



TRBOnet Enterprise/PLUS Capacity Plus

Deployment Guide

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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. The document describes the steps required to configure communication with a MOTOTRBO Capacity Plus 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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АРАС	+61 28 607 8325	<u>http://kb.trbonet.com</u> — online knowledge base

2 System Components and Terms

2.1 TRBOnet Software

software

The TRBOnet software consists of several modules, a combination of which enables 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). The number of control stations depends on how many talk groups and revert channels are registered in your system.



3 System Topology

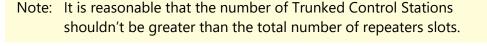
Capacity Plus (also known as Capacity Plus Single Site) is a digital trunked two-way MOTOTRBO system that allows you to accommodate high volume communication. It is designed to provide a stable connection between a few groups within one building or a set of buildings. This system type allows you to increase the number of channels for voice and data transmission between the radio units and control centers. The radio units are always automatically forwarded to a free channel. The main objective of a Capacity Plus system is to support more simultaneous voice and data transmissions within one capacious system.

Also note that, according to the Motorola MOTOTRBO System Planner, if more than one repeaters are used in a Capacity Plus system, these repeaters must reside on the same LAN behind a router. In addition, the PC with TRBOnet Server must not reside on the same LAN with the repeaters.

3.1 Capacity Plus without NAI

3.1.1 System with Trunked Control Stations

TRBOnet Server can be connected to a Capacity Plus system using one or more Trunked Control Stations. The number of Trunked Control Stations depends on how many talk groups are registered in your system. To make a call to a talk group, the dispatcher uses the Trunked Control Station associated with the group.



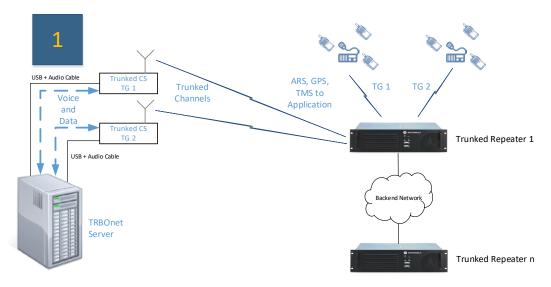


Figure 1: System with Trunked Control Stations



3.1.2 System with Trunked Control Stations and Revert Control Stations

For a higher data throughput, the preferred configuration is to have channels dedicated for data only. Such channels are defined as Data Revert Channels. If Data Revert Repeaters are present in the system, then one Revert Control Station is required per Data Revert Slot.

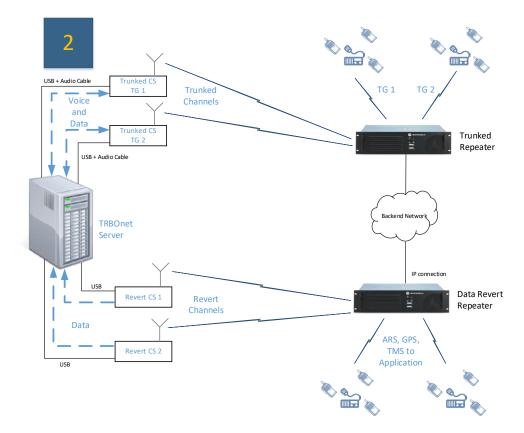


Figure 2: System with Trunked Control Stations and Revert Control Stations



3.1.3 System with Data Revert Repeaters having IP Connection

In this configuration, TRBOnet Server has an IP connection to Data Revert Repeaters to receive data from, and Trunked Control Stations associated with the talk groups.

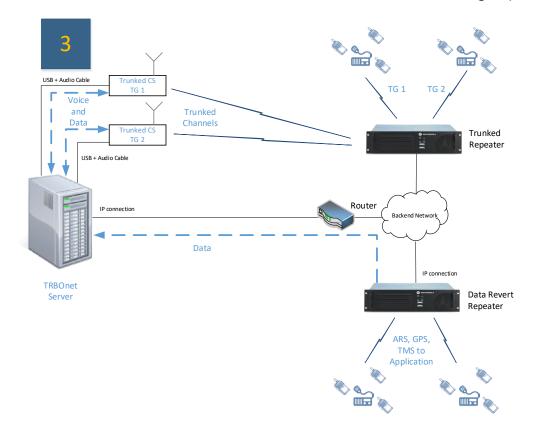


Figure 3: System with Data Revert Repeaters having IP Connection



3.1.4 System with Trunked and Data Repeaters having IP Connection

In this configuration, TRBOnet Server has an IP connection to Data Revert Repeaters as well as to Trunked Repeaters. To transmit voice and data from TRBOnet Server to radios, a Control Station shared by all talk groups can be used. Note that in this case only one radio call is possible at a time.

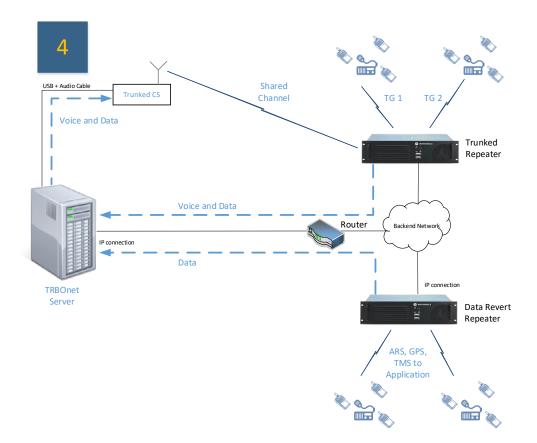


Figure 4: System with Trunked and Data Repeaters having IP Connection



3.2 Capacity Plus with NAI

In the following configurations, Motorola's NAI Data and NAI Voice protocols are used, which provide two-way transmission of data and voice over IP connection.

3.2.1 System with NAI Data and Trunked Control Stations

In this configuration, TRBOnet Server has an IP connection to Data Revert Repeaters as well as to Trunked Repeaters. In addition, NAI Data protocol is used on Data Revert repeaters and Trunked repeaters.

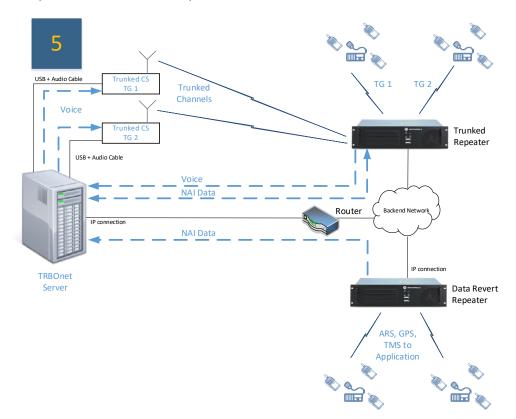


Figure 5: System with NAI Data and Trunked Control Stations



3.2.2 System with NAI Data and Shared Control Station

Analogously to the previous configuration, Trunk Repeaters and Data Revert Repeaters have IP connection to TRBOnet Server, as well as NAI Data protocol is used on Data Revert repeaters and Trunked repeaters. Unlike the previous configuration, to transmit voice from TRBOnet Server to radios, a Control Station shared by all talk groups is used. Note that in this case only one radio call is possible at a time.

