

CTI Products

**RadioPro! IP Gateway**  
**Installation Guide**  
**for**  
**Kenwood NEXEDGE NX-57xx/58xx Radios**



Document # S2-61905-823

For Version 8 Software

**Contact Us**

Support, replacement part ordering, and service may be arranged by contacting our Cincinnati office. Parts for service can be returned following a request of a Return Material Authorization.

CTI Products, Inc.  
1211 W Sharon Rd  
Cincinnati, OH 45240

513-595-5900

[support@ctiproducts.com](mailto:support@ctiproducts.com)

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**Fonts used in this document:**

*Technical terms*

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[Hyperlinks to other documents or web pages](#)

**Warnings**

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

**Software parameter values**

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# 1 SYSTEM OVERVIEW

**RadioPro<sup>®</sup>** provides remote access to 2-way radios via IP Networks. This "Dispatch over IP" (DoIP) solution consists of PC-based software allowing voice and data communications between PC users and 2-way radio subscribers. Communications with radio subscribers is also possible for remote mobile users using Android or iOS devices. A RadioPro system consists of at least one RadioPro IP Gateway (server) and at least one client (Dispatch<sup>™</sup>, Solo<sup>™</sup>, Talk<sup>™</sup>, or Talk for Mobile<sup>™</sup>) with an IP network connecting the RadioPro components.

## 1.1 System Components

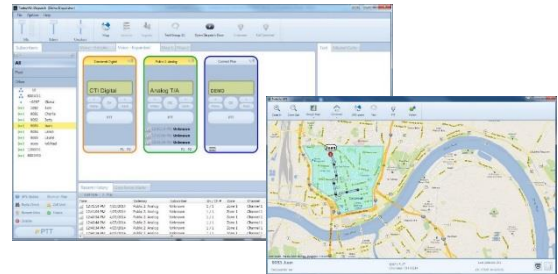
CTI's Dispatch over IP system is based on Server-Client architecture. System components are described below:

- RadioPro IP Gateway Kit** (CTI Part # S2-61815) is the hardware interface that connects a mobile radio (control station) to an IP network. The IP Gateway is the **Server** for the control station radio connected to it. Each control station radio used for voice requires one IP Gateway. System components, such as IP Gateways and clients (Dispatch, Solo, Talk, or Talk Mobile), may be located together or separated geographically and connected via a Wide Area Network (WAN) or Virtual Private Network (VPN). An optional license can be purchased for the IP Gateway to allow users of Solo, Talk, and/or Talk for Mobile client applications to connect to the two-way radio system. Each IP Gateway requires a static IP address. For more information, see the following documents:



[RadioPro IP Gateway - Installation Guide for Motorola MOTOTRBO XPRxxxx, Doc # S2-61903](#)  
[RadioPro IP Gateway - Installation Guide for Kenwood NEXEDGE NX-7xx/8xx, Doc # S2-61904](#)  
[RadioPro IP Gateway - Installation Guide for Kenwood NEXEDGE NX-57xx/58xx, Doc # S2-61905](#)  
[RadioPro IP Gateway Data Sheet](#)  
[RadioPro System Brochure](#)

- RadioPro Dispatch Client** (CTI Part #s S1-61770 Core, S1-61771 Voice Module, S1-61772 GPS Module, S1-61773 Telemetry Module, S1-61774 Text Messaging Module) is a dispatch console for PCs that provides voice dispatching to multiple simultaneous radio channels or talk groups, as well as GPS/AVL, Telemetry, Text Messaging, and Voice Logging. Windows 10 Pro, 8 Pro or Windows 7 Pro operating system is required. This application can be used with either Motorola MOTOTRBO or Kenwood NEXEDGE systems. System components, such as Dispatch clients and IP Gateways, may be located together or separated geographically and connected via a Wide Area Network (WAN) or Virtual Private Network (VPN).



For more information, see the following information:

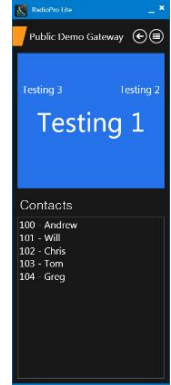
[RadioPro Dispatch Client Installation and Configuration Guide, Document # S2-61785](#)  
[RadioPro Dispatch Client User Guide, Document # S2-61786](#)  
[RadioPro Dispatch Client Data Sheet](#)  
[RadioPro System Accessories Catalog](#)  
[RadioPro System Brochure](#)

- **TalkÎ for Windows PC** is a software application for PCs and notebooks that provides voice dispatching to a single radio channel or talk group. Other features include Voice Logging for 24 hours, Text Messaging, and channel steering. It requires Windows 10, 8 or 7 operating system. This application can be used with either Motorola MOTOTRBO or Kenwood NEXEDGE systems. The use of this application requires a license installed on the IP Gateway. The license will permit some number of simultaneous Solo, Talk, and Talk Mobile application users to connect to the radio system. System components, such as clients and IP Gateways, may be located together or separated geographically and connected via a Wide Area Network (WAN) or Virtual Private Network (VPN).

For more information, see the following documents:

[RadioPro Talk for PC Data Sheet](#)

[RadioPro System Brochure](#)



- **TalkÎ for Mobile devices** is a mobile app for AndroidÎ and iPhoneÎ /iPadÎ that provides remote access to a 2-way radio system for voice communications, text messaging, and locating another user. This application can be used with either Motorola MOTOTRBO or Kenwood NEXEDGE systems. The Mobile app is useful over cellular or Wi-Fi networks when you are on-the-go and outside the coverage of your radio system, yet still need radio communications. The use of this application requires a license installed on the IP Gateway. The license will permit some number of simultaneous Solo, Talk, and Talk Mobile application users to connect to the radio system.

For more information, see the following documents:

[RadioPro Talk for Mobile Devices How-to-Guide](#)

[RadioPro Talk for Mobile Devices Data Sheet](#)

[RadioPro System Brochure](#)



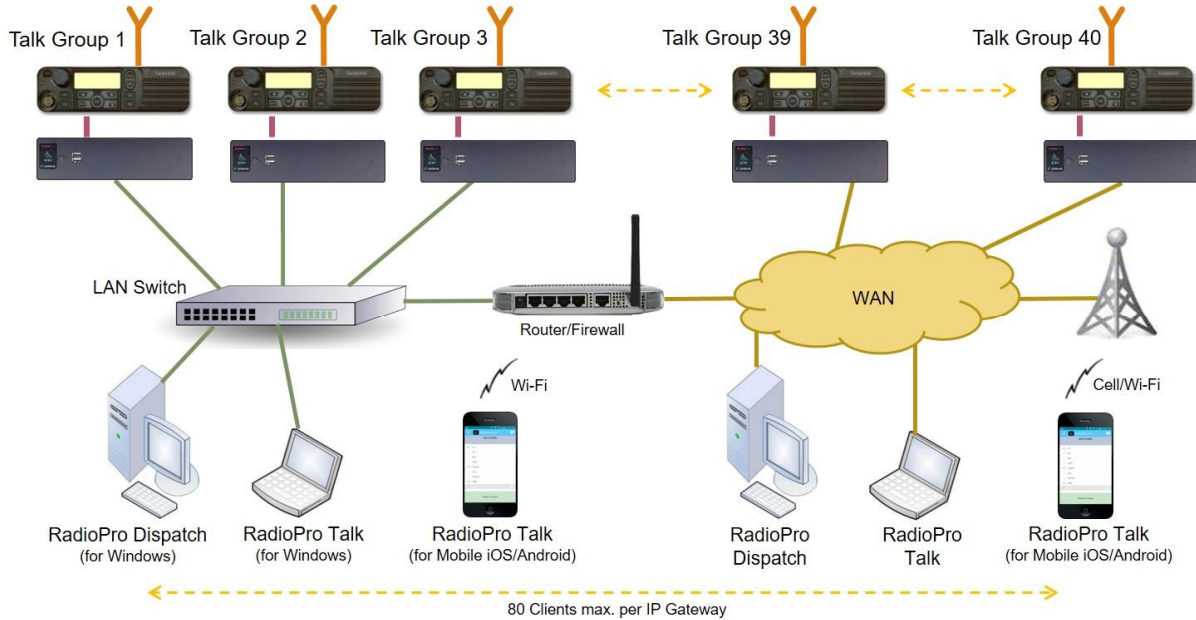
- **Control Station Radio** - A control station radio must be used as the interface to the radio system, and connects to a RadioPro IP Gateway using the rear accessory/communications port. Each control station radio used for voice requires one IP Gateway. Radio models that can be used for a Control Station radio and provide full radio functionality from a RadioPro client include:
  - Motorola MOTOTRBO: XPR5550/5580 (North America)  
DGM5500/8500 (Latin America)  
DM4600/4601 (Europe)  
XiR M8260/M8268/M8660/M8668 (Asia Pacific)
  - Kenwood NEXEDGE: NX-700/800  
NX-720/820 (NX-700/800 is preferred)  
NX-5700/5800
- **Personal Computer or Workstation** is required to host the RadioPro Dispatch, Solo, or Talk for PC clients. Console accessories may include microphone and speakers (or headset), Push-to-Talk footswitch, and touch screen monitor.

## 1.2 Architecture

The IP Gateways interface the radio system to an IP network. One IP Gateway is required for each control station radio used for voice. The IP Gateways and control station radios can be centrally located or scattered among different locations using a Virtual Private Network (VPN) or Wide Area Network (WAN) such as the Internet.

Each IP Gateway in a RadioPro system acts as the server for the Control Station Radio connected to it, and ensures easy wide-area deployment. Since there is not a server PC, the architecture reduces “single point-of-failure” concerns.

A system may have a mixture of RadioPro Dispatch, Solo, and Talk clients for PCs, as well as RadioPro Talk for Mobile apps running on mobile devices. These Clients may be centrally located or scattered among different locations using a Virtual Private Network (VPN) or Wide Area Network (WAN) such as the Internet.



### System Maximum Build-out

A RadioPro system may have maximum components listed below.

System Component	Maximum
Dispatch Clients	20
Simultaneous Solo, Talk, and Talk for Mobile client connections per IP Gateway	80
IP Gateways	50

### System Planner Document and Template

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

Use the System Planner Template (located at the end of this document) in the planning phase of a project to record IP addresses, usernames, passwords, serial numbers, and device names.

