

CTI Products

**RadioPro™ IP Gateway**  
**Installation Guide**  
**for**  
**Motorola MOTOTRBO Radios**  
**(XPR 2500, 45xx, 55xx)**



**Document # S2-61903-830**

**For Version 8 Software**

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**Fonts used in this document:**

*Technical terms*

*Cross-references within this document*

*Hyperlinks to other documents or web pages*

**Warnings**

**Software menus, menu options, folders, pages, and parameters**

**Software parameter values**

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# 1 OVERVIEW

This Manual will focus on configuring and using the *Motorola MOTOTRBO Radios* with the RadioPro System.

Please Refer to the [RadioPro IP Gateway Installation Guide](#) for general installation information relevant for all radio system types.

## 1.1 System Planner Document and Template

The [RadioPro System Planner for Motorola MOTOTRBO S2-61645](#) includes examples for various MOTOTRBO radio network topologies and should be consulted if the RadioPro Dispatch client is being deployed.

Use the System Planner Template on page 34 of this document in the planning phase of a project to record IP addresses, usernames, passwords, serial numbers, and device names.

## 1.2 Required Items

### 1.2.1 Radio Interface Cable

A radio interface cable must be ordered for each IP Gateway from the following table:

<i>Control Station Radio</i>	<i>Cable Part #</i>
Motorola XPR4550/5550	S2-61431
Motorola XPR2500	S2-61916

Other cables are available to connect a dedicated data revert radio. Contact CTI for more information.

### 1.2.2 Control Station Radio

Each Control Station radio used for voice requires one IP Gateway. The control station radio connected to the IP Gateway **must at least have the minimum firmware version listed below**. Motorola's CPS (Customer Programming Software) software will be needed to configure the control station radio.

<i>Control Station Radio</i>	<i>Minimum Version</i>	<i>Programming Software</i>
Motorola MOTOTRBO in Conventional, IPSC, Cap+, or LCP	1.08.0	CPS
Motorola MOTOTRBO in Connect Plus mode	2.2.0	CPS
Motorola MOTOTRBO Connect Plus Option Board	1.3.0	CPS

### 1.2.3 Radio Programming Cable

Either the Motorola programming cable or the RadioPro Gateway cable may be used with the CPS software to configure the Control Station radio.

**Note:** A programming cable connected to the front microphone connector on the Control Station radio may prevent communications to a RadioPro IP Gateway through the Rear Accessory Connector.

**WARNING: Remove any other cables from the front microphone connector before attempting to connect and use the RadioPro IP Gateway or a programming PC on the rear accessory connector. The front and rear ports cannot be engaged at the same time.**

## 2. FEATURE AVAILABILITY

### Motorola MOTOTRBO Systems

Depending on MOTOTRBO System Type, some features may not be available. Use the following table to determine if a feature discussed in this document is not available.

<i>System Type</i> <i>Feature</i>	<i>Anal og</i>	<i>Conv. Digital</i>	<i>Cap +</i>	<i>IP Site Connect</i>	<i>Linked Cap +</i>	<i>Connect Plus</i>
Voice Dispatch	✓	✓	✓	✓	✓	✓
Text Messaging	-	✓	✓	✓	✓	-
GPS Mapping	-	✓	✓	✓	✓	-
ARS	-	✓	✓	✓	✓	-
Private Call	-	✓	✓	✓	✓	✓
Remote Monitor	-	✓	✓	✓	✓	✓
Remote Enable/Disable	-	✓	✓	✓	✓	✓
Telephone interconnect Rec/Mon	-	✓	✓	✓	✓	✓

### 3. CONFIGURATION AND INSTALLATION

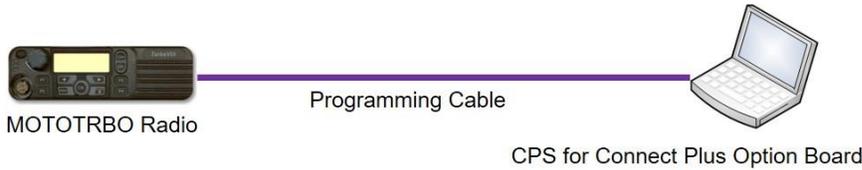
Use the steps in the following table to install a RadioPro System. Each step is discussed in detail starting on page 7. Following installation of the IP Gateway in Step 5, at least one Client must be installed from Step 6.

Step #	Description	Motorola MOTOTRBO
1a	Configure XPR 45xx / 55xx Control Station Radio(s) for Voice	S2-61903, page 7 IP Gateway Installation Guide
1b	Configure XPR 45xx / 55xx Control Station Radio(s) for Data	Same as the previous Step 1a
1c	Configure MOTOTRBO Connect Plus Option Board	S2-61903, page 17 IP Gateway Installation Guide (Required only if Connect Plus.)
1d	Configure Subscriber Radios for ARS, GPS, and TMS	S2-61903, page 18 IP Gateway Installation Guide (Required only for ARS, GPS, or TMS. Not required for Connect Plus.)
1e	Configure XPR 2500 Control Station Radio(s) for Voice	S2-61903, page 22 IP Gateway Installation Guide
1f	Configure MOTOTRBO repeater(s) for Enhanced GPS option	S2-61903, page 26 IP Gateway Installation Guide (Required only for GPS data using Enhanced GPS.)
2	Connect RadioPro IP Gateway to Control Station Radio	S2-61903, page 27 IP Gateway Installation Guide
3	Configure RadioPro IP Gateway(s) using ICU.exe	S2-61903, page 28 IP Gateway Installation Guide

Please Refer to the [RadioPro IP Gateway Installation Guide](#) for additional installation steps relevant for all radio system types.

**Step 1a. for Motorola XPR 45XX & 55XX (Voice):**

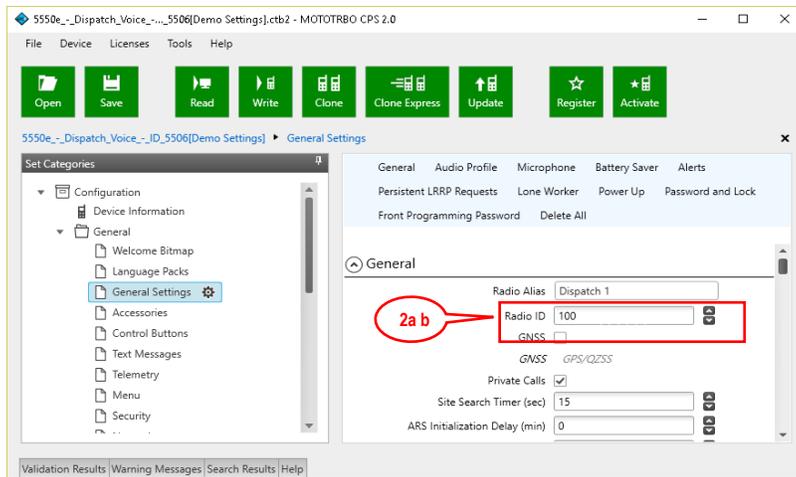
**Configure Control Station Radio (For Voice) using MOTOTRBO CPS**



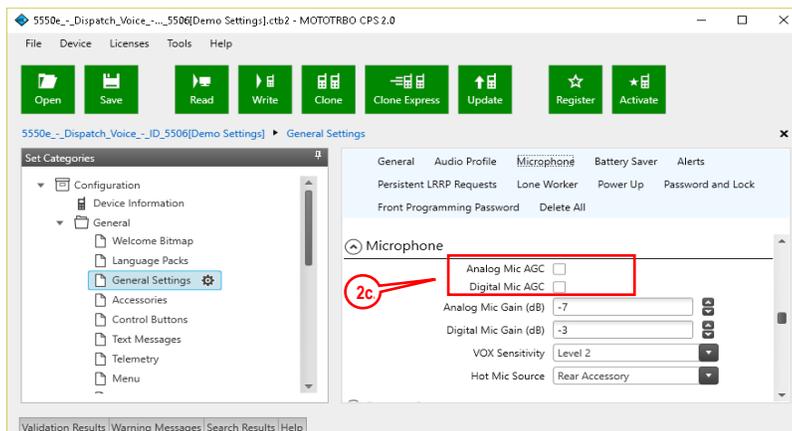
Follow the **9 steps** in this section to configure Control Station Radios for both Voice and Data operation.

Use MOTOTRBO CPS (Motorola’s Customer Programming Software) to configure MOTOTRBO radio parameters using the following steps. (CTI Cable S2-61431 may be used for programming instead of the Motorola programming cable.)

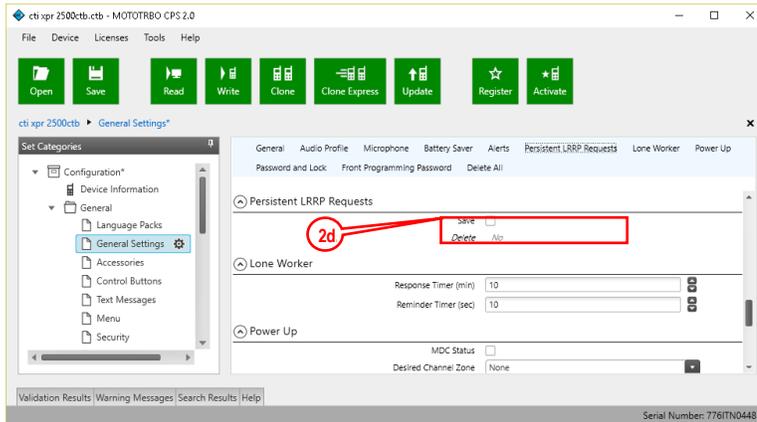
1. From the **View** menu, choose **Expert**.
2. **General Settings** folder:
  - a. The **Radio IDs** of the *Voice Radio* and the *Data Revert Radio* that share a RadioPro IP Gateway must be the same.
  - b. **Disable GPS**.



