





TRBOnet Enterprise/PLUS IP Site Connect **Deployment Guide**

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This document was last revised on April 27, 2021.



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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 IP Site Connect (IPSC) 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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EMEA	+44 203 608 0598	info@trbonet.com — general and commercial inquiries
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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 control stations (also known as control radios or donor radios). Two control stations are required to transmit and receive voice and data to/from a repeater, that is, one control station per time slot.

2.4 Wide Area Channels

A wide area channel (**WAC**, Slot 1 or 2, or both) is a repeater's channel configured so that a call on the wide area channel is repeated to all the sites within an IPSC system.

2.5 Local Channels

A local channel (**LC**, also known as Local Slot) is a repeater's channel that is used only on the local site, that is, voice and data are transmitted only at the local site and not to any other site in the IPSC system. Note that if a slot on one repeater is used as a local slot, this slot will also be used as a local slot on the other repeaters within an IPSC system.



3 System Topology

An IPSC system is a digital conventional two-way MOTOTRBO system that provides two wide-area channels per repeater to increase your communications RF coverage area. It is possible to connect up to 15 repeaters (each geographical location of a repeater is called a "site") into one system using an IP connection, which allows increasing the coverage area for voice and data transmissions. The main objective of an IPSC system is to provide a much more reliable connection between radio units and control centers regardless of the geographical distance between them.

You can configure the IPSC system in a number of different topologies depending on your needs and requirements.

3.1 Wireless Connection

This configuration is recommended when there is no IP connection between the TRBOnet Server and the repeater. Two control stations will be required to transmit and receive voice and data, that is, one control station per time slot. Depending on whether you are using local slots on your repeaters, the configurations can be as follows.

3.1.1 Wireless Connection (WAC)

Below is an example of the IPSC system configuration with multiple repeaters and no local slots (wide-area only).



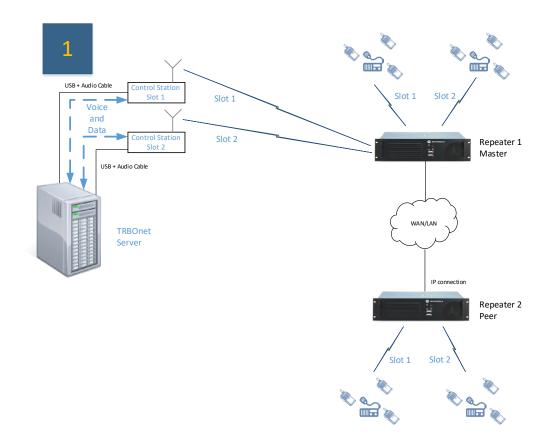


Figure 1: Wireless Connection (WAC)

Below is a table with the features supported in this configuration.

Table 1: Supported features for Wireless Connection (WAC)

Feature	Availability
Voice Dispatch	Yes
Voice Recording	Yes
Data	Yes



3.1.2 Wireless Connection (Local Slots)

Below is an example of the IPSC system configuration with multiple repeaters, where Slot 1 is a WAC and Slot 2 is a local slot to all repeater sites.

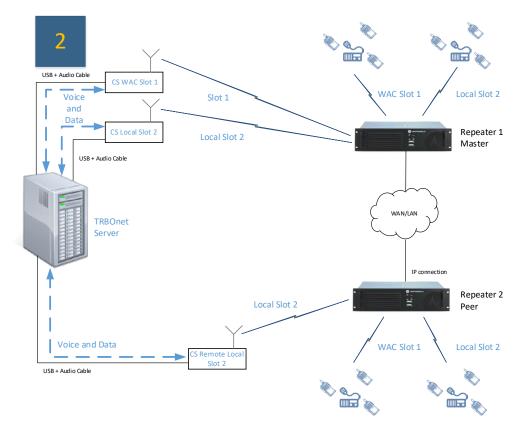


Figure 2: Wireless Connection (Local Slots)

Below is a table with the features supported in this configuration.

Table 2: Supported	features for Wireless	s Connection (Local Slots)

Feature	Availability
Voice Dispatch	Yes
Voice Recording	Yes
Data	Yes



3.2 IP Connection

In these configurations, TRBOnet Server has an IP connection to a master repeater. Depending on whether you are using local slots on your repeaters, the configurations can be as follows.

3.2.1 IP Connection (WAC)

Below is an example of the IPSC system configuration with two repeaters and no local slots (wide-area only).

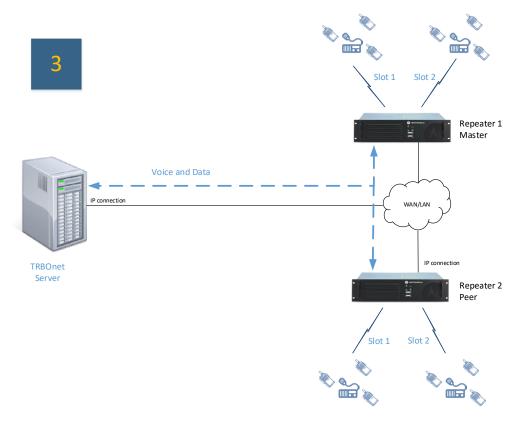


Figure 3: IP Connection (WAC)

Below is a table with the features supported in this configuration.

Table 3: Supported features for IP Connection (WAC)

Feature	Availability
Voice Dispatch	Yes
Voice Recording	Yes
Data	Yes



3.2.2 IP Connection (Local Slots)

Below is an example of the IPSC system configuration with two repeaters and local slots (in this example, Slot 2 is used as a local slot on both repeaters).

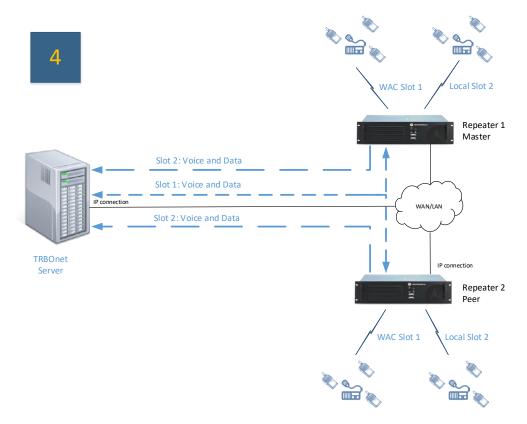


Figure 4: IP Connection (Local Slots)

Below is a table with the features supported in this configuration.

Feature	Availability
Voice Dispatch	WAC only *
Voice Recording	Yes
Data	WAC - yes; LC - RX only

* To use the Voice Dispatch feature on **local slots**, TRBOnet PLUS must be used with the Network Application Interface Voice protocol enabled on the repeaters (see Figure 7).



3.2.3 IP Connection with Control Stations (Local Slots)

In this configuration, two Control Stations are used to transmit/receive voice and data to/from the local slots.