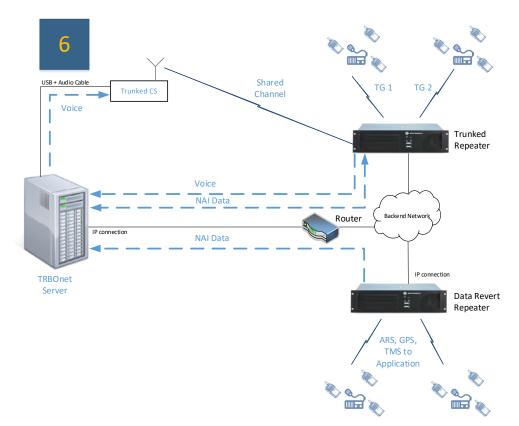


Figure 6: System with NAI Data and Shared Control Station



3.2.3 System with NAI Data and NAI Voice

This is the most advanced configuration using the power of NAI Data and NAI Voice protocols. All voice and data will be received and transmitted over an IP connection, that is, no Control Stations are required. Note that TRBOnet PLUS is required to utilize this system topology.

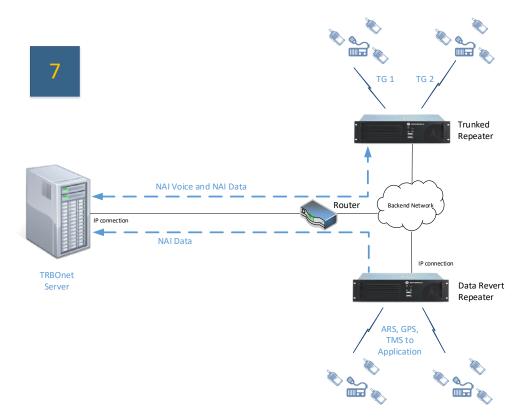


Figure 7: System with NAI Data and NAI Voice



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 a Capacity Plus 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.

6	F	Ē			×	X	Ē	Ē	Q	Þ	Þ	Þ	8	192.168.11.1	
F	RW	Open	Save	Reports	Delete	Cut	Сору	Paste	Search	Read	Write	Clone	Bluetooth	TO ENGOLITI	

4.1.1 General Settings

• In the left pane, select General Settings.

DR 3000	General Settings
Accessories	Top CWID Voting Microphone
Security	Radio Name C+ Master
Link Establishment	Radio ID 222
🕻 🆓 Talkgroups	SIT (ms) 6000
. Hornels (Hannels) (Hannels)	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)
	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**.

DR 3000	Network
🛛 Accessories	Top Radio Network Network Setting IP Repeater Programming
Link Establishment	Radio IP 172 168 0 1 Accessory IP 172.168.0.2 1
	Netmask 255.255.0
🛨 ···· 🚞 Channels	Radio Network
	CAI Network 12
	Network Setting
	DHCP Ethernet IP 192 168 1 15 Gateway IP 192 168 1 1 Gateway IP 192 255 255 0
	IP Repeater Programming

- In the **Network** pane, specify the following parameters:
 - Radio IP

This is the IP address used by the radio to communicate with a PC (using 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.

DR 3000 Link Establishment	
Accessories <u>Top IP Site Connect</u> <u>Capacity Plus</u> Security	
Antwork	
Link Establishment	
Master UDP Port 50000 ÷	
UDP Port 60000 ÷	
Peer Firewall Open Timer (sec)	
Master Archive File	
IP Site Connect	1
Beacon Duration (ms) 4320	
Beacon Interval (sec) 60	
Capacity Plus	
Site ID 1	
Site Alias Site 1 - MSTR	
Beacon Duration (ms)	
Beacon Interval (ms) 1920 ÷	
Rest Channel/Site IP 192 · 168 · 1 · 10	

- 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 WAN IP address of the site router if you are configuring a master repeater, or the LAN IP address of the master repeater, if you are configuring a peer repeater and a NAT loopback is disabled on the router.



• Enter the WAN IP address of the site router on all the repeaters, if a NAT loopback is enabled and the port forwarding rules are specified for all the repeaters and the rest channel on the site router.

Note: In all the cases, the port forwarding rules must be specified for both the master repeater and the rest channel on the site router.

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**.

Rest Channel/Site IP

This is a private network IP address that is required for correct operation of a Capacity Plus system. This IP address MUST be the same for all repeaters.

Rest Channel/Site UDP Port

This is the UDP port of the Repeater's rest channel. This UDP port MUST be the same for all repeaters.

4.1.4 Capacity Plus Channel

Depending on its role in a Capacity Plus system (Trunked or Data Revert Repeater), the repeater can be configured either with a Voice Channel or with a Data Channel, respectively.

4.1.4.1 Adding a Voice Channel

• In the left pane, under **Channels**, right-click **Zone** and from the drop-down menu, select **Add** > **Capacity Plus Voice Channel**.

DR 3000						Zor	ne1						
	-		Drag channels to desired position										
Security	hment		Position	Channel Chann Name (kHz)		Squelch	Squeich Level	Wireline Mute GPIO Pin	Voice Emphasis	Color Code	Network Application Interface Phone	Syster Contro Mode	
A Talkgroups	_	▶ л.⊚	1	Channel1	N/A	N/A	6 🕂	N/A	N/A	1 🛨		Γ	
È € Channels	Add					01-14-55	_						
	-			nalog Channel igital Channel		Shift+F5 Shift+F6							
		Ctrl+X Ctrl+C		ynamic Mixed Mode	Channel	Shift+F11							
		Ctrl+V	C	apacity Plus Voice Cl	hannel	Shift+F8							
	Delete Rename	Del F2	c	apacity Plus Data Ch apacity Plus Voice Cl apacity Plus Data Ch	hannel (Linked)	Shift+F9 Ctrl+Shift+F8 Ctrl+Shift+F9							
	Sort		•										
	_	4										F	

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



- T DR 3000			
General Settings		CaPlus_V	
Accessories		TOD RX IX	
Security			
Network		Color Code 1	
Link Establishment			
	Network Ap	plication Interface Phone	
		RSSI Threshold (dBm) -60 ÷	
🗄 🛁 Channels			
🖻 – 🚞 Zone1		IF Filter Type Wide 💌	
CaPlus_V		Preference Level 1	
		Slot 1 Channel ID 1 🕂	
		Slot 2 Channel ID 2	
	RX		TX
		Offset (MHz)	
	Frequency (MHz) 146.420000	0.000000	Frequency (MHz) 167.420000
		Сору	
	Ref Frequency Default		Ref Frequency Default
			Power Level Low -
			TOT (sec) 60 +
			, <u></u>

- In the **Channel** pane, specify the following channel-related parameters.
 - Slot 1 Channel ID

Specify the Channel ID of Slot 1 for voice channels. This also determines the value for **Slot 2 Channel ID** which is always one increment higher than the value of Slot 1 Channel ID.

- 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.

DR 3000							Z	one1							
		Drag channels to desired position													
Security Security Network Link Establishment Sites		Position	Channel Name	Channel Bandwidth (kHz)	Squelch	Squeich Level	Wireline Mute GPIO Pin	Voice Emphasis	Color Code	Network Application Interface Phone	System Controller Mode	IP Site Connect	Messaging Delay	RSSI Threshold (dBm)	
Talkgroups						6			1 🕂						
Channels	л. 0	2	Channel1	N/A	N/A	6 ÷	N/A	N/A	1 🔅			None	Normal	-100	
E Sone1 CaPlus_V 	•													•	



4.1.4.2 Adding a Data Channel

• In the left pane, under **Channels**, right-click **Zone** and from the drop-down menu, select **Add** > **Capacity Plus Data Channel**.