## 1.3 Environmental Considerations

The operating environment for the IP Gateway must be within limits noted in the specifications, as well as other conditions. Do not install equipment in an area where any of the following exist:

- Extreme temperature and humidity beyond limits listed in the specifications
- High EMI (Electro-Magnetic Interference) or RFI (Radio Frequency Interference)
- High dust concentration
- High ESD (Electrostatic Discharge)
- Extreme Vibration

### ***RF Interference***

To prevent RF interference, **Mobile radio antennas** should be kept a **minimum of 24 feet** from the RadioPro IP Gateway when in high-power mode, or a **minimum of 12 feet** when in low-power mode. **Portable radios** should be kept a **minimum of 6 feet** from the RadioPro IP Gateway.

### ***Lightning and Fire Protection***

Lightning protection should be implemented at both the equipment and at the point of entry of the building. Lightning protection and power transient protection should be implemented to reduce the risk of fire caused by these phenomena. Circuit breakers and fuses offer the best methods for preventing extended over-current and over-voltage conditions.

### ***Power Requirements***

When using the supplied AC power adapter, each IP Gateway requires 100-240VAC, 200mA maximum.

When connecting a DC supply directly to the IP Gateway, each IP Gateway requires the following input, depending on the IP Gateway Serial Number:

<i>IP Gateway Serial Numbers</i>	<i>Voltage Range</i>
1000 through 3153	11.5 . 12.5 VDC (Normally)
3154 and newer	12.0 . 32.0 VDC (with optional PS upgrade)

**Note:** In order to accommodate a higher voltage and/or a wider range, a different Power Supply option is required. The option is compatible with gateways produced after the Serial number 3154. This upgrade option needs to be specifically ordered for new gateways, whereas existing gateways may still be upgradable post sale, through the CTI RMA process, if supplies are available.

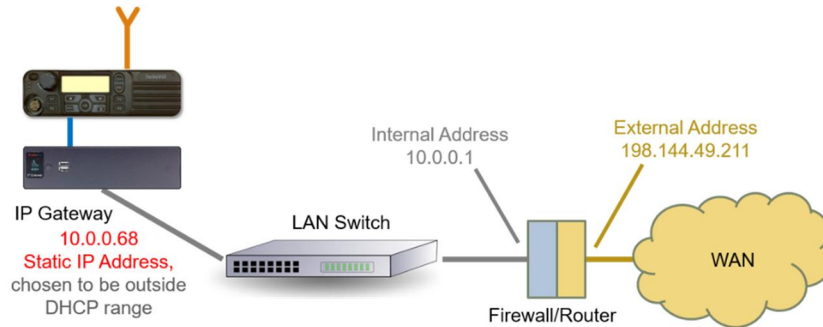
## 1.4 RadioPro Version Match

RadioPro Dispatch clients and IP Gateways must have compatible versions in order to communicate with each other. Compatibility can be ensured when the first two digits of the version match. (The third digit indicates a minor revision and does not need to match.) See section [6.4 Appendix - System Compatibility Considerations](#) on page [37](#) for more details.

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## 1.5 Static IP Address

Each RadioPro IP Gateway **requires a static IP address**. The IP Gateway must have IP Network Parameters configured using ICU.exe (IP Configuration Utility) before connecting to an active network. Contact the IT administrator to provide a static IP Address for each RadioPro IP Gateway, along with its Subnet Mask and Default Gateway.



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## 1.6 Accessing the RadioPro IP Gateway using Port Forwarding

If RadioPro clients (such as Dispatch, Solo, Talk, or Talk for Mobile) will access an IP Gateway from a different IP network, then the IT Administrator must configure port forwarding within the firewall or router(s) that separates the RadioPro IP Gateway from the clients. This is also true when one or more of the clients listed above will connect to a RadioPro IP Gateway from the Internet. See [Step 5. Configure Port Forwarding](#) on Firewall Device on Page 33 for more information.

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## 1.7 Licensing

### **RadioPro Dispatch Clients**

Each PC that runs the RadioPro Dispatch client requires a unique software license file to be imported during installation of the software. The license file specifies the number of IP Gateways that a RadioPro Dispatch console can connect to, as well as licensing for GPS and Text Messaging options. Connections for additional IP Gateways can be purchased and added to the license file at any time.

### **RadioPro Solo and Talk clients for PC, and RadioPro Talk for Mobile apps**

For client types other than RadioPro Dispatch, a license file is factory-installed in the IP Gateway, and allows connections from Solo and Talk clients (for PCs and Notebooks) and Talk for Mobile apps (for Android<sup>®</sup> and iPhone<sup>®</sup> / iPad<sup>®</sup>). Solo, Talk, and Talk for Mobile licenses can be purchased when the IP Gateway is purchased, and can easily be added to an IP Gateway that is already installed. The number of Solo, Talk, and Talk for Mobile licenses on the license file is the maximum number of simultaneous connections from users of these client applications.

The number of Solo, Talk, and Talk for Mobile licenses installed on the IP Gateway is indicated on the serial number label located on the bottom of the IP Gateway. It can also be determined using the ICU.exe utility. See [Step 3. Configure RadioPro IP Gateway](#) on Page 27 for more details.



## 2. WHAT IS INCLUDED

### 2.1 RadioPro IP Gateway Kit

The RadioPro IP Gateway (Part # S2-61815) includes the following items:

<i>CTI Part #</i>	<i>Description</i>	<i>Notes</i>
S2-61815	RadioPro IP Gateway	Includes power supply
S2-61790	CD, RadioPro IP Gateway	Contains Installation Guide, ICU.exe (for configuring IP Gateway), and Solo and Talk client installation programs.
89-10712	Cable, Cat 5 RJ45, 10 ft	Can be used to connect IP Gateway to LAN

**Note: ICU.exe (IP Configuration Utility) is available on either of the following distribution CDs:**

- **RadioPro IP Gateway** Part Number S2-61790. This CD contains an executable file that must be copied to a writeable disk before running. (The ICU cannot be run directly from the CD.)
- **RadioPro Dispatch** Part Number S2-61791. This CD contains an installer program that will install the RadioPro Dispatch Client Software and the ICU onto the PC. Following the installation from the distribution CD, this utility can be located by clicking the **Start** menu button, then click on **All Programs**, then click on the **RadioPro Dispatch** folder, then click **RadioPro ICU**.

## 3. OTHER ITEMS NEEDED

### 3.1 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, DGM5500/8500, DM4000, XiR M8260	S2-61431
Kenwood NEXEDGE NX-700/800/5700/5800	S2-61769
Kenwood NEXEDGE NX-720/820	S2-61890

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

### 3.2 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) or Kenwood's FPU (Field Programming Unit) software will be needed to configure the control station radio.

<i>Control Station Radio</i>	<i>Minimum Version</i>	<i>CPS or FPU</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
Kenwood NEXEDGE NX-700/800 or NX-720/820	3.21.00	KPG-111DN
Kenwood NEXEDGE NX-5700/5800	2.31.00	KPG-D1N

### 3.3 Radio Programming Cable

A radio programming cable is required 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 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 microphone connector.**

### 3.5 Laptop or PC

A laptop or PC will be needed to run the ICU.exe utility mentioned in [Section 1.1 System Components](#) starting on page 4.

## 4. CONFIGURATION AND INSTALLATION STEPS: OUTLINE

Use the steps in the following table to install a RadioPro System. Each step is discussed in detail starting on Page 12. Following installation of the IP Gateway in Step 5, at least one Client must be installed from Step 6.

Step #	Description	Kenwood NEXEDGE NX-57xx/58xx
1a	Configure Control Station Radio(s) for Voice	S2-61904, page <a href="#">12</a> IP Gateway Installation
1b	Configure Control Station Radio(s) for Data	S2-61904, page <a href="#">19</a> IP Gateway Installation
1d	Configure Subscriber Radios for ARS, GPS, and TMS	S2-61904, page <a href="#">20</a> IP Gateway Installation
2	Connect RadioPro IP Gateway to Control Station Radio	S2-61904, page <a href="#">26</a> IP Gateway Installation
3	Configure RadioPro IP Gateway(s) using ICU.exe	S2-61904, page <a href="#">27</a> IP Gateway Installation Guide
4	Connect RadioPro IP Gateway to IP Network	S2-61904, page <a href="#">32</a> IP Gateway Installation Guide
5	Configure Port Forwarding on Firewalls/Routers	S2-61904, page <a href="#">33</a> IP Gateway Installation Guide (Required only if RadioPro client is outside the LAN)
6a	Install and configure RadioPro Solo and/or Talk client applications	S2-61568 Solo Client Installation Guide (Optional)
6b	Install and configure RadioPro Dispatch client applications	S2-61785 Dispatch Client Installation Guide (Optional)
6c	Install and configure RadioPro Talk for Mobile apps	S2-61787 Talk for Mobile App Installation Guide (Optional)

## Step 1a. for NEXEDGE NX-57xx/58xx: Configure Voice Control Station Radio(s) using Kenwood FPU



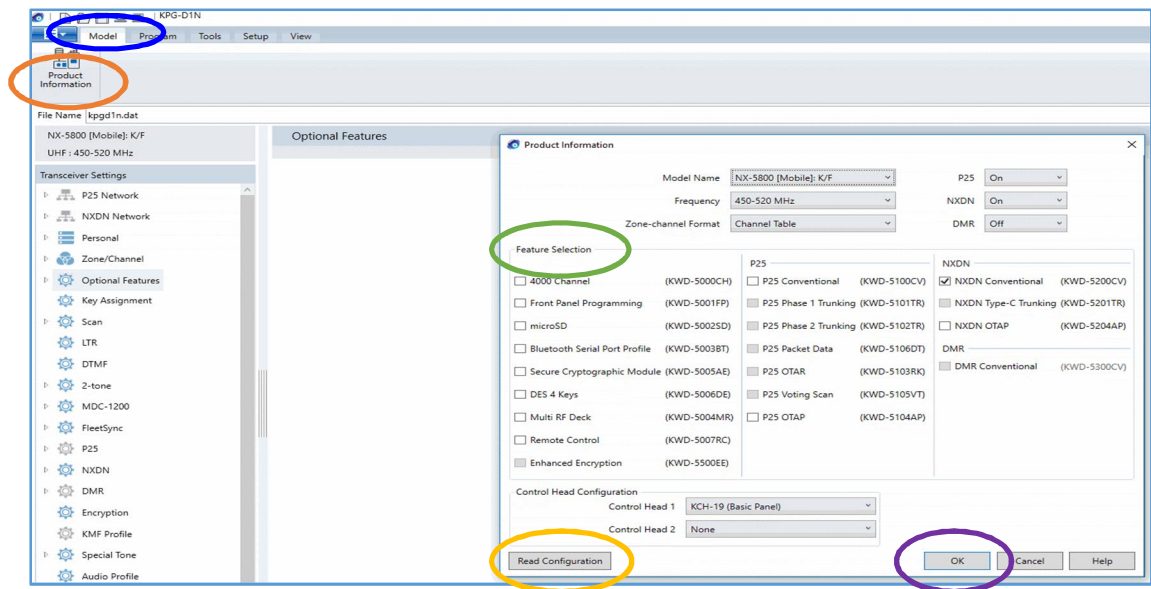
(For NX-700/800 radios see document # S2-61904.)

