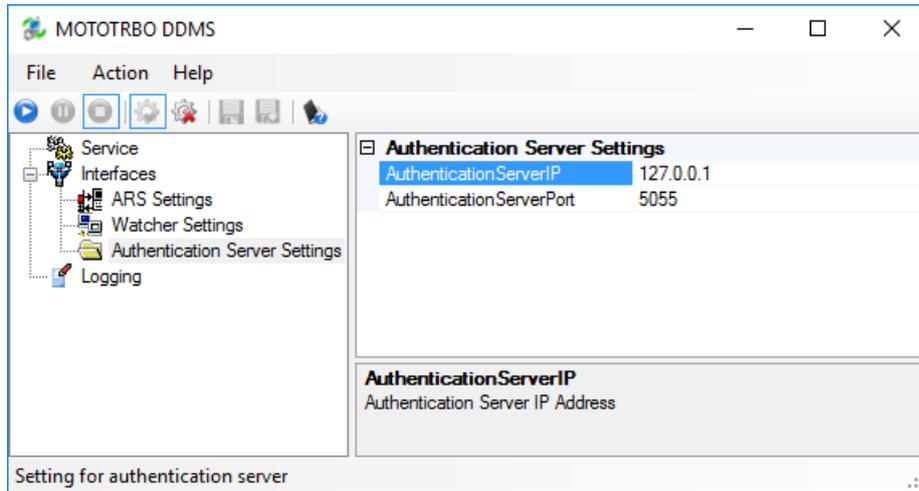
- **AuthenticationServerIP**
  This is the authentication server IP address.

- **AuthenticationServerPort**
  This is the authentication server port number.

  > Note: These values will be used when configuring DDMS parameters in section 5.1.1.2, DDMS Service, **Service IP Address** and **Authentication Port**, respectively.
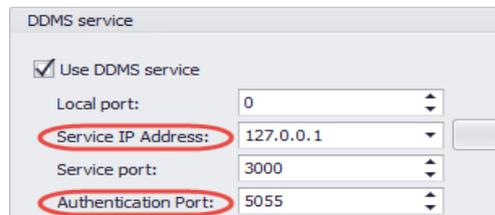
- Once you have finished configuring the desired DDMS parameters, click the **Start** button on the toolbar.
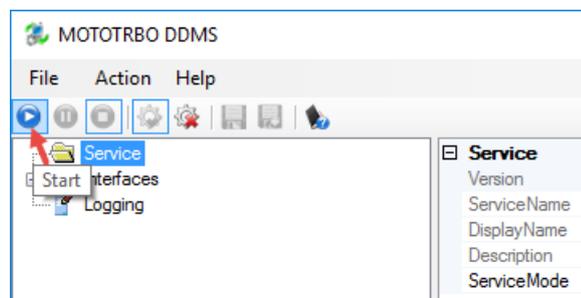
4.5 Configuring MOTOTRBO MNIS

The MNIS, or Motorola Network Interface Service, is a Windows application which acts as a data gateway between the data applications and the radio system. Data messages are routed through the MNIS. The topologies using MNIS are depicted in Figure 1. This section describes how to configure and run MOTOTRBO MNIS service using MNIS Configuration Utility.

- Launch MNIS Configuration Utility.
- In the left pane, select **General**.
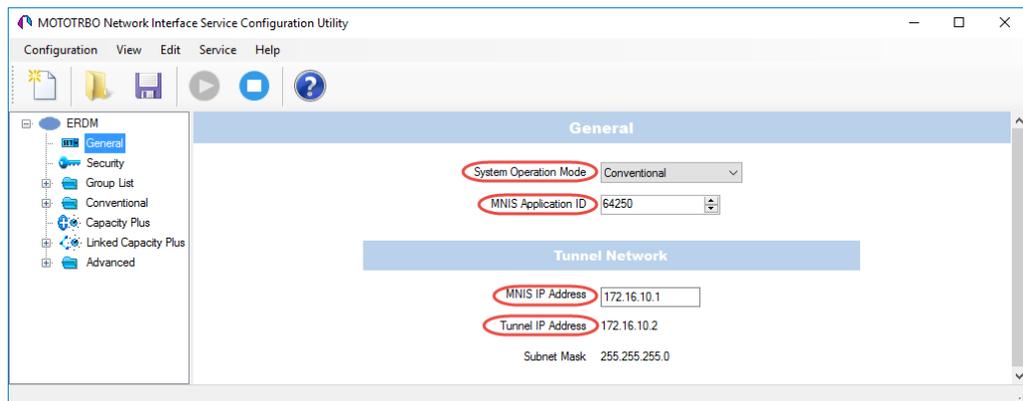
- **System Operation Mode**
  From the drop-down list, select **Conventional**.
- **MNIS Application ID**
  This is an individual ID that uniquely identifies the MNIS application in the radio system. The recommended value is **64250**.

  Note: This is the ID that TRBOnet Server uses as its **Radio ID** when connecting a master repeater.

- **MNIS IP Address**
  It is recommended that the value of **172.16.10.1** is used unless there are conflicts with other network interfaces on the PC.
- **Tunnel IP Address**
  This is the IP Address used by the MNIS to communicate with TRBOnet Enterprise (see 5.1.1.3, MNIS Data Service, **IP Address**).
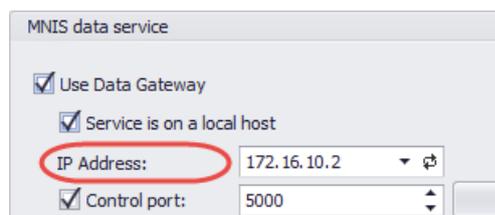
- In the left pane, select **Conventional > Domain 1**.
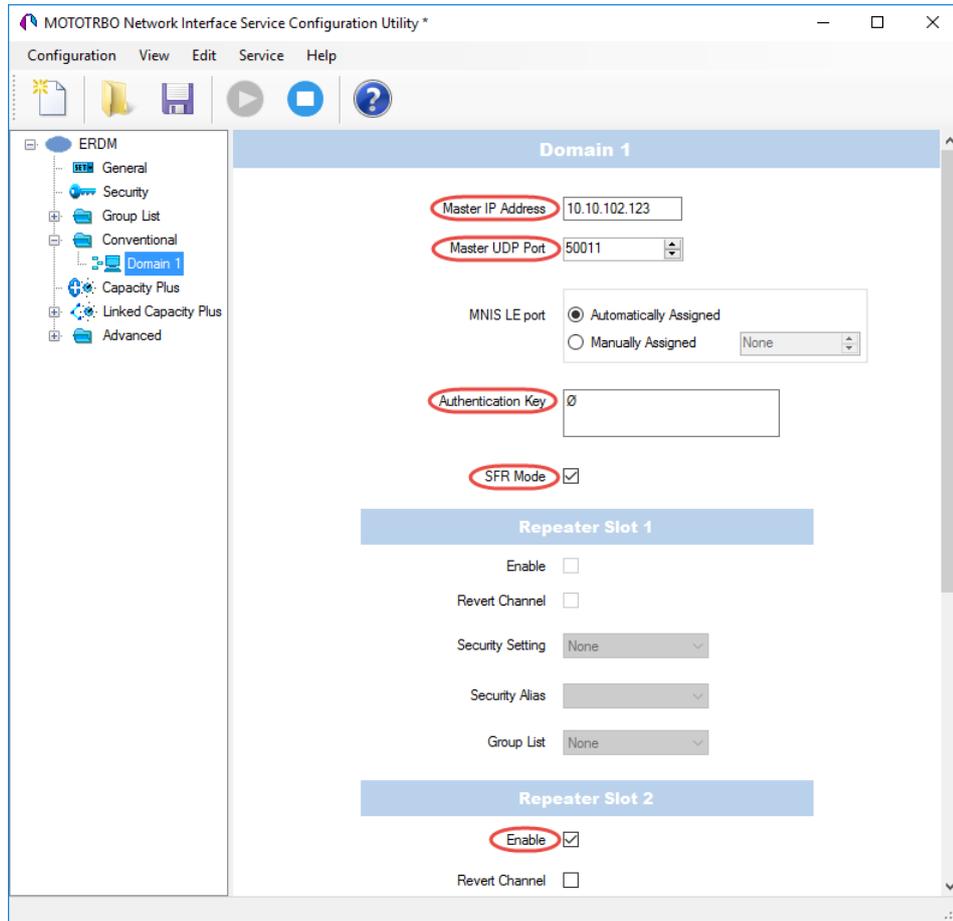
- ▪ **Master IP Address**
  Enter the Ethernet IP address of the master repeater.

- ▪ **Master UDP Port**
  Enter the UDP port number of the master repeater.

- ▪ **Authentication Key**
  Enter the master repeater's authentication key (if any).

- ▪ **SFR Mode**
  Select this option to enable the Single Frequency Repeater (SFR) mode.

- ▪ **Repeater Slot 2 Enable**
  Select this options so that MNIS will be able to send or receive data over the slot.

- In the left pane, select **Advanced**.
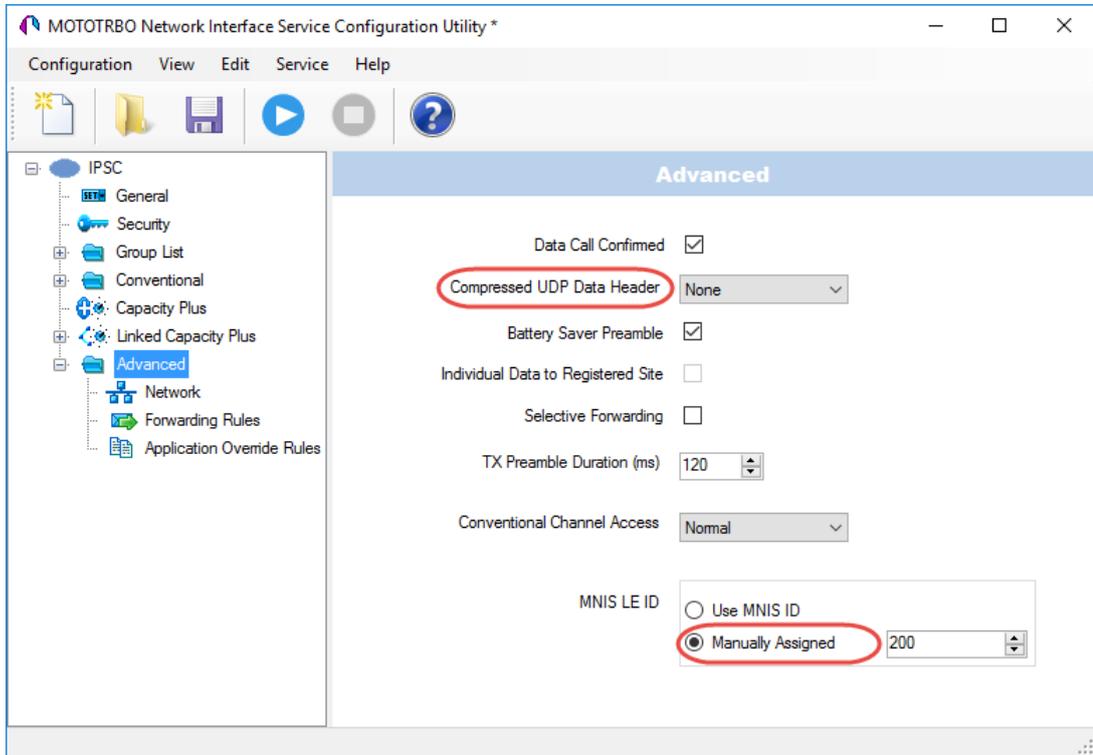
- ▪ **Compressed UDP Data Header**
  From the drop-down list, select the type of compression protocol used for the UDP Data Header (None, MSI, DMR). It is recommended selecting **MSI**. Note that the same type must be set on all subscriber radio channels (*CPS>Channels>Compressed UDP Data Header*).

- ▪ **MNIS LE ID > Manually Assigned**
  Enter a unique Peer ID among the repeaters in a radio system.

- In the left pane, select **Network**.
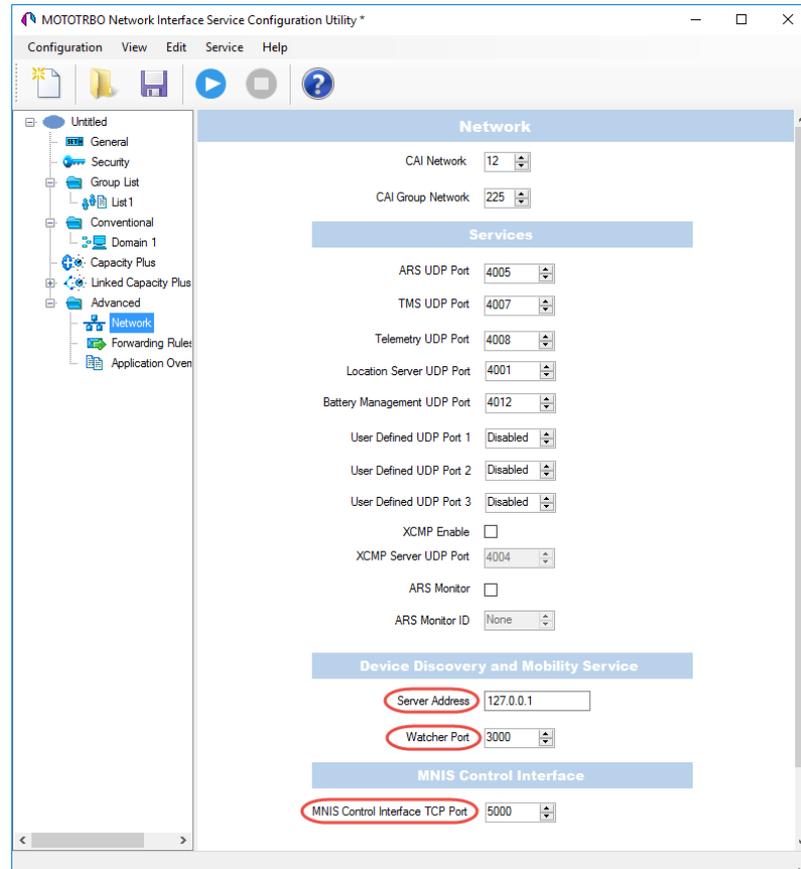
Device Discovery and Mobile Service

- **Server Address**
  This is the IP address of the MOTOTRBO Device Discovery and Mobility Service (DDMS). The recommended value is `127.0.0.1` if both DDMS and MNIS reside on the same PC.

- **Watcher Port**
  This is the port number on the MOTOTRBO Device Discovery and Mobility Service (DDMS) server to which the Watcher requests should be sent.

MNIS Control Interface

- **MNIS Control Interface TCP Port**
  This is the Transmission Control Protocol (TCP) port for the MNIS Control Interface server. This value is used when connecting TRBOnet Server to MNIS Service (see 5.1.1.3, MNIS Data Service, **Control port**).
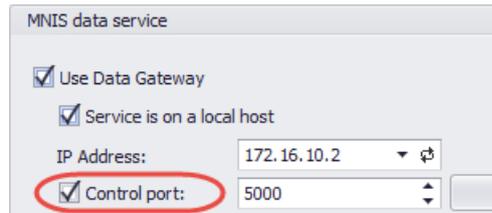
Once you have finished configuring the desired MNIS parameters, do the following:

- Click the **Save** button on the toolbar.

- On the **Configuration** menu, click **Set as Active Configuration**.
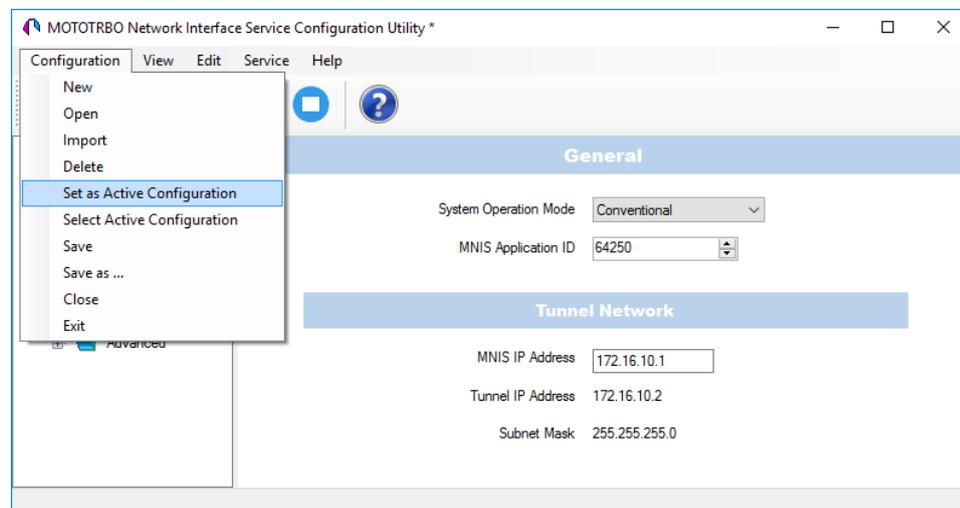
- Click the **Start** button on the toolbar.

5   Configuring TRBOnet Enterprise

This section describes how to configure TRBOnet Enterprise software. By properly configuring TRBOnet Server and TRBOnet Dispatch Console, you will be able to utilize the full capabilities of your Extended Range Direct Mode system.

5.1   Configuring TRBOnet Server

To start TRBOnet Server, click the corresponding shortcut on the desktop, or click **Start > All Programs > Neocom Software > TRBOnet Server x.x**

For instructions on how to configure TRBOnet Server's Database, Service, Network parameters, etc., refer to *TRBOnet Enterprise Quick Start Guide*.

5.1.1   Adding a Repeater

This section describes how to configure TRBOnet Server for communication with the repeater of an ERDM system.

- In the **Radio Systems** pane, click **Add**.
  Or, in the **Configuration** pane, right-click **Radio Systems**.

- In the drop-down menu, click **Add MOTOTRBO System**.
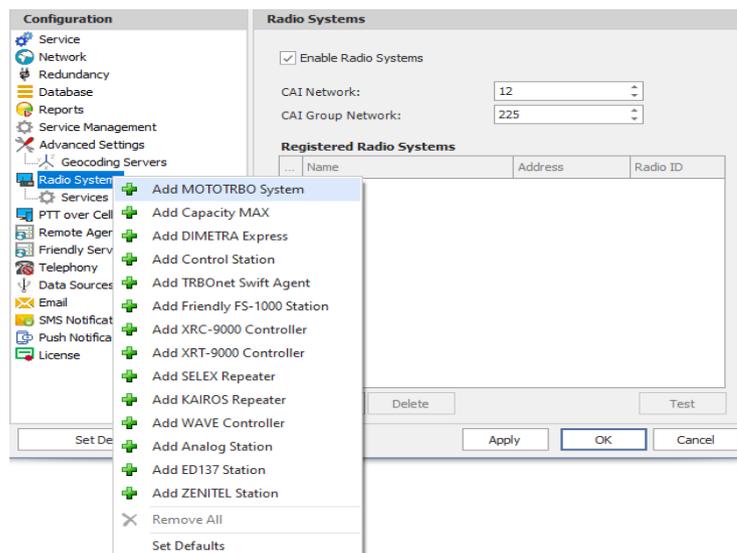
In the **Repeater** pane, specify the connection parameters. To ensure your connection parameters match the actual configuration of your radio network, you may need to use Motorola CPS to determine the values. Contact your radio network administrator, if you do not have this information.
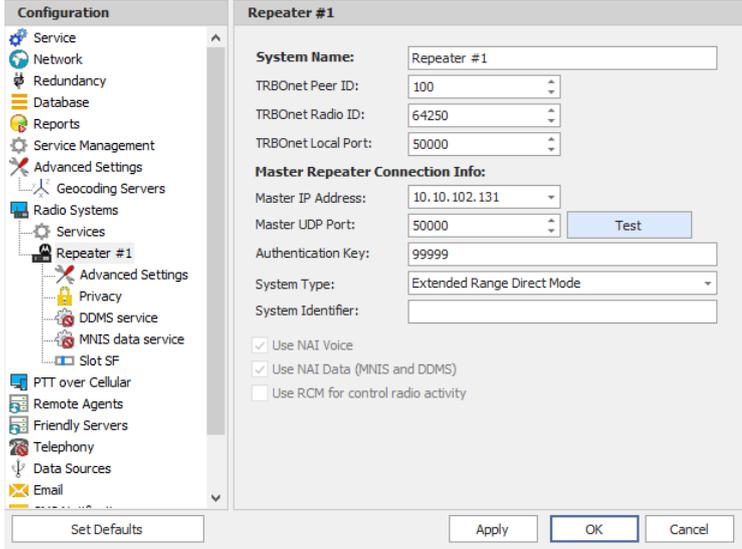
- **System Name**
Enter a name for the repeater. This name will be displayed in the Dispatch Console.

- **TRBOnet Peer ID**
Enter a Peer ID for TRBOnet Server. The Peer ID must be unique among the repeaters in the radio system.

- **TRBOnet Radio ID**
Enter the Radio ID of the gateway for voice and data in the radio system. This Radio ID is used as **ARS Radio ID** and **TMS Radio ID** in the Network settings of subscriber radios (see sections 4.3, Configuring a Subscriber Radio, 4.3.2, Network). The default value is **64250**.

- **TRBOnet Local Port**
Enter the port number on the TRBOnet Server computer that will be used by TRBOnet Server to establish a connection to the repeater. Use unique port numbers for each repeater connection if there are several repeaters connected.

- **Master IP Address**
Enter the Ethernet IP address of the master repeater.

    Note: This value is programmed for a repeater via MOTOTRBO CPS, in *Link Establishment>Master IP*. See section 4.1.3.

- **Master UDP Port**
Enter the UDP port number of the master repeater.

    Note: This value is programmed for a repeater via MOTOTRBO CPS, in *Link Establishment>Master UDP Port*. See section 4.1.3.

- **Authentication Key**
  Enter the repeater's authentication key (if any).

  > Note: This value is programmed for a repeater via MOTOTRBO CPS, in
  > *Link Establishment>Authentication Key*. See section 4.1.3.

- **System Type**
  From the drop-down list, select **Extended Range Direct Mode**.

- **Test**
  Click this button to check the connection to your master repeater. If the test is successful, you'll see the information about the repeater you are connected to, such as the serial number, firmware version, and other relevant information.

- **System Identifier**
  Enter the system identifier. Note that the system identifier should be the same for all control stations and repeaters used in the same radio system.

- **Use NAI Voice**, **Use NAI Data (MNIS and DDMS)**
  These options are automatically selected.

Click **Apply** after entering all the required values. A confirmation dialog will appear, prompting you to save the configuration and restart the TRBOnet Server service. You can also restart the service manually.

5.1.1.1 Advanced Settings

- In the **Configuration** pane, under the corresponding **Repeater**, select **Advanced settings**.
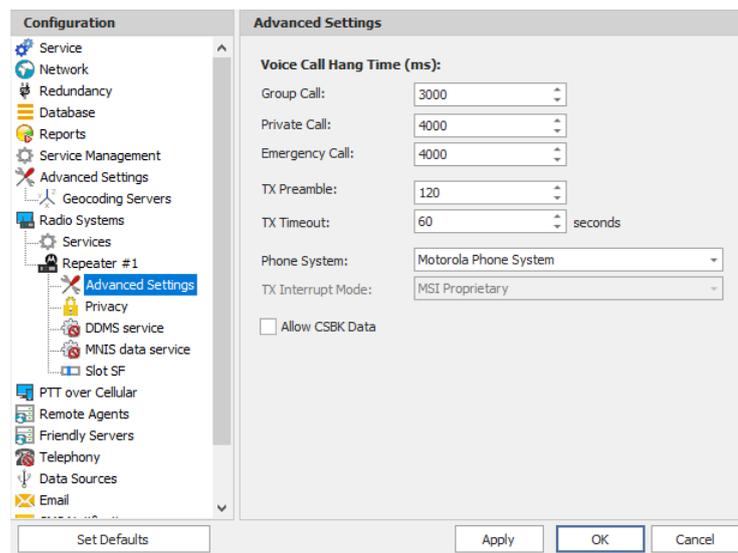
- In the **Advanced Settings** pane, specify the following repeater-related advanced settings:

  Voice Call Hang Time (ms):

- **Group Call**
  This value sets the duration the repeater reserves the channel after the end of a group call transmission. During this time, only members of the group that the channel is reserved for can transmit.

- **Private Call**
  This value sets the duration a radio keeps the private call setup after a user releases the PTT button. This is to avoid setting up the call again each time a user presses the PTT button to transmit. During this time, other radios can still transmit since the channel is essentially idle. After the hang timer expires, the radio transmits using the *TX Contact Name* parameter specified for this channel in MOTOTRBO CPS.

- **Emergency Call**
  This value sets the duration the repeater reserves the channel after the end of an emergency call transmission. During this time, only members of the Group that the channel is reserved for can transmit.

  > Note: The values of the above three parameters must be taken from the corresponding parameter values programmed for the repeater via MOTOTRBO CPS in *General Settings*.

- **TX Preamble**
  Enter the value of the TX Preamble. The TX Preamble is a string of bits added in front of a data or control message (Text Messaging, Location Messaging, Registration, Radio Check, Private Call, and other message types) before transmission. The acceptable range is 0 - 8640 ms. The recommended value is 120 ms.

- **TX Timeout**
  Enter the time, in seconds, to be used as a voice session limit. When the dispatcher starts any voice session in the Dispatch Console, transmission will be interrupted after this TX Timeout expires.

- **Phone system**
  From the drop-down list, select **Motorola Phone System**.

5.1.1.2 DDMS Service

The DDMS, or Device Discovery and Mobility Service is a service for tracking the presence of radio subscribers in the radio network and transmitting the data to the server.

- In the **Configuration** pane, under the corresponding **Repeater**, select **DDMS service**.
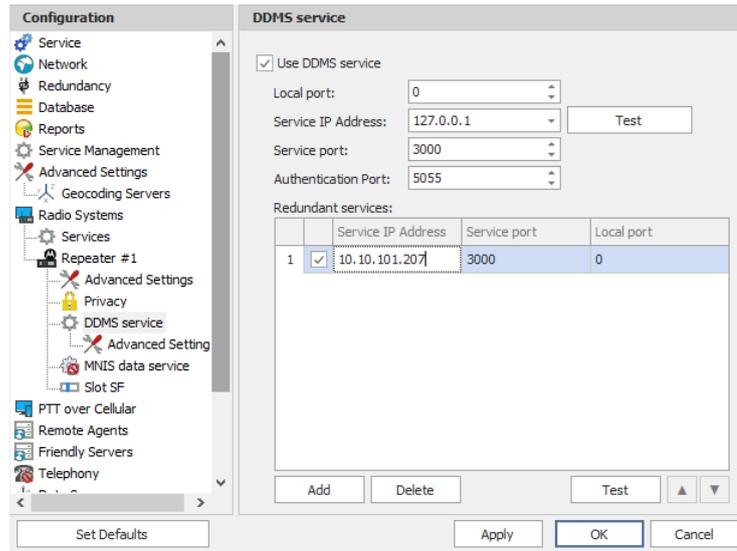
- In the **DDMS service** pane, specify the following DDMS service-related settings:

  - **Use DDMS service**
    Select this option to enable the DDMS service for the server.

  - **Local Port**
    Enter the number of the local port to be used on a PC with TRBOnet Dispatch Software for DDMS service.

  - **Service IP Address**
    Enter the IP Address of the PC with the DDMS service installed and running.

  - **Service port**
    Enter the service port number.

    > Note: This value is programmed for a DDMS service via MOTOTRBO DDMS Administrative Client, in *Interfaces>Watcher Settings>PortWatcher*.

  - **Authentication Port**
    Enter the authentication server port number.

    > Note: This value is programmed for a DDMS service via MOTOTRBO DDMS Administrative Client, in *Interfaces>Authentication Server Settings> AuthenticationServerPort*.

  - **Redundant services**
    Here you see the list of redundant DDMS services for failover purposes.

    - Click **Add** and specify the required parameters for the DDMS service being added.

    - Click **Test** to test if the selected DDMS service is available.

- Use the **Up** (▲) and **Down** (▼) buttons to move a selected DDMS service up and down in the priority list of DDMS services.

5.1.1.3 MNIS Data Service

MNIS, or Motorola Network Interface Service, is a Windows application which acts as a data gateway between the data applications and the radio system. Data messages are routed through MNIS.

- In the **Configuration** pane, under the corresponding **Repeater**, select **MNIS data service**.
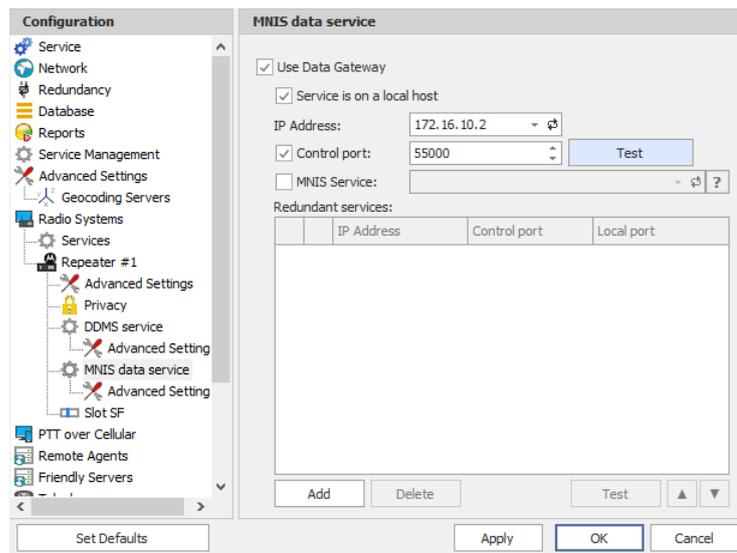
- In the **MNIS data service** pane, specify the following MNIS data service-related settings:

  - **Use Data Gateway**
    Select this option to enable the MNIS data service for the server.

  - **Service is on a local host**
    Select this option if the MNIS data service will be used on the local PC.

  - **IP Address**
    Enter the IP Address used by the MNIS to communicate with the PC.

    > Note: This value is programmed for a MNIS data service via MOTOTRBO MNIS Configuration Utility, and can be retrieved from *General>Tunnel Network>Tunnel IP Address*.

  - **Control port**
    Enter the number for the MNIS control port.

    > Note: This value is programmed for a MNIS data service via MOTOTRBO MNIS Configuration Utility, in *Advanced>Network>MNIS Control Interface TCP Port*.

- **MNIS Service**
Select this option, and from the drop-down list select the available MNIS service.

- **Redundant services**
Here you see the list of redundant MNIS data services for failover purposes.

  - Click **Add** and specify the required parameters for the MNIS data service being added.

  - Click **Test** to test if the selected MNIS data service is available.

  - Use the **Up** (▲) and **Down** (▼) buttons to move a selected MNIS data service up and down in the priority list of MNIS data services.

5.1.1.4 Slot SF

- In the **Configuration** pane, under the corresponding **Repeater**, select **Slot SF**.
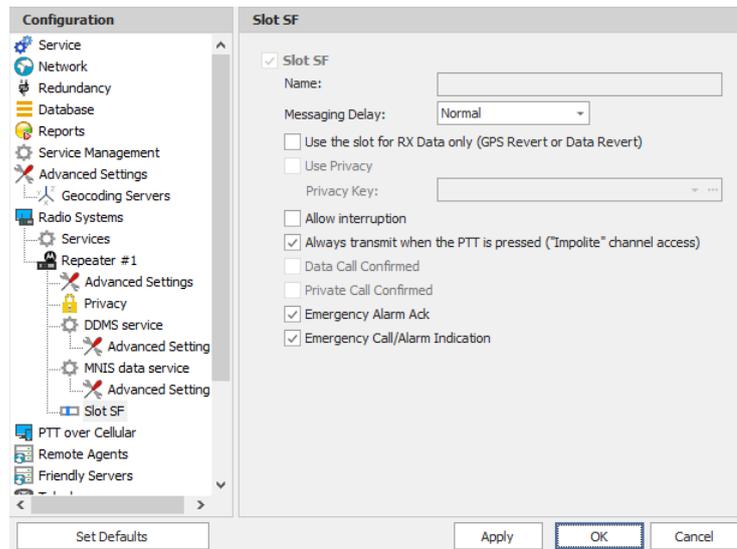
- In the **Slot SF** pane, specify the following slot-related parameters:

  - **Name**
  Enter a name for the slot. This name will be displayed in the Dispatch Console.

  - **Messaging Delay**
  From the drop-down list, select the inter-repeater messaging delay based on the IP network configuration.

    - Normal
    The inter-repeater messaging delay is 60 ms.

    - High
    The inter-repeater messaging delay is 90 ms.

- **Use the slot for RX data only (GPS Revert or Data Revert)**
  Select this option to configure the slot so that it will only receive data, thus having no transmission capability.

- **Allow interruption**
  Select this option to allow interrupting dispatcher transmissions by radios that are Transmit Interrupt capable.

- **Always transmit when the PTT is pressed ("Impolite" channel access)**
  Select this option so that when the PTT button is pressed, the dispatcher will start transmitting regardless of whether the channel is free or not (that is any transmission in progress will be interrupted).

- **Data Call confirmed**
  Select this option to enable individual packets in data calls (ARS, GPS, and Text Message) on the current slot to be confirmed.

- **Private Call Confirmed**
  Select this option to set Private calls on the current slot as confirmed. By default, Private calls are unconfirmed.

- **Emergency Alarm Ack**
  Select this option so that the Dispatch Console is allowed to acknowledge an emergency alarm received via this slot.

- **Emergency Call/Alarm Indication**
  Select this option so that audio and visual indication is given for an emergency call/emergency alarm received via this slot.

5.1.2   Adding a Control Station

This section describes how to configure TRBOnet Server for communication with a control station in an ERDM system.

- In the **Radio Systems** pane, click **Add**.
  Or, in the **Configuration** pane, right-click **Radio Systems**.
- In the drop-down menu, click **Add Control Station**.
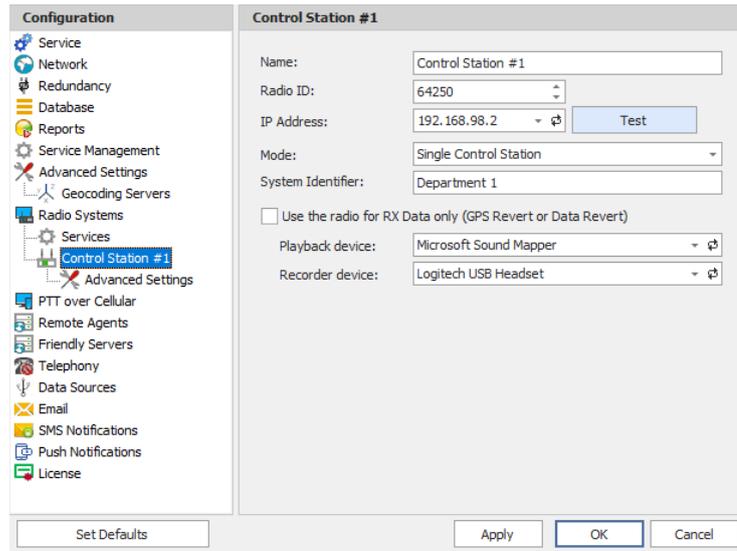
- In the **Control Station** pane, specify the following control station-related parameters:

  - **Name**
  Enter a name for the control station. This name will be displayed in the Dispatch Console.

  - **Radio ID**
  This is the Radio ID of the radio unit connected as a control station.

    > Note: This box is populated automatically once you have successfully tested the control station by clicking the **Test** button.

  - **IP Address**
  Enter, or select from the list, the IP Address of the control station network interface.

    > Note: This value can be taken from the radio's configuration in MOTOTRBO CPS, in *Network>Accessory IP*.

  - **Test**
  Click this button to check the connection to the control station. If the test is successful, you'll see the information on the control station you are connected to, such as radio ID, serial number, firmware version, and other relevant information.

  - **Mode**
  From the drop-down list, select **Single Control Station**.

  - **System Identifier**
  Enter the system identifier. Note that the system identifier should be the same for all control stations and repeaters used in the same radio system.

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- **Use the radio for RX data only (GPS Revert or Data Revert)**
  Select this option to configure the radio channel so that it will only receive data, thus having no transmission capability.

- **Playback device**
  From the drop-down list, select the playback device on the PC that will be used to transfer audio to the control station.

- **Recorder device**
  From the drop-down list, select the recording device on the PC that will be used to audio from the control station via a line-in jack connection.

- Click **Apply** after entering all the required values. A confirmation dialog will appear, prompting you to save the configuration and restart the TRBOnet Server service. You can also restart the service manually.

5.1.2.1 Advanced Settings

- In the **Configuration** pane, under the corresponding **Control Station**, select **Advanced Settings**.
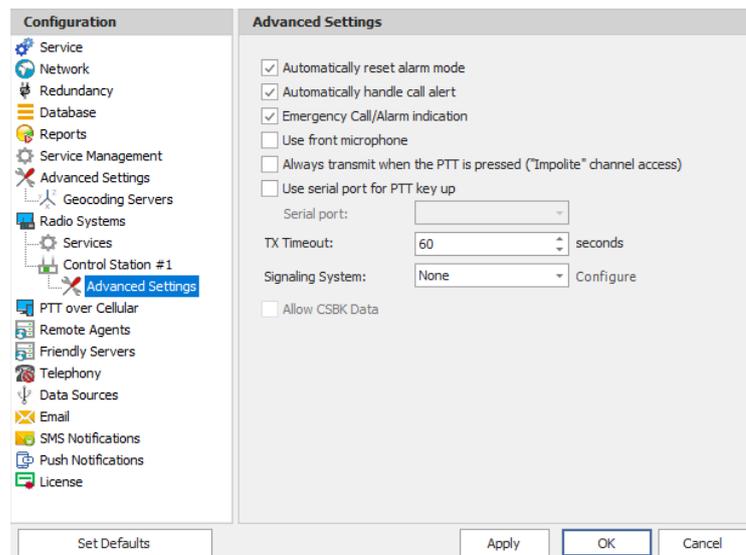
- In the **Advanced Settings** pane, specify the following control station-related advanced settings:

  - **Automatically reset alarm mode**
    Select this option to reset alarm mode on the control station radio automatically. It is recommended to enable this option.

  - **Automatically handle call alert**
    Select this option to automatically redirect call alerts from the control station radio to the Dispatch Console.

  - **Emergency Call/Alarm indication**
    Select this option so that audio and visual indication is given by the control station radio when an Emergency Call/Emergency Alarm is received.

- **Use front microphone (for PTT key up)**
  Select this option to use the speaker microphone on the front of the radio.

- **Always transmit when the PTT is pressed ("Impolite" channel access)**
  Select this option so that when the PTT button is pressed, the radio will start transmitting regardless of whether the channel is free or not (that is any transmission in progress will be interrupted).

- **Use serial port for PTT key up**
  Select this option to use a remote control of the PTT button via the serial port of the PC, and select the serial port from the drop-down list.

- **TX Timeout**
  Enter the time, in seconds, to be used as a voice session limit. When a dispatcher starts any voice session in the Dispatch Console, the ongoing transmission will be interrupted after this TX Timeout expires.

- **Allow CSBK Data**
  Select this option so that GPS data is sent in a single CSBK.

5.2 Configuring TRBOnet Dispatch Console

To start TRBOnet Server, click the corresponding shortcut on the desktop, or click **Start > All Programs > Neocom Software > TRBOnet Dispatch x.x**

The dialog box will appear prompting you to enter the TRBOnet Server IP address, User Name, and Password. The default Administrator credentials are *admin* for the login and *admin* for the password.

For a more detailed information on how to use TRBOnet Dispatch Console, refer to *TRBOnet Enterprise User Manual*.

5.2.1 Registering Radio Groups

Go to **Administration** (1), **Radio Group** (2) to add/edit/delete Radio Groups in the system.
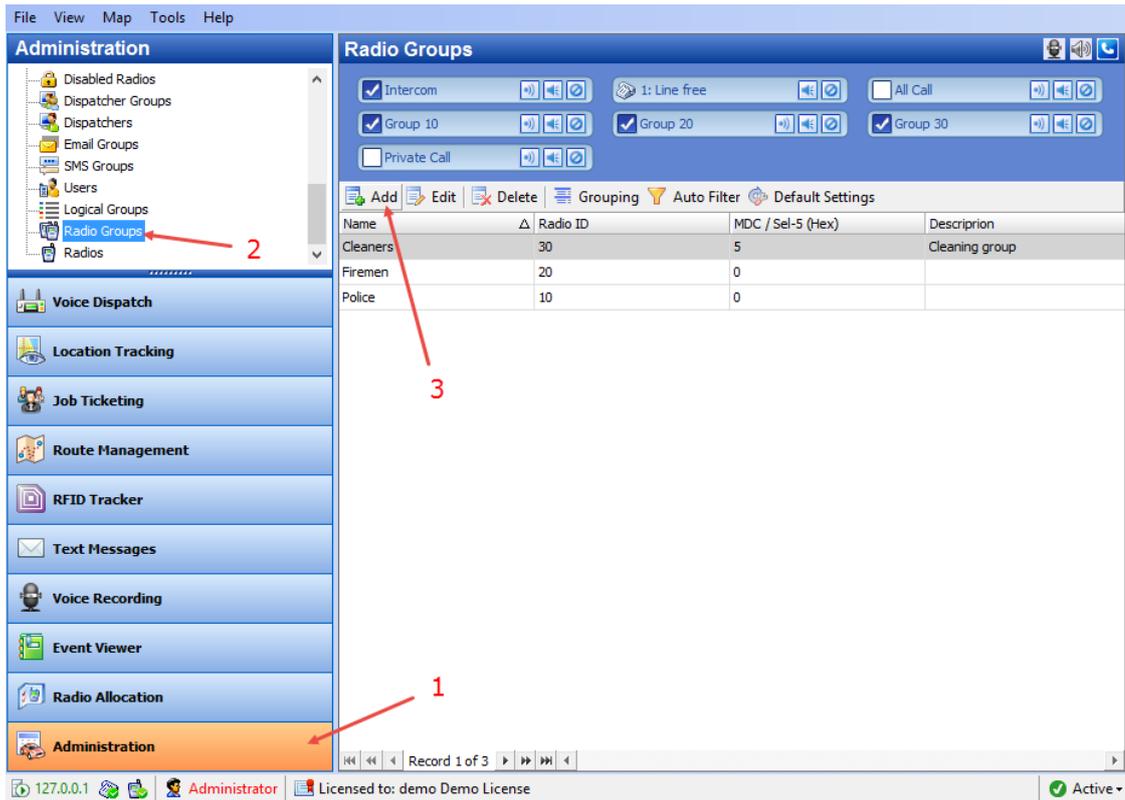
- Click **Add** (3) to add a radio group to the system:
- In the dialog box that appears, specify the **Name** and **Group ID** (Radio ID) of the group you are adding.

Note: Make sure that the radio group(s) created in the Dispatch Console are present in the radio's RX Group List (see section 4.3.4, RX Group Lists).

5.2.2 Registering Radios

Go to **Administration** (1), **Radios** (2) to add/edit/delete Radios in the system.
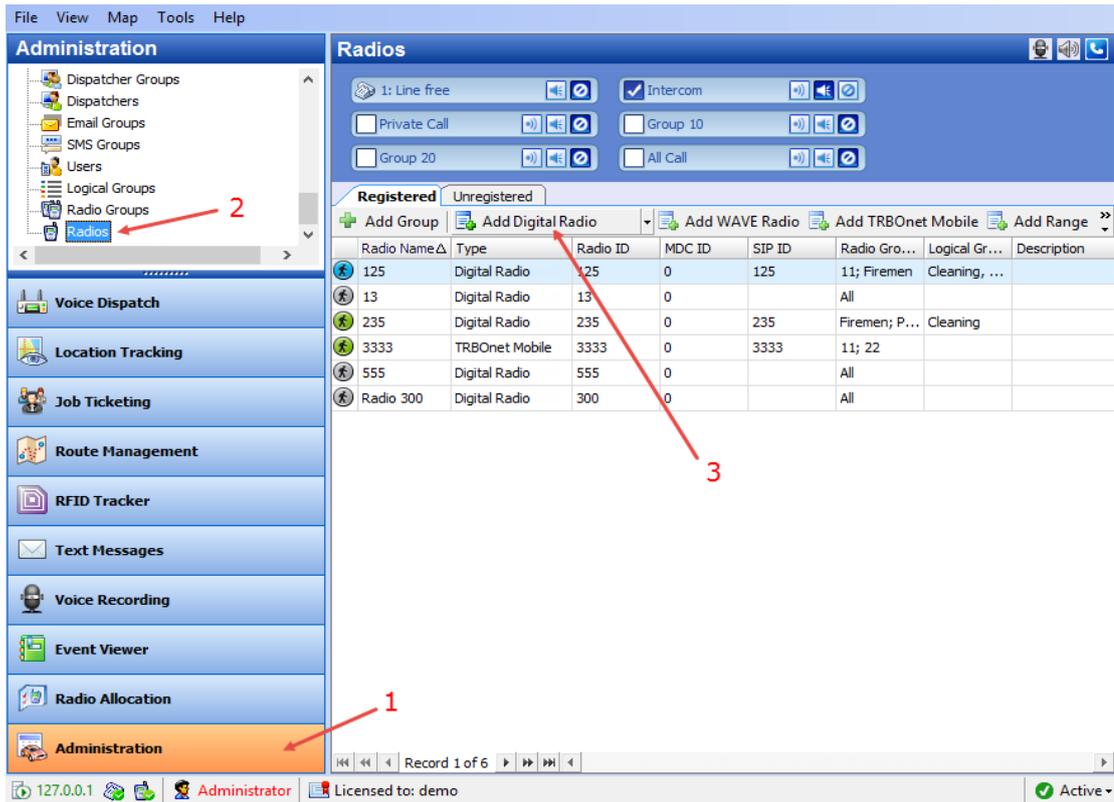
- Click **Add MOTOTRBO Radio** (3) to add a new radio.
- In the dialog box that appears, specify the **Callsign**, **Radio ID**, **Radio Groups**, and **Home Group** to which the radio belongs.