	000 Seneral Sett	ingo		Zone1											
	Accessories	-		Drag channels to desired position											
Service Servic	Security Network .ink Establis	hment		Position		Channel Name	Channel Bandwidth (kHz)	Squelch		quelch evel	Wireline Mute GPIO Pin	Voice Emphasis	Color Code	System Controller Mode	IP Site Connect
	Sites					Channel1	12.5	Normal	6	÷	None	De & Pre	1 🕂	Γ	N/A
	- go raikgroups														
Ė (alog Channel		Shift+F5							
	Add				Dig	ital Channel	al Channel Shif								
		Copy (Ctrl+C		Dyr	namic Mixed Mode Cl	Shift+F11								
		Paste	Ctrl+V		Cap	pacity Plus Voice Cha	annel	Shift+F8							
		Delete	Del		Cap	pacity Plus Data Cha	nnel	Shift+F9							
		Rename	F2			pacity Plus Voice Cha		Ctrl+Shift+F8							
	Sort				Cap	pacity Plus Data Cha	nnel (Linked)	Ctrl+Shift+F9							
	Sort														
	4														Þ

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

E	CaPlus D
General Settings	
	Top Enhanced GPS RX TX
Security	
Network	Color Code 1
Link Establishment	RSSI Threshold (dBm)
	IF Filter Type Wide 🔻
白 🔁 Channels	
E Eeer1	Enhanced GPS
GaPlus_D	
	Window Periodic Window Shared Channel
	Enable Size Reservation (%) Frequency
	Slot 1 75 v
	Slot 1 8 + 75 +
	Skot 2 8 v 775 v
	RX TX
	Offset (MHz)
	Onset (Minz)
	Frequency (MHz) 147.087500 0.000000 (Frequency (MHz)) 150.662500
	Сору
	Ref Frequency Default
	Power Level Low 🗸
	TOT(sec) 60 🛨

- In the **Channel** pane, specify the following channel-related parameters.
 - 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.
- Once you have finished configuring the desired repeater parameters, click the **Write** button on the toolbar.

്ത	i 🖻			×	X	Þ	Ē.	Q			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 a Capacity Plus system. Control stations are used in the topologies depicted in Figures 1-6.

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

E 🔋 🕻	DP4801	^	General Settings	
	General Settings			
	Accessories		Top CWID Audio Profile Microphone Backlight Battery Saver Alerts Over-the-A	vir Proc
	Buttons		Development I BBB Development I and Market Development I and Look Const Development	
	🖂 Text Messages		Persistent LRRP Requests Lone Worker Power Up Password and Lock Front Programmir	ig Pas
	101) Telemetry		Delete All 5 Tone Radio ID	
	Menu			^
	🛲 Security		Radio Name Control Station	
	Network		Select	
	Announcement			
Ē (📄 Job Tickets		Welcome Image	
÷ (🚞 Signaling Systems		Remove	
Ē (Encoder			
Ē (Decoder 📄			
Ē (Contacts		Radio ID 64250	
	RX Group Lists		<	× `
l 📩 (Channale	Υ.	1.5	-

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

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



4.2.2 Network

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

DP4801	Network
Accessorie Accessorie Buttons Text Mess	Top Radio Network Services Control Station IP Site Connect Bluetooth Bluetooth Serial Port Profile Data USB HID Data Routing
💷 Telemetry 🛅 Menu	Radio IP 192 . 168 . 98 . 1
Security Security Network Announcen	nt Bluetooth IP 192.168.99.1
Contacts	Radio Network
Channels	CAI Network 12 🕂
⊕ 📄 Roam ⊕ 📄 Capacity P	S CAI Group Network 225 ÷ Max TX PDU Size (bytes) 750 ▼
	Telemetry UDP Port
	Forward to PC Via USB

• 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 5.1.2, Adding a Control Station.

Control Station #1					
Name:	Control Station #1				
Radio ID:	64250				
IP Address:	192.168.98.2 🔻 🕫				
Mode:	Capacity Plus				
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** > **Capacity Plus** 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.

	DP4	4801 General Settings	*							Capacity	Plus			
		Accessories Buttons Text Messages			Contact	Name	\supset	Call ID)	Connection Type	Route Type	Call Receive Tone	Ring Style	Text Messag Alert Tone
	(101)	Telemetry		4030					÷		Regular		No Style	Repetitive
	7	Menu		Cað	TG 20			20	÷	USB	Regular		No Style	Repetitive
		Security		Cað						USB	Regular		No Style	Repetitive
				C a	Radio 12	5				USB	Regular		No Style	Repetitive
[Signaling System Encoder Decoder Contacts 5 Tone MDC Quik-Call I Digital				Group Call	Ctrl+F7	_						
			700											
		Cao		Ctrl+X		Private Call	Ctrl+F8							
		C80	Сору	Ctrl+C		All Call	Ctrl+F9							
		0	Paste	Ctrl+V		Dispatch Call	Ctrl+F10							
	÷	RX Group L	Sort		•	PC Call	Ctrl+F11							Þ

• 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 > Capacity Plus. Right-click it, and choose Add > RX Group List.

💷 Telemetry	^	L	ist_LCP_TG ²	10	
Security					
Network		Available		Members	
	-	TG 20		TG 10	
🕂 💼 Job Tickets		TG 77			
🗄 ···· 📄 Signaling Systems					
🗄 ···· 📄 Encoder			Add >>		
🗄 ···· 📄 Decoder					
🛨 ···· 🚞 Contacts			<< Remove		
🚊 🔤 RX Group Lists					
🕂 ···· 🚞 Digital					
Capacity Plus					
😽 👸 List_LCP_TG20					
主 💼 Flexible RX List					
🗄 🖳 Channels					
🗄 💼 Scan					
🗄 🖳 📄 Roam					
🗄 🖮 📄 Capacity Plus	× .				

- 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

4.2.5.1 Important Notes

Depending on its role in a Capacity Plus system (Trunked Control Station or Data Revert Control Station), the control station can be configured either with a Capacity Plus Personality Channel or with a Digital Channel, respectively.

When using the configurations depicted on figures 1, 3, 4, 5, and 6, you are employing a Capacity Plus Personality Channel.

In the configuration depicted in fig. 2, that is a configuration with the data revert repeater, you will need to use a Digital Channel. The fact is that there are no rest channels on a data revert repeater. Thus, to send data to TRBOnet Server, the subscriber radios will use a data revert channel. In this case, you'll have to forcibly set the control station to the corresponding frequencies of the data revert repeater.

A single data revert control station may receive data from only one data revert slot. If there is only one data revert control station in the radio system, then all subscribers must send data only to the slot with which this control station operates. The Radio ID of this data revert control station must match the Radio ID of at least one voice control station. If the system has several data revert control stations, their Radio ID's be the same and match at least one voice control station.

Also note that the system identifier in TRBOnet Server should be the same for all control stations and repeaters used in the same radio system.

4.2.5.2 Adding a Capacity Plus Personality Channel

	Telemetry Menu		^				Channels	
	Security Network						Drag zones to desired position Set Voice Files Clear Voice Files	
÷	Job Ticket				Position	Zone Name	Voice Announcement File	
÷ 🖻	Signaling S	Systems		۶.		Zone1	None	
÷ 🖻	Encoder			1	2	Channel Pool	None	
	Decoder Contacts RX Group	Lists					·	
	Channels	Add			Z	one Ctrl+F2		
		Cut	C	trl+X				
		Сор	y C	trl+C				
Ē	🖳 👘 Cha	Pas	te C	trl+V				
÷	Scan Roam	Sort	_					
<u>÷</u> … [Capacity P	Plus	~					

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

In the left pane, select the zone you have added. Right-click it, and choose
 Add > Capacity Plus Personality.



🖃 🖷 🖥 DP4801										
General General	Settings					Zone1				
Q Access	-		Drag channels to desired position							
Buttons					-		1			
	ssages				Set Voice Files	Clear Voice F	iles			
101 Teleme	-									
Menu				Channel			Channel	Dual Capacity	Timing Leader	
			Position	Name	Voice Announcement File	9	Bandwidth (kHz)	Direct Mode	Preference	
Networ							(K12)			
Annour		▶n.e	1	Channel 1	None		N/A		Eligible	
🛨 💼 Job Tic	cets								_	
🕂 💼 Signalir	g Systems									
🕀 💼 Encode	r									
🕂 💼 Decode	r									
🕂 💼 Contac	5									
🕂 📄 RX Gro	up Lists									
🕂 🔁 Channe	Is									
	Add	•	Analog Ch	annel	Shift+F5					
ш., — 🎲 с			Digital Cha	annel	Shift+F6					
🕂 🕕 Can	Copy Ctrl+C		Capacity F	Plus Personality	Shift+F7					
🕂 🧰 Roam	Paste Ctrl+V		Capacity F	Plus Personality (Link	ed) Ctrl+Shift+F7					
The Capaci		_	5 Tone Ch	annel	Shift+F4					
	Delete Del	10								
	Rename F2									
	Sort	•							Þ	

• In the left pane, select the channel (for example, named CapPlus_TG10) that has previously been added.

⊟…		24801 General Settings		CapP	lus_TG10		
		Accessories		Top	RX IX		
		Buttons		100			
	📐	Text Messages		Voice Announcement File	None	-	<u>^</u>
		Telemetry		ARS			
		Menu		ARS	Disabled		
		- Security		Privacy			
		Network		Privacy Alias	Privacy Key1	•	
r		Announcement Job Tickets			Privacy Roy I		
	+) (Signaling Systems		AES Alias	None	-	
	∓) (Encoder		RAS Alias	None	•	
	÷	Decoder				•	
	÷	Contacts		Option Board	V		
E	÷ 🖻	RX Group Lists		Lone Worker			
E	⇒… ∈	Channels		Commented UDD Date Useday			
	E	🚞 Zone1		Compressed UDP Data Header	None		
		CapPlus_TG10		Over-the-Air Battery Management			
		竹 Channel Pool		Voice List)	VoiceList_Site_1	•	
	<u>∔</u> }	_			VoiceList_Site_1	•	
	1) (1) (Roam Capacity Plus		Data List	None	•	
	±1			Rest Channel Acquisition TOT (min)	5 ÷		
				Beacon Interval (ms)	1920 🛨		
				Channel Inhibit			
				RX Only	_		
				RX Only			
			RX			ТХ	
			RA				
					Contrast News		_
			Group List No	one 💌	Contact Name	TG 10	•
			Emergency Alarm Indication		Emergency System	None	•
			Emergency Alarm Ack		VOX	1	
			Emergency Call Indication		Power Level	High 💌	
							v

- In the right pane, specify the following parameters:
 - 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.

Voice List

Select the Capacity Plus Voice List you have specified in section <u>4.2.6</u>, <u>Capacity Plus Voice List</u>.

RX Group List

Select the Group list you have specified in section <u>4.2.4, RX Group Lists</u>. If you select **None**, the radio will receive calls only from the group specified in the **TX Contact Name** box.

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>.

4.2.5.3 Adding Channels to Channel Pool

Channel Pool is used for organizing channels in the radio that are not tied to a channel selector position. The Channel Pool is not visible when the radio user navigates through the zones.

- In the left pane, select Channels > Channel Pool. Right-click on it, and choose Add > Capacity Plus Voice Channel.
- In the left pane, select the first channel (for example, named CPlusMaster) that has previously been added.

Network Network Network		CPlusMaster	
Job Tickets		Top RX TX	
🕂 🚞 Signaling Systems			
Encoder		Color Code 1 ÷	
🕂 🧰 Decoder		Phone System Phone_100	
E Contacts		Phone_100	•
E RX Group Lists			
🖻 🚞 Channels	RX		ТХ
E- Cone1			
🖻 🎲 Channel Pool		Offset (MHz)	
CPlusMaster	Frequency (MHz) 167.420000	0.000000	Frequency (MHz) 146.420000
CPlusPeer1	167.42000		140.42000
⊞ 🚞 Scan ⊞ 🚞 Roam		Сору	
	Ref Frequency Default		Ref Frequency Default 💌
Capacity Plus			

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.

Phone System

Select the phone system you have specified in section 4.3.8, Phone System.

 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.

4.2.5.4 Adding a Digital Channel for Receiving Data

This section describes how to configure a data revert channel for receiving data on a control station (see also section <u>4.2.5.1</u>, <u>Important Note</u>).

- In the left pane, select the zone you have added. Right-click it, and choose Add > Digital Channel.
- In the left pane, select the channel (for example, named DataChannel1) that has previously been added.

DP4801	DataCh	nannel1
Accessories	Top RJ	X IX
Buttons		
🖂 Text Messages	Color Code 1	÷
Telemetry	Repeater/Time Slot) 1	•
🔂 Menu		
Security	Phone System Ph	tone_100 💌
Announcement	ARS DH	sabled •
Job Tickets	Enhanced GPS	
Gignaling Systems		
Encoder	Window Size 8	v
🕀 🧰 Decoder	Privacy V	
🕀 🧰 Contacts	Privacy Alias Pri	and the state of t
RX Group Lists		ivacy Key1
白 🚞 Channels	AES Alias No	one 💌
DataChannel1	RAS Alias No	one 💌
E Channel Pool		
🕀 💼 Scan	Option Board	
🗄 🚞 Roam	Option Board Trunking	
🗄 ··· 🚞 Capacity Plus	Lone Worker	
	Allow Talkaround	
	IP Site Connect	
	Messaging Delay (ms) 60	
	Compressed UDP Data Header No	one 💌
	Text Message Type	oprietary 👻
	Over-the-Air Battery Management	
	Channel Inhibit	
	RX Only	
	RX	ТХ
	Offset (MHz)	
	Frequency (MHz) 159.662500 0.000000	Frequency (MHz) 147.087500
	Сору	
	Ref Frequency Default	Ref Frequency Default 💌

Color Code

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

Repeater/Time Slot

Select one of the data repeater time slots.

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).
- 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 corresponding data 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.

4.2.6 Capacity Plus Voice List

This section describes how to add the channels contained in the Channels Pool to a Capacity Plus Voice List.

 In the left pane, select Capacity Plus > Voice. Right-click on it, and choose Add > Capacity Plus Voice List.

Network	^	VoiceList_1							
🕂 📄 Job Tickets 🕀 📄 Signaling Systems		Available		Members	IDs				
Encoder	J.	CPlusPeer1		CPlusMaster	1-2 3-4 5-6				
Contacts RX Group Lists			Add >>		7-8 9-10 11-12				
⊞ 💼 Channels ⊞ 💼 Scan ⊞ 💼 Roam			<< Remove		13-14 15-16				
Capacity Plus									
↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓									
⊡ ⊡ Sites	~	,							

- In the left pane, select the Voice 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.

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



- Note: The order of the channels in the Members list must follow the order of their respective Slot IDs, for example 1-2, 3-4, and so on.
 - 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 a Capacity Plus system.

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

⊡	01400	1 ieneral Settings	^	General Settings	
		ccessories	I	Top CWID Audio Profile Microphone Backlight Battery Saver Alerts Over-the-Air Programming Persistent LRRP Requ	<u>ue</u>
		elemetry		Radio Name Radio 235	^
	_	ecurity etwork nnouncement		Welcome Image	
E	🖣 📄 s	ob Tickets ignaling Systen ncoder	ns		
Ē	🖣 – 🧰 c	ecoder ontacts X Group Lists	ł	Radio ID 235 GPS V	
E	- 🔁 c	hannels can	~	GNSS GPS/QZSS	~

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 calling radios when addressing the radio, for instance, when making a private call or sending a 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**.
- In the **Network** pane, click the **Radio Network** link, or scroll down to the Radio Network section.

DP4801				Ne	etwork		
General S	_						
🞈 Accesso	ries <u>Top</u>	Radio Network	Services	Control Station	IP Site Connect	Bluetooth	Bluetooth Serial Port Profile Data F
Buttons	USB	HID Data Routing					
Text Mes	sages	no oddi rooding					
💷 Telemetry	/			Radio IP	192 . 168	. 10 . 1	^
🛅 Menu				\sim			
🐨 Security				Accessory IF	192.168.10.2		
Network				Netmask	255.255.255.0		
	ement						
🕂 🖮 🚞 Job Ticke	ets			Bluetooth IP	192.168.11.1		
🕂 📄 💼 Signaling	Systems		В	luetooth Accessory IF	192.168.11.2		
🕀 🚞 Encoder		_					
🕀 💼 Decoder				Radio	Network		
🕂 💼 Contacts							_
🕀 💼 🛚 RX Grou	p Lists			CAI Network	12 ÷		
🕂 💼 Channels	a						
🕂 🚞 Scan				CAI Group Network	225 ÷		
🕀 🚞 Roam			Max	TX PDU Size (bytes)	750 💌		
🕂 📄 Capacity	Plus						
				Telemetry UDP Port	4008 🛨		
				Forward to PC			
				I Of Ward to PC	Disabled	•	
				Sei	vices		
				00	1000		-
				ARS Radio ID	64250 ÷		
				100.0			
				ARS IF	13.0.250.250		
				ARS UDP Port	4005 ÷		
				TMS Radio ID	64250 🗧		÷
	1						

• In the **Radio Network** section, specify the following parameter:

Forward to PC

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

- In the Services section, specify the following parameters:
 - ARS Radio ID

Specify the Radio ID of the ARS server.

TMS Radio ID

Specify the Radio ID of the TMS server.

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



4.3.3 Contacts

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

— …	.	DP4801 General Setti	inas						Capacity	Plus			
		 Accessories Buttons Text Messac 			Contact	Name	\supset	Call ID	Connection Type	Route Type	Call Receive Tone	Ring Style	Text Messag Alert Tone
	(Telemetry						10 -	USB	Regular		No Style	Repetitive
	· '	Menu		Cað	TG 20			20 -	USB	Regular		No Style	Repetitive
		Security			TG 77			77 -		Regular		No Style	Repetitive
		Network Network Network						USB	Regular	~	No Style	Repetitive	
6		Job Tickets Signaling Sys Encoder Decoder Contacts F - G Tone MDC Outik-C Outik-C											
		- 689 -	Add		•	Group Call	Ctrl+F7						
			Cut	Ctrl+X		Private Call	Ctrl+F8						
			Сору	Ctrl+C		All Call	Ctrl+F9						
		C • •	Paste	Ctrl+V		Dispatch Call	Ctrl+F10						
r		RX Group L	Sort		•	PC Call	Ctrl+F11						Þ

• 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 > Capacity Plus. Right-click on it, and choose Add > RX Group List.

		Telemetry Menu	^		List_LCP_TG10				
		Security							
		Network			Available		Members		
	(0)))	Announcement		Т	G 20		TG 10		
[÷ 💼	Job Tickets		т	3 77				
[÷ 📄	Signaling Systems							
[÷ 📄	Encoder				Add >>			
[÷ 📄	Decoder							
[÷ 📄	Contacts				<< Remove			
[÷ 🔁 .	RX Group Lists							
	÷	🚞 Digital							
	<u> </u>	Capacity Plus							
		🛶 👌 📄 List_LCP_TG10							
		👋 🗎 List_LCP_TG20							
	÷	📋 Flexible RX List							
[÷ 🚞	Channels							
[÷ 📄	Scan							
[÷ 📄	Roam							
[± 💼	Capacity Plus							

- 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

4.3.5.1 Adding a Capacity Plus Personality Channel

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

		Telemetry Menu	^				Channels	
	Security						Drag zones to desired position	
		Announcement	t –				Set Voice Files Clear Voice Files	_
ŧ) 🚞	Job Tickets			Position	Zone Name	Voice Announcement File	
ŧ) 🚞	Signaling Syste	ems			Zone1	None	
Ē	🚞	Encoder		٢	2	Channel Pool	None	
Ē	_	Decoder					<u></u>	
E I	_	Contacts						
Ē	_	RX Group Lists	S					
Ē) 💼 (=	Channels Zon	Add		Zo	ne Ctrl+F2		
	T		Cut	Ctrl+X				
			Сору	Ctrl+C				
	÷	- 🕥 Cha	Paste	Ctrl+V				
Ē		Scan Roam	Sort					
Ė	···· 🚞	Capacity Plus	*					~

In the left pane, select the zone you have added. Right-click on it, and choose
 Add > Capacity Plus Personality.

					Zone1				
General S	-								
	es		Drag channels to desired position						
Buttons			Set Voice Files Clear Voice Files						
Text Mes	-			1			1		
101 Telemetry		I				Channel			
····· 📷 Menu			Position	Channel	Voice Announcement File	Bandwidth	Dual Capacity	Timing Leader	
		I	Name			(kHz)	Direct Mode	Preference	
Network									
- 🕘 Manounce	ment	▶ n. €	1	Channel 1	None	N/A		Eligible	
🕂 💼 👌 Job Ticke	ts								
🕂 🗀 Signaling	Systems	1							
Encoder									
Elicoder									
T -									
🕂 📄 Decoder	Lists								
Decoder	Lists								
Decoder					~~~ 5				
Decoder D	Lists Add	•	Analog Cł		Shift+F5				
Decoder Contacts C	Add		Analog Cł Digital Ch		Shift+F5 Shift+F6				
Contacts Contacts Contacts Contacts Channels Contacts Channels Contacts Channels Contacts Channels Contacts	Add		Digital Ch						
Decoder Contacts C	Add Cut Ctrl+X		Digital Ch Capacity	annel	Shift+F6 Shift+F7				
Decoder Contacts C	Add Cut Ctrl+X Copy Ctrl+C Paste Ctrl+V		Digital Ch Capacity	annel Plus Personality Plus Personality (Link	Shift+F6 Shift+F7				
Decoder Contacts C	Add Cut Ctrl+X Copy Ctrl+C Paste Ctrl+V Delete Del		Digital Ch Capacity Capacity	annel Plus Personality Plus Personality (Link	Shift+F6 Shift+F7 ced) Ctrl+Shift+F7				
Decoder Contacts C	Add Cut Ctrl+X Copy Ctrl+C Paste Ctrl+V		Digital Ch Capacity Capacity	annel Plus Personality Plus Personality (Link	Shift+F6 Shift+F7 ced) Ctrl+Shift+F7				

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



⊡ Ì		OP48		Capa	acityPlus		
			General Settings				
		· ·	Accessories	Top	<u>RX TX</u>		
			Buttons Text Messages	Voice Announcement File			^
			Telemetry	Voice Announcement File	None	<u>_</u>	
			Menu	ARS	On System Change -		
		_	Security				
			Network	Privacy			
			Announcement	Privacy Alias	Privacy Key1 -	1	
F		· · ·	Job Tickets			-	
Ĥ		_	Signaling Systems	AES Alias	None		
Ĥ		_	Encoder	RAS Alias	None	1	
Ĥ		_	Decoder			1	
Ĥ		_	Contacts	Option Board			
Ť			RX Group Lists	Lone Worker			
Ē			Channels				
	i	ġ	Zone1	Compressed UDP Data Header	None		
			CapacityPlus	Over-the-Air Battery Management			
Ē			Channel Pool Scan	Voice List	VoiceList_1]	
Ė	(Roam	Data List	DataList 1	1	
Ė	h (Capacity Plus		DataList_1	1	
				Rest Channel Acquisition TOT (min)	5 🕂		
				Beacon Interval (ms)	1920 ≑		
				Channel Inhibit			
				RX Only			
				RX		ТХ	
				Group List LIST_LCP_All	Contact Name	TG 77 💌	
				Emergency Alarm Indication	Emergency System	None 🔻	
				Emergency Alarm Ack	vox [
				Emergency Call Indication	Power Level	High	~
			1				

• In the right pane, specify the following parameters:

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 or this feature will not function.

Voice List

Select the Capacity Plus Voice List you have specified in section <u>4.3.6,</u> <u>Capacity Plus Voice List</u>.

Data List

Select the Capacity Plus Data List you have specified in section <u>4.3.7</u>, <u>Capacity Plus Data List</u>.



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.

4.3.5.2 Adding Channels to Channel Pool

Channel Pool is used for organizing channels in the radio that are not tied to a channel selector position. The Channel Pool is not visible when the radio user navigates through the zones.

- In the left pane, select Channels > Channel Pool. Right-click on it, and choose Add > Capacity Plus Voice Channel.
- In the left pane, select the first channel (for example, named CPlusMaster) that has previously been added.

		Network	^`		CPlusMaster	
E	🚺	Job Tickets			TOD RX IX	
E	3 🚺	Signaling Systems				
E	··· 🚺	Encoder			Color Code 1 ÷	
E	🚺	Decoder			Phone System Phone_100	
E	_	Contacts		,	Phone_100	•
E	[RX Group Lists				
E		Channels		RX		TX
		E- 💼 Zone1				
	E	- 🎲 Channel Pool			Offset (MHz)	
		CPlusMaster		Frequency (MHz) 167,420000	0.000000	Frequency (MHz) 146.420000
		CPlusPeer1		187.42000		140.42000
E	_	Scan Roam		Ref Frequency Default -	Сору	Ref Frequency Default -
E	_	Capacity Plus		Ref Frequency Default		Ref Frequency Default
6	L		41			

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.

Phone System

Select the phone system you have specified in section <u>4.3.8, Phone System</u>.

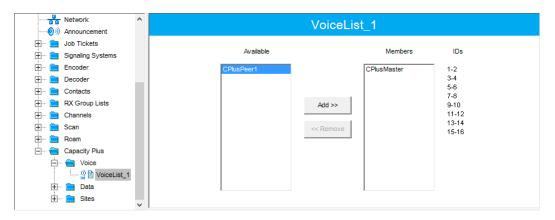
- In the **RX Frequency** box, specify the radio frequency the radio will receive on.
- In the **TX Frequency** box, specify the radio frequency the radio will transmit on.
 - Note: The RX and TX frequencies of the radio must be the opposite to the RX and TX frequencies of the repeater. In other words,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



4.3.6 Capacity Plus Voice List

This section describes how to add the channels contained in the Channels Pool to a Capacity Plus Voice List.

 In the left pane, select Capacity Plus > Voice. Right-click on it, and choose Add > Capacity Plus Voice List.



- In the left pane, select the Voice 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.

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

Note: The order of the channels in the Members list must follow the order of their respective Slot IDs, for example 1-2, 3-4, and so on.

4.3.7 Capacity Plus Data List

This section describes how to add the channels contained in the Channels Pool to a Capacity Plus Data List.

 In the left pane, select Capacity Plus > Data. Right-click on it, and choose Add > Capacity Plus Data List.

Telemetry	^	DataList_1						
🔁 Menu		2						
😳 🖚 Security								
Network		Available	Memb	ers				
		CaPlus_D2	CaPlus_D1					
🕂 💼 Job Tickets								
🕂 🖮 🚞 Signaling Syste	ms							
🕂 🖻 Encoder			Add >>					
🕂 🗠 🚞 Decoder								
🕂 💼 Contacts			<< Remove					
🕂 🚞 RX Group Lists								
🕂 💼 Channels								
🕂 💼 Scan								
🕂 💼 Roam								
🚊 🛁 Capacity Plus								
🕂 ···· 🚞 Voice								
🚊 🗠 💼 Data		Enhanced GPS Window	w Size 5 👻					
🔐 🗎 Data	aList_1							
🕂 💼 Sites		Enhanced Channel A	ccess					
	✓ I							

• In the left pane, select the Voice 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.

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

4.3.8 Phone System

- In the left pane, select **Signaling Systems > Phone**. Right-click on it, and choose **Add > System**.
- In the left pane, under **Phone**, select the phone system that has been just added.

General Settings	Phone_100
Buttons Text Messages Telemetry Menu Security Security Solution Announcement Job Tickets	Top DTMF Gateway ID 100 = Access Code 0 Deaccess Code # DTMF
Signaling Systems Signaling Systems Source Strategy Source Strategy So	Pretime (ms) 500 ÷ TX Tone Duration (ms) 120 ÷ TX Tone Interval (ms) 80 ÷ Pause Duration (ms) 4000 ÷
Contacts RX Group Lists	

- 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.

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 topologies 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			_	×
File Action Help				
۵ 💿 🔜 🔹 🏟 🔘 💿 🛇				
Service	Watcher Settings			
interfaces	PortWatcher	3000		
ARS Settings	WatcherTO	14400		
Watcher Settings	NotifyGroup	0		
Authentication Server Settings	NotifyRate	5		
Engling				
	PortWatcher Port listening for Watcher Subsc Range: 1000 - 65535	ribe requests		
Settings for Watcher interface				

Settings for Watcher interface

PortWatcher

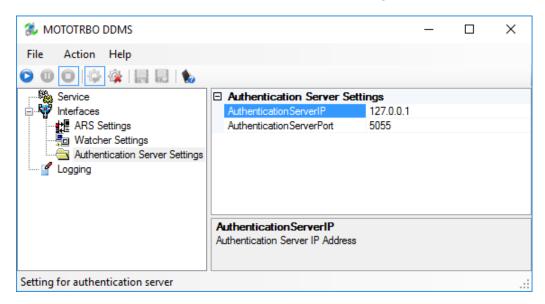
This is the port number for listening TRBOnet Server requests.

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

Service IP Address and Authentication Port, respectively.

DDMS service			
Vuse 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.

	🀍 mototrbo	DDMS	
Service Start Interfaces Version ServiceName	File Action	Help	
Start sterfaces Version Cogging ServiceName	00	🏟 🔜 🔜 🏡	
Logging ServiceName	Service		Service
	E Start Interfaces		Version
Do L N	🕤 Logging		ServiceName
DisplayName			DisplayName
Description			Description
ServiceMode			ServiceMede



4.5 Configuring MOTOTRBO MNIS

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 Interfac	e Service Configuration Utility * -	×
Configuration View Edit	Service Help	
1		
⊡· CAP+	General	
Group List 금 Group List 나 왕합 List 1 요 글 Conventional	System Operation Mode Capacity Plus V MNIS Application ID 64250 🖨	
 Capacity Plus Linked Capacity Plus 	Tunnel Network	
🗄 🗃 Advanced	MNIS IP Address 172.168.10.1 Tunnel IP Address 172.168.10.2	
	Subnet Mask 255.255.255.0	
		:

System Operation Mode

From the drop-down list, select Capacity Plus.

MNIS Application ID

Configure 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>5.1.1.4, MNIS Data Service</u>, **IP Address**).

MNIS data service		
🗹 Use Data Gateway	host	
IP Address:	172.168.10.2	▼ ¢
Control port:	5000	÷



• In the left pane, select Capacity Plus

MOTOTRBO Network Interfac	ε Service Configuration Utility *	-		×
Configuration View Edit	Service Help			
⊡ 🛑 CAP+ 	Capacity Plus			
Group List Group List Conventional Capacity Plus Capacity Plus Advanced	Master IP Address 10.10.188.35 Master UDP Port 50000 🔹 MNIS LE Port Or Automatically Assigned Manually Assigned None		•	
	Authentication Key Ø			
	Security Setting Basic V			
	Security Alias			
	Group List List1 ~			
	Outbound Data Limit 2			
	GPS Latitude			
	GPS Longitude			
				:

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).



- MOTOTRBO Network Interface Service Configuration Utility * \times Configuration View Edit Service Help ? 🖃 🌰 IPSC General Gran Security Data Call Confirmed 🗹 🗄 💼 Group List 🗄 💼 Conventional Compressed UDP Data Header None \sim Capacity Plus Battery Saver Preamble 🗄 ζ 🙆 Linked Capacity Plus 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 Interfac	e Service Configuratio	on Utility *		-	х
Configuration View Edit	Service Help				
1 🔝 🔁		?			
🖃 🎃 Untitled					^
- III General		CAI Network	12		
Group List		CALINGWOIK			
📙 🍪 🗎 List 1		CAI Group Network	225 🜩		
Conventional		S	ervices		
Capacity Plus		ARS UDP Port	4005		
🕢 🎸 Linked Capacity Plus					
Advanced		TMS UDP Port	4007		
 Forwarding Rules 		Telemetry UDP Port	4008		
Application Oven		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		
		ARS Monitor			
		ARS Monitor ID	None 🔺		
		Device Discover	y and Mobility Service		
		Server Address	127.0.0.1		
		Watcher Port	3000		
		MNIS Co	ntrol Interface		
	C	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, MNIS Data Service</u>, **Control port**).

MNIS data service		
🗹 Use Data Gateway		
🗹 Service is on a loca	l host	
IP Address:	172.168.10.2	→
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 Configuration Utility	_	\times
Configuration View Edit	Service Help		
New			
Open			
Delete	General		
Set as Active Configuration			
Save	System Operation Mode Capacity Plus	~	
Save as			
Close	MNIS Application ID 64250		
Exit			
 Capacity Plus Cinked Capacity Plus 			
🗉 🚞 Advanced		_	
	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 Capacity Plus 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 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 a Capacity Plus system.

Note: Only the Master repeater needs to be added 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.

Configuration		Digital Systems			Version: 5.3.0.170
Service Service Network Redundancy	^	🗹 Enable Digital	Systems		
Database		CAI Network:		12	‡
😪 Reports		CAI Group Netv	/ork:	225	÷
Service Management		and aroup need			•
X Advanced settings		Registered Dig	jital Systems		
上一人 Geocoding Server	s	Name		IP Address	Radio ID
Radio Networks					
TRBOnet Cloud					
Digital Syste	Add MOTOTR	BO System	1		
Analog Cont 🖶	Add Capacity	MAX			
🔂 Remote Agents 🔒	Add DIMETRA	Express			
Friendly Servers	Add Control S	tation			
Telephony	Add TRBOnet				
y bata boarces =		-			
Email - Email	Add Friendly F	S-1000 Station	Delete		Test
	Add XRC-9000	Controller			
Set Defau 🚽	Add XRT-9000	Controller		Apply	OK Cancel
	Add SELEX Re	peater	-		
-	Add KAIROS R	epeater			
-	Add WAVE Co	ntroller			
×	Remove All				

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 \land			
🕤 Network	System Name:	Repeater #1	
🛱 Redundancy	TRBOnet Peer ID:	100 ‡	
Database	TRBOnet Radio ID:	64250	
Reports	TROUTEL RAUIO ID;	•	
Service Management	TRBOnet Local Port:	50000 🗘	
X Advanced settings	Master Repeater Conr	ection Info:	
Geocoding Servers	Master IP Address:	10.10.188.35 -	
Radio Networks	Master UDP Port:	50000	Test
			Test
Services	Authentication Key:	123456	
Repeater #1	System Type:	Capacity Plus	•
X Advanced setti			
···· 🔒 Privacy	System Identifier:	Department 1	
🔞 DDMS service	Vuse NAI Voice		
{🔞 MNIS data ser\	🗸 Use NAI Data (MNIS an	d DDMS)	
Audio Paths	Use RCM for control rad	•	
🔜 💼 Analog Control Station: 🗸		ulo acuvicy	
< >			
Set Defaults		Apply	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 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</u>, <u>Configuring a Subscriber Radio</u>, <u>4.3.2</u>, <u>Network</u>). The default value is **64250**.

• TRBOnet Local Port

Enter the local port number 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 WAN IP address of the site router behind which the master repeater resides. Or, enter the LAN address of the single master repeater if there is no site router.

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 Capacity Plus.

• Test

Click this button to check the connection to your master repeater. If the test is successful, you'll see the information on 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.

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**.

Note: These settings are applicable only when **Use NAI Voice** and **Use NAI Data (MNIS and DDMS)** are deselected in the Repeater pane.

Configuration		Advanced settings				
♂ Service Network	^	Voice Call Hang Time (ms):			
Redundancy		Group Call:	3000	\$]	
Database		Private Call:	4000	\$]	
Service Management		Emergency Call:	4000	÷]	
Advanced settings		TX Preamble:	120	÷]	
Radio Networks		TX Timeout:	60	÷	seconds	
Digital Systems Services		Phone System:	Motoro	a Phone System		•
Repeater #1		Allow CSBK Data				
X Advanced settings						
DDMS service						
MNIS data service						
Audio Paths						
Analog Control Stations	~					
Set Defaults				Apply	ОК	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	F	Privacy			Version: 5.3.5.1874
🛷 Service	^				
S Network		Privacy Type:	Enhan	ced 🔻	
🛱 Redundancy		Basic Privacy Key ID:	1	A	
Database		Enhanced Privacy Key	15.		
😪 Reports					
Service Management			ID	Name	Value
💥 Advanced Settings		ARC4 (40 bit) 🔻	1		
→ K Geocoding Servers		ARC4 (40 bit)	1		
Radio Networks		AES (256 bit)			
		AES (256 bit) Legacy			
🛛 🙆 Digital Systems					
Services					
Repeater #1					
Advanced Sett					
Privacy					
🛄 Audio Paths	v	Add	emove		File
< >		Add	emove		
Set Defaults				Apply	OK 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		DDMS se	ervice					Version: 5.3.5.1874
🛷 Service 🕥 Network	^		MOD	service				
Redundancy			l port		0		1	
Database				Address:	127.0.0	.1 •	1	Test
Service Management		Serv	ice po	ort:	3000	\$]	
Advanced Settings		Auth	entica	ation Port:	5055	\$		
Radio Networks		Redu	undan	t services:				
				Service IP A		Service port		Local port
Digital Systems Services Repeater #1		1		10.10.101.	207	3000		0
Advanced Settings								
MNIS data service Audio Paths	~		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.

5.1.1.4 MNIS Data Service

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.

• In the **Configuration** pane, under the corresponding **Repeater**, select **MNIS data service**.

Configuration		MNIS data service				
💣 Service	^					
🕥 Network		🗹 Use Data Gateway				
🛱 Redundancy		Service is on a local	host			
Database		IP Address:	172, 168, 10).2 ▼ ¢		
😪 Reports			172,100,10			
🔅 Service Management		Control port:	5000	÷	Test	
💥 Advanced settings		MNIS Service:	MOTOTRBO	O Network Inter	face Service	- ¢ ?
Geocoding Servers		Redundant services:				
Radio Networks		IP Address	(Control port	Local port	
Services						
Repeater #1						
🛛 💥 Advanced setti						
DDMS service						
MNIS data serv						
Advanced :						
Audio Paths	v	Add	elete		Test	
< >					rest	
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 Audio Paths

The Audio Paths are talk paths of the system to make and receive Voice Calls; in general, they are talk groups. TRBOnet Server requires that all audio paths of a Capacity Plus system be registered in its configuration. If an audio path is not registered, the TRBOnet operator will not be able to receive and transmit to the corresponding talk group.

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

Configuration	Audio Paths	
Service A Network	Load Groups Map	
🛱 Redundancy	Call Type	Group ID
Database	Group Call	10
😪 Reports	Group Call	20
🔅 Service Management	Private Call	
X Advanced settings	All Call	
Geocoding Servers		
Radio Networks		
Digital Systems		
Services		
Repeater #1		
X Advanced settings		
Privacy		
DDMS service		
MNIS data service		
Advanced settin		
Audio Paths		
Analog Control Stations	Add Delete	Configure
< >		
Set Defaults	Apply O	K Cancel

- In the Audio Paths pane, specify the following Audio Path-related settings:
 - To add an audio path to the system, click **Add**.
 - Make sure the check box in the first column is selected to make and receive voice calls from the selected subscriber.
 - From the drop-down list, select the **Call Type** for the audio path. The available call types are All Call, Group Call, and Private Call.



- Enter the Group ID, which is an ID of the talk group the dispatcher can make calls to. The Group ID is not applicable for Private Calls and All Calls.
- To configure the selected audio path, click **Configure**.
- Specify the desired audio path settings similar to those for a common repeater <u>slot</u>.

5.1.2 Adding a Control Station

This section describes how to configure TRBOnet Server for communication with a control station in a Capacity Plus 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	
Configuration DDMS service MNIS data service Advanced settin Audio Paths Control Station #1 Advanced settings	Control Station #1 Name: Radio ID: IP Address: Mode:	Control Station #1 64250 192.168.10.2 ✓ Test
Audio Paths Analog Control Stations Remote Agents	System Identifier:	Department 1 lata only (GPS Revert or Data Revert)
Friendly Servers Telephony Advanced settings Internal PBX Server Advanced settings	Playback device: Recorder device:	Speakers (Logitech USB Headset) ・ マ Line In (2- High Definition Audio Device) ・ ダ
V Data Sources		
Email 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 Capacity Plus.

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 shapped so that it will only respire

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 data to the connected control station.

Recorder device

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

• 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		
Advanced settings Privacy DDMS service MNIS data service Advanced setting Audio Paths Control Station #1 Advanced settings Audio Paths Analog Control Stations Remote Agents Friendly Servers Advanced settings Telephony Advanced settings Telephony Advanced settings Comports COM ports COM ports COM ports COM ports COM ports COM ports COM ports COM ports COM ports	Automatically reset ala Automatically handle of Emergency Call/Alarm Use front microphone	all alert indication the PTT is pressed ("Impoli	te" channel access) seconds Configure
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 a remote control of the PTT button via a remote speaker microphone on 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 the GPS data are compressed into a single CSBK data.

5.1.2.2 Audio Paths

The Audio Paths are talk paths of the system to make and receive Voice Calls; in general, they are talk groups. TRBOnet Server requires that all audio paths of a radio system be registered in its configuration. If an audio path is not registered, the TRBOnet operator will not be able to receive and transmit to the corresponding talk group.

• In the **Configuration** pane, under the corresponding **Control Station**, select **Audio Paths**.

Configuration	Audio Paths	
Advanced settings		Crown TD
Privacy	Call Type	Group ID
DDMS service	Group Call	10
MNIS data service	Group Call	20
Advanced setting	Private Call	
Audio Paths	All Call	
Control Station #1		
Advanced settings		
Audio Paths		
Analog Control Stations		
Remote Agents		
Friendly Servers		
Telephony		
Advanced settings		
Internal PBX Server		
Advanced settings		
Pata Sources		
COM ports		
TCP/IP		
< >	Add Delete	
Set Defaults	Apply	K Cancel

- In the **Audio Paths** pane, specify the following Audio Path-related settings:
 - To add an audio path to the system, click **Add**.



- Make sure the check box in the first column is selected to make and receive voice calls from the selected subscriber.
- From the drop-down list, select the **Call Type** for the audio path. The available call types are All Call, Group Call, and Private Call.
- Enter the **Group ID**, which is an ID of the talk group the dispatcher can make calls to. The Group ID is not applicable for Private Calls and All Calls.

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			
Advanced settings	Telephony ✓ Use Telephony SIP Server ✓ Internal PBX Server			
Advanced settings Data Sources COM ports TCP/IP Modbus TCP Email SMS License				
< >	Add Delete Test			
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
Audio Paths Audio Paths Advanced setti Audio Paths	✓ Use Internal PBX Server Local IP: 10.10.00.99 ▼ ♥ Port: 5060 €
Analog Control Station:	Dispatch Center
Friendly Servers Telephony Advanced settings	SIP ID: 1234 SIP User: 1234
Internal PBX Server	
CP Modbus TCP	
🔀 Email	
SMS	
< >	
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 MS Users		〕 1: Line free	All Call •) € Ø
- Logical Groups - Radio Groups - Radios 2 ↓	Image: Add Image: Edit Image: Edit Image: Edit Image: Edit Name △ Radio ID Cleaners 30	MDC / Sel-5 (Hex) 5	; Descriprion Cleaning group
Voice Dispatch	Firemen 20 Police 10	0	
Location Tracking Job Ticketing Route Management RFID Tracker	3		
Voice Recording			
Radio Allocation	1		
Administration	H4 44 4 Record 1 of 3 + H+ HH 4		۱.
🔂 127.0.0.1 🛞 🕵 🧕 🖉 Administrator 📑 Lie	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>). In addition, make sure these radio groups have been added to TRBOnet Server as Audio Paths.



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							👲 🐠 🕒
	1: Line free Private Call Group 20	*)) * (;	0	✓ Intercom Group 10 All Call	0) ((0) ((0) ((0		
Radio Groups 2	Registered				(A) (5 D () 🗔			
Radios 🗸 🗸	🖶 Add Group	🛃 Add Digital R			/AVE Radio 📑			
< >	Radio Name∆	MOTOTRBO Radio	Radio I	D MDC ID	SIP ID 125	11; Firemen	Logical Gr	Description
A de union prime de	 123 13 	MOTOTRBO Radio		0	125	All	cicuring,	
Voice Dispatch	235	MOTOTRBO Radio		0	235	Firemen; P	Cleaning	
Location Tracking	3333	TRBOnet Mobile	3333	0	3333	11; 22		
Location Tracking	\$ 555	MOTOTRBO Radio	555	0		All		
🙀 Job Ticketing	🛞 Radio 300	MOTOTRBO Radio	300	0		All		
Route Management				3				
Text Messages								
Voice Recording								
Event Viewer								
Radio Allocation	1							
Administration	HI II Record	1of6 🕨 🗰 🗰	(Þ
🔂 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** and **Radio ID**, and **Radio Groups**, 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 Edit X Delete If Grouping Auto Filter @ Default Settings
	SIP Phone SIP User Caption TBBOnet Mobile Client 1234 Internal PBX Server
Voice Dispatch	Radio 125 125 125 Radio 235 235 235
Location Tracking	
Route Management	
Text Messages	1
[행] Radio Allocation	
Administration	HI II Record 1 of 3 + + + H I
🔂 127.0.0.1 🛞 🤶 Administrator 📑 Li	ensed 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.