Radio models NX-5700/5800 can be used as a control station radio.

Use the KPG-D1N FPU (Kenwood's NEXEDGE Field Programming Utility) configuration software for NX-7x0/8x0 radios) to configure NEXEDGE radio parameters using the following steps.

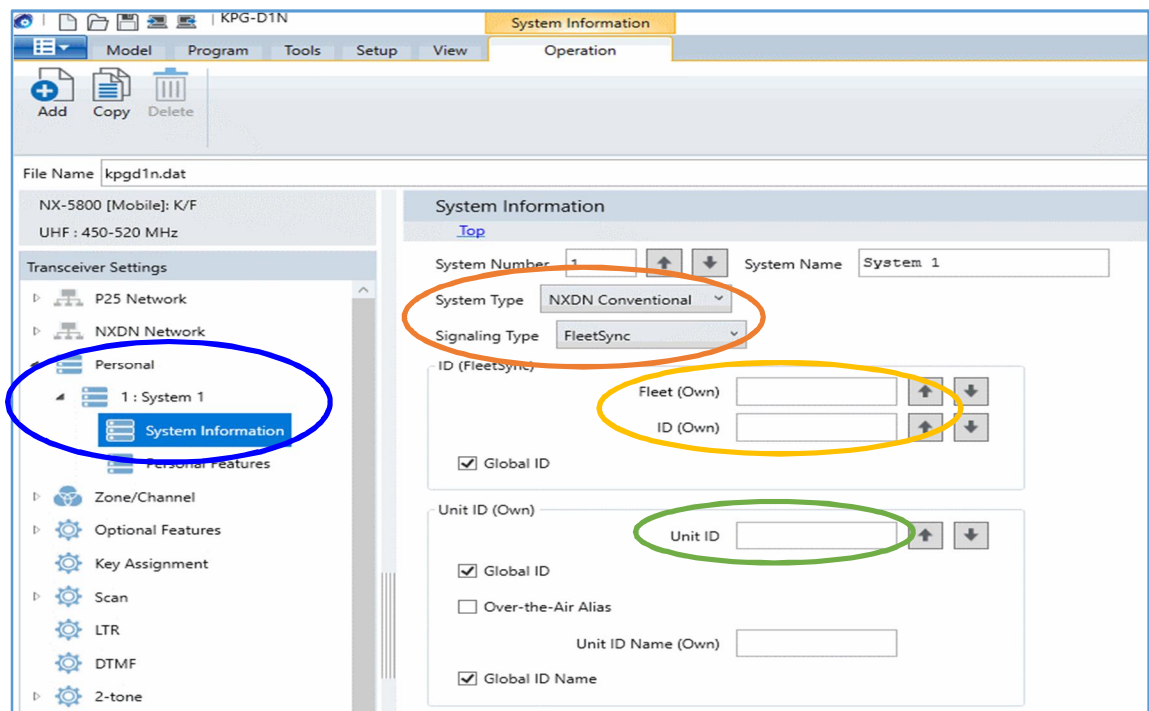
### 1. Connect and read the control station as any other radio

- Using a Kenwood programming cable, connect the NX-5700/5800 Control Station radio to a PC or Notebook that has the correct Kenwood FPU version (KPG-D1N in this case).
- Open the **KPG-D1N** FPU.
- Ensure that the correct COM port is selected.
- From the **Model** tab, choose the **Product Information** page, and then click the **Read Configuration** button as shown below.
- Enable **Feature Selections** that this radio is licensed for with a check mark in the appropriate boxes, and then click the **OK** button.



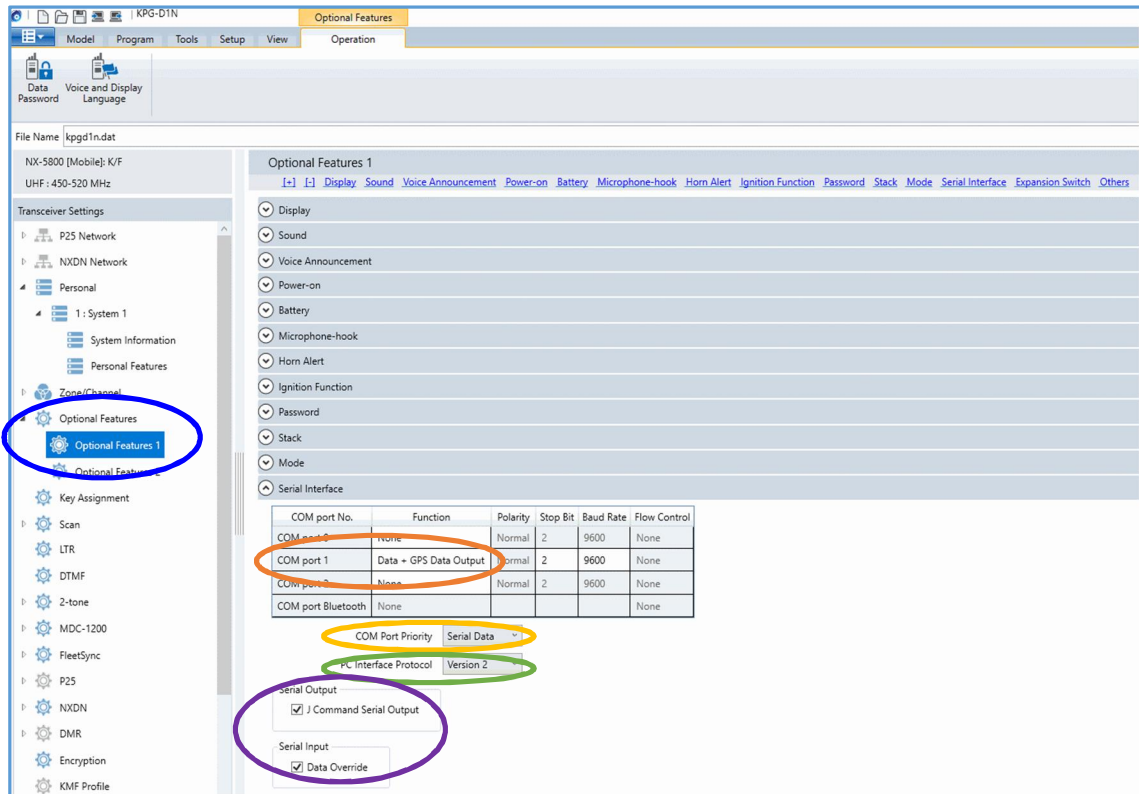
## 2. Configure NXDN and FleetSync System

- Expand the **Personal** folder, expand the **System 1** folder under that, and then select **System Information**.
- In the System Information window, for System Type select **NXDN Conventional**, and for Signaling Type select **FleetSync**.
- In the **ID (FleetSync)** box, enter a value for **Fleet (Own)** and **ID (Own)**.  
(Note: These parameters do not have to be used elsewhere, but they must have an assigned value even if the radio is being used in analog mode without FleetSync, or in digital mode with NXDN. Not entering an ID will prevent RadioPro from functioning properly.)
- In the **Unit ID** box, enter a value for **Unit ID**.  
(Note: This parameter does not have to be used elsewhere, but it must have an assigned value even if the radio is being used in analog mode without FleetSync. Not entering an ID will prevent RadioPro from functioning properly.)



3. *Configure the Data Port*

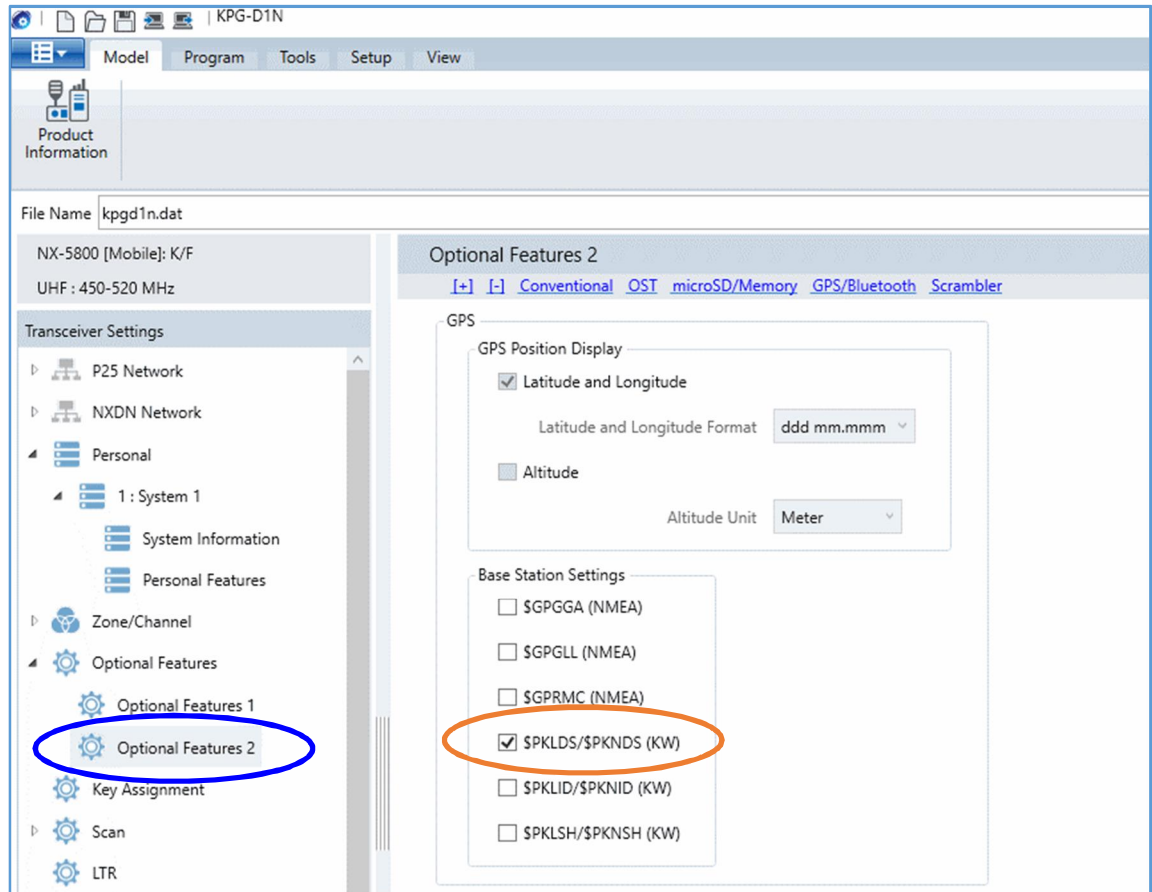
- a. Expand the **Option Features** folder, and then select **Optional Features 1**.
- b. In the **Optional Features 1** window, expand **Serial Interface**, and then under the **Function** column for **COM port 1**, select **Data + GPS Data Output**.
- c. For **COM Port Priority**, select **Serial Data**.
- d. For **PC Interface Protocol**, select **Version 2**.
- e. Enable all options for **Serial Output** and **Serial Input** with a check mark in the appropriate boxes.