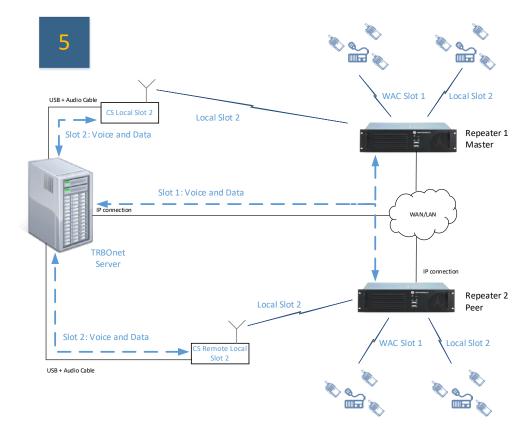


Figure 5: IP Connection with Control Stations (Local Slots)

Below is a table with the features supported in this configuration.

Table 5: Supported features for IP Connection with Control Stations (Local Slots)

Feature	Availability
Voice Dispatch	Yes
Voice Recording	Yes
Data	Yes



3.3 NAI IP Connection

You can use NAI Voice and NAI Data protocols to avoid using control stations to transmit/receive voice and data to/from the local slots. Note that TRBOnet PLUS is required to provide the Voice Dispatch feature in the systems with local slots.

3.3.1 NAI IP Connection (WAC)

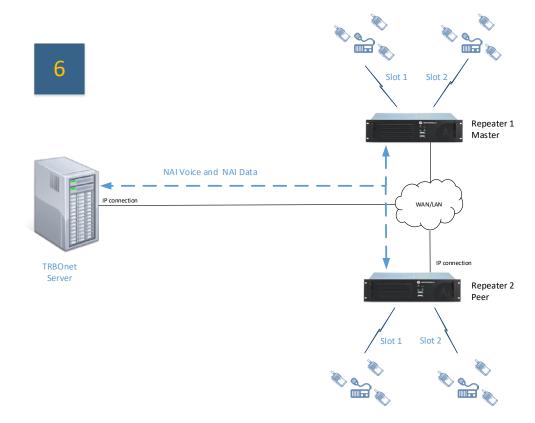


Figure 6: NAI IP Connection (WAC)

Below is a table with the features supported in this configuration.

Table 6: Supported features for NAI IP Connection (WAC)

Feature	Availability
Voice Dispatch	Yes
Voice Recording	Yes
Data	Yes



3.3.2 NAI IP Connection (Local Slots)

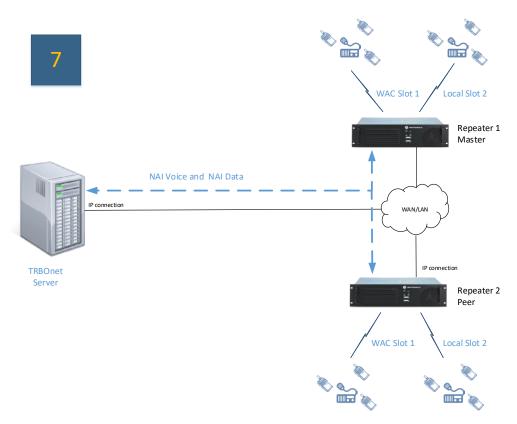


Figure 7: NAI IP Connection (Local Slots)

Below is a table with the features supported in this configuration.

Table 7: Supported features for NAI IP Connection (Local Slots)

Feature	Availability
Voice Dispatch	For LCs, requires using TRBOnet PLUS
Voice Recording	Yes
Data	Yes



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.

4.1 Configuring a Repeater

This section describes how to configure a repeater to be used in an IPSC 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**.

ategories A	General CWID	Voting Microphone	
Configuration* Device Information	(a) General		
General General Settings	Radio Alias	IPSC Master]
Accessories	Radio ID	1002	
Security	SIT (ms)	6000	
Network	Group Call Hang Time (ms)	3000	
Link Establishment	Private Call Hang Time (ms)	4000	
Sites	Emergency Call Hang Time (ms)	4000	
Talkgroups Talkgroups Channel Assignment	Call Hang Time (sec)	3	
	Repeat Gain (dB)	0.0	
	Antenna Relay Delay Timer (ms)	100	
	Digital/Band 1 TX Low Power (W)	27.5	
	Digital/Band 1 TX High Power (W)	44.0	
	Band 1 DC TX Power (W)	27.5	
	Disable All LEDs		
	Backup Repeater Connected		
	Codeplug Password	^	

• 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**.

t Categories	General Radio Network Network Setting IP Repeater Programming
 Configuration* Device Information 	(<a>) General
 General General Settings 	Radio IP 192.168.40.1
Accessories	Accessory IP 192.168.40.2
Network	Radio Network
Link Establishment	CAI Group Network 225
Sites	
 Zone/Channel Assignment 	Network Setting
	MOTOTRBO & MTR3000 Repeater
	Ethermet IP 10.10.102.131 Gateway IP 10.10.0.1
	Gateway Netmask 255.255.0.0
	(→) IP Repeater Programming

- 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**.

DR3000 🕨 Link Establishment*		×
Set Categories 4 Image: Configuration* Image: Configuration Image: Configuration Image: Configuration	Network Setting IP Site Connect Capacity Plus	î
	Link Type Master Authentication Key 99999 Master IP 10.10.102.131	
 Network Link Establishment Sites 	Master UDP Port 50011	I
☐ Talkgroups ▶ ☐ Zone/Channel Assignment	IP Site Connect Beacon Duration (ms) 4320	-
4 Validation Results(1*) Warning Messages Search Result	Beacon Interval (sec) 60	•
vandador nesaris (17) maniling messages (Search Resour	Serial Number: CYPHEM	.2615

- 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 IPSC) you have added and click the pencil button.

Categories 📮		Ge	neral Enhanced	GNSS RX/TX	
 Configuration* 					
Device Information	General				
General General Zone/Channel Assignment			Channel Type	Digital	
🗋 Zone 🏟		c	hannel Name	SC	
		(Color Code 1		
	(Network Application Int	erface Phone		
		System Cor	ntroller Mode	lo	
	(IP Site Conne	ect (Repeater) SI	ot 1 & Slot 2	
		Messagir	ng Delay (ms) 6)	
		Repeater RSSI Thr	eshold (dBm) -1	00	A V
			IF Filter Type W	ïde	•
			BSI Mode	Inalog	
	Enhanced GNS	5			
	<u> </u>	Enable	Windo	w Size Periodic Reservati	
	Slot	:1	8	75	No
	Slot	2	8	75	No
	(→ RX/TX				
	RX			TX	
	RX	146.420000	Offset (N 0.000000 Copy		requency 167.420000 MHz)
	RX		0.000000 Copy		requent 167.420000 MHz) cy (MHz) Default
	RX (MHz)		0.000000 Copy	(Hz) Ref Frequer	MHz)
	RX (MHz)		0.000000 Copy	(Hz) Ref Frequer Po	MHz) hcy (MHz) Default

- In the right pane, specify the following channel-related parameters.
 - Color Code

Specify the color code for the repeater. Note that the color codes on the radios must match the color code of the repeater.