- c. In the **Microphone** section, change **Analog Mic AGC** and **Digital Mic AGC** to **Unchecked**.



- d. In the **Persistent LRRP Requests** section, verify that **Save** and **Delete** parameters are **Unchecked**.



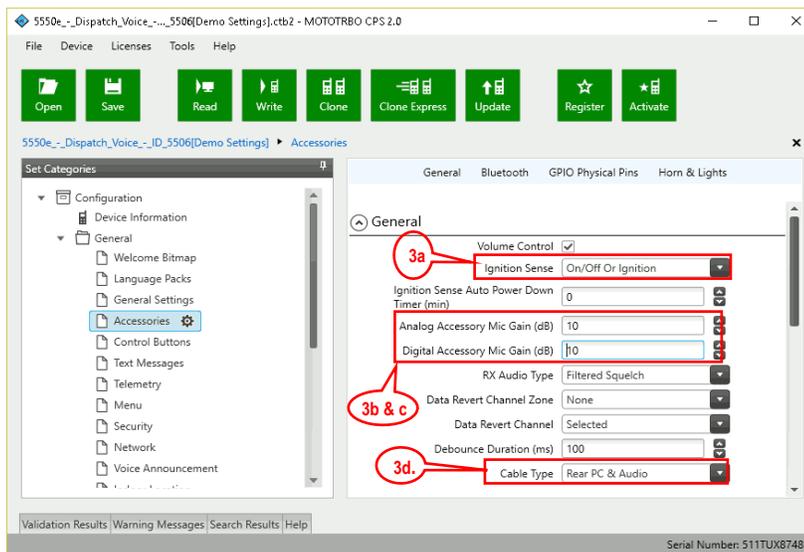
3. **Accessories** folder:

- a. Change **Ignition Sense** to **On/Off Or Ignition**.
- b. Change **Analog Rear Mic Gain** to **+10db**. (This setting is not needed for a *Data Revert Radio*.)
- c. Change **Digital Rear Mic Gain** to **+10db**. (This setting is not needed for a *Data Revert Radio*.)

**Note:** The above mentioned ‘Rear Mic Gain Settings’ may tolerate **minor** adjustments to optimize mic audio levels.

**Warning:** Do not set levels outside the range of +9db to +11db, or adverse audio quality will be the result!

- d. Change **Cable Type** to **Rear PC and Audio**.



4. **Network** folder:

- a. Typically, the factory default Radio IP Address programmed into the Control Station radios ‘Network’ tab, **does not need to be changed**. However, it must be on a different subnet than the RadioPro IP Gateway that is connected to it via the Rear Accessory Connector. See [4.1 Appendix - IP Addressing](#) on page 30 for more information.

For radios sharing an IP Gateway, the following rules must be met:

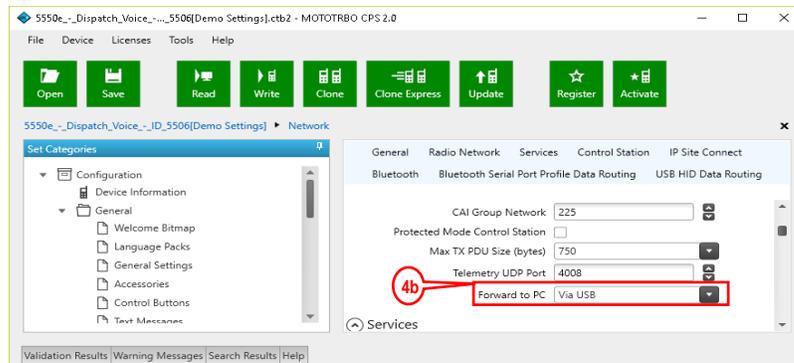
- i. All radios sharing an IP Gateway **MUST** have the **SAME Radio ID**.
- ii. All radios sharing an IP Gateway **MUST** be on **DIFFERENT IP subnets**.

See [RadioPro System Planner for Motorola MOTOTRBO](#) for more details and system diagrams.

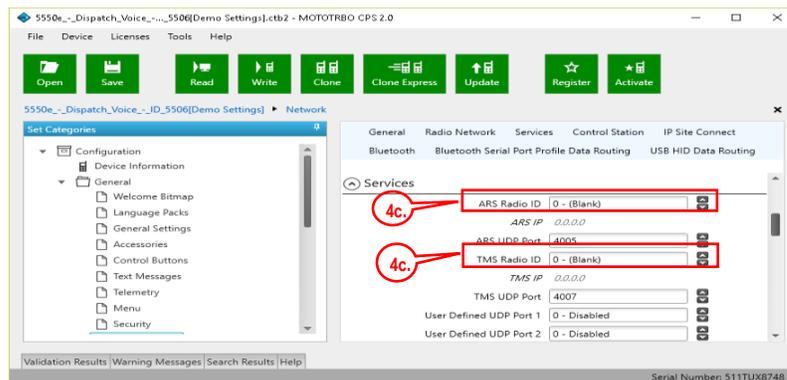
- iii. The **IP address** of the **Voice Radio** must be **LOWER** than the **IP addresses** of the **GPS Data Revert Radio(s)**.



- b. Change **Forward to PC** to **Via USB**. This step is required for the **Text Message** function when using RadioPro Dispatch, Solo, Talk, or Talk for Mobile client.



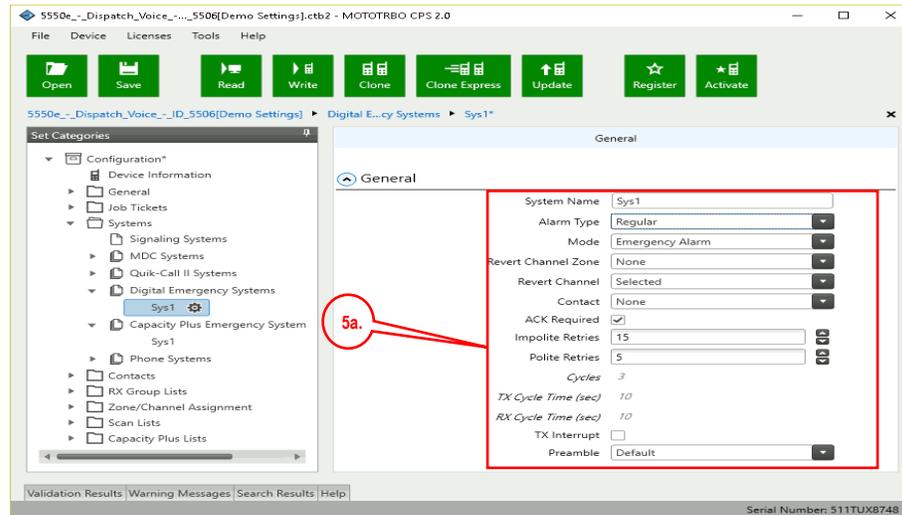
- c. The **ARS Radio ID** and **TMS Radio ID** fields **MUST** be **blank**.



5. **Signaling Systems** folder:

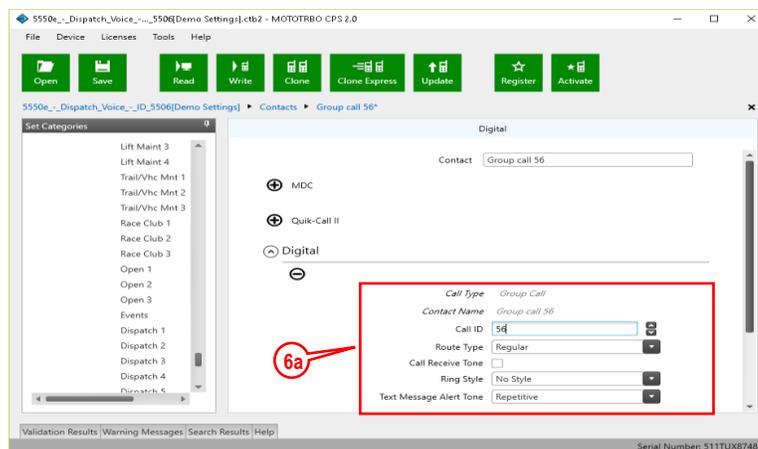
This step is required if a RadioPro client will be sending an emergency indication to other radios. (Also, see Step 7d below for required setup of **Channels** folder.)

Right-Click **MDC**, **Digital**, or **Capacity Plus**, depending on type of channel(s) programmed in radio. Then click **Add**, and then **System**. Choose appropriate parameters for the **Signaling System** being added.