#### 4. Configure GPS Settings

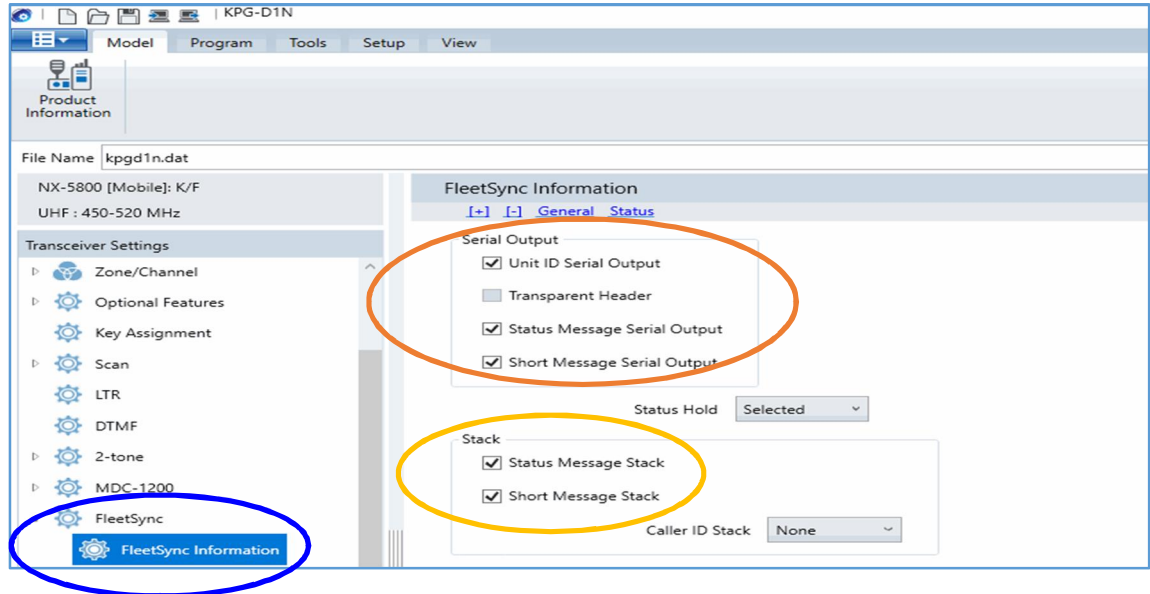
So that RadioPro can process GPS information from subscriber radios, the control station radio must know what data to send to the IP Gateway. Configure this as follows:

- Expand the **Optional Features** folder, then select **Optional Features 2**.
- In the **Base Station Settings** section of the **GPS** page, enable **\$PKLDS/\$PKNDS (KW)** with a check in the box.



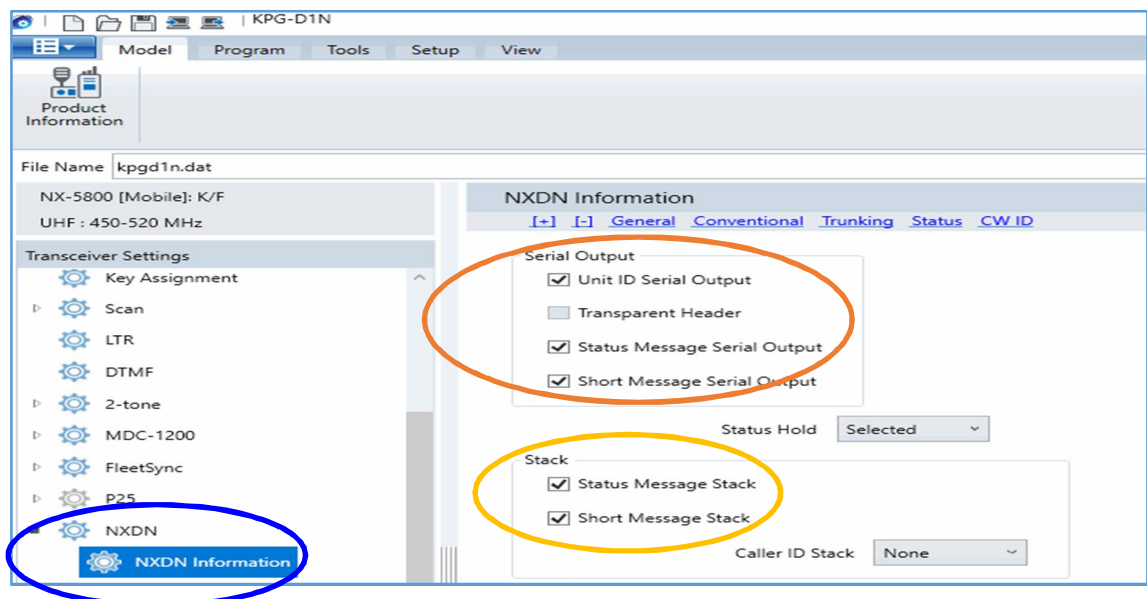
## 5. Configure FleetSync Settings

- Expand the **FleetSync** folder, then select **FleetSync Information**.
- Enable all options in the **Serial Output** section, except for **Transparent Header**.
- Enable all options in the **Stack** section.



## 6. Configure NXDN Settings

- Expand the **NXDN** folder, then select **NXDN Information**.
- Enable all options in the **Serial Output** section, except for **Transparent Header**.
- Enable all options in the **Stack** section.

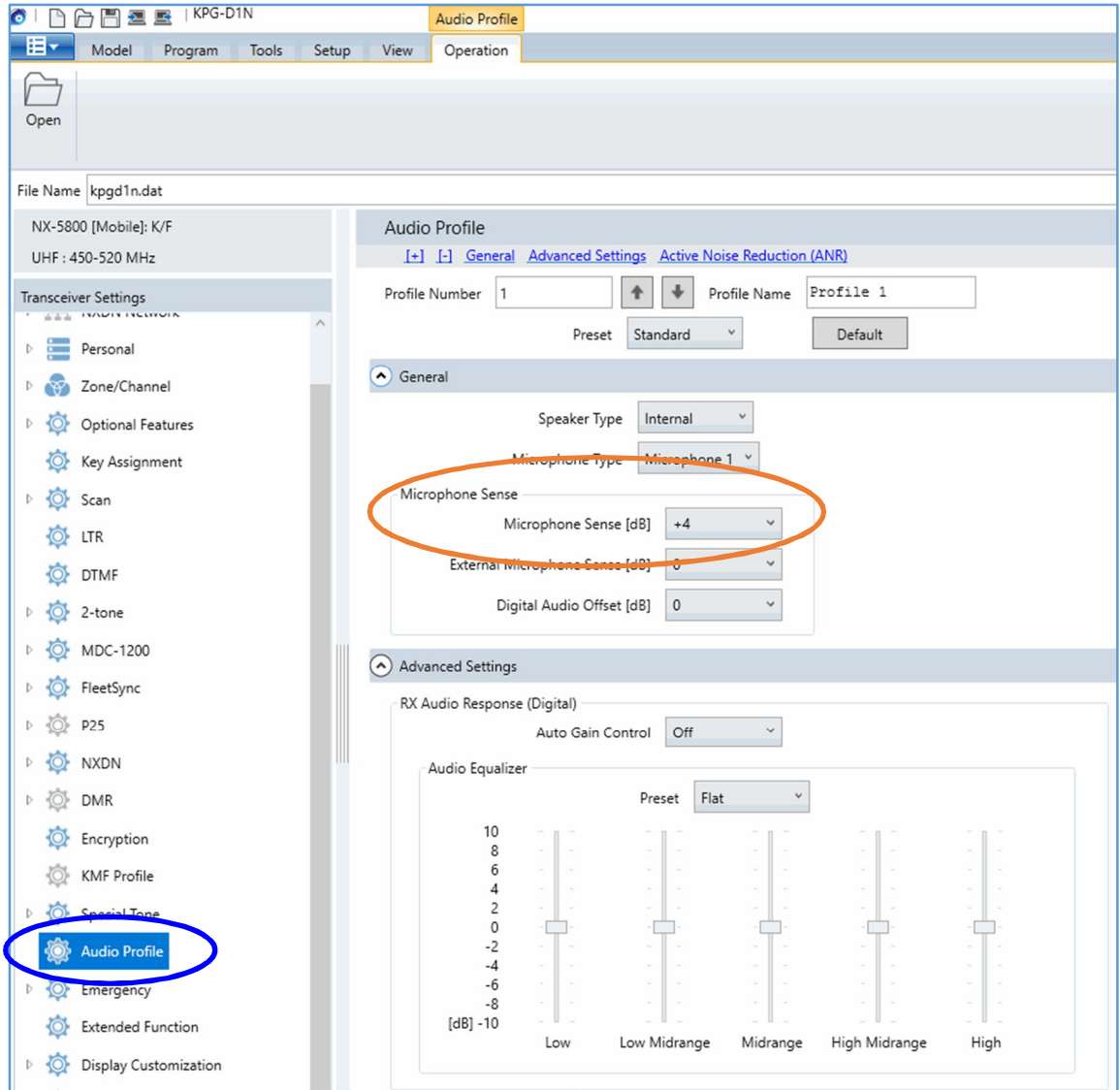




### 7. Configure Sound Options

The steps in this section may be skipped if this radio is to be used for GPS only; ie, not used for voice communications.

- a. Select the **Audio Profile** folder.
- b. In the **General** section of the **Audio Profile** page, change **Microphone Sense** to **+4 dB** (High).



## 8. Configure Audio Routing Options

The steps in this section may be skipped if this radio is to be used for GPS only; ie, not used for voice communications.

- Select the **Extended Function** folder.
- Expand the **Modulation Line** tab.
- For **Mic PTT**, select **Connect** for both **Mic Line** and **MI2 Line**.

The screenshot shows the KPG-D1N software interface. The 'Extended Function' folder is selected in the left sidebar. The 'Modulation Line' tab is expanded, and the 'Mic PTT' row is highlighted. The 'Mic Line' and 'MI2 Line' columns for 'Mic PTT' are set to 'Connect'. A diagram below shows the audio routing path from the microphone through an audio processor to a modulation circuit and antenna.

	PTT	Mic Line	MI2 Line	DI Line	with QT/DQT	with STE
Mic PTT		Connect	Connect	Disconnect	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
External PTT (Voice)	Disconnect	Disconnect	Connect	Disconnect	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
External PTT (Data)	Disconnect	Disconnect	Disconnect	Connect	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Data PTT	Disconnect	Disconnect	Disconnect	Connect	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Modulation Line by Mic PTT


Mic → Connect → Audio Processor → Modulation Circuit → ANT

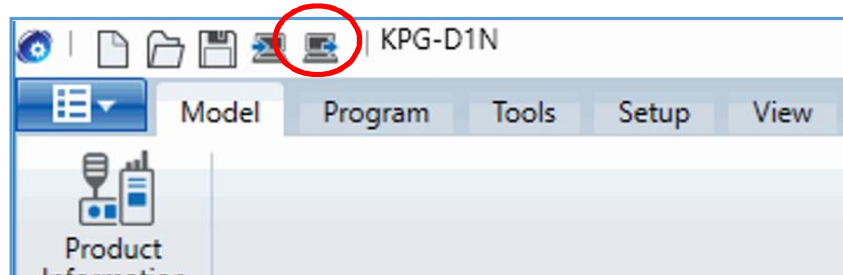
MI2 → Connect → Audio Processor

DI → Disconnect → Audio Processor

Control Head Mic Input (Control Head 1) Modular Jack

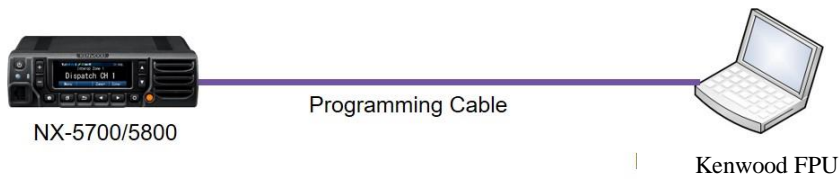
## 9. Write New Configuration to Radio

- Click the  icon found in the main toolbar.



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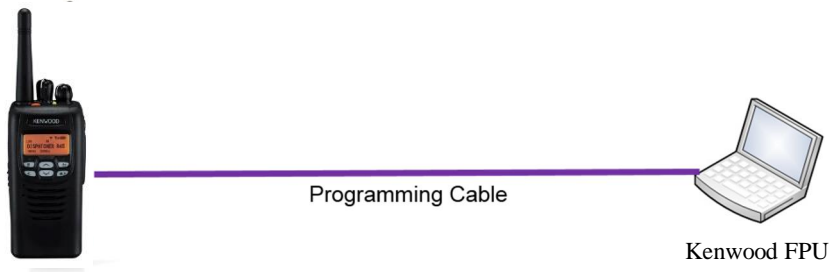
## Step 1b. for NEXEDGE NX-57xx/58xx: Configure Data Revert Control Station Radio(s) using Kenwood FPU



If you are using a Data Revert radio, follow the same steps for configuring the radio as you would for the Voice Radio with the following exceptions:

- Because the Data Revert Radio does not deal with audio, you may skip the steps for [Configure Sound Options](#) on page 17, as well as steps for [Configure Audio Routing Options](#) on page 18.
- **Be certain to follow steps described on page 15, Configure GPS Settings.**
- Because *Channel Steering* only affects the Voice Radio, program only the data channel into the radio.

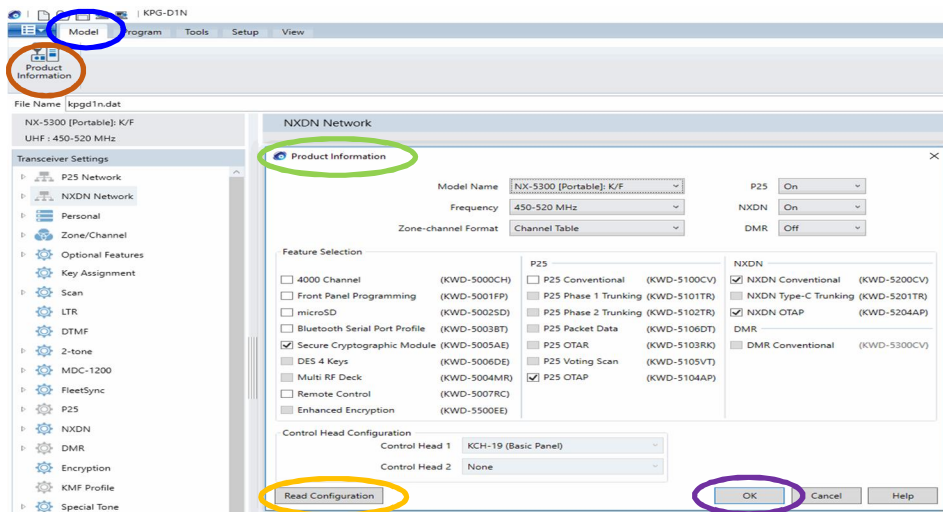
## Step 1d. for NEXEDGE NX-57xx/58xx: Configure Subscriber Radios using the Kenwood FPU Software



Use the **FPU**, (Kenwood's NEXEDGE Field Programming Utility) configuration software) to configure NEXEDGE radio parameters using the following steps.

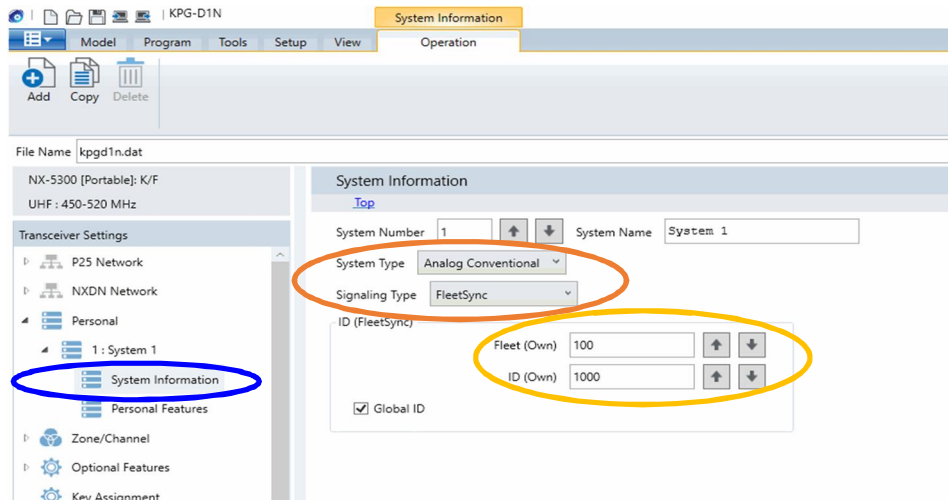
### 1. Configure the subscriber radio as any other radio.

- a. Using a Kenwood programming cable, connect the NX-5200/5300 Control Station radio to a PC or Notebook that has the correct Kenwood FPU version (KPG-D1N in this case).
- b. Open the **KPG-D1N** FPU.
- c. Ensure that the correct COM port is selected.
- d. From the **Model** tab, choose the **Product Information** page, and then click the **Read Configuration** button as shown below.
- e. Enable **Feature Selections** that this radio is licensed for with a check mark in the appropriate boxes, and then click the **OK** button.



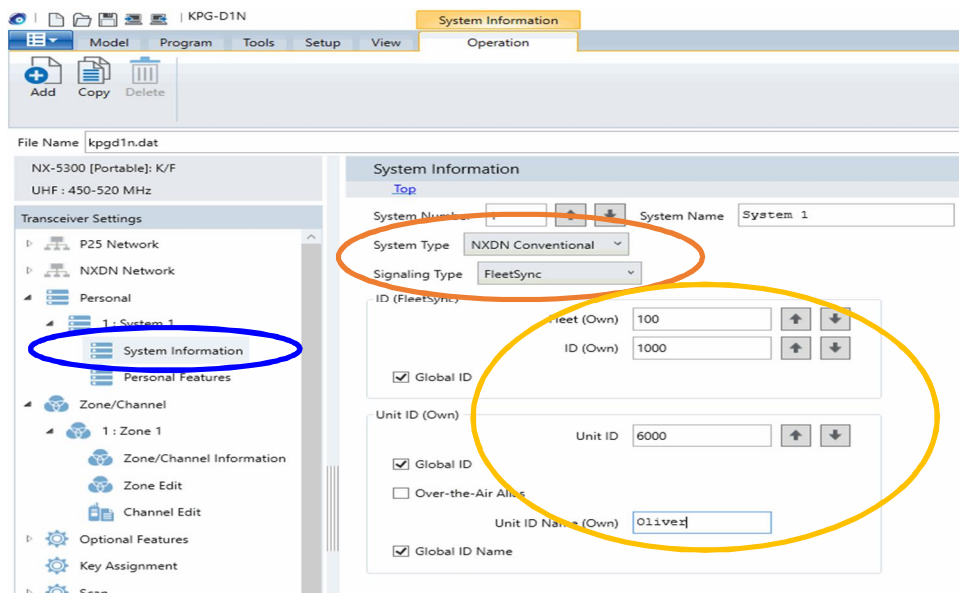
## 2. Configure ID settings for FleetSync.

- If using FleetSync, expand the **Personal** folder, expand the **System 1** folder under that, and then select **System Information**.
- In the System Information window, for **System Type** select Analog Conventional and for **Signaling Type** select FleetSync.
- Enter a value for **Fleet (Own)** and **ID (Own)**.



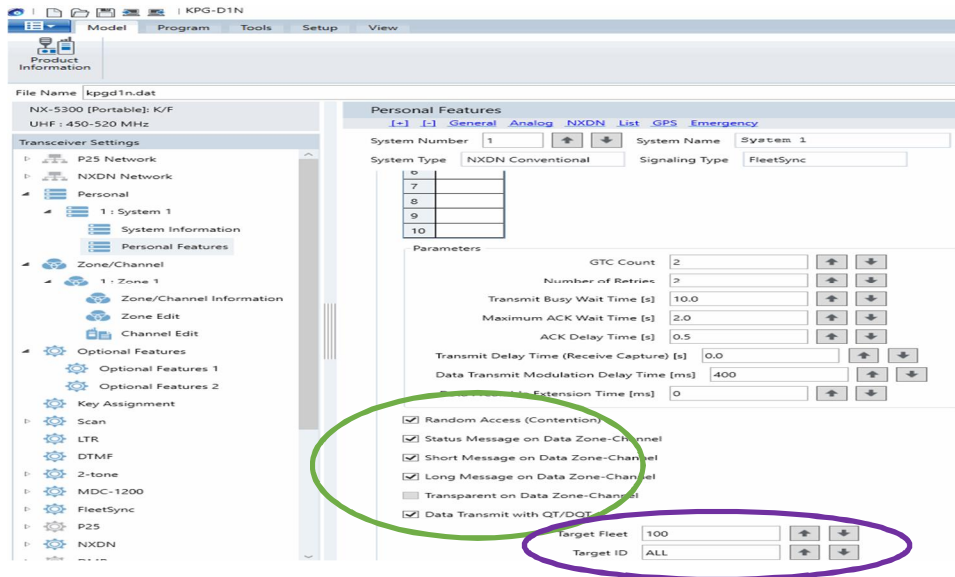
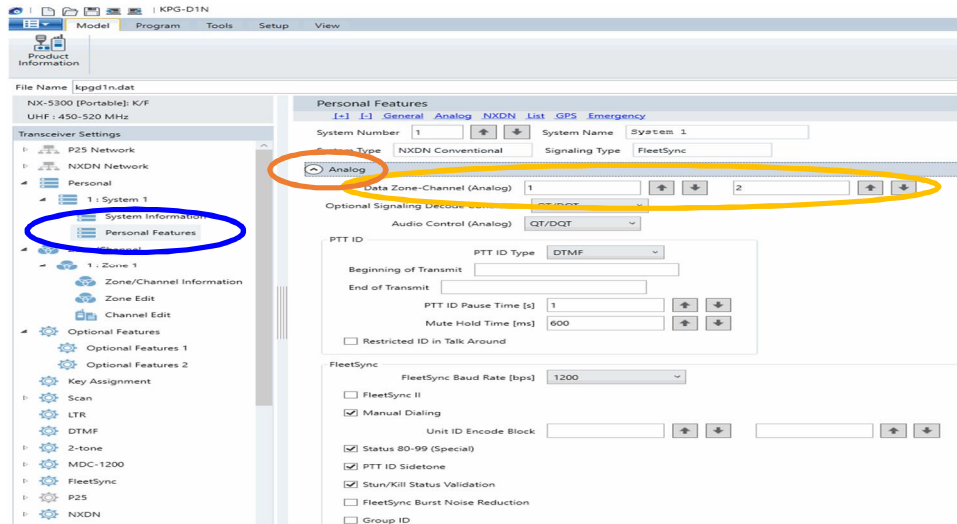
## 3. Or, Configure ID settings for NXDN.

- If using NXDN, expand the **Personal** folder, expand the **System 1** folder under that, and then select **System Information**.
- In the System Information window, for **System Type** select NXDN Conventional and for **Signaling Type** select FleetSync.
- Enter a value for **Fleet (Own)**, **ID (Own)**, **Unit ID** and **Unit ID Name (Own)**.

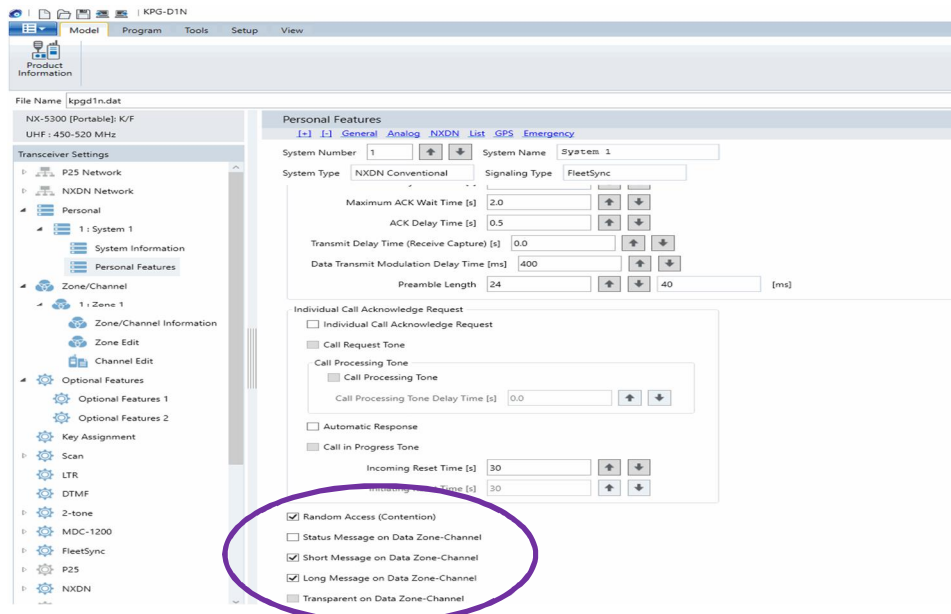
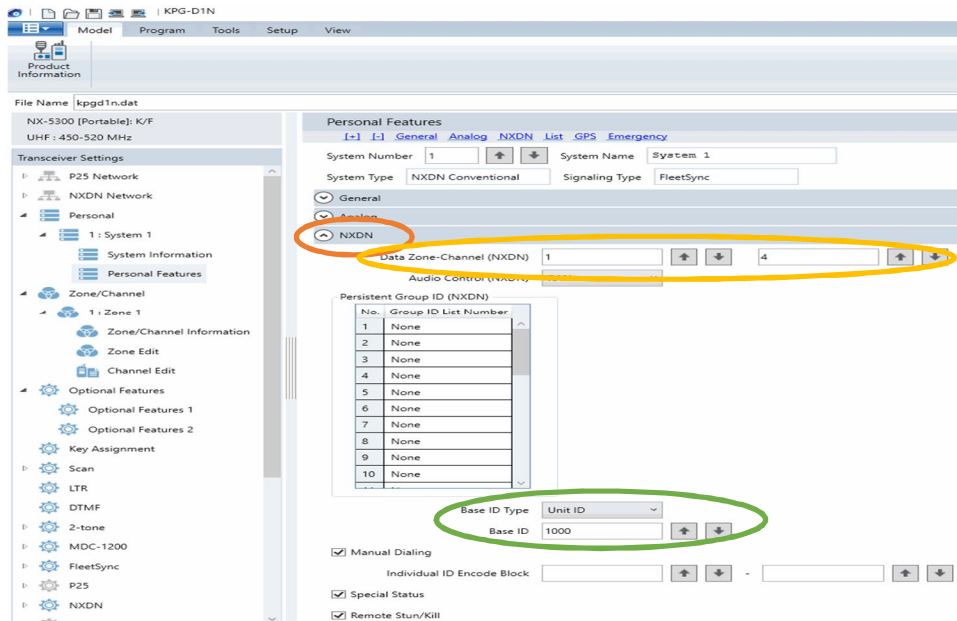


4. Configure Data settings & Target/Base ID settings.

- a. Expand the **Personal** folder, expand the **System 1** folder under that, and then select **Personal Features**.
- b. If using **FleetSync** on a conventional (non-trunked) system, use the **Analog** section to ensure that the correct data will be sent to the Data Channel:
  - i. Specify the channel to use for data by assigning the **Data Zone-Channel (Analog)** field as required for your system.
  - ii. **Enable the desired messages** to send across the Data Zone-Channel with a Check.
  - iii. Enter a value For **Target Fleet** and **Target ID**.  
 Note: If the target does not include the Control Station(s), data will not appear in RadioPro.

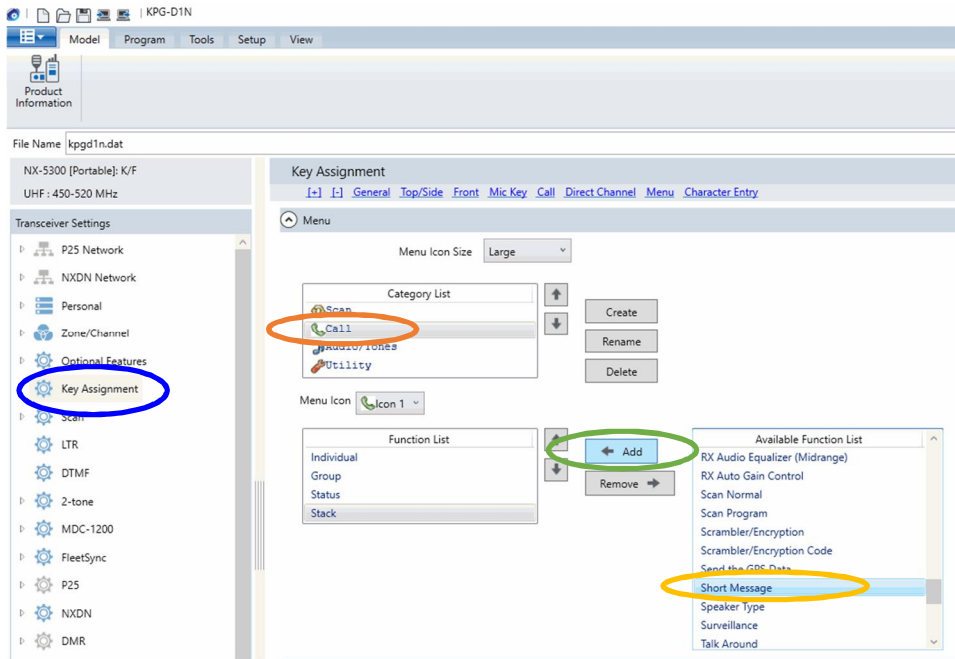


- c. If using NXDN on a conventional system, use the **NXDN** section to ensure that the correct data will be sent to the Data Channel:
  - i. Specify the channel to use for data by assigning the **Data Zone-Channel (NXDN)** field as required for your system.
  - ii. Enter a value for **Base ID Type** and **Base ID**.
  - iii. **Enable the desired messages** to send across the Data Zone-Channel with a Check.  
 Note: If the Base ID does not include the Control Station(s), data will not be sent to RadioPro clients.



5. *Configure Text Message Settings.*

- a. Select the **Key Assignment** folder, in the **Menu** section choose **Call** in the **Category List**, select **Short Message** from the **Available Function List**, and then click the **Add** button.

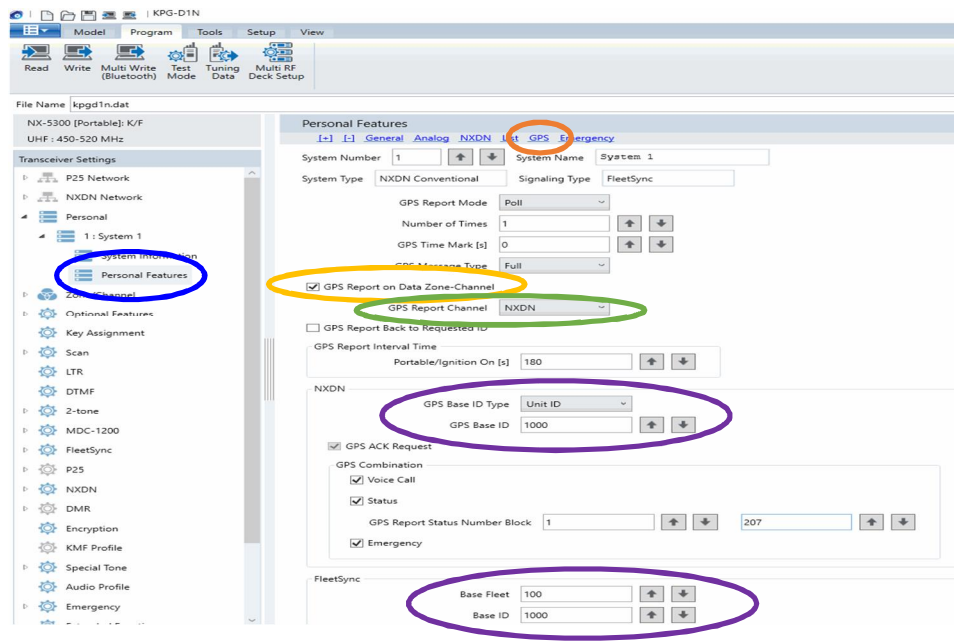




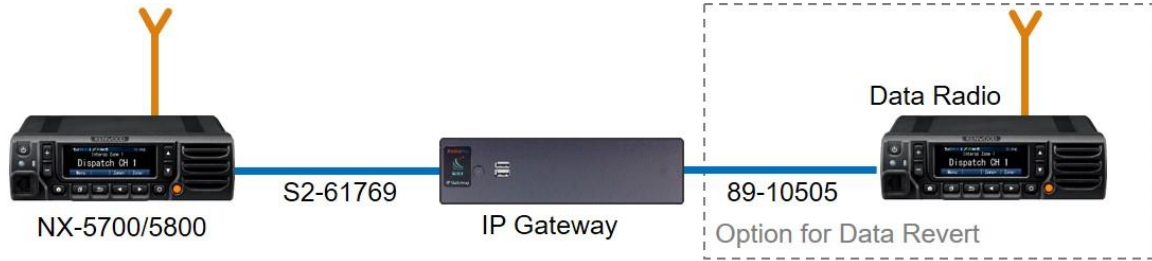
## 6. Configure the GPS settings.

- If using GPS, configure the desired behavior for the radio by expanding the **Personal** folder, expand the **System 1** folder under that, and then select **Personal Features**.
- In the **GPS** section enable **GPS Report on Data Zone-Channel** with a check mark, and then select the correct channel to use in the **GPS Report Channel** box.
- Ensure the GPS Base ID Type includes the Control Station radio.
  - If using GPS with NXDN, in the **NXDN** section, enter a value for **GPS Base ID Type** and **GPS Base ID**.
  - If using GPS with FleetSync, in the **FleetSync** section, enter a value for **Base Fleet** and **Base ID**.

**Note:** This is the ID the subscriber will respond to, which will be the ID of the data revert control station radio. If the Base ID does not include the Control Station(s), data will not appear in RadioPro.



## Step 2. for NEXEDGE NX-57xx/58xx: Connect RadioPro IP Gateway to Control Station Radio



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

See Section [6.7 Appendix - Radio Interface Cables ó NEXEDGE NX700/800](#) on Page [40](#) for interface cable details.

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

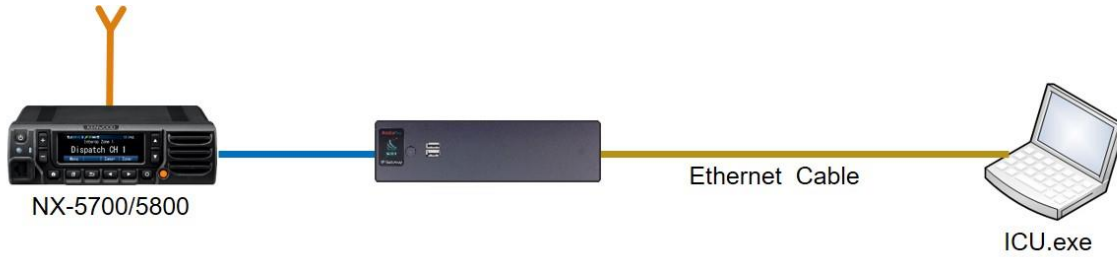
1. Connect the DB-25 side of cable S2-617691 to the DB-25 connector on the rear of the NEXEDGE NX-800 radio.
2. Connect the DE-9 male side of the cable to the DE-9 female connector on the rear of the IP Gateway.
3. Ensure that jack screws on both connectors are tightened to hold connectors in place.

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

1. Connect the DB-25 side of cable 89-10505 (DB25 Male to DE9 Female) to the DB-25 connector on the rear of the NEXEDGE NX-800 radio.
2. Connect the DE-9 female side of the cable to the DE-9 male connector on the rear of the IP Gateway.
3. Ensure that jack screws on both connectors are tightened to hold connectors in place.

**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

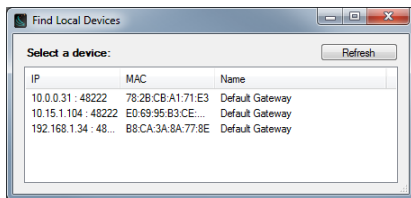
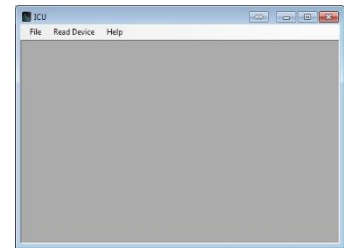


**Note:** Before continuing, ensure that Wi-Fi connection has been disabled in the PC or Laptop being used to configure the IP Gateway.

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.

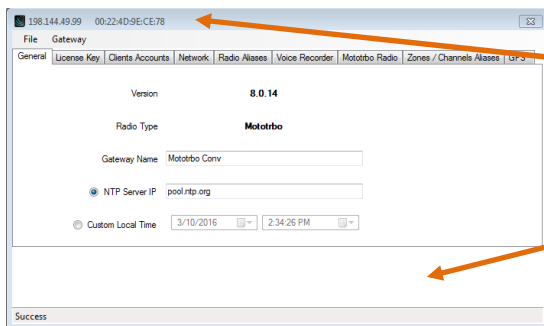
Configure the IP Gateway as follows:

1. Use an Ethernet cable to connect the RJ45 connector on the rear of the RadioPro IP Gateway to a local PC or laptop to be used for configuration.
2. Power up the RadioPro IP Gateway **AND** the Control Station radio.
3. Run the ICU.exe application. (See [Section 2. What is Included](#) on Page 9. to locate this utility program.) The window shown to the right will be displayed:
4. Click on **Read Device**, and then click **Auto Find** to display the following Configuration window.



If the connected IP Gateway is not listed in the above window, choose **Manual** from the **Read Device** menu. If **Manual** method is used, the IP Address of the IP Gateway must be known. (The Factory Default IP Address is 10.15.1.101). The **Manual** method must be used if the connection between the PC and the IP Gateway involves one or more IP routers or switches.

5. Double-click on a device in the above list to display the following Device Configuration window:



MAC Address

**Tip:** Expand the window to view the help information near the bottom.

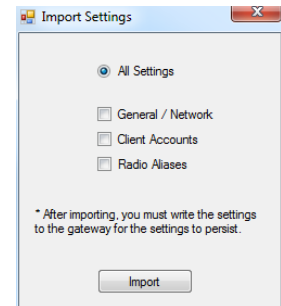
6. The File menu item contains the following functions:

**a. Export**

**Export** can be used to save all of the ICU settings for an IP Gateway to a file with an extension of `.icu`. This can be used to create a backup of settings in case the IP Gateway requires replacement.

**b. Import**

**Import** can be used to import the entire settings or just a subset of the ICU settings for an IP Gateway. After a file is selected for importing, the **Import Settings** window shown at right will be displayed.



7. Enter appropriate parameters for each of the tabs:

**c. General tab**

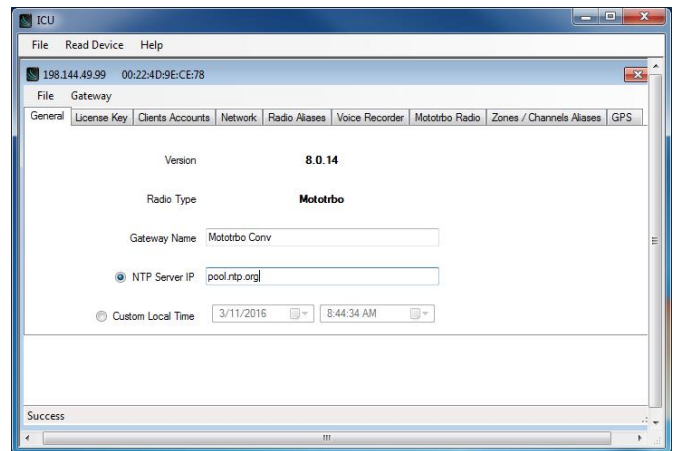
**Version** indicates the current software version of this RadioPro IP Gateway. RadioPro Software for the IP Gateway and Clients (Dispatch, Solo, Talk, and Talk for Mobile for mobile devices) must all have compatible versions in order to communicate with each other. Compatibility occurs when the first two digits of the version match. (The third digit indicates a minor revision, and does not need to match.)

**Radio Type** will display the factory configuration for this IP Gateway.

**Gateway Name** factory default is **Default Gateway**. If RadioPro Dispatch client will be used to connect to this IP Gateway, this name should be changed to a descriptive name that will be recognizable at the RadioPro Dispatch client. Two lines of 24 characters each can be displayed to identify a radio controller in the RadioPro Dispatch client.

**NTP Server IP** should be enabled if a RadioPro Dispatch client(s) will connect to this IP Gateway, and should contain the IP Address where the Network Time Server is running. If a Network Time Server is not accessible by this IP Gateway on its network, then a Time Server should be installed on an accessible PC; this PC could be one that is running the RadioPro Dispatch Client. Either an IP address or a name recognized by the Domain Name Server can be entered. See [Section 6.5 Appendix - Installing a Time Server](#) Page 38 for more details.

**Custom Local Time** can be used if an NTP Server is not used. Enter the current date and time.

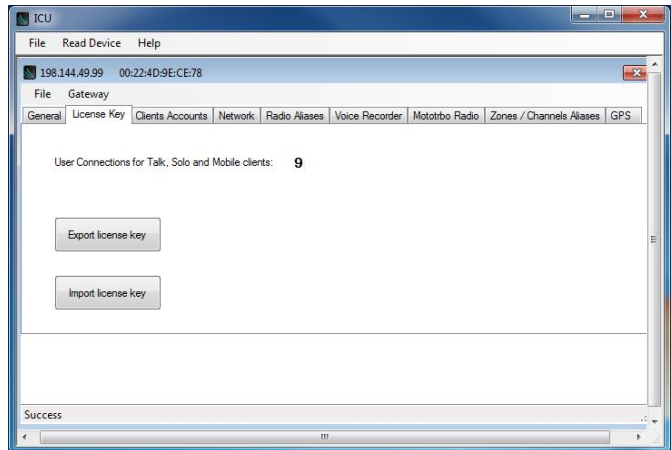


#### d. License Key tab

This tab is used to transfer the License File to/from the IP Gateway when an upgrade to the License is purchased. The License File contains a value between 1 and 80 specifies the number of simultaneous users allowed to connect to this IP Gateway from RadioPro Solo, Talk, and Talk for Mobile applications.

Use the **Export license key** button to create a file with the current License information. This file can be sent to CTI Products when an upgrade to the number of User Connections is needed.

Use the **Import license key** button to push the upgraded license file to the IP Gateway.



#### e. Client Accounts tab

##### Solo/Talk/Talk Mobile Clients

Username and Passwords for Solo, Talk, and Talk for Mobile clients are managed on this tab.

To add a new client account, click the **Add** button. In the **Add account** window, enter the new **Username**, **Password**, and then click the **OK** button.

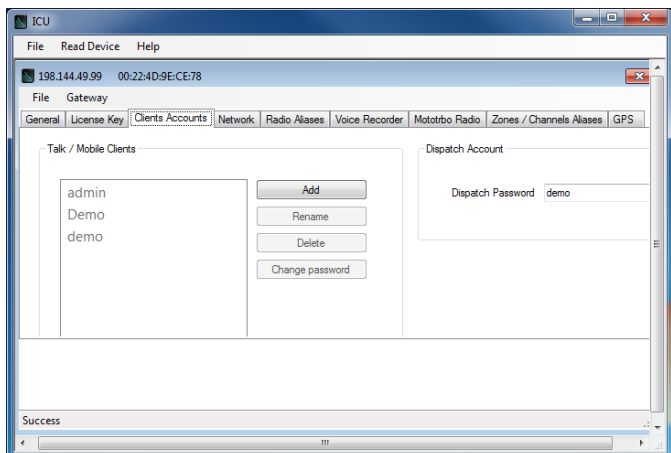
The `admin` client account will be listed first, and is the default account for logging into the IP Gateway from a RadioPro Solo, Talk, or Talk for Mobile client. The `admin` account cannot be

Renamed or Deleted. It is recommended that the password of the `admin` account be changed from its default value of `admin` in order to prevent unauthorized changes. This can be accomplished by selecting `admin` from the list of accounts, and then clicking the **Change password** button. In the **Change password** window, type a new password in the **Password** text box, retype it in the **Retype** text box, and then click the **OK** button.

The `admin` client account is also used when using ICU.exe to write new parameters to the IP Gateway.

##### Dispatch Account

The Dispatch Password is the password needed for a Dispatch client to connect to this IP Gateway.



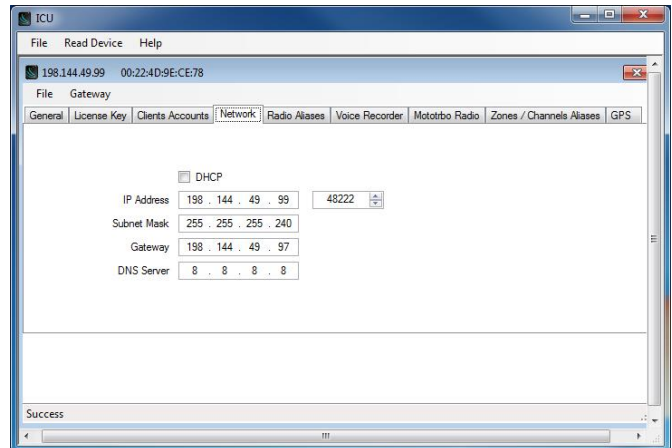
## f. Network tab

Do **NOT** use leading zeros for any of the address fields. **DHCP** should **NOT** be selected unless an engineer at CTI Products is consulted.

The default **TCP Port #** is 48222. This can normally be left at its default value.

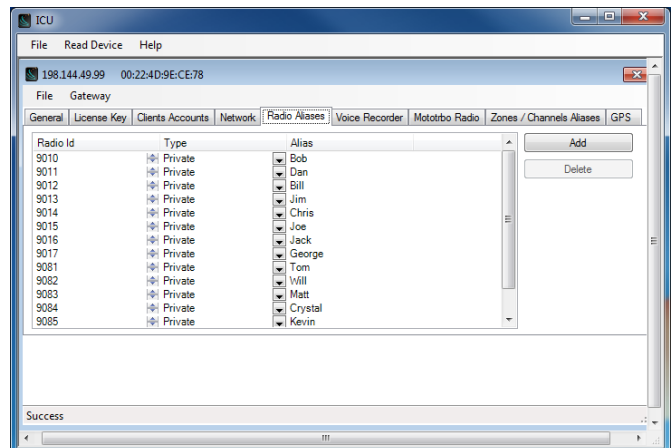
An entry for default **Gateway** is needed only if RadioPro clients (Dispatch, Solo, Talk, Talk for Mobile) will be accessing this IP Gateway from another network, or the Internet.

An entry for **DNS Server** is needed only if an NTP server host name was specified in the General tab (instead of an IP Address). If an NTP server host name is not specified, then **DNS Server** should be blank or **0.0.0.0**.



## g. Radio Aliases tab

This tab is used to create Alias Names for radio IDs. The Alias Names listed on this tab will be displayed in the contact list for RadioPro Solo, Talk, and Talk for Mobile clients.

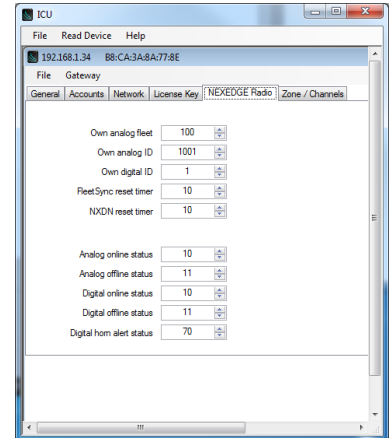


## h. NEXEDGE tabs

When an IP Gateway has been licensed for use with a NEXEDGE radio, the following tabs will allow parameter input.

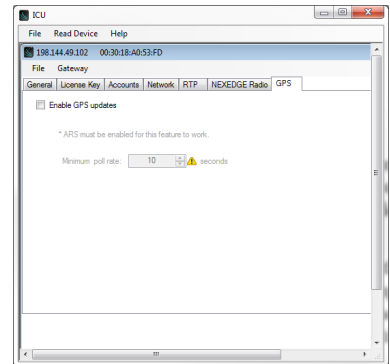
**NEXEDGE Radio** tab

Enter the appropriate radio ID values for the fields on this tab.

**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.

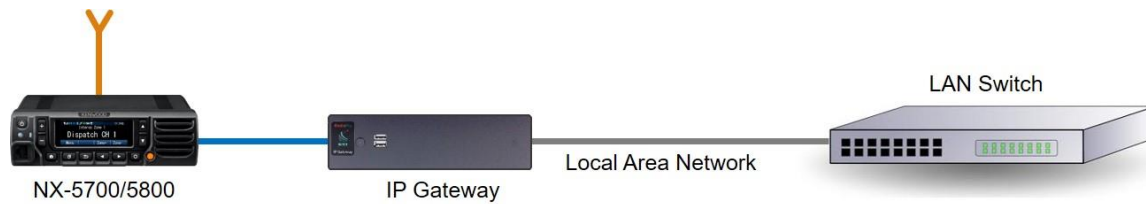


## 8. Write settings to the IP Gateway:

- a. From the **Gateway** menu, click on Write Settings. Enter the Admin **Gateway Password** (factory default password is `admin0`), then close the configuration window for this IP Gateway.
- b. Remove the Ethernet cable between the RadioPro IP Gateway and the local PC or laptop used for configuration.

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## Step 4. Connect RadioPro IