



# **TRBOnet Enterprise**

# Extended Range Direct Mode

**Deployment Guide** 

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NAL RADIO

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# **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 <u>Documentation section</u> 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

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# 2 System Components

software

#### 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 systems'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.

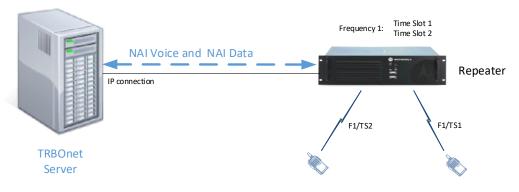


Figure 1: IP Connection to the repeater

#### 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).

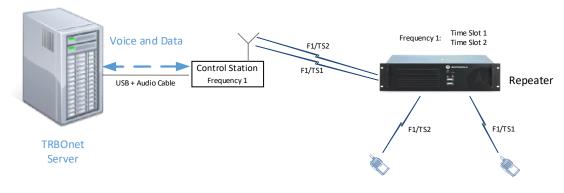


Figure 2: Wireless connection to the repeater



# **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).
   Or, if an IP connection is available and the network parameters are known (Remote > IP System Settings), establish a connection to your remote repeater (Remote > Connect).
- Click the **Read** button on the toolbar.



#### 4.1.1 General Settings

• In the left pane, select General Settings.

SLR 5500	General Settings
Accessories	Top CWID Voting Microphone
Security	Radio Name IPSC Master
Link Establishment	Radio ID 102
Sites	SIT (ms) 6000 -
	Group Call Hang Time (ms) 3000 -
	Private Call Hang Time (ms) 4000
	Emergency Call Hang Time (ms) 4000 -
	Call Hang Time (sec) 3 -
	Repeat Gain (dB) 0.0 -
	Antenna Relay Delay Timer (ms)

• In the **General Settings** 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 left pane, select Network.

SLR 5500	Network
	Top Radio Network Network Setting IP Repeater Programming
Security	Radio IP 192 . 168 . 40 . 1
·····R Link Establishment	Accessory IP 192.168.40.2
Sites	Netmask 255.255.2
Em Channels	Radio Network
	CAI Network 12 ÷
	CAI Group Network 225 ÷
	Network Setting
	рнср 🗔
	Ethernet IP 10 . 10 . 102 . 131
	Gateway IP 10 . 10 . 0 . 1
	Gateway Netmask 255 . 255 . 0 . 0
	IP Repeater Programming
	Enable 🖂

- In the **Network** 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 left pane, select Link Establishment.

SLR 5500	Link Establishment	
Accessories	Top IP Site Connect Capacity Plus	
Network	Link Type Master	^
MOTOTRBO Link	Authentication Key	
<b>{i</b> i Talkgroups ⊕ <b>C</b> hannels	Master IP 10 . 10 . 102 . 131	
	Master UDP Port 50011	
	UDP Port 50011 +	
	Master Archive File	
	IP Site Connect	~
	]	

- In the Link Establishment 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 left pane, under **Channels**, right-click **Zone** and from the drop-down menu, select **Add** > **Digital Channel**.

SLR 5500	gs	Zone1											
		Drag channels to desired position											
Security     Security     Security     Link Establish		Position	Channel Name	Channel Bandwidth (kHz)	Squelch	Squelch Level	Voice Emphasis	Color Code	Extended Range Direct Mode	Inbound Color Code			
MOTOTRBO	LINI <b>Fr.e</b>	1	Link S1	N/A	N/A	6 ÷	N/A	7 ÷	Enabled	1			
Channels	Add	► Ctrl+X	Analog Channel Digital Channel			t+F5							
	Сору	Ctrl+C Ctrl+V	Dynamic Mixed I Capacity Plus Vo		Shift+		J						
	Delete Rename	Del F2	Capacity Plus Da Capacity Plus Vo Capacity Plus Da	vice Channel (Linl	ked) Ctrl+Shif								
	Sort	•					1						

• In the left pane, right-click the channel you have just added and from the drop-down menu select **Rename**, or select the channel and just press **F2** on the keyboard. Enter a new name for the channel, for example, "ERDM".

SLR 5500	ERDM
Accessories	Top Enhanced GNSS RX IX
Network	Color Code 0 📩
MOTOTRBO Link	Extended Range Direct Mode Enabled
🔄 😁 🚞 Channels	
n 🔅 ERDM	Network Application Interface Phone
	IP Site Connect None v
	Messaging Delay (ms) 60 -
	RSSI Threshold (dBm)
	<

- In the **ERDM** 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.



SLR 5500	ERDM	
— 🞈 Accessories — 🚛 Security	Top Enhanced GNSS RX TX	
Link Establishment	RX TX	^
「八子 MOTOTRBO Link 「一〇 Sites 「〇〇 Talkgroups 日一 (二) Channels	Offset (MHz)	
È⊢ 🔁 Zone1	Power Level High  TOT (sec) 60  Enhanced Channel Access	~
	< Contract of the second secon	>

- 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.

SLR 5500							Zoi	ne1						
	Drag channels to desired position													
		Position	Channel Name	Channel Bandwidth (kHz)	Squelch	Squelch Level	Wireline Mute GPIO Pin	Voice Emphasis	Color Code	Network Application Interface Phone	System Controller Mode	IP Site Connect	Messaging Delay	RSSI Thresh (dBm)
Talkgroups	▶ <b>л.⊚</b>	$\bigcirc$	ERDM	N/A	N/A	6 主	N/A	N/A	1 ÷			Slot 1 & Slot 2	Normal	-100
E Channels	<b>C</b> 22	2	CaPlus_V	N/A	N/A	6 <u>÷</u>	N/A	N/A	1 🔹			N/A	N/A	-60
E -														
	•													Þ

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

6	<b>2</b>			×	Х	Ē	Ē	0		Þ	Þ	8	192.168.11.1 -	]
RM	Open	Save	Reports	Delete	Cut	Copy	Paste	Search	Read	Write	Clone	Bluetooth	15211001111	



#### 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.

🖃 ··· 🔋 DP4801	^	General Settings	
General Settings		Centeral Cettings	
Accessories		Top CWID Audio Profile Microphone Backlight Battery Saver Alerts Over-the-	Air Proc
Buttons		Descisional Long Maders Descended and Long Country	
Text Messages		Persistent LRRP Requests Lone Worker Power Up Password and Lock Front Programm	ing Pas
💷 Telemetry		Delete All 5 Tone Radio ID	
Menu			^
Security		Radio Name Control Station	
Network			
Announcement		Select	
🕂 🚞 Job Tickets		Welcome Image	
🕂 🚞 Signaling Systems		Remove	
🗄 🗠 💼 Encoder			
🛨 💼 Decoder			
🛨 🗂 Contacts		Radio ID 64250	
🕂 🗁 💼 RX Group Lists			× *
🗒 💼 Channele	~	<	>

#### 4.2.1 General Settings

- In the left pane, select General Settings.
- In the General Settings 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 <u>5.1.2, Connecting a Control</u> <u>Station</u>.

Control Station #1	
Name:	Control Station #1
Radio ID:	64250
IP Address:	192.168.98.2 ▼ ¢
Mode:	Single Control Station
System Identifier:	Department 1



#### 4.2.2 Network

• In the left pane, select **Network**.

DP4801	I Settings			Ne	etwork			
Access	100	Radio Network HID Data Routing	Services	Control Station	IP Site Connect	<u>Bluetooth</u>	Bluetooth Serial Port Profile	e Data I
🔟 Teleme 📘 Menu	iry			Radio IF	192 . 168	. 98 . 1		^
·····································	< cement			<u> </u>	255.255.255.0			ł
T _	g Systems r			uetooth Accessory If JSB DNS-SD Interva				
E Contact	s up Lists			Radio	Network			
	ls			CAI Networl	12 1			
⊞ <mark>⊟</mark> Roam 	y Plus		Мах	CAI Group Networl TX PDU Size (bytes				
				Telemetry UDP Por		•		~

• In the **Network** 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 <u>5.1.2, Connecting a Control</u> <u>Station</u>.

Control Station #1	
Name:	Control Station #1
Radio ID:	64250
IP Address:	192.168.98.2 🔹 🕫
Mode:	Single Control Station
System Identifier:	Department 1

#### Forward to PC

From the drop-down list, select Via USB.



#### 4.2.3 Contacts

• In the left pane, select **Contacts** > **Digital** and right-click it. Click **Add** > and from the drop-down menu select the type of a call you want to add a contact for.

	DP4801 IIII General Setting	gs ^					Diç	gital			
	<ul> <li>Accessories</li> <li>Buttons</li> <li>Text Message</li> </ul>	s		Contact Name	(	Call ID	Connection Type	Route Type	Call Receive Tone	Ring Style	Text Message Alert Tone
(	Telemetry		▶n.gð	Police		10 🛨		Regular		No Style	Repetitive
	Menu		бал	Firemen	2	20 ÷	USB	Regular		No Style	Repetitive
	Security Security Solution Sol	ems									
		Add	)	Group Call	Ctrl+F7						
		Cut	Ctrl+X	Private Call	Ctrl+F8						
	± 💼 🖬	Сору	Ctrl+C	All Call	Ctrl+F9						
÷- (	RX Grou	Sort		Dispatch Ca PC Call	Ctrl+F10 Ctrl+F11						
Ē	Channel	~									•

• Enter the **Contact Name** and **Call ID** for the contacts you have added.

#### 4.2.4 RX Group Lists

 In the left pane, select RX Group Lists > Digital. Right-click it, and choose Add > RX Group List.

	Text Messages	^	List1
	Telemetry		
	Menu		
•			Available Members
	Network		Police Firemen
0	Announcement		
÷… (	Job Tickets		
÷… 🧧	Signaling Systems		Add >>
÷ (	Encoder		
÷ 🕻	Decoder		<< Remove
÷ 🧧	Contacts		
	RX Group Lists		
E	] 📄 Digital		
	👸 🖗 List1		
E	- Capacity Plus		
E	🗄 📄 Flexible RX List		
÷… 🧧	Channels		
÷ 🧧	Scan		
Ė… €	Roam	¥	

- 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 left pane, select **Channels**. Right-click it, and choose **Add** > **Zone**.

	_	Telemetry Menu	^				Channels
	<b>3</b>	Security					Drag zones to desired position
		Network Announcement					Set Voice Files Clear Voice Files
÷		Job Tickets			Position	Zone Name	Voice Announcement File
÷		Signaling System	ns			Zone1	None
÷		Encoder		1	2	Channel Pool	None
÷		Decoder					
÷		Contacts					
÷		RX Group Lists					
<b>P</b>	· 🔁	Channels	Add		Zo	ne Ctrl+F2	
	Τ	n.e	Cut (	Ctrl+X			
		<b></b>	Сору (	Ctrl+C			^
	÷	👘 Cha	Paste (	Ctrl+V			
+		Scan Roam	Sort				
		Capacity Plus	~				Y

In the left pane, select the zone you have added. Right-click it, and choose
 Add > Digital Channel.

🛨 – 🧰 Job Tickets 🛨 – 🧰 Signaling Syster	ms			Zon	ne1			
			S	Drag channels to	desired positio			
RX Group Lists	Add >	Position Channel Name Analog Channel	Voice Announcement File Shift+F5	Ba	hannel andwidth (Hz)	Dual Capacity Direct Mode	Timing Leader Preference	Scan List
	Cut Ctrl+X	Digital Channel	Shift+F6	N//	A	Γ	Eligible	N/A
	Copy Ctrl+C	Capacity Plus Personality	Shift+F7	N//	A		Eligible	N/A
🖵 😭 Chai 🛨 — 🧰 Scan	Paste Ctrl+V	Capacity Plus Personality (Linked) 5 Tone Channel	Ctrl+Shift+F7 Shift+F4	N//	A		Eligible	N/A
⊞— 🚞 Roam ⊞— 🚞 Capacity F	Rename F2	•						

• In the left pane, select the channel (for example, named ERDM) that has previously been added.

DP4801 ^	ERDM
🞈 Accessories	IOO RX IX
Buttons Message:	Voice Announcement File None
Menu	Dual Capacity Direct Mode
Security	Timing Leader Preference Eligible -
Announcement	Scan IRoam List  Scan List
🕂 ··· 📄 Job Tickets	Auto Scan
🕀 📄 Encoder	Color Code 0 ±
🕀 💼 Decoder	Extended Range Direct Mode Enabled
RX Group Lists     Group Lists	
🚊 🚞 Zone1	Outbound Color Code 2 ÷
n eRI	Repeater/Time Slot 1 -
🕀 💼 Scan	Phone System None v
< roant	ARS On System Change 💌

- In the right pane, specify the following parameters:
  - Extended Range Direct Mode

From the drop-down list, select **Enabled**.



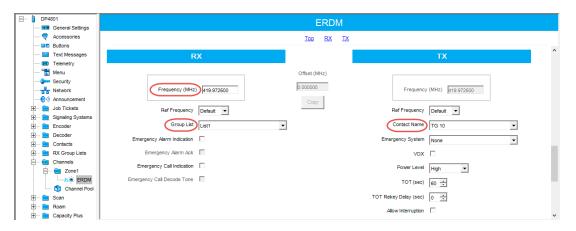
#### Inbound Color Code and Outbound Color Code

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 <u>4.2.3, Contacts</u>.

• 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.

<b></b> .	DP4801	General Settings	
	Accessories	Top CWID Audio Profile Microphone Backlight Battery Saver Alerts Over-the-Air Programming Persistent LRRP R Lone Worker Power Up Password and Lock Front Programming Password Delete All 5 Tone Radio ID	leque
	····· 🚾 Text Messages ····· 💷 Telemetry ····· 💼 Menu	Radio Name Radio 235	^
	Security     Security     Network     Notwork     Notwork	Welcome Image	
	Job Tickets		
	Decoder		
	RX Group Lists     Channels     Scan	GNSS GPS/QZSS	
<	>	( mail card )	$\sim$

#### 4.3.1 General Settings

- In the left pane, select General Settings.
- In the General Settings 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 left pane, select **Network**.

DP4801	Network	
General Settings		
Accessories	Top Radio Network Services Control Station IP Site Connect Bluetooth Bluetooth Serial Port Profile Dat	<u>a F</u>
Buttons	USB HID Data Routing	
Text Messages		
Telemetry	Radio IP 192 . 168 . 10 . 1	^
🛅 Menu		
Security	Accessory IP 192.168.10.2	
Network	Netmask 255.255.255.0	
	Bluetooth IP 192.168.11.1	
🕀 💼 Job Tickets		
🕂 🖮 📄 Signaling Systems	Bluetooth Accessory IP 192.168.11.2	
Encoder	Radio Network	
🗄 💼 Decoder	Radio Network	
E Contacts		
🕀 💼 RX Group Lists	CAI Network 12 🛨	
+ Channels	CAI Group Network	
🕀 💼 Scan		
🕀 💼 Roam	Max TX PDU Size (bytes) 750 🗸	
🕀 ···· 📄 Capacity Plus	Telemetry UDP Port 4008	
	Forward to PC Disabled	
	Services	
	ARS Radio ID 64250 ÷	
	ARS IP 13.0.250.250	
	ARS UDP Port 4005 ÷	
	TMS Radio ID 64250 ÷	Ļ

- In the **Network** 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 **TRBOnet Radio ID** in the Repeater settings of TRBOnet Server. The recommended value is **64250** for both parameters.



Repeater #1		
System Name:	Repeater #1	
TRBOnet Peer ID:	100	<b>‡</b>
TRBOnet Radio ID:	64250	<b>‡</b>
TRBOnet Local Port:	50000	<b>+</b>
Master Repeater Cor	nection Info:	

#### 4.3.3 Contacts

 In the left pane, select Contacts > Digital and right-click it. Click Add > and from the drop-down menu select the type of a call you want to add a contact for.

General S	ettings					Di	gital			
Accessor	es	¢	Contact Name	(	Call ID	Connection Type	Route Type	Call Receive Tone	Ring Style	Text Message Alert Tone
101 Telemetry	-	▶n.şê P			10 🚊					
Menu		ாஃச் Fi	iremen	2	20 ÷	USB	Regular		No Style	Repetitive
						1			1	1
Network										
	ment									
🛨 💼 Job Ticke	is i									
🗄 📄 Signaling	Systems									
🕂 💼 Encoder										
🛨 💼 Decoder										
Contacts										
🕂 🧰 5 То										
		1								
	Carn									
	Add	•	Group Call	Ctrl+F7						
Quik	Add		Group Call Private Call	Ctrl+F7 Ctrl+F8						
	Add Cut C	Ctrl+X								
	Add Cut C Copy C	Ctrl+X Ctrl+C	Private Call All Call	Ctrl+F8 Ctrl+F9						
	Add Cut C Copy C	Ctrl+X	Private Call	Ctrl+F8						

• Enter the **Contact Name** and **Call ID** for the contacts you have added.

#### 4.3.4 RX Group Lists

 In the left pane, select RX Group Lists > Digital. Right-click it, and choose Add > RX Group List.

🖂	Text Messages	^	List1	
	Telemetry		Elect	
🛅	Menu			
	Security	-1	Available	Members
	Network		Police Firemer	en
@)))	Announcement			
÷ 🚞	Job Tickets			
÷ 🚞	Signaling Systems		Add >>	
÷ 🚞	Encoder			
÷ 🚞	Decoder		<< Remove	
÷ 🚞	Contacts			
÷ 🔁	RX Group Lists			
<b>P</b>	Digital			
÷.	Capacity Plus			
÷.	Flexible RX List		r I	
÷ 🚞	Channels			
÷ 🚞	Scan			
ė 😑	Roam	~		

- 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.



#### 4.3.5 Channel

• In the left pane, select **Channels**. Right-click it, and choose **Add** > **Zone**.

		Telemetry Menu	^					Channels	
	<b>.</b>	Security Network						Drag zones to desired position Set Voice Files Clear Voice Files	
	<b>0</b> ))	Announcemer Job Tickets	nt		De	sition	Zone Name	Voice Announcement File	_
		Signaling Syst	tems	•	1		Zone1	None	
÷		Encoder		1	2		Channel Pool	None	
		Decoder Contacts							
÷.		RX Group Lis	ts						
<b>–</b>	· 📄	Channels	Add		۲	Zon	e Ctrl+F2		
	Τ		Cut	Ctrl+X		-			
		n.e	Сору	Ctrl+C					
_	÷	🕤 😭 Cha	Paste	Ctrl+V					
÷		Scan Roam	Sort		٢				
÷		Capacity Plus	×						$\sim$

In the left pane, select the zone you have added. Right-click it, and choose
 Add > Digital Channel.

SLR 5500						Zo	one1			
- 🞈 Accessories		Drag channels to desired position								
Network		Position	Channel Name	Bandwidth	Squeich Squeich Level		Voice Emphasis	Color Code	Extended Range Direct Mode	Inbound Color Code
MOTOTRBO Lini	▶ <b>n.e</b>	1	Link S1	N/A	N/A	6 ÷	N/A	7 ÷	Enabled	1
	Add	•	Analog Channel		Shif	t+F5	1			
	Cut C	trl+X	Digital Channel		Shif	t+F6				
	Copy C	trl+C	Dynamic Mixed		Shift					
1	Paste C	trl+V	Capacity Plus V		Shift+F8					
	Delete	Del	Capacity Plus D			t+F9				
	Rename	F2		pice Channel (Lin		t+F8				
-	Sort		Capacity Plus D	ata Channel (Link	ced) Ctrl+Shif	t+F9	]			
		•								

• In the left pane, select the channel (for example, named ERDM) that has previously been added.

🖃 👘 DP4801 🔨	ERDM
General Setting	
Recessories	TOP RX IX
Buttons	
Text Message:	Voice Announcement File None 🗸
Telemetry	Dual Capacity Direct Mode
Menu	Dual Capacity Direct Mode
Security	Timing Leader Preference Eligible v
Network	
	Scan/Roam List Scan List1 -
🛨 💼 Job Tickets	Auto Scan
🕀 📄 Signaling Syste	_
Encoder	Color Code a 📩
🕀 💼 Decoder	Extended Range Direct Mode Finabled
🕀 📄 Contacts	Extended Range Direct Mode Enabled
🕀 📄 RX Group Lists	Inbound Color Code
Channels	
🖻 🖶 🔁 Zone1	Outbound Color Code) 2 🛨
	Repeter/Time Slot
👘 Channel F	
🕀 📄 Scan	Phone System None v
🕂 😑 Roam 🗸	
< >	ARS On System Change 👻

• 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.

⊡… (		4801 General Settings			ERDM				
	🤇	-			<u>Top RX TX</u>				
		Text Messages	RX				ТХ		^
	- 1	Menu			Offset (MHz)				
	-	Security Network	Frequency (MHz)	419.972500	0.000000	Frequenc	y (MHz) 419.972500		
G	C	) Announcement Job Tickets	Ref Frequency	efault 💌	Сору	Ref Frequency	Default 💌		
6	_	Signaling Systems Encoder	Group List	ist1		Contact Name	TG 10	•	
6	_	Decoder Contacts	Emergency Alarm Indication	1		Emergency System	None	•	
Đ	_	RX Group Lists	Emergency Alarm Ack	1		VOX			
E	<del>(</del>	Channels	Emergency Call Indication	1		Power Level	High 💌		
		Channel Pool	Emergency Call Decode Tone	1		TOT (sec)	60 🛨		- 1
G	📋	Scan				TOT Rekey Delay (sec)	0 ≑		
9		Roam Capacity Plus				Allow Interruption			~

- 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 <u>4.3.4, RX Group Lists</u>.

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.

🍰 MOTOTRBO DDMS			_	$\times$
File Action Help				
ی 🔬 🔜 🕵 🐼 🔘 🔘 🛇				
Service	Watcher Settings			
🗄 🐺 Interfaces	PortWatcher	3000		
ARS Settings	WatcherTO	14400		
	NotifyGroup	0		
Authentication Server Settings	NotifyRate	5		
🛄 🥤 Logging				
	PortWatcher			
	Port listening for Watcher S	Subscribe requests.		
	Range: 1000 - 65535			
Settings for Watcher interface				

Settings for Watcher interface

#### PortWatcher

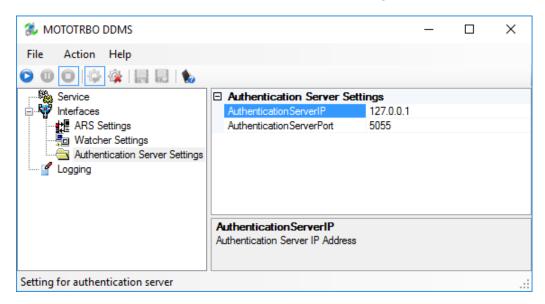
This is the port number for listening TRBOnet Server requests.

Note: This value will be used when configuring DDMS parameters in section <u>5.1.1.2</u>, DDMS Service, **Service port**.

DDMS service			
DDMS Service			
🗹 Use DDMS service			
Local port:	0	÷	
Service IP Address:	127.0.0.1	•	
Service port:	3000	÷	
Authentication Port:	5055	+	



• 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 <u>5.1.1.2, DDMS Service</u>,

Service IP Address and Authentication Port, respectively.

DDMS service			
Use DDMS service			
Local port:	0	<b>‡</b>	
Service IP Address:	127.0.0.1	•	
Service port:	3000	<b>+</b>	
Authentication Port:	5055	+	

• Once you have finished configuring the desired DDMS parameters, click the **Start** button on the toolbar.

🌲 MOTOTRBO DDMS	
File Action Help	
00 🖗 🎄 🔚 🔜 🐁	
Service	□ Service
E Start Interfaces	Version
🌱 Logging	ServiceName
	DisplayName
	Description
	ServiceMode



#### 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.

MOTOTRBO Network Interface Service Configuration Utility – – ×     Configuration View Edit Service Help     Image: Configuration Image: Configuration Image: Configuration Image: Configuration     Image: Configuration Image: Configuration Image: Configuration Image: Configuration   Image: Convertional Image: Convertional Image: Convertional Image: Convertional   Image: Convertional Image: Convertional Image: Convertional Image:					
Image: Second System Operation Mode     Image: Second System Oper	MOTOTRBO Network Interface Serv	vice Configuration Utility		-	×
ERDM       General         Image: Security       System Operation Mode         Conventional       Image: System Operation Mode         Image: Capacity Plus       Image: System Operation Mode<	Configuration View Edit Servi	/ice Help			
General Genera	1				
Security     System Operation Mode Conventional     Group List     Group List     Conventional     (MNIS Application 10) 64250     (Capacity Plus     (MNIS IP Address) 172.168.10.1     Tunnel IP Address) 172.168.10.2     Subnet Mask 255.255.0					^
Advanced  Tunnel Network  MNIS IP Address 172.168.10.1  Tunnel IP Address 172.168.10.2  Subnet Mask 255.255.0	- Orr Security - Group List - Group Conventional - Group Capacity Plus				
Tunnel IP Address 172.168.10.2 Subnet Mask 255.255.255.0			Tunnel Network		
· · · · · · · · · · · · · · · · · · ·					
			Subnet Mask 255.255.255.0		

#### 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 **172.168.10.1** 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 <u>5.1.1.3</u>, <u>MNIS Data Service</u>, **IP Address**).



• In the left pane, select **Conventional > Domain 1**.

MOTOTRBO Network Interface Serv	ice Configuration Utilit	ty *			-	×
Configuration View Edit Serv	rice Help					
1 1						
ERDM						^
- IIII General - IIII General - IIII Group List Conventional 		Master IP Address Master UDP Port	10.10.102.123       50011			
- 🛟 Capacity Plus E 🌾 Linked Capacity Plus E 🚔 Advanced		MNIS LE port	<ul> <li>Automatically Assigned</li> <li>Manually Assigned</li> </ul>	None	* *	
		Authentication Key	Ø			
		SFR Mode				
		Rep	eater Slot 1			
		Enable				
		Revert Channel				
		Security Setting	None $\lor$			
		Security Alias	$\sim$			
		Group List	None 🗸			
		Rep	eater Slot 2			
		Enable				
		Revert Channel				~

#### 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.



- MOTOTRBO Network Interface Service Configuration Utility \*  $\times$ Configuration View Edit Service Help ۵  $\triangleright$ ? 🖃 🛑 IPSC General Grant Security Data Call Confirmed 🗹 🗄 💼 Group List 🗄 💼 Conventional Compressed UDP Data Header None  $\sim$ Capacity Plus Battery Saver Preamble 🛛 🗄 ζ 🙆 Linked Capacity Plus ė. 🗃 l Individual Data to Registered Site Network Forwarding Rules Selective Forwarding Application Override Rules TX Preamble Duration (ms) 120 ÷ Conventional Channel Access Normal  $\sim$ MNIS LE ID O Use MNIS ID Manually Assigned 200 +
- 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**.

MOTOTRBO Network Interface Service Configuration Utility *	– 🗆 X
Configuration View Edit Service Help	
1	
	Network
- 🛲 General - Şərər Security CAI Net	twork 12 🔷
🖶 📻 Group List	etwork 225 🜩
- 🖓 🖗 List1 CAI Group Ne	
🛄 📲 📃 Domain 1	Services
Capacity Plus ARS UD ARS UD ARS UD	P Port 4005
🖻 🧰 Advanced 🛛 🛛 TMS UD	P Port 4007
- 중 Network - ☞ Forwarding Rulet Telemetry UD	IP Port 4008 🜩
Application Oven	0P Port 4001 🜩
Battery Management UD	0P Port 4012 🜩
User Defined UDP	Port 1 Disabled
User Defined UDP	Port 2 Disabled
User Defined UDP	Port 3 Disabled
XCMP E	
XCMP Server UD	P Port 4004
ARS N	Aonitor
ARS Mon	nitor ID None
Device Die	and the billion Consider
	covery and Mobility Service
Server Ac	ddress 127.0.0.1
Watche	er Port 3000 🖨
MN	IIS Control Interface
MNIS Control Interface TCF	P Port 5000 \$
< >	· · · · · · · · · · · · · · · · · · ·

#### **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 <u>5.1.1.3</u>, <u>MNIS Data Service</u>, **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**.

♠ MOTOTRBO Network Interface Service Configuration Utility*								
Configuration View Edit Service	Help							
New Open	0							
Delete	General							
Set as Active Configuration Select Active Configuration	System Operation Mode Conventional ~							
Save Save as	MNIS Application ID 64250							
Close								
Exit	Tunnel Network							
H. Auvanceu	MNIS IP Address 172.168.10.1							
	Tunnel IP Address 172.168.10.2							
	Subnet Mask 255.255.255.0							
				:				

• 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 Connecting a Repeater

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

Note: Only the Master repeater needs to be connected to TRBOnet Server.

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

Configuration	R	epeater #1		Version: 5.3.0.1703
<ul> <li>♂ Service</li> <li>◇ Network</li> <li>♦ Redundancy</li> <li>■ Database</li> <li>♀ Reports</li> </ul>	^	<b>System Name:</b> TRBOnet Peer ID: TRBOnet Radio ID:	Repeater #1 100 64250	•
Service Management Advanced settings Ceocoding Servers Radio Networks TRBOnet Cloud Digital Systems Services Repeater #1 Advanced settings		TRBOnet Local Port: Master Repeater Conn Master IP Address: Master UDP Port: Authentication Key: System Type: System Identifier:	50000 ection Info: 10.10.102.123 50011 99999 Extended Range Dire Department 1	Test
Analog Control Stations		Use NAI Voice Use NAI Data (MNIS an Use RCM for control rac	· · · · · · · · · · · · · · · · · · ·	OK Cancel

#### • 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, which is a gateway for voice and data. The Radio ID must be unique in the radio system. 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 <u>4.1.3</u>.

#### 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 <u>4.1.3</u>.

#### • 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 <u>4.1.3</u>.

#### • 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 entires are externatively selected

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**.

Configuration		Advanced settings		Version: 5.3.0.1703		
💣 Service	^					
🕤 Network		Voice Call Hang Time (	ms):			
🛱 Redundancy		Group Call:	3000	\$	]	
Database		Private Call:	4000		1	
😪 Reports		Private Call;	4000	•		
Service Management		Emergency Call:	4000	÷		
💥 Advanced settings			_		-	
Geocoding Servers		TX Preamble:	120	\$		
Radio Networks		TX Timeout:	60	÷	seconds	
Digital Systems		Phone System:	Motor	ola Phone System		-
Services		Allow CSBK Data				
IPSC						
🔀 Advanced settings						
🔒 Privacy						
III Slot SF						
Analog Control Stations						
Remote Agents	۷.					
Set Defaults				Apply	OK	Cancel

• 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**.

Configuration	DDMS service		Version: 5.3.0.1703
Service     Network	🗹 Use DDMS service		
	Local port:	0 ‡	
Reports	Service IP Address:	127.0.0.1 🔻	Test
Service Management	Service port:	3000 🗘	
Advanced settings	Authentication Port:	5055 🗘	
Radio Networks	Redundant services:		
TRBOnet Cloud	Service IP A	ddress Service port	Local port
Digital Systems	1 🗹 10.10.101.2	207 3000	0
🗘 Services			
IPSC			
X Advanced setti			
Privacy			
DDMS service			
Advanced :			
MNIS data serv			
Slot SF V	Add D	elete	Test 🔺 🔻
Set Defaults		Apply	OK Cancel

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**.



Configuration	MNIS data service		Version: 5.3.0.1703
Setwork ∧	🗹 Use Data Gateway		
Database Reports Service Management	☑ Service is on a local IP Address: ☑ Control port:	192.168.10.2 <b>•</b>	Test
Advanced settings	MNIS Service: Redundant services:		- ही ?
TRBOnet Cloud	Add D	Control port	Local port
< >		LIC UL	Test A
Set Defaults		Apply	OK Cancel

• 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**.

Configuration	Slot SF	Version: 5.3.0.1703
Database     Reports     Service Management     Advanced settings     Geocoding Servers     Radio Networks     TRBOnet Cloud     Digital Systems     Services     Repeater #1     Advanced settings     Privacy     DDMS service     MNIS data service     X dvanced setting     Sot SF	Slot SF Name: Messaging Delay: Use the slot for RX Data Use Privacy Privacy Key: Allow TX interrupt	Normal Severt or Data Revert)
Set Defaults		Apply OK Cancel

• 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 TX interrupt

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 Connecting a Control Station

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

- In the **Digital Systems** pane, click **Add**. Or, in the **Configuration** pane, right-click **Digital Systems**.
- In the drop-down menu, click Add Control Station.

Configuration	Control Station #1	Version: 5.3.0.1703
<ul> <li>Service</li> <li>Network</li> <li>Redundancy</li> <li>Database</li> <li>Reports</li> <li>Service Management</li> <li>Advanced settings</li> <li>Geocoding Servers</li> <li>Radio Networks</li> <li>TRBOnet Cloud</li> <li>Digital Systems</li> <li>Services</li> <li>Control Station #1</li> <li>Advanced settings</li> </ul>	<ul> <li>Name:</li> <li>Radio ID:</li> <li>IP Address:</li> <li>Mode:</li> <li>System Identifier:</li> </ul>	Version: 5.3.0.1703
Analog Control Stations Remote Agents Friendly Servers Telephony	•	
Set Defaults		Apply OK Cancel

- 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.

 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**.



Configuration	Advanced settings
Configuration  Configuration  Service  Network  Redundancy  Database  Reports  Service Management  Advanced settings  Control Station #1  Advanced settings  Analog Control Stations  Remote Agents  Friendly Servers  Control Stations  Remote Agents  Friendly Servers  Networks  Control Stations  Remote Agents  Control Stations  Remote Agents  Control Stations  Control Stat	Advanced settings  Advanced settings  Automatically reset alarm mode  Automatically handle call alert  Emergency Call/Alarm indication  Use front microphone  Always transmit when the PTT is pressed ("Impolite" channel access)  Use serial port for PTT key up Serial port:  TX Timeout: 60 \$seconds \$signaling System: None Configure Allow CSBK Data
Email Set Defaults	Apply OK Cancel

• 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.

#### Signaling system

From the drop-down list, select the signaling system.



- **MDC 1200** signaling is a Motorola data system using audio frequency shift keying (ASFK) using a 1,200 baud data rate. A general option is to enable or disable an acknowledgement (ACK) data packet.
- **SELECT 5** (5 Tone Signaling System). In the 5 Tone Signaling Systems, each radio has a unique numeric identity (for example, 12345).
- Allow CSBK Data
  - Select this option so that GPS data is sent in a single CSBK.

#### 5.1.3 Enabling Telephony

TRBOnet Server has its own built-in SIP server to support VoIP communications between the radios as well as other SIP-compliant clients.

- In the Configuration pane, select Telephony
- In the **Telephony** pane, select **Use Telephony**.

Configuration		Telephony	
Configuration Slot #1 Slot #2 Slot #2 Control Station #1 TBOnet Swift Agent#1 TBOnet Swift Agent#1 Controller #1 Selex #1 Analog Control Stations Remote Agents Friendly Servers Telephony Advanced settings		Telephony          Image: SIP Server         Image: SIP Server	
Thernal PBX Server			
↓ Data Sources			
Nodbus TCP			
Email			
SMS		Add Delete Test	
📮 License	Υ.		
Set Defaults		Apply OK Cancel	]



#### 5.1.3.1 Internal PBX Server

- Make sure the Internal PBX Server option is selected in the Telephony pane.
- In the **Configuration** pane, select **Internal PBX Server**.

Configuration		Internal PBX Server
Slot #1	^	✓ Use Internal PBX Server       Local IP:       10.10.100.99       ▼ Port:       5060
TRBOnet Swift Agent#1		Dispatch Center
		SIP ID: 1234
Selex #1		SIP User: 1234
🔂 Remote Agents		
Friendly Servers		
Telephony		
Advanced settings		
Internal PBX Server		
Advanced settings		
🜵 Data Sources		
🍀 Modbus TCP		
🔀 Email		
SMS		
📮 License	۷.	
Set Defaults		Apply OK Cancel

- In the Internal PBX Server pane, specify the following parameters:
  - Local IP

Enter the IP address of the PC with TRBOnet Server.

Port

Enter the local UDP port number for the SIP service (5060, by default).

#### **Dispatch Center**

SIP ID

Enter the SIP ID that will be used by the Dispatch Center.

SIP user

Enter the SIP user name that will be used by the Dispatch Center.



#### 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.

File View Map Tools Help			
Administration	Radio Groups		9 😔 🔁
Disabled Radios     Dispatcher Groups     Dispatchers     Dispatchers     Email Groups     SMS Groups     Dispatchers     Users	✓ Intercom      ●) ●           ✓ Group 10      ●) ●           Private Call      ●) ●	<ul> <li>③ 1: Line free</li> <li>④ (€)</li> <li>④ (€)</li> <li>Ø</li> </ul>	All Call () (€ () ✓ Group 30 () (€ ()
Logical Groups	□         Add         □         Edit         □         Pelete         □         Grou           Name         △         Radio ID         Cleaners         30         Firemen         20	uping Y Auto Filter 💮 Default Settin MDC / Sel-5 (Hex) 5 0	Descriprion Cleaning group
Voice Dispatch	Police 10	0	
Location Tracking  Location Tracking  Job Ticketing  Route Management  RFID Tracker  Text Messages	3		
Voice Recording			
Event Viewer			
Radio Allocation	1		
Administration	H4 44 4 Record 1 of 3 + ++ ++ 4		Þ
🐻 127.0.0.1 🛞 🅵 🧟 Administrator 📑 Li	censed to: demo Demo License		🕑 Active 🗸

- 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 <u>4.3.4, RX</u> <u>Group Lists</u>).



#### 5.2.2 Registering Radios

Go to Administration (1), Radios (2) to add/edit/delete Radios in the system.

File View Map Tools Help								
Administration	Radios							👲 🐠 🛂
Dispatcher Groups     Dispatchers     Dispatchers     Email Groups     SMS Groups     Users	1: Line free Private Call Group 20		0	✓ Intercom Group 10 All Call	•)) <b>4</b> € •)) <b>4</b> €	0		
Logical Groups	Registered			1.1				
Radios 4	🖶 Add Group	🛃 Add MOTOT			AVE Radio 📑	Add TRBOne	t Mobile 📑	Add Range
< >	-	Туре	Radio I		SIP ID		Logical Gr	Description
	125	MOTOTRBO Radio	25	0	125	11; Firemen	Cleaning,	
Voice Dispatch	13	MOTOTRBO Radio		0		All	-	
	<ul> <li>235</li> <li>235</li> </ul>	MOTOTRBO Radio		0	235	Firemen; P	Cleaning	
Location Tracking	3333	TRBOnet Mobile	3333	0	3333	11; 22		
8-0 · · ·	<ul> <li>★ 555</li> <li>★ Radio 300</li> </ul>	MOTOTRBO Radio MOTOTRBO Radio		0		All		
🚰 Job Ticketing	Radio 300	MUTUTRBU Radio	300	<b>Y</b>		All		
💓 Route Management				3				
RFID Tracker				J				
C Text Messages								
Uoice Recording								
Event Viewer								
😥 Radio Allocation	_1							
Administration	HI II A Record	1of6 🕨 🗰 🙌	(					)
🔂 127.0.0.1 🛞 🕵 🙎 Administrator 📑	Licensed to: dem	0						Active

- 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.



#### 5.2.3 Registering SIP extensions

This section describes how to add SIP extensions to TRBOnet Dispatch Console.

- Go to Administration (1), Telephony (2).
- In the Telephone pane, click the Extensions tab (3), and then Add > SIP Phone (4).

File View Map Tools Help	
Administration	Telephony 🔮 🚸 😉
Server	I: Line free       Intercom       Intercom         Configure Calls       Extensions       Redirect Calls       Aliases       Profiles         Add       Image: Construct the second seco
System Bridging     Z	SIP Phone         SIP User         Caption           TRBOnet Mobile Client         1234         Internal PBX Server
Voice Dispatch	Radio         125         125         125           Radio         235         235         235
Location Tracking	
Route Management	
Text Messages	1
Administration	
Administration	HI 4I 4 Record 1 of 3 + H HI 4
🔂 127.0.0.1 🛞 🤶 Administrator 📑 Li	censed to: demo Demo License 🥑 Active 🗸

• In the dialog box that appears, specify the **SIP ID** and **SIP User** of the SIP user you are adding.