Network Application Interface Phone

Select this option if the **Use NAI Voice** check box is selected in TRBOnet Server (**Radio Systems > Repeater**). See section <u>5.1.1, Adding</u> <u>a Master Repeater</u>. This feature is used in the schemes depicted in Figures 6-7.

IP Site Connect

From the drop-down-list, select **Slot 1 & Slot 2** if there are no local channels on the repeater (see figures 1, 3, 6 in section <u>3, System</u> <u>Topology</u>). If you are going to use a local channel on the repeater, select **Slot 1** or **Slot 2** that will be used as a wide area channel, whereas the remaining slot will be used as a local channel (see figures 2, 4, 5, 7 in section <u>3, System Topology</u>).

- In the **RX Frequency** box, enter the radio frequency the repeater will receive on.
- In the **TX Frequency** box, enter the radio frequency the repeater will transmit on.



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.

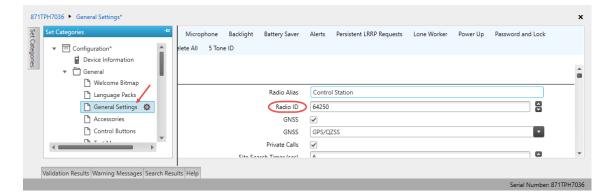
Configuration*		Zone	Name Zone1		
Device Information General Zone/Channel Assignment	Zone Items	⊕ 🔺 ▼			
🗋 Zone 🏟	Position	Channel Type	Channel Name	Color Code	Network Application
	▶ n.※	1 Digital	IPSC	1	v
	C ⁽¹⁾	2 Capacity Plus Void	ce CaPlus_V	1	
		_			
	2 items found (1 c	urrently selected).			•

• 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 IPSC system. Control stations are used in the schemes depicted in Figures 1, 2, 5.

- 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 <u>5.1.2</u>, <u>Adding a Control Station</u>.

Control Station #1	
Name:	Control Station #1
Radio ID:	64250 🗘
IP Address:	192.168.98.2 🔻 🕫
Mode:	IP Site Connect
System Identifier:	Department 1

4.2.2 Network

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

871	TPH7036 • Network*			×
Set (Set Categories 😕	Services Control Station IP Site Connect	Bluetooth Bluetooth Serial Port Profile Data Routing USB HID Data Routing	
Set Categories	 Configuration* Device Information General Welcome Bitmap Language Packs General Settings Accessories 	Radio IP Accessory IP USB DNS-SD Interval	192.168.98.1 192.168.98.2 90 sec	-
	Control Buttons Text Messages Telemetry	CAI Network CAI Group Network	12 225 C	-
	Menu Security Network	Protected Mode Control Station Max TX PDU Size (bytes) Telemetry UDP Port	□ (750 (4008 (100)	
	Validation Results Warning Messages Search Res	Forward to PC	Via USB	-

• 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 <u>5.1.2, Adding a Control</u> <u>Station</u>.



Control Station #1	
Name:	Control Station #1
Radio ID:	64250
IP Address:	192.168.98.2 🔻 🕫
Mode:	IP Site Connect
System Identifier:	Department 1

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.

Set Categories	View by:	By Name By Typ	pe 🗌 Name Only	
 Configuration* Device Information 	1 🖉 🤄	$\Theta \odot$		
 General 	Contact	Name	Call Type	Call ID
Job Tickets	Firemen	ாஃல்	Digital Calls-Group Call	20
Systems Encoder	Police	лад	Digital Calls-Group Call	10
Decoder				
Contacts Contacts				
Police				
Firemen				
RX Group Lists	-			
•	•			
alidation Results(4*) Warning Mes	sages Search Results	Help		
				Serial Number: 871TRVF

• 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.



871TPH7036 • Digital RGroup List • List1	1*	×
Set Categories 7	General	
,		•
Validation Results(1*) Warning Messages Sear	rch Results Help	
	Serial Number: 3	871TPH7036

• 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 IPSC1) you have added and click the pencil button.

871TPH7036 → Zone → Zone1* Set Categories		Zone I Voice Announcemer			
■ General	Zone Items	Channel Name	Voice Announcement File	Dual Capacity Direct Mode	Timing Leader Preferen
Decoder Contacts			None	Duar capacity Direct mode	Eligible
RX Group Lists		IPSC 2	None		Eligible
	2 items found (1 currently selected).				•
< >					
Validation Results(1*) Warning Messages Search Res	sults Help				
reading wessages bearen wes	and lines				Serial Number: 871TPE



871TPH7036 Zone Zone Zone1	ns 🕨 IPSC 1*	x
Set Categories Review R	Gener	a) RX/TX
▼	General	
 Language Packs General Settings Accessories 	Channel Name Voice Announcement File Dual Capacity Direct Mode	None
Control Buttons	Timing Leader Preference Scan/Roam List	Eligible RoamList/List1
Telemetry	Auto Scan	No
Menu Menu Security	Color Code	
Network	Extended Range Direct Mode	Disabled
 Voice Announcement Job Tickets 	Outbound Color Code	1
Systems Encoder	Repeater/Time Slot	Sys1
Decoder	Phone System ARS	Sys1
Contacts RX Group Lists	Enhanced GNSS	
 Zone/Channel Assignment Zone 	Window Size Privacy	
😑 Zone1 🔅	Privacy Alias	Privacy Key1
Channel Pool	Fixed Privacy Key Decryption	
Capacity Plus Lists	Ignore Rx Clear Voice/Packet Data RAS Alias	None
	Option Board	
	Option Board Trunking	
	Lone Worker	
•	Allow Talkaround IP Site Connect	
Validation Results(1*) Warning Messages Sear	th Results Help	Serial Number: 871TPH7036

• In the right pane, specify the following parameters:

Color Code

Enter the color code for the radio. Note that the color codes on the radios must match the color code of the repeater.

Repeater/Time Slot

Select the time slot of the repeater the radio operates on.

Privacy

Select this option to allow privacy on the channel.

Note: The **Privacy** option is available if the Basic or Enhanced Privacy Type has been selected in the **General** >**Security** section.

Privacy Alias

From the drop-down list, select the Key Alias.

Note: The **Privacy Alias** option is available if the Enhanced Privacy Type has been selected in the **Security** section. The same Key Alias must be used on all system nodes (repeaters and radios).

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.



tegories [#]		General RX/TX
 Configuration* I Device Information General Job Tickets Systems Decoder Contacts Contacts Contacts Concenchannel Assignment ✓ Zone Cannel Pool Scan Lists Capacity Plus Lists 	RX	TX Offset (MH2) Copy Copy Ref Frequency (MH2) Cotact Name Police Emergency System DigitalEmergen VDX No Power Level Low TOT (Rely Dely (se) O TOT Reley De

- In the **RX Frequency** box, specify the radio frequency the radio will receive on.
- In the **TX Frequency** box, specify the radio frequency the radio will transmit on.
 - Note: The RX and TX frequencies of the radio must be the opposite to the RX and TX frequencies of the repeater the radio operates on. In other words, the RX frequency of the repeater must be the same as the TX frequency of the radio; the TX frequency of the repeater must be the same as the RX frequency of the radio.