6. **Contacts** folder:

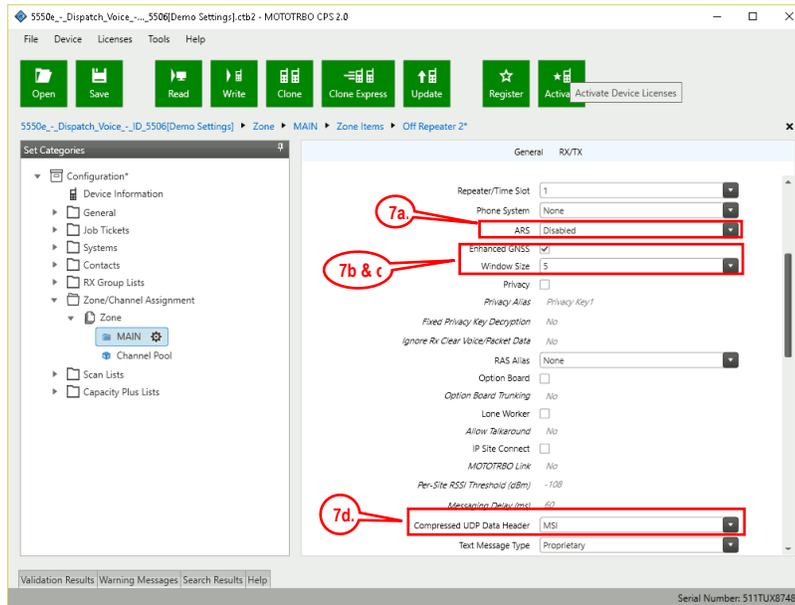
a. Right-Click **MDC**, **Digital**, or **Capacity Plus**, depending on type of channel programmed in radio. Then click **Add**, **Group Call**, and then enter the **Call ID** (Group ID programmed in radio). This step is required for **Group Calls**.

b. Right-Click **MDC**, **Digital**, or **Capacity Plus**, depending on type of channel programmed in radio. Then click **Add**, and then **All Call**. This step is required for the **All-Call** function when using RadioPro Dispatch.



## 7. Channels folder:

- a) For each Digital channel, change the **ARS** parameter to **Unchecked**.



- b) If this is a **Data Revert** control station radio, and if the repeater for this channel has the **Enhanced GPS Option** enabled, then **enable** the **Enhanced GPS** parameter. If this is a **Voice** control station, then change the **Enhanced GPS** parameter to **Unchecked**.
- c) If **Enhanced GPS** is **enabled** in step b. above, then set the **Window Size** to **5** normally or **6**, if using the selection for **Privacy Type**. Note that the **Window Size** parameter **is system-wide and must also be set in the Data Revert Repeater(s) to match this value**. See the tables below for more details.

In the following **Enhanced GPS Radio Update Tables**, the number of radio GPS updates is indicated based on selection criteria of **Update Interval** and **Window Reservation**.

**Enhanced GPS Radio Update Tables**

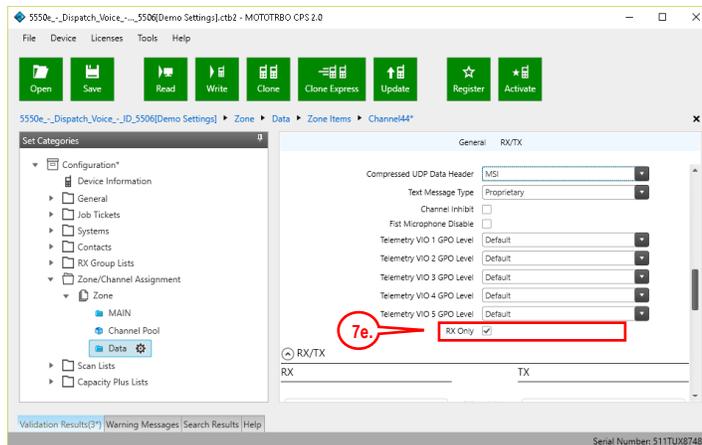
**Window Size = 5, Privacy Type must be None**

Window Reservation Update Interval	90% (Recommended)	75%	60%	45%
30 sec	90	75	60	45
1 min	180	150	120	90
2 min	360	200	240	18
4 min	720	600	480	360
8 min	1440	1200	960	720

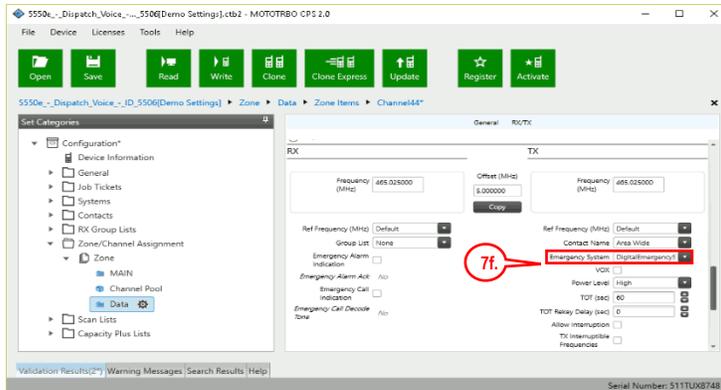
**Window Size = 6, Privacy Type is Basic or Enhanced**

Window Reservation Update Interval	90% (Recommended)	75%	60%	45%
30 sec	74	62	49	37
1 min	148	124	98	74
2 min	296	248	196	148
4 min	592	496	392	296
8 min	1184	992	784	592

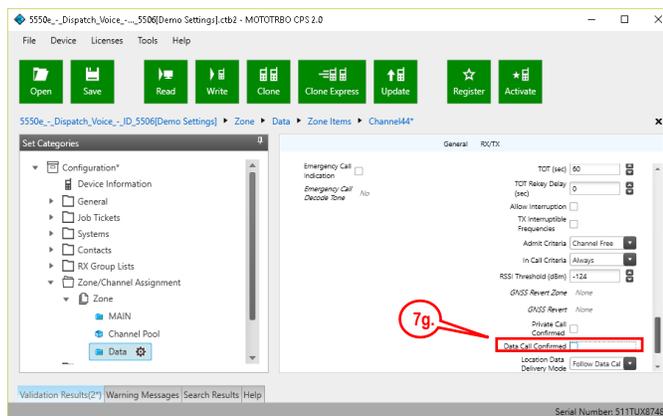
- d) For each Digital channel, enable **Compressed UDP Data Header** by choosing **MSI**.
- e) If this control station radio will be used **ONLY** to collect GPS location data using a Data Revert repeater slot, then change the **RX Only** parameter to **Checked**.



- f) This step is required if a RadioPro Dispatch client will be sending an emergency indication to other radios. (Also see Step 5a above for required setup of **Signaling Systems** folder.) In the **TX** section, choose an **Emergency System** (for digital channels) or **Signaling System** (for analog channels). This step is required for the **All-Emergency** function when using RadioPro Dispatch client.



- g) In the **TX** section for each Digital channel, change the **Data Call Confirmed** parameter to **Unchecked**.



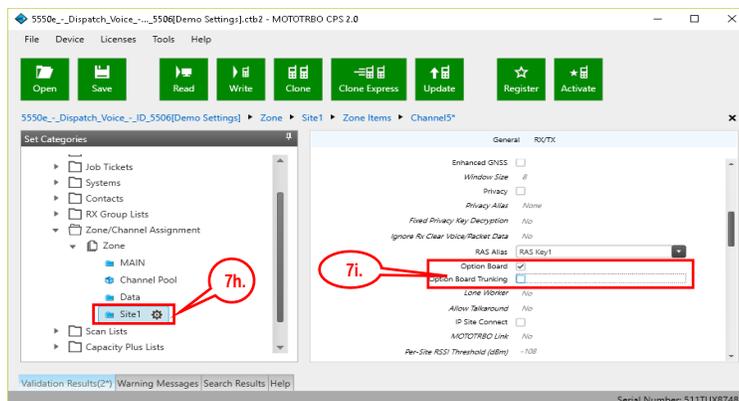
### *Additional CPS Setup for Connect Plus Channels*

In a Connect Plus radio, the Connect Plus Option Board is configured with the various Talk Groups for the radio system. The Connect Plus Option Board CPS must be used to configure these various Talk Groups, or “Zones”. However, for a radio that is used as a control station, since the Connect Plus Option Board cannot pass this information out the rear connector, an application (such as RadioPro Dispatch, Solo, Talk, or Talk for Mobile) does not have knowledge of these Connect Plus “Zones” (talk groups).

Further, MOTOTRBO CPS is used to configure a radio for only one digital “Channel”, i.e., “Transportation”. Control of the talk group selection is passed to the Option Board by enabling two options described in Step 7h below.

In order to allow selection of a talk group from a RadioPro client, the following configuration must be performed for a Control Station radio using MOTOTRBO CPS.

- h) In the **Channels** folder, add a quantity of channels to match the number of **zones** configured in the Connect Plus Option Board. In the following screen shot, **Channel1**, **Channel2**, etc., have been added to match the number of “Zones” configured in the Connect Plus Option Board. The Channel Names are not important since these names are not transferred out of the rear connector of the control station radio; only the generic names of “Channel1”, “Channel2”, etc. will be sent to a RadioPro client.
- i) For each of the added channels, **enable** both the **Option Board** and **Option Board Trunking** parameters. It is not necessary to change any other parameters.



After writing the CPS configuration to the control station radio, the radio will send messages to the RadioPro IP Gateway and indicate that the radio has been programmed for the “additional” talk groups.

ICU.exe can be used to view and configure the IP Gateway for zones and channels as follows:

- i. Use the **Zones/Channels** tab in ICU.exe to view Channel names as they will appear in RadioPro clients. By default, they will be generically named “Channel1”, “Channel2”, etc.
- ii. If it is desired to display more descriptive channel names, right-click on a channel name to edit it.
- iii. If it is desired that a channel or zone is not displayed in a RadioPro client, click on the zone or channel, and then **uncheck** the **Visible** parameter near the bottom of this tab page.
- iv. Write the new configuration to the RadioPro IP Gateway by choosing **Write Settings** from the **Gateway** menu.

### 8. **Writing CPS Parameters to Radio:**

After writing the CPS parameters to the MOTOTRBO Control Station radio, remove the programming cable from the Control Station radio. A programming cable connected to the front mic connector on the Control Station radio will prevent communications to a RadioPro IP Gateway from the Rear Accessory Connector. Therefore, when a cable is connected to the Rear Accessory Connector to connect a RadioPro IP Gateway or a PC (during programming), **ensure that the programming cable has been disconnected from the front mic connector.**

*Summary of MOTOTRBO CPS Setup for Control Station Radios*

<i>Folder</i>	<i>Sub-Folder</i>	<i>Parameter</i>	<i>Step #</i>	<i>Setting</i>
General Settings	Main	Radio ID	2a.	Voice Radio and Data Revert Radio that share an IP Gateway must have the same Radio ID
	Main	GPS	2b.	Disable
	Microphone	Analog Mic AGC	2c.	Disable
	Microphone	Digital Mic AGC	2c.	Disable
	Persistent LRRP	Save	2d.	Disable
	Persistent LRRP	Delete	2d.	Disable
Accessories	Main	Ignition Sense	3a.	"On/Off" Or "Ignition"
	Main	Analog Rear Mic Gain	3b.	+ 10dB: May need to be adjusted for appropriate audio level transmitted from RadioPro client. Data Revert radio does not require this.
	Main	Digital Rear Mic Gain	3c.	+ 10dB: May need to be adjusted for appropriate audio level transmitted from RadioPro client. Data Revert radio does not require this.
	Main	Cable Type	3d.	"Rear PC and Audio"
Network	Main	Radio IP	4a.	For radios sharing an IP Gateway, the IP address of the Voice Radio must be lower (and in a different subnet) than the IP addresses of the Data Revert Radios. An IP Gateway and all radios connected to it must have unique subnets.
	Radio Network	Forward to PC	4b.	"Via USB"
	Services	ARS Radio ID	4c.	Leave this field blank (ARS disabled)
	Services	TMS Radio ID	4c.	Leave this field blank (TMS disabled)
Signaling Systems	MDC, Digital, or Capacity Plus	System	5a.	Choose appropriate parameters for the signaling system being added for All-Emergency function. Data Revert radio does not require this.
Contacts	MDC, Digital, or Capacity Plus	add Group Call	6a.	Add Group Call contact for the Group Call function. Data Revert radio does not require this.
		add All Call	6b.	Add All-Call contact for the All-Call function. Data Revert radio does not require this.
Channels	Digital	ARS	7a.	Disable for all channels
	Digital	Enhanced GPS	7b.	Enable if this control station is a data revert radio
	Digital	Window Size	7c.	5 if Privacy Type is "None" 6 if Privacy Type is "Basic" or "Enhanced"
	Digital	Compressed UDP Data Header	7d.	"MSI" for all channels
	Digital or Analog	RX Only	7e.	Enable for a data revert radio that will ONLY receive GPS location data from a data revert repeater slot.
	Digital or Analog	Emergency System	7f.	Choose appropriate Emergency ID for All-Emergency function. Data Revert radio does not require this.
	Digital	Data Call Confirmed	7g.	Disable for all channels
	Connect Plus	Option Board	7h.	Enable for all Connect Plus talk groups. Data Revert radio does not require this.
	Connect Plus	Option Board Trunking	7i.	Enable for all Connect Plus talk groups. Data Revert radio does not require this

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**Step 1b. for [Motorola XPR 45XX & 55XX \(DATA\)](#):**

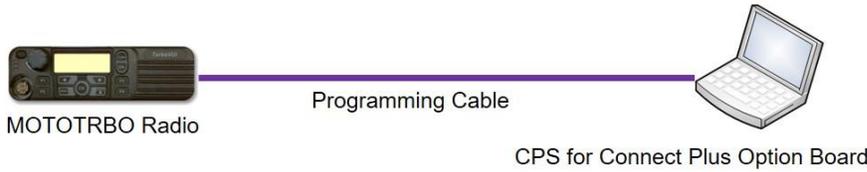
*Configure Control Station Radio (For Data) using MOTOTRBO CPS*

**SAME AS THE PREVIOUS STEPS**

**Follow the previous process starting at 1a on page 7**

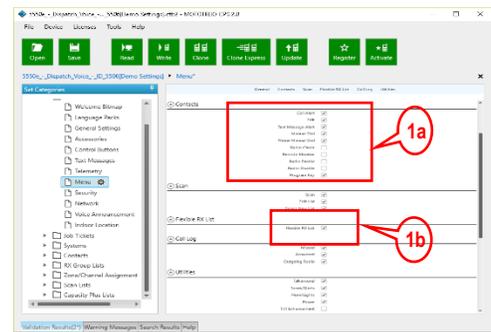
**Step 1c. for Motorola XPR 45XX / 55XX Connect Plus Radios :**

**Configure MOTOTRBO Connect Plus Option Board**



If this Control Station radio is being used in a Connect Plus system, then the Connect Plus Option Board must also be configured. Use Connect Plus Option Board CPS version R01.30.100 (or later) to configure the Option Board using the following steps. (CTI Cable S2-61431 may be used as a programming cable in lieu of the Motorola programming cable.)

1. **General -> Menu** folder:
  - a. In the **Contacts** section, **enable** the following parameters: **Call Alert, Manual Dial, Radio Check, Remote Monitor, Radio Enable, and Radio Disable.**
  - b. In the **Call Log** section, **enable** the following parameters: **Missed, Answered, and Outgoing.**
2. Write the CPS parameters to the Connect Plus Option Board. CTI Cable S2-61431 may be used as a programming cable in lieu of the Motorola programming cable.
3. Remove the programming cable from the Control Station radio.

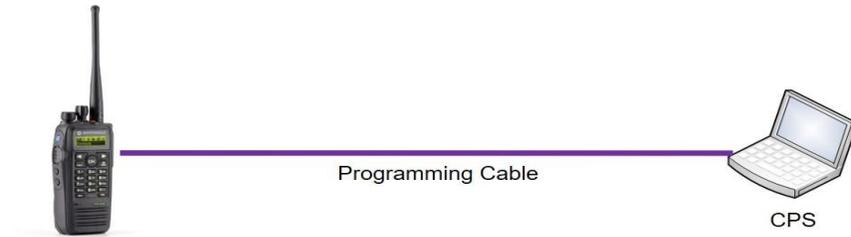


A programming cable connected to the front mic connector on the Control Station radio will prevent communications to a RadioPro IP Gateway from the Rear Accessory Connector. Therefore, when a cable is connected to the Rear Accessory Connector to connect a RadioPro IP Gateway or a PC (during programming), **ensure that the programming cable has been disconnected from the front mic connector.**

Folder	Section	Parameter	Step #	Setting
Menu	Contacts	Call Alert	1a.	Enable
		Manual Dial	1a.	Enable
		Radio Check	1a.	Enable
		Remote Monitor	1a.	Enable
		Radio Enable	1a.	Enable
		Radio Disable	1a.	Enable
	Call Log	Missed	1b.	Enable
		Answered	1b.	Enable
		Outgoing	1b.	Enable

## Step 1d. for Motorola MOTOTRBO Subscriber Radios:

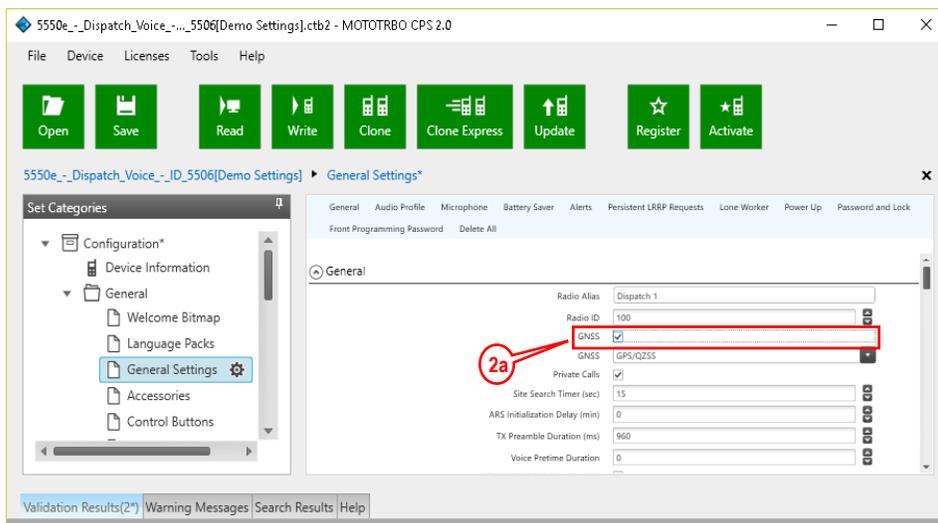
### Configure Subscriber Radios for ARS, GPS, and TMS



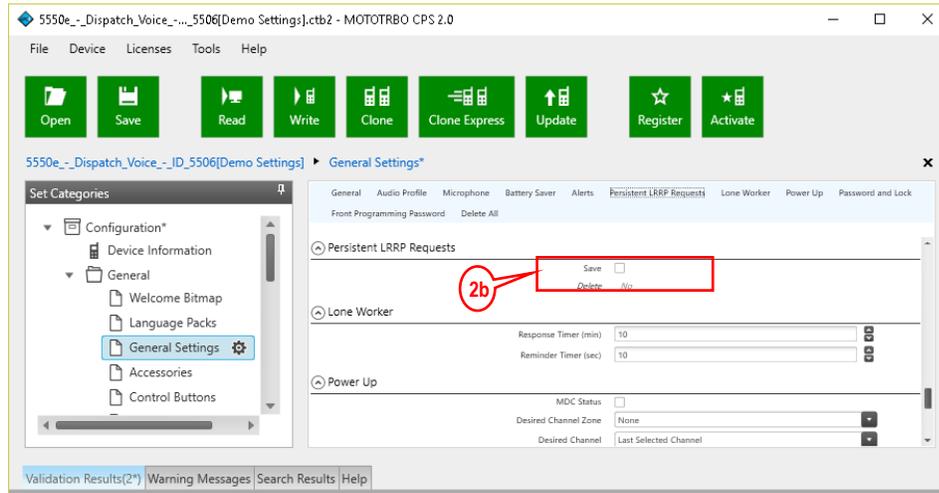
This step is required if **ARS**, **GPS**, or **Text Messaging Service** is needed at the RadioPro client (such as Dispatch, Solo, Talk, or Talk for Mobile). This step is not required for a Connect Plus system, since these functions are not available using a Control Station interface.

Use **MOTOTRBO CPS** (Motorola's Customer Programming Software) to configure MOTOTRBO radio parameters using the following steps.

1. From the **View** menu, choose **Expert**.
2. **General Settings** folder:
  - a. Change the **GNSS** parameter to **Checked**.

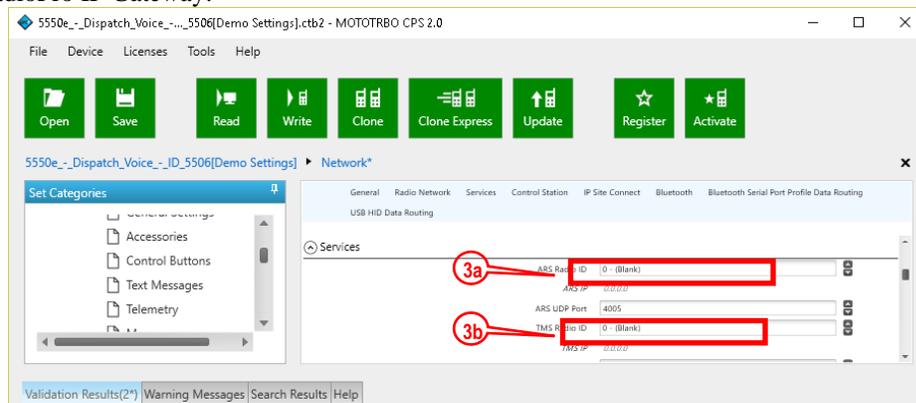


- b. In the **Persistent LRRP Requests** section, verify that **Save** and **Delete** parameters are **Unchecked**.



### 3. Network folder:

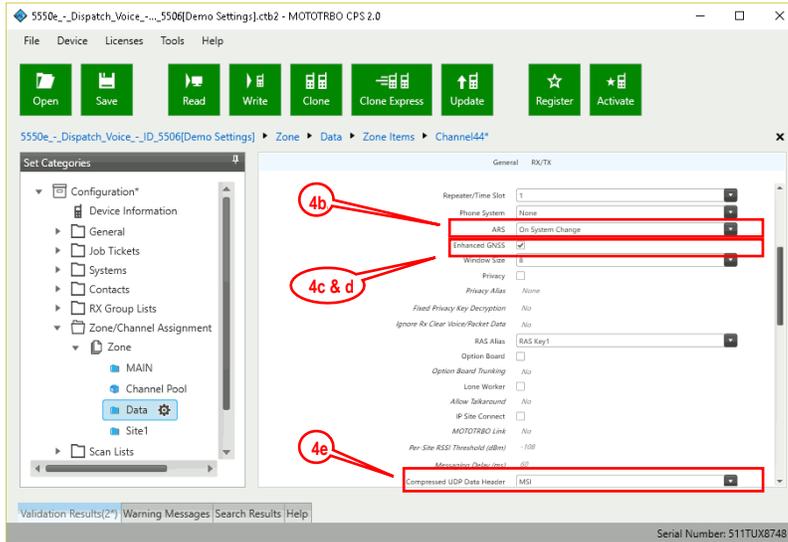
- a. Enter the **ARS Radio ID**. This should be the Radio ID of the Control Station radio that is connected to the RadioPro IP Gateway.
- b. Enter the **TMS Radio ID**. This should be the Radio ID of the Control Station radio that is connected to the RadioPro IP Gateway.



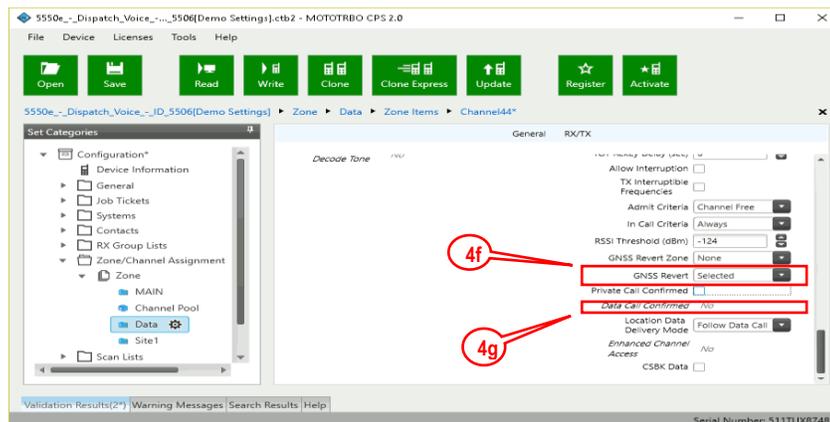
4. **Channels** folder:

Make the following changes for each digital channel that will be used to transmit GPS coordinates:

- Set **Scan/Roam List** to **None**. (*ARS* and *GPS* will not function if **Scan** is enabled with a **Scan List**.)
- Set **ARS** to **On System Change**.
- For *Data Revert* channels, and if the repeater for this channel has the *Enhanced GNSS Option* enabled, **enable** the **Enhanced GNSS** parameter.



- If **Enhanced GPS** is **enabled** in step c. above, then set the **Window Size** to either **5** or **6**, depending on the selection for **Privacy Type**. Note that the **Window Size** parameter **is system-wide and must also be set in the Data Revert Repeater(s) to match this value**. See the tables on page 17 for more details.
- Set the **Compressed UDP Data Header** parameter to **MSI**
- In the **TX** section of this channel, change **GPS Revert** to one of the following:
  - If this radio will use a *Data Revert* repeater slot to send GPS data to a RadioPro client, then change this parameter to the appropriate Channel Name.
  - If there is no *Data Revert* repeater slot, then change this parameter to **Selected**.
- Disable the **Data Call Confirmed** parameter by changing it to **Unchecked**. If this parameter is greyed-out, then ensure that the **Enhanced GPS** parameter is disabled (**Unchecked**).



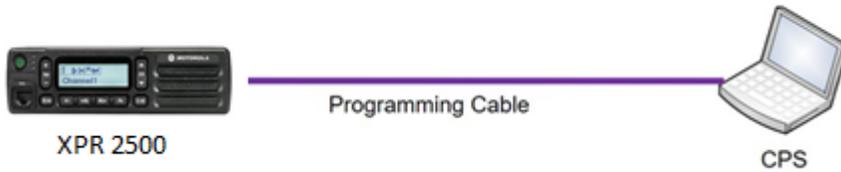
5. Write the CPS parameters to the MOTOTRBO Control Station radio.

**Summary of MOTOTRBO CPS Setup for Subscriber Radios**

<i>Folder</i>	<i>Sub-Folder</i>	<i>Parameter</i>	<i>Step #</i>	<i>Setting</i>
General Settings	Main	GPS	2a.	Enable (if applicable)
	Persistent LRRP	Save	2b.	Disable
	Persistent LRRP	Delete	2b.	Disable
Network		ARS Radio ID	3a.	Must match Radio ID of control station connected to IP Gateway
		TMS Radio ID	3b.	Must match Radio ID of control station connected to IP Gateway
Channels	Digital	Scan/Roam List	4a.	"None" (ARS and GPS will not function if Scan is enabled)
		ARS	4b.	"On System Change"
		Enhanced GPS	4c.	Enable if this control station is a data revert radio
		Window Size	4d.	5 if Privacy Type is "None" 6 if Privacy Type is "Basic" or "Enhanced"
		Compressed UDP Data Header	4e.	"MSI"
		GPS Revert	4f.	If no Data Revert: "Selected" If Data Revert: "Channel Name" of Data Revert Channel
		Data Call Confirmed	4g.	Disable

**Step 1e. for Motorola XPR 2500 Radio:**

**Configure Control Station Radio (For Voice) using MOTOTRBO CPS**

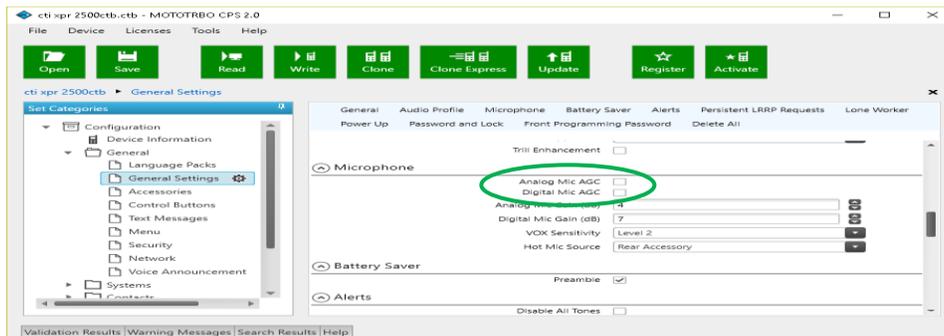


Use this section to configure Control Station Radios for Voice.

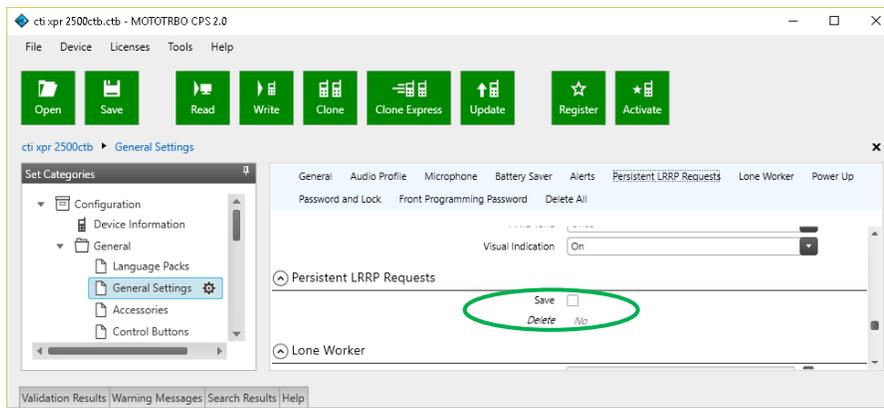
Use MOTOTRBO CPS (Motorola’s Customer Programming Software) to configure MOTOTRBO radio parameters via the following steps.

**Note:** (CTI Cable S2-61916 may be used as a programming cable in place of the Motorola programming cable.)

6. From the **View** menu, choose **Expert**.
7. **General Settings** folder:
  - a. The **Radio IDs** of both the *Voice Radio* and *Data Revert Radio* that share a RadioPro IP Gateway must be the same.
  - b. In the **Microphone** section, be sure to **Uncheck the Analog Mic AGC** and **Digital Mic AGC**.



- c. In the **Persistent LRRP Requests** section, verify that **Save** and **Delete** parameters are **Unchecked**.

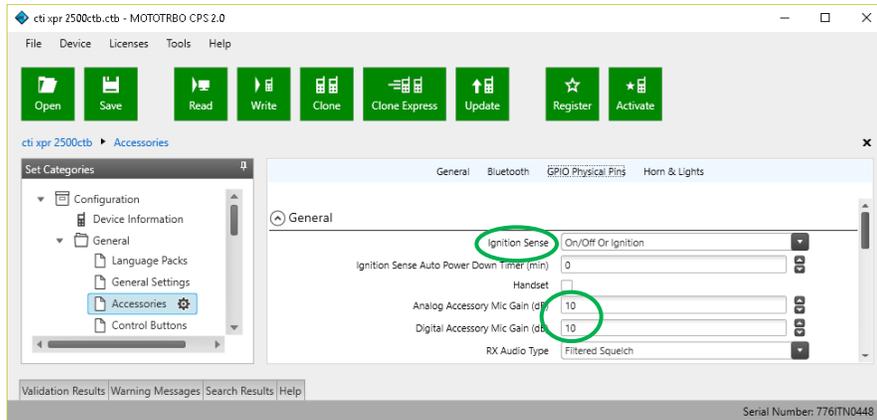


## 8. General -> Accessories folder:

- a. Change **Ignition Sense** to **On/Off Or Ignition**.
- b. Change **Analog Rear Mic Gain** to **+10db**. (This setting is not needed for a *Data Revert Radio*.)
- c. Change **Digital Rear Mic Gain** to **+10db**. (This setting is not needed for a *Data Revert Radio*.)

**Note:** The above mentioned ‘Rear Mic Gain Settings’ may tolerate **minor** adjustments to optimize mic audio levels.

**Warning:** Do not set levels outside the range of +9db to +12db, as severe audio quality will result!



## 9. Network folder:

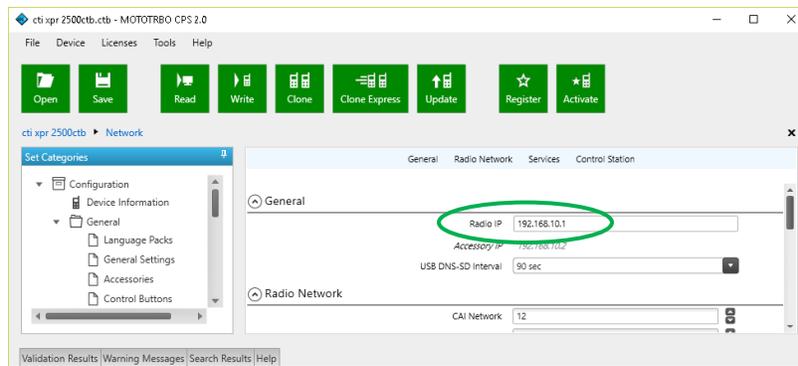
Typically, the factory default IP Address programmed into the XPR 2500 Control Station radio **does not need to be changed**. However, when it is connected to a RadioPro IP Gateway via the Rear Accessory Connector, it must be on a different subnet than that gateway. See [4.1 Appendix - IP Addressing](#) on page 30 for more information.

For radios sharing an IP Gateway, the following conditions must be met:

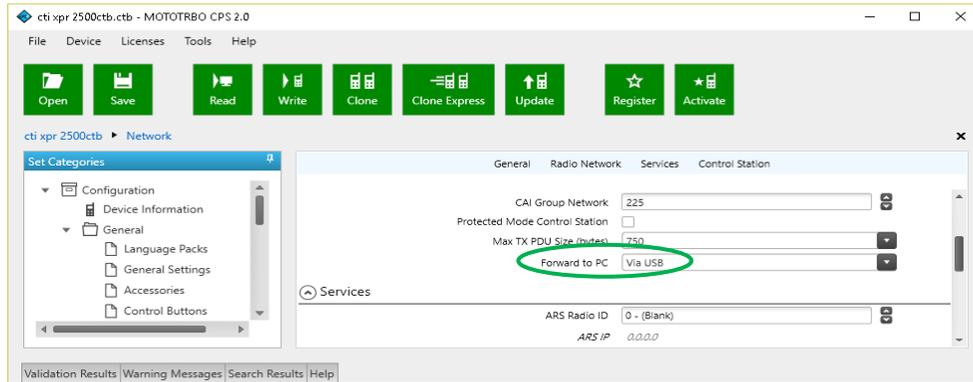
- i. All radios sharing an IP Gateway MUST have the SAME **Radio ID**.
- ii. All radios sharing an IP Gateway MUST be on DIFFERENT **IP subnets**.

See [RadioPro System Planner for Motorola MOTOTRBO](#) for more details and system diagrams.

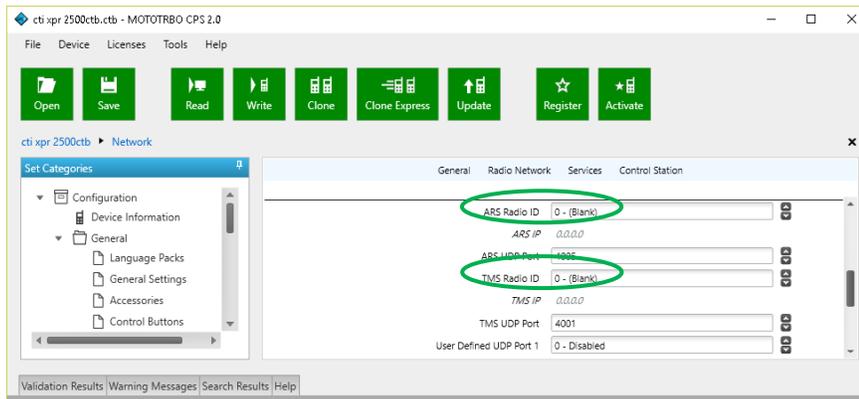
- iii. The **IP address** of the *Voice Radio* must be LOWER than the **IP addresses** of the *GPS Data Revert Radio(s)*.



- iv. Change **Forward to PC** to **Via USB**. This step is required for the **Text Message** function when using RadioPro Dispatch, Solo, Talk, or Talk for Mobile client.



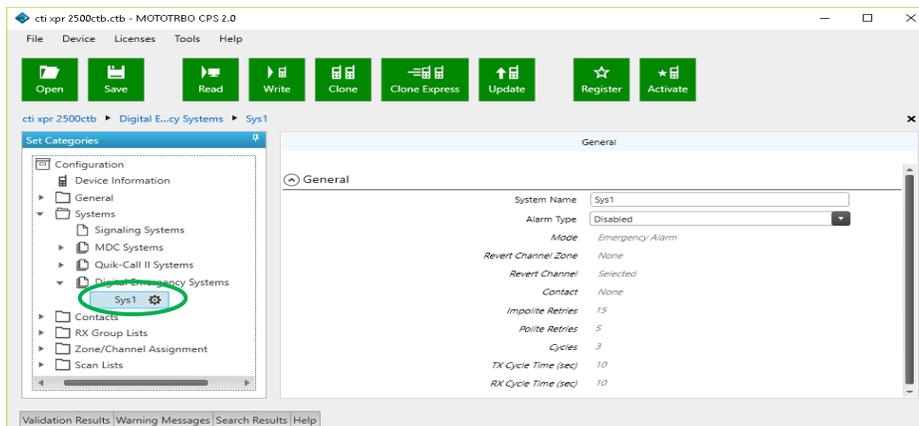
The **ARS Radio ID** and **TMS Radio ID** fields MUST be **blank**.