RX Group List

Select the Group list you have specified in section <u>4.2.4, 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 <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 IPSC system.

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

871TPH7036 General Settings*		×
Set Categories 7	General CWID Audio Profile Microphone Backlight Battery Saver Alerts	
▼ □ Configuration*	Persistent LRRP Requests Lone Worker Power Up Password and Lock Front Programming Password	
Device Information	Delete All 5 Tone ID	
▼ 🗍 General		
Welcome Bitmap	General	â
	Radio Alias Radio 235	-
🕒 General Setting 🖗 🏠		
Accessories	Radio ID 235	
Text Messages	GNSS	
	GNSS GPS/QZSS	
	Private Calls	-
Validation Results Warning Messages Search Results	Help	
	Serial Number: 871TPH	7036

4.3.1 General Settings

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

GNSS

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

871TPH7036 Network*			×
Set Categories 4	General Radio Network Services	Control Station IP Site Connect	Bluetooth
▼	Bluetooth Serial Port Profile Data Routing	USB HID Data Routing	
Device Information			
▼ ☐ General	General		Â
🗋 Welcome Bitmap	Radio IP	192.168.10.1	
Language Packs			
General Settings	Accessory IP	192.168.10.2	
	USB DNS-SD Interval	90 sec	_
Control Buttons	Radio Network		
	CAI Network	12	
Telemetry			
Security	CAI Group Network	225	
Network	Protected Mode Control Station		_
Voice Announcement	Max TX PDU Size (bytes)	750	•
Job Tickets	Telemetry UDP Port	4008	
Systems	Forward to PC	Disabled	
Decoder	Services	(
Contacts	ARS Radio ID	64250	
RX Group Lists	ARS IP	13.0.250.250	
Zone/Channel Assignment	ARS UDP Port	4005	
▼ 170ne ▼	TMS Radio ID	64250	
Validation Results Warning Messages Search Results	Help		
The stages of the states in			

• In 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

Enter the Radio ID of the ARS server.

TMS Radio ID

Enter 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 <u>5.1.1</u>, <u>Adding a</u> <u>Master Repeater</u>), or **Radio ID** in the Control Station settings if the control station is connected to TRBOnet Server via USB (see section <u>5.1.2</u>, <u>Adding a Control</u> <u>Station</u>), or **MNIS Application ID**, if MNIS is enabled (see section <u>4.5</u>, <u>Configuring MOTOTRBO MNIS</u>). 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.

Sample_DP4801e Contacts*					×
Set Categories 4	View by: By Name	Ву Ту	pe 🗌 Name Only		
▼	/ 🕀 🖂 😳				
General	Contact Name		Call Type	Call ID	
Job Tickets	Firemen	лав	Digital Calls-Group Call	20	
Systems Encoder	Police	68n	Digital Calls-Group Call	10	
Decoder					
Contacts Contacts Contacts					
Police					
Firemen					
RX Group Lists					
<					
Validation Results(4*) Warning Messages Sear	ch Results Help				
				Serial Number: 871TRV	P888

• 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.

'1TPH7036 ► Digital RGroup List ► List1 et Categories	1* General	
 Configuration* Device Information Configuration 	⊘ General	
Job Tickets Gystems Encoder	Digital Name List1 Available Members	
 Decoder Contacts RX Group List Digital RX Group List List Capacity Plus RX Group Rexibe Capacity Plus R) Cone/Channel Assignment Scan Lists Capacity Plus Lists 	Police Firemen	
Idation Results(1*) Warning Messages Sear	rch Results Help	

- 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 Channels

- 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**.

Note: You'll have to create two digital channels for the repeater's slots 1 and 2.

• In the right pane, select the channel (for example, named IPSC1) you have added and click the pencil button.

871TPH7036 F Zone F Zone1*					
Set Categories Image: Configuration* Image: Configuration* Image: Configuration* Image: Configuration * Image: Configuration* Image: Configuration* Image: Configuration* </td <td>Zone Items</td> <td>Zone N Voice Announcemen</td> <td></td> <td></td> <td></td>	Zone Items	Zone N Voice Announcemen			
		IPSC 1 A	Voice Announcement File Ione	Dual Capacity Direct Mode	Timing Leader Preferen Eligible Eligible
Cone Channel Pool Cane Channel Pool Cane Lists Cane Lists Cane Channel Pool Cane Ch	2 items found (1 currently selected).				þ
- Coperty 708 LSIS					
Validation Results(11) Warning Messages Search	Results Help				
					Serial Number: 871TP



871TPH7036 • Zone • Zone1 • Zone Ite	ems ► IPSC1*	×
Set Categories #	General RX/TX	
 Configuration* Device Information Configuration 	(<a>) General	_Î
Job Tickets	Channel Type Digital	- 1
Systems	Channel Name IPSC1	- 8
Encoder	Voice Announcement File None	- 8
Decoder Contacts	Dual Capacity Direct Mode	- 8
RX Group Lists	Timing Leader Preference Eligible	- 8
▼ ☐ Zone/Channel Assignment	Scan/Roam List RoamList/List1	- 8
🔻 🗋 Zone	Auto Scan No	- 8
🚍 Zone1 🚯	Color Code 1	- 8
Channel Pool	Extended Range Direct Mode Disabled	- 8
Scan Lists	Inbound Color Code 1	
Capacity Plus Lists	Outbound Color Code 1	
	Repeater/Time Slot	
	Phone System Phone_100	
	ARS On System Change	
	Enhanced GNSS	
	Window Size 8	
	Privacy V	
	Privacy Alias Privacy Key1	
	Fixed Privacy Key Decryption	
	Ignore Rx Clear Voice/Packet Data	
	RAS Alias None	
	Option Board 🗸	
	Option Board Trunking	
	Lone Worker	
• • • • • • • • • • • • • • • • • • •	IP Site Connect)	
Validation Results Warning Messages Search	Results Help	
	Serial Number: 8711	PH7036

- In the right pane, specify the following parameters:
 - Scan/Roam List

Select the Roam list you have specified in section <u>4.3.6, Roam Lists</u>.

Color Code

Enter the color code for the radio. Note that the color codes on the radios must match the color code of the repeater.

Repeater/Time Slot

Select one of the repeater time slots.

Phone System

Select the phone system you have specified in section <u>4.3.7, Phone</u> <u>System</u>.

ARS

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

Privacy

Select this option to allow privacy on the channel.

Note: The **Privacy** option is available if the Basic or Enhanced Privacy Type has been selected in the Security section.

Privacy Alias

From the drop-down list, select the Key Alias.



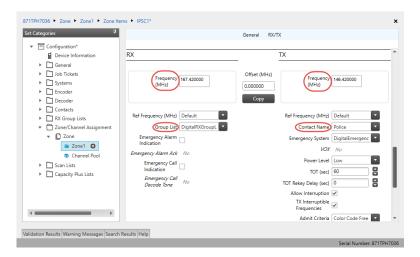
Note: The **Privacy Alias** option is available if the Enhanced Privacy Type has been selected in the Security section. The same Key Alias must be used on all system nodes (repeaters and radios).