10. **Signaling Systems** folder:

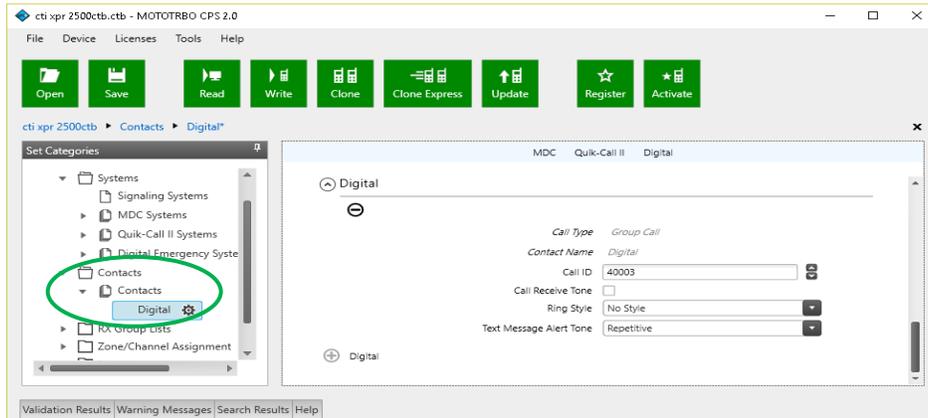
This step is required, if a RadioPro client will be sending an emergency indication to other radios. Also, see Step 7 below for required setup of **Channels** folder.)

Right-Click **MDC** or **Digital** depending on type of channel(s) programmed in radio. Click **Add**, and then click **System**. Choose appropriate parameters for the **Signaling System** being added.

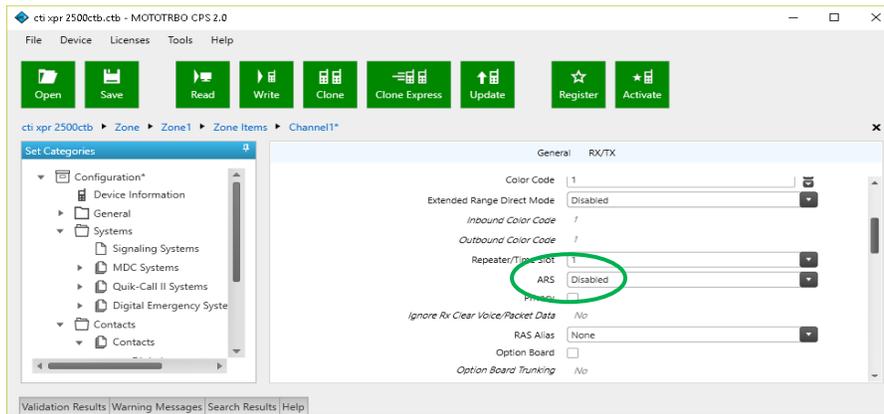


11. **Contacts** folder:

- Right-Click **MDC** or **Digital**, depending on type of channel programmed in radio. Then click **Add, Group Call**, and then enter the **Call ID** (Group ID programmed in radio). This step is required for **Group Calls**.
- Right-Click **MDC** or **Digital**, depending on type of channel programmed in radio. Click **Add**, and then click **All Call**. This step is required for the **All-Call** function when using RadioPro Dispatch.

12. **Channels** folder:

- For each Digital channel, change the **ARS** parameter to **Disabled**.



13. Write the CPS parameters to the XPR 2500 Control Station radio.

14. Writing CPS Parameters to Radio:

After writing the CPS parameters to the XPR 2500 Control Station radio, remove the programming cable from the Control Station radio.

**Warning:** You must remove the programming cable from the front connector and power cycle the Control Station radio, to prevent communication failure with the RadioPro IP Gateway on the Rear Accessory Connector.

**NOTE:** The XPR 2500 Radio does not offer any GPS functionality. Therefore, the Data-revert operation cannot be utilized when using this model radio.

*Summary of MOTOTRBO CPS Setup for Control Station Radios*

Folder	Sub-Folder	Parameter	Step #	Setting
General Settings	Main	Radio ID	7a.	Voice Radio and Data Revert Radio that share an IP Gateway must have the same Radio ID
	Microphone	Analog Mic AGC	7b.	Disable
	Microphone	Digital Mic AGC	7b.	Disable
	Persistent LRRP	Save	7c.	Disable
	Persistent LRRP	Delete	7c.	Disable
Accessories	Main	Ignition Sense	8a.	“On/Off” Or “Ignition”
	Main	Analog Rear Mic Gain	8b.	+ 10dB: May need to be adjusted for appropriate audio level transmitted from RadioPro client. Data Revert radio does not require this.
	Main	Digital Rear Mic Gain	8c.	+ 10dB: May need to be adjusted for appropriate audio level transmitted from RadioPro client. Data Revert radio does not require this.
Network	Main	Radio IP	9a.	For radios sharing an IP Gateway, the IP address of the Voice Radio must be lower (and in a different subnet) than the IP addresses of the Data Revert Radios. An IP Gateway and all radios connected to it must have unique subnets.
	Radio Network	Forward to PC	9a.	“Via USB”
	Services	ARS Radio ID	9b.	Leave this field blank (ARS disabled)
	Services	TMS Radio ID	9b.	Leave this field blank (TMS disabled)
Signaling Systems	MDC, Digital, or Capacity Plus	System	10.	Choose appropriate parameters for the signaling system being added for All-Emergency function. Data Revert radio does not require this.
Contacts	MDC, Digital, or Capacity Plus	add Group Call	11a.	Add Group Call contact for the Group Call function. Data Revert radio does not require this.
		add All Call	11b.	Add All-Call contact for the All-Call function. Data Revert radio does not require this.
Channels	Digital	ARS	12a.	Disable for all channels

**Step 1f. for Motorola MOTOTRBO Repeater:**

**Configure Motorola Repeaters for Enhanced GPS Option**

If RadioPro Dispatch will map GPS data for more than 25 radios per repeater slot, then it is recommended to dedicate one or more Data Revert slots for this GPS data. Further, repeaters with Data Revert slots should have the “Enhanced GPS Option” enabled. Contact Motorola for ordering information for this option.

Configure the **Enhanced GPS Option** in the repeater using Motorola installation information. Set the **Window Size** parameter in the repeater to **5** or **6**, depending on the setting for **Privacy Type**.

See the **Window Size** parameter on Page [12](#). This parameter must match the **Window Size** parameter in the Subscriber radios.

**Step 2. for Motorola MOTOTRBO systems:****Connect the RadioPro IP Gateway to the Control Station Radio**

**Note: Before continuing, ensure that the programming cable has been disconnected from the front mic connector.**

See Section [4.2 Appendix – Radio Interface Cables](#)

Motorola MOTOTRBO XPR4550 on Page [31](#) for interface cable details.

Connect the IP Gateway to the Control Station Voice radio using the following steps:

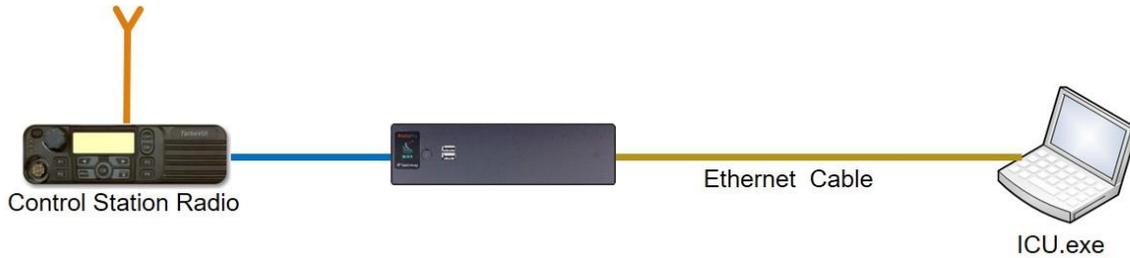
1. Connect the USB connector of cable S2-61431 to any USB port on the rear of the RadioPro IP Gateway module. In addition, for this Voice Control Station radio, connect the DE-9 side of cable S2-61431 to the DE-9 connector on the rear of the RadioPro IP Gateway module.
2. Connect the other end of the cable to the Rear Accessory Connector on the MOTOTRBO Voice radio.

Connect the RadioPro IP Gateway to the Data Revert Control Station radios using the following steps:

3. Connect the USB connector of cable S2-61664 to any USB port on the rear of the RadioPro IP Gateway module.
4. Connect the other end of the cable to the Rear Accessory Connector on the MOTOTRBO Data radio.

**Note: Since the IP Gateway has not yet been configured with appropriate IP parameters, do NOT connect the IP Gateway to an IP network.**

### Step 3. Configure RadioPro IP Gateway



**Note:** Before continuing, ensure that Wi-Fi connection has been disabled in the PC or Laptop being used to configure the IP Gateway.

The RadioPro ICU (IP Configuration Utility) must be used to configure each RadioPro IP Gateway with the necessary parameters. Configuration of each RadioPro IP Gateway must be performed before connecting the IP Gateway to a local area network.

#### Configure RadioPro IP Gateway settings:

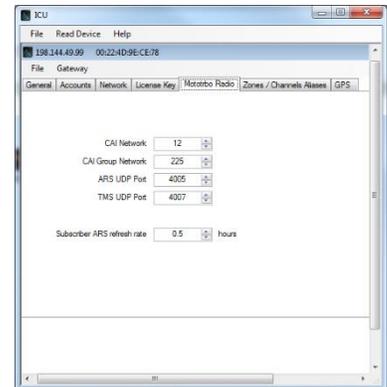
Please Refer to the [RadioPro IP Gateway Installation Guide](#) for information about how to connect to the IP Gateway and for settings that apply to all radio systems.

#### Configure MOTOTRBO specific settings: (Once connected to the IP Gateway with the ICU Utility)

##### *Mototrbo Radio tab*

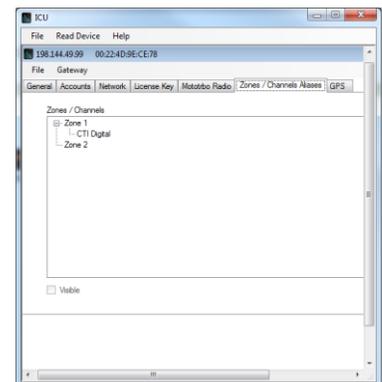
Use the **ARS Subscriber Refresh Rate** to set the time between successive ARS (Automatic Registration Service) updates for subscribers. The default value is **0.5** hours.

Other parameters on this tab are factory-default values and match the default parameters programmed into the Control Station radio. Under normal circumstances, these values **should not be altered**.



##### *Zones/Channels Aliases tab*

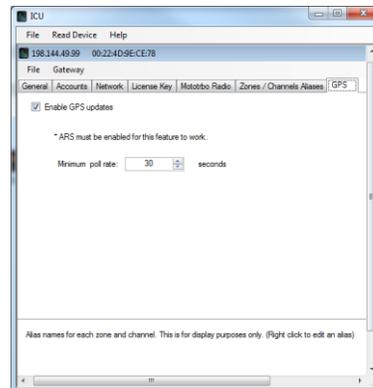
This list is downloaded from the connected MOTOTRBO radio and will be displayed in a RadioPro Dispatch client's radio controller. A **Zone** or **Channel** can be re-named by clicking on it, then editing its name. If a name cannot be edited, be sure that the MOTOTRBO radio is connected and powered on. In Capacity Plus systems, the MOTOTRBO radio adds an additional Zone to the list called **Channel Pool**. In most cases, this should be hidden from the Dispatcher by clicking on this **Channel Pool**, then removing the check mark in the **Visible** box.



### GPS tab

If mapping locations of subscribers is required, place a check mark next to **Enable GPS Updates**. Since this option will increase the amount of radio transmissions, leave this unchecked if GPS mapping is not needed.

Then choose a **Minimum Poll Rate** to set the minimum time between successive GPS updates. Increasing this parameter will decrease the number of GPS updates, thereby allowing more channel bandwidth for voice conversations.



Refer to the [RadioPro IP Gateway Installation Guide](#) for instructions on how to connect the RadioPro IP Gateway to an IP Network, configure Port Forwarding, and installing RadioPro Clients.

## 4. APPENDIX

### 4.1 Appendix - IP Addressing

Normally, the factory default IP Address programmed into the Control Station radio **should not be changed**. However, it must be on a different subnet than the RadioPro IP Gateway that is connected to it via the Rear Accessory Connector.

For example, if the network's Subnet Mask is 255.255.255.0, then at least one of the first three octets of the MOTOTRBO radio IP address must be different than the RadioPro IP Gateway module IP address.

The following **IS NOT** a valid IP addressing scheme since both devices are on the **SAME** subnet:

	<b>Control Station Radio</b>	<b>RadioPro IP Gateway</b>
<b>IP Address:</b>	<b>192.168.12.2</b>	<b>192.168.12.3</b>
<b>Subnet Mask:</b>	255.255.255.0	255.255.255.0

The following **IS** a valid IP addressing scheme since the devices are on **DIFFERENT** subnets:

	<b>Control Station Radio</b>	<b>RadioPro IP Gateway</b>
<b>IP Address:</b>	192.168. <b>12</b> .2	192.168. <b>10</b> .3
<b>Subnet Mask:</b>	255.255.255.0	255.255.255.0

For additional information see Cisco's "IP Addressing and Subnetting for New Users", Document ID 13788, located at: [http://www.cisco.com/en/US/tech/tk365/technologies\\_tech\\_note09186a00800a67f5.shtml](http://www.cisco.com/en/US/tech/tk365/technologies_tech_note09186a00800a67f5.shtml)

## 4.2 Appendix – Radio Interface Cables

### Motorola MOTOTRBO XPR4550/5550

#### Voice Radio

##### Interface Cable # S2-61431

Signal Name	IP Gateway DE-9 Pin #	IP Gateway USB Pin #	XPR Radio J2 Accessory Connector
Tx+ (Mic audio to radio) Transformer isolated, 600 ohms	4	-	11 (Yel)
Tx- (Mic audio to radio)	5	-	16 (Blk)*
Rx+ (Speaker audio from radio) Transformer isolated, 600 ohms	8	-	14 (Gry)
Rx- (speaker audio from radio)	9	-	16 (Blk)*
Accessory ID	6	-	5 (Blu)
12v Accessory	2	-	25 (Red)
Power Gnd	1	-	8 (Brn)
USB Data +	-	3	1 (Grn)
USB Data -	-	2	2 (Wht)
USB 5Vdc	-	1	3 (RED)
USB Gnd	-	4	4 (Blk)

\* These signal wires are pinned together.

This interface cable requires DE-9 Male to connect to the IP Gateway female connector.

#### Data Radio

##### Interface Cable # S2-61664

Signal Name		IP Gateway DE-9* Pin #	XPR Radio J2 Accessory Connector
USB Data +		3	1
USB Data -		2	2
USB 5Vdc		1	3
USB Gnd		4	4

**Motorola MOTOTRBO XPR2500**

**Voice Radio**

<i>Signal Name</i>	<i>IP Gateway DE-9* Pin #</i>	<i>IP Gateway USB Pin #</i>	<i>XPR Radio J2 Accessory Connector</i>
Tx+ (Mic audio to radio) Transformer isolated, 600 ohms	4 (Yell)		5
Tx- (Mic audio to radio)	5 (Blck)		1
Rx+ (Speaker audio from radio) Transformer isolated, 600 ohms	8 (Grey)		11
Rx- (speaker audio from radio)	9 (Blck)		1
12v Accessory	2 (Red)		10
Power Ground	1 (Brwn)		7
USB Data +		3	17 (Grn)
USB Data -		2	18 (Wht)
USB 5Vdc		1	19 (RED)
USB Gnd		4	20 (Blk)

\* Interface cable requires DE-9 Male to connect to the IP Gateway female connector.

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**6. SYSTEM PLANNER TEMPLATE** **PAGE 1 OF 2**

**RadioPro IP Gateways**

**Parameters Common to all IP Gateways**

<b>ICU.exe Admin Password</b> <small>for ICU.exe, default is "admin"</small>	<b>Dispatch Client Password</b> <small>for Dispatch client connections default is "user"</small>	<b>NTP Server IP Address</b> <small>Network Time Protocol</small>

**Parameters Unique to each IP Gateway**

GPS = GPS Data Revert.  
Each IP Gateway supports 1  
Voice & 1 GPS Data Radio.

	<b>Name</b> <small>IP Gateway name has max 2 lines, 24 chars per line</small>	<b>Serial #</b>	<b>IP Address</b>	<b>Subnet Mask</b>	<b>Default Gateway</b>
<b>IP Gateway A</b>	Example Gateway Name	1234	192.168.56.22	255.255.255.0	192.168.56.1
<b>Voice Radio A0</b>	Example Radio VR A0		192.168.10.1	255.255.255.0	
<b>GPS Radio A1</b>	Example Radio GPS A1		192.168.11.1	255.255.255.0	
<b>IP Gateway B</b>					
<b>Voice Radio B0</b>					
<b>GPS Radio B1</b>					
<b>IP Gateway C</b>					
<b>Voice Radio C0</b>					
<b>GPS Radio C1</b>					
<b>IP Gateway D</b>					
<b>Voice Radio D0</b>					
<b>GPS Radio D1</b>					
<b>IP Gateway E</b>					
<b>Voice Radio D0</b>					
<b>GPS Radio D1</b>					
<b>IP Gateway F</b>					
<b>Voice Radio D0</b>					
<b>GPS Radio D1</b>					
<b>IP Gateway G</b>					
<b>Voice Radio D0</b>					
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<b>Voice Radio E0</b>					
<b>GPS Radio E1</b>					

If additional IP Gateways are needed, copy this page.

See next page for System Planner Template Page 2 of 2

**6. SYSTEM PLANNER TEMPLATE** **PAGE 2 OF 2**

**RadioPro Dispatch Clients**

See [RadioPro Dispatch Installation and Configuration Guide S2-61785](#) for more information.

**Parameters Common to all Dispatch clients**

<i>Administrator Password</i> <small>for Edit Mode</small>

**Parameters Unique to each Dispatch client**

<i>PC Name</i>	<i>IP Address</i>	<i>License #</i>	<i>Licensed IP Gateway Connections</i>

**RadioPro Solo, Talk, and Mobile Clients**

See [RadioPro Solo Client Installation Guide S2-61568](#), for more information.

**Parameters Common to all Talk Clients**

<i>Administrator Login Name</i> <small>Not Editable</small>	<i>Administrator Password</i> <small>default is "admin"</small>
admin	

<i>User Login Name</i> <small>default is "user"</small>	<i>User Password</i> <small>default is "user"</small>

If additional Solo, Talk, or Mobile client logins are needed, copy this page.