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.

IP Site Connect

Select this option to configure the channel as an IP Site Connect channel. If this option is selected, you can add the channel to a Roam List (see section <u>4.3.6, Roam Lists</u>).



- In the **RX Frequency** box, specify the radio frequency the radio will receive on.
- In the **TX Frequency** box, specify the radio frequency the radio will transmit on.
 - Note: The RX and TX frequencies of the radio must be the opposite to the RX and TX frequencies of the repeater. In other words, the RX frequency of the repeater must be the same as the TX frequency of the radio; the TX frequency of the repeater must be the same as the RX frequency of the radio.

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 <u>4.3.3, Contacts</u>.



4.3.6 Roam Lists

Roaming will allow using the radio on different sites of an IPSC system.

- In the **Set Categories** pane, select **Scan Lists > Roam List**.
- In the right pane, click the plus sign button and add the corresponding roam list.

871TPH7036 Roam List List1* Set Categories		General	×
Set categories		General	
 Configuration* 			
Device Information	(General		
General	<u> </u>		
Job Tickets		RoamList Name List1	
Systems			
Encoder	Available	Members	
Decoder	IPSC 2	Selected	
Contacts		IPSC1	
RX Group Lists			
Zone/Channel Assignment			
▼ 🗍 Scan Lists			
□ Scan			
Gan Items			
Roam		Add	
▼ D Roam List		Remove	
List1 🔯			
Capacity Plus Lists			
	L		
	Use Per-Site	RSSI Threshold 🖌	
• • • • • • • • • • • • • • • • • • •	RSSI	Threshold (dBm) -108	
Validation Results Warning Messages Search	esults Help		
		Seri	al Number: 871TPH7036

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

Note: The channels for all the IPSC repeaters must be previously created on the radio.

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

• RSSI Threshold (dBm)

If the RSSI measurement of the site is above the specified RSSI Threshold, then the radio will remain on that site and not roam.



4.3.7 Phone System

- In the Set Categories pane, select Systems > Phone Systems.
- In the right pane, click the plus sign button and add the corresponding phone system.
- In the left pane, select the phone system you have added.

TPH7036 ► Phone Systems ► Phone_100*	General DTMF
 ▼ Configuration* B Device Information C General D Job Tickets Tob Tickets Signaling Systems U Ser Defined 5 Tone S Tone Systems 	System Name Phone_100 Gateway ID 100 Access Code 0 Deaccess Code #
 MDC Systems Quik-Call II Systems Digital Emergency Systems Capacity Plus Emergency Systems Phone_100 Fr.coder Decoder Contacts RX Group Lists Capacity Plus Lists 	VF Pretime (ms) 500 TX Tone Duration (ms) 120 TX Tone Interval (ms) 80 Pause Duration (ms) 4000

- In the right pane, specify the following parameters:
 - Gateway ID

Enter the same ID as **TRBOnet Peer ID** in the Repeater settings of TRBOnet Server.

Repeater #1		
System Name:	Repeater #1	
TRBOnet Peer ID:	100	÷
TRBOnet Radio ID:	64250	*
TRBOnet Local Port:	50000	* *
Master Repeater Conn	ection Info:	

Set Access Code to 0 and Deaccess Code to #, respectively

• TX Tone Duration (ms)

Enter the duration of the DTMF tone digits, in milliseconds, for the phone system. It is recommended to set this value to **120**.

TX Tone Interval (ms)

Enter the duration of the intervals between the DTMF tone digits in a transmission sequence, in milliseconds, for the phone system. It is recommended to set this value to **80**.

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



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 schemes using DDMS are depicted in Figures 6-7. 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				
۵ 🚯 🔜 🖓 🌾 🖸 🛛 🛇				
Service	Watcher Settings			
🖃 🙀 Interfaces	PortWatcher	3000		
ARS Settings	WatcherTO	14400		
	NotifyGroup	0		
	NotifyRate	5		
📖 🥤 Logging				
	PortWatcher			
	Port listening for Watcher S	Subscribe requests.		
	Range: 1000 - 65535			
Settings for Watcher interface				.:

PortWatcher

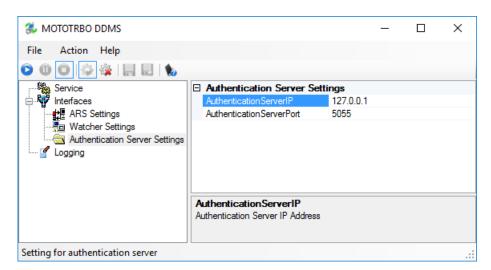
This is the port number for listening TRBOnet Server requests.

Note: This value will be used when configuring DDMS parameters in section <u>5.1.1.3</u>, DDMS Service, **Service port**.

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

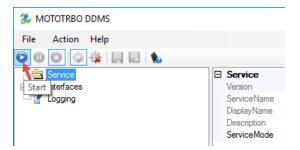
This is the authentication server port number.

Note: These values will be used when configuring DDMS parameters in section <u>5.1.1.3</u>, DDMS Service,

Service IP Address and Authentication Port, respectively.

DDMS service		
Use DDMS service		
Local port:	0 🗘	
Service IP Address:	127.0.0.1 🔹	
Service port:	3000 🗘	
Authentication Port:	5055 🗘	

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

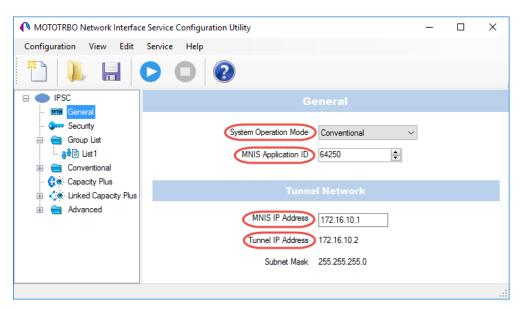




4.5 Configuring MOTOTRBO MNIS

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 6 and Figure 7. 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 <u>5.1.1.4, MNIS Data Service</u>, **IP Address**).



MNIS data service						
🗹 Use Data Gateway						
🗹 Service is on a local host						
IP Address:	>	172.16.10.2		Ŧ	ø	
Control port:		5000		_	\$	

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

MOTOTRBO Network Interfac	Service Configuration Utility *	-		×
Configuration View Edit	Service Help			
	Domain 1			^
Group List G	Master IP Address 10.10.102.131 Master UDP Port 50011			
Linked Capacity Plus	MNIS LE port O Automatically Assigned			
🗄 🔁 Advanced	Manually Assigned None		-	
	Authentication Key Ø			
	Repeater Slot 1			
	Enable			
	Revert Channel			
	Security Setting None ~			
	Security Alias			
	Group List None ~			
	Repeater Slot 2			
	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).

Repeater Slot 1 Enable/Repeater Slot 2 Enable
 Select these options so that MNIS will be able to send or receive data over these slots.



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

MOTOTRBO Network Interface Service	Configuration Utility *	_		×
Configuration View Edit Service	e Help			
	Advanced			
General Security Group List Group List Conventional Capacity Plus Capacity Plus Advanced Security Security Security Security	Data Call Confirmed Compressed UDP Data Header None Battery Saver Preamble Individual Data to Registered Site Selective Forwarding]		
	TX Preamble Duration (ms) 120			
	Conventional Channel Access Normal ~]		
	MNIS LE ID Use MNIS ID Manually Assigned	200	×	
				:

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 Co	nfiguration Utility *		-	×
Configuration View Edit Service	Help			
Untitled General				
- gran Security	CAI Network	12 🜩		
🖮 💼 Group List	CAI Group Network	225 🜩		
🖃 🚞 Conventional	s	ervices		
- Domain 1	ARS UDP Port	4005		
 Control Capacity Plus Advanced 	TMS UDP Port	1000 P		
······································				
Forwarding Rule:	Telemetry UDP Port	4008		
	Location Server UDP Port	4001		
	Battery Management UDP Port	4012		
	User Defined UDP Port 1	Disabled 🚖		
	User Defined UDP Port 2	Disabled 🚖		
	User Defined UDP Port 3	Disabled		
	XCMP Enable XCMP Server UDP Port	4004		
		4004		
	ARS Monitor			
	ARS Monitor ID	None 🌲		
	Device Discover	y and Mobility Service		
	Server Address	127.0.0.1		
	Watcher Port	3000		
	MNIS Co	ontrol Interface		
	MNIS Control Interface TCP 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>5.1.1.4</u>, <u>MNIS Data Service</u>, **Control port**).

MNIS data service		
☑ Use Data Gateway ☑ Service is on a local	host	
IP Address:	172.16.10.2	* ¢
Control port:	5000	‡



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	e Configuration Utility *	_	×
Configuration View Edit Servic	e Help		
New Open	0		
Import Delete	General		
Set as Active Configuration Select Active Configuration	System Operation Mode Conventional ~		
Save Save as	MNIS Application ID 64250		
Close	Tunnel Network		
Exit	MNIS IP Address 172.16.10.1		
	Tunnel IP Address 172.16.10.2		
	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 IP Site Connect 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 Master Repeater

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

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

- 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.

Configuration	Radio Syste	ms		
 ♂ Service ○ Network i Redundancy 	🗸 Enable F	adio Systems		
Database	CAI Netwo	·k:	12	÷
Reports	CAI Group	Network:	225	*
Service Management	Criticity -			Ŧ
X Advanced Settings	Registere	d Radio Systems		
Geocoding Servers	Name		Address	Radio ID
Radio System 🕂 Add M	MOTOTRBO System			
🛒 PTT over Cell 🐈 🛛 Add 🕻	Capacity MAX			
🔂 Remote Ager 🖶 🛛 Add 🛙	DIMETRA Express			
📷 Friendly Serv 🖶 Add 🕻	Control Station			
	IRBOnet Swift Agent			
	Friendly FS-1000 Station			
SMS Notificat	(RC-9000 Controller			
	(RT-9000 Controller			
🖶 Add S	SELEX Repeater			
🖶 Add K	KAIROS Repeater	Delete		Test
Add V	WAVE Controller			
Set De 🕂 Add A	Analog Station		Apply OK	Cancel
🕂 🕹 Add E	ED137 Station			
🚽 Add 2	ZENITEL Station			
🗙 Remo	ove All			
Set De	efaults			



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		Repeater #1					
💣 Service	^						
S Network		System Name:	Repeater #1				
🛱 Redundancy		TRBOnet Peer ID:	100	÷			
Database		TRBOnet Radio ID:	64250	*			
Reports				*			
Service Management		TRBOnet Local Port:	50000	÷			
X Advanced Settings		Master Repeater Con	nection Info:				
Geocoding Servers		Master IP Address:	10.10.102.131	-			
Radio Systems		Master UDP Port:	50000	-	Test		
Services				Ŧ	Test		
Repeater #1		Authentication Key:	99999				
Advanced Settings		System Type:	IP Site Connect			Ŧ	
Privacy		System Identifier:	Department 1				
Slot #1							
		Use NAI Voice					
PTT over Cellular		Use NAI Data (MNIS ar	nd DDMS)				
Remote Agents		Use RCM for control ra	dio activity				
Friendly Servers							
Telephony							
 ↓ Data Sources 							
Email							
·····	×						_
Set Defaults			Apply		ОК	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 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 <u>4.3, Configuring a Subscriber</u> <u>Radio, 4.3.2, Network</u>). 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 **IP Site Connect**.

• 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)

Select these options if the Network Application Interface Voice and Network Application Interface Data features are enabled on the repeaters (see section <u>3.3, NAI IP Connection</u>).

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**.

TRBOnet IP Site Connect — Deployment Guide



Configuration		Advanced Settings				
Service Network	^	Voice Call Hang Time	(ms):			
Redundancy		Group Call:	3000	-		
Database			3000	*		
Reports		Private Call:	4000	÷		
Service Management		Emergency Call:	4000	÷		
X Advanced Settings		70			1	
Geocoding Servers		TX Preamble:	120	÷		
🖶 Radio Systems		TX Timeout:	60	÷	seconds	
Services						
Repeater #1		Phone System:	Motorola Phone S	ystem		*
X Advanced Settings		TX Interrupt Mode:	MSI Proprietary			*
🔒 Privacy						
III Slot #1		Allow CSBK Data				
III Slot #2						
Local Slots						
🖵 PTT over Cellular						
Remote Agents						
Friendly Servers						
Telephony						
↓ Data Sources						
🔀 Email	~					
Cat Dafaulta	1		- Annelia		OK	Consel
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 the system for phone calls:

• Motorola Phone System

This system uses a special call type with the parameters specified for a radio unit in MOTOTRBO CPS. The Motorola Phone System is recommended for IP Site Connect mode to minimize Radio response time.

• TRBOnet Phone System (TX Interrupt)

This is a phone call system based on the private call type using TX Interrupt feature. This phone system is available for radio systems with control stations.

5.1.1.2 Privacy

• In the **Configuration** pane, under the corresponding **Repeater**, select **Privacy**.

Configuration		Privacy						
 Service Network Redundancy 	^	Privacy Type: Basic Privacy Key II	\.	Enhar	nced	_		
Database		Enhanced Privacy K	eys:	1				
Service Management Advanced Settings			ID 1		Name	Valu	le	
Radio Systems		ARC4 (40 bit)						
Advanced Settings								
TT over Cellular Remote Agents Friendly Servers								
∲ Data Sources	•	Add	Remo	ve				5 File
Set Defaults					Apply	ОК		Cancel

• In the **Privacy** pane, specify the following privacy-related settings:



Privacy Type

From the drop-down list, select one of the privacy types: **None**, **Basic**, or **Enhanced**.

Basic Privacy Key ID

Enter the Privacy Key ID available for the **Basic** privacy type.

Enhanced Privacy Keys

Here you add enhanced privacy keys when the **Enhanced** privacy type is selected.

• Click **Add** and specify the required **Algorithm**, **ID**, **Name**, and **Value** for the privacy key being added.

✓ Algorithm

From the drop-down list, select one of the enhanced algorithms if you are going to use additional encryption.

5.1.1.3 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		DDI	15 s	ervi	ce					
🗬 Service	^									
🕤 Network		\checkmark	Use (DDM:	S service					
🛱 Redundancy		L	.ocal	port	:	0	÷			
Database			Convi	ca TD	Address:	127.0.0	1 -		Test	
Reports							- -		(Cot	
Service Management		5	Servi	ce po	ort:	3000	÷			
X Advanced Settings		4	Authe	entica	ation Port:	5055	÷			
Geocoding Servers			lodu	ndan	t services:					
Radio Systems			ceuu	nuan					1	
Services					Service IP A	ddress	Service port	L	ocal port	
Repeater #1			1	\checkmark	10.10.101.2	207	3000	0		
🛛 🔀 Advanced Settings										
Privacy										
DDMS service										
Advanced Setting										
III Slot #1										
III Slot #2										
Local Slots										
🖵 PTT over Cellular										
🔂 Remote Agents	5									
< >>				Add		elete			Test 🔺	▼
Set Defaults]					[Apply	O	K Ca	incel

• 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.

5.1.1.4 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**.

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Configuration	M	NIS data s	service				
💣 Service 🗸	1 1						
S Network		Use Data	Gateway				
🛱 Redundancy		Service	e is on a local	host			
Database		IP Addres		176.16.1	0.2 - ¢		
Reports					•		
Service Management		 Contr 	ol port:	5000	÷	Test	
X Advanced Settings		MNIS	Service:				- ¢ ?
Geocoding Servers		Redundar	t services:				
Radio Systems			IP Address		Control port	Local port	
- 🗘 Services			IF Address		Control por c	Local por c	
Repeater #1							
Advanced Settings							
Privacy							
DDMS service							
Advanced Settinc							
MNIS data service							
Advanced Settin <u>c</u>							
Slot #1							
Slot #2							
Local Slots							
TT over Cellular				l-t-		Teet	
< >>		Add	De	elete		Test	
Set Defaults					Apply	ОК	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.

5.1.1.5 Slots

• In the **Configuration** pane, under the corresponding **Repeater**, select **Slot #1** or **Slot #2**.

Configuration		Slot #1
 Service Network 	^	✓ Slot #1
🛱 Redundancy		Name: Slot 1
Database Reports		Messaging Delay: Normal -
Service Management		Use the slot for RX Data only (GPS Revert or Data Revert)
💥 Advanced Settings		Use Privacy
		Privacy Key:
🖶 Radio Systems		Allow interruption
🗘 Services		Always transmit when the PTT is pressed ("Impolite" channel access)
Repeater #1		✓ Data Call Confirmed
X Advanced Settings		Private Call Confirmed
Privacy		Emergency Alarm Ack
I Slot #1		✓ Emergency Call/Alarm Indication
Slot #2		,,,,,
Local Slots		
TT over Cellular		
Remote Agents		
Telephony		
Data Sources		
Email		
	×	
Set Defaults		Apply OK Cancel

- In the **Slot #1** (or **Slot #2**) 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.
- Use Privacy

Select this option to use Privacy for the slot.



Note: This option is available only if the **Basic** or **Enhanced** Privacy Type have been selected in Repeater's <u>Privacy</u> settings.

Privacy Key

From the drop-down list, select the privacy key.

Note: This option is available only if the **Enhanced** Privacy Type has been selected in Repeater's <u>Privacy</u> settings).

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.



5.1.1.6 Local Slots

On a local slot in IPSC systems, voice or data is not transmitted between sites due to MOTOTRBO limitations; TRBOnet Server can only receive on those local slots, but cannot transmit via an IP connection.

Note: Local slots are available only when **IP Site Connect** is selected, and the **Use NAI Voice** option is also selected in the **Repeater** pane.

If the **Use NAI Voice** option is cleared, local slots will be available only through dedicated control stations.

• In the **Configuration** pane, under the corresponding **Repeater**, select **Local Slots**.

Configuration		Local Slots		
Service Network	^	Load Peers Map		
🛱 Redundancy		Name	Peer ID	Peer Slot
Database		✓ Local Brine's	1002	Slot #1 -
😪 Reports				
Service Management				
🔀 Advanced Settings				
Geocoding Servers				
Radio Systems				
Services				
Repeater #1				
Advanced Settings				
Privacy				
DDMS service				
Advanced Setting				
MNIS data service				
Advanced Setting				
III Slot #1				
III Slot #2				
Local Slots				
TT over Cellular	v -	Add Remove		Configure
< >		Add		comgdre
Set Defaults		Apply	ОК	Cancel

- In the Local Slots pane, specify the following Local Slot-related settings:
 - To add a Local Slot to the system, click **Add**.
 - Select the option in the first column to enable the selected local slot.
 - Enter a Name for the local slot. This name will be displayed in the Dispatch Console.
 - Enter the **Peer ID** of the repeater.

Note: This value can be taken from the repeater's configuration in MOTOTRBO CPS, in *General Settings*>*Radio ID*. See section 4.1.1

- From the drop-down list, select the **Peer Slot**.
- To configure the selected local slot, click **Configure**:

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TX Configuration			×
Name:	Local Brine's		
Messaging Delay:	Normal	•	
Use the slot for RX D	ata only(GPS Rev	vert or Data Revert)	
Use Privacy			
Privacy Key:		—	
Allow TX interrupt			
🔲 Always transmit whe	n the PTT is pres	sed ("Impolite" channel acc	ess)
Data Call Confirmed			
Private Call Confirme	ed		
🗹 Emergency Alarm Ac	k		
🗹 Emergency Call/Aları	m Indication		
		ОК Са	ancel

 Specify the desired local slot settings similar to those for a wide-area repeater slot (see section <u>5.1.1.5, Slots</u>).

5.1.2 Adding a Control Station

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

Configuration	Control Station #1		
Service Service Service Control Station Service Management Service Management Advanced Settings Control Station #1 Control Sta	Name: Radio ID: IP Address: Mode: System Identifier:	Control Station #1 64250 \$ 192.168.98.2 * IP Site Connect Department 1 Data only (GPS Revert or Date Microsoft Sound Mapper Logitech USB Headset	Test
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 IP Site Connect.

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
 Service Network Redundancy Database Reports Service Management Advanced Settings Services Geocoling Servers Radio Systems Services Control Station #1 Advanced Settings PTT over Cellular Remote Agents Friendly Servers Telephony Data Sources Email SMS Notifications Push Notifications License 	 ✓ 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 f seconds Signaling System: None ✓ Configure Allow CSBK Data
Set Defaults	Apply OK Cancel

- In the **Advanced Settings** pane, specify the following control stationrelated 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.

5.1.3 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	Telep	hony	Y Contraction of the second
Service Network		se Te	lephony
🛱 Redundancy 🔤 Database			SIP Server
😪 Reports	1	\checkmark	Internal PBX Server
🔅 Service Management			
🔀 Advanced Settings			
Geocoding Servers			
🖶 Radio Systems			
Services			
Repeater #1			
🔒 Privacy			
Slot #1			
Slot #2			
Local Slots			
🛒 PTT over Cellular			
Remote Agents			
Friendly Servers			
Telephony Telephony			
X Advanced Settings		Add	Delete Test 🔺 🔻
Internal PBX Server			
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	Int	ernal PBX Server				
 Advanced Settings Geocoding Servers Radio Systems Services Repeater #1 Advanced Settings Privacy Slot #1 Slot #2 Local Slots PTT over Cellular Remote Agents Friendly Servers Advanced Settings Internal PBX Server Advanced Settings Data Sources Email SMS Notifications Push Notifications License 	•	Use Internal PBX Se Local IP: Dispatch Cente User Extension: User Name:	10.10.100.	99	v v Port:	5060 \$
Set Defaults				Apply	ОК	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**
- User Extension

Enter the user extension number that will be used by the Dispatch Center.

User Name

Enter the 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	Radi	o Groups					👲 🐠 🛂
Disabled Radios Dispatcher Groups Dispatchers Dispatchers Email Groups SMS Groups		Intercom Group 10 Private Call	0) 46 (0) 0) 46 (0) 0) 46 (0)	I: Line free ✓ Group 20	€0 •) €0	All Call) .) .)
Logical Groups □ Logical Groups □ Radio Groups □ Radios	Vame Cleaner Firemer	s	Δ Radio ID 30 20	uping 🍸 Auto Fil	lter 🗇 Default Settin MDC / Sel-5 (Hex) 5	Descriprion Cleaning grou	p
Uvice Dispatch	Police	3	10		0		
RFID Tracker							
Text Messages							
Event Viewer		1					
Administration	H H H	 Record 1 of 3 	► H+ HH - I				Þ
🔂 127.0.0.1 🛞 🕵 🙎 Administrator		o: demo Demo Li					🕑 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 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		🔮 🚳 🛂
		✓ Intercom ④) Group 10 ④) All Call ④)	0
	Registered Unregistered		Add TRBOnet Mobile 📑 Add Range
< >	Radio Name∆ Type Radio		Radio Gro Logical Gr Description
1.1		0 125	11; Firemen Cleaning,
Voice Dispatch	13 Digital Radio 13 13 Digital Radio 235 Digital Radio 235	0 235	All Firemen; P Cleaning
	3333 TRBOnet Mobile 3333	0 3333	11; 22
Location Tracking	(k) 555 Digital Radio 555	0	All
🔡 Job Ticketing	Radio 300 Digital Radio 333	ě	All
😿 Route Management		3	
RFID Tracker		5	
🖂 Text Messages			
Voice Recording			
Event Viewer			
Radio Allocation	_1		
💫 Administration 🛛 🖌	H4 44 4 Record 1 of 6 + H+ HH 4		
🐻 127.0.0.1 🛞 🕵 💆 Administrator 🛙	Licensed to: demo		🕑 Active

- Click Add Digital Radio (3) to add a new radio.
- In the dialog box that appears, specify the **Radio Name**, **Radio ID**, **Radio Groups**, and **Home Group** to which the radio belongs.



5.2.3 Configuring Telephony

5.2.3.1 Registering SIP extensions

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

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

File View Map Tools Help		
Administration	Telephony	👲 🐠 🕓
Server Ucense Database Radio Systems Radio Systems	③ 1: Line free 【 Ø Intercom ④ ● Private Call Cleaners Ø € Premen Ø € IPSC 1: Slot ✓ IPSC 1: Slot ≠2 Ø € Ø € IPSC 1: Slot	•) • O
Tasks 2	Configure Calls Extensions Redirect Calls Phone Contacts Dial Plans Add Edit Delete Management Numbers Toroning Value Filter Default Type 3 User Extension User Name First Name Last Name Display Na	Settings Logical Groups
Voice Dispatch	Dispatch Cer Phone User X Internal PB ✓ Dispatch Cer signet.ru	
Location Tracking	X SIP Phone General Logical Groups Custom Fields Walt X SIP Phone User Extension: 2408 Eugene	
😼 Job Ticketing	V SIP Phone User Name: John Prune	
😥 Route Management	User Password: •••••	
Text Messages	First Name: John	
🖞 Voice Recording	Last Name: Bingham	
🕞 Reports	Display Name: John B.	
Event Viewer		
[행] Radio Allocation		
administration 🖌	144 44 Record 1 of 5 + 14 14 14	Þ
🕉 Connected 🛞 🕵 🕵 🕵 Admi	istrator II Licensed to: demo Demo License	🕜 Active

In the **Phone User** dialog box, specify the following parameters:

User Extension

Enter the extension number that will be used by the phone user.

User Name

Enter the user name that will be used by the phone user.

User Password

Enter the password for the phone user to be authenticated by the telephone system.

Password (repeat)

Enter the password again.

- Fist Name/Last Name/Display Name
 Enter the first, last and display names of the phone user.
- In addition, on the **Logical Groups** tab, specify logical groups for the phone user.
- On the **Custom Fields** tab, specify the desired values for the custom fields.



5.2.3.2 Setting DTMF codes

This section describes how to set DTMF Access and Deaccess codes in TRBOnet Dispatch Console.

Go to Administration (1), Telephony (2), Configure Calls (3), Configure (4) and

set **Access code** and **Deaccess code** (5) to **0** and **#**, respectively:

Administration	Telephony	
Server Curces Curces Control Curces Cu	I: Une free Intercom I Cal I Cal I Cal I Cal I Cal I Configure Cals Extensions Redrect Cals Prone Conts	Group 11 Group 22 Gours Geners G Fremen G G Scholl Plan
By Indus ITO Connections Connections Connections Connections Connections Conneconnections Connections Connections Connections Con	Radio Call Configuration 3 Access code: Deacess code: Caliback Request Options Allow rado users to make outpoing colis: Send a DTMF command to request a calibada: Send a DTMF command to request a calibada: Start transmission: Phone-to-Radio Calis Start transmission: Response timeout: Check if radio is savalable before establishing the cali:	0 P Yes Yes Yes P Dancess code: Calback Request Options Vallack Request options Vallac
Voice Dispatch	Mised Call notifications: Play sound on the phone when PTT is pressed or released: Configure 4 Inbound Call Configuration Tobound Call Configuration	Yes Use this prefix in text messages: sp: Start transmission: Immediately Phone-to-Radio Calls
器 Job Ticketing 愛 Route Management	Call to Dispatch Center: Call to unregistered number: Interactive Voice Response (IVR) Options	Forwal I Check if radio is available before establishing the call
Text Messages Voice Recording	Do not wait for Accept code: Maximum number of digits: Accept code:	Yes 3 Sound on the phone when PTT is pressed or released 3 Sound level: - + + +
Reports	<u>Number</u> 0 1 <number></number>	Cal de Cal de Cal radio with Radio ID = <number></number>
Radio Allocation Administration Oconnected B B	Configure	Call rado Rado 235 Call dopatcher (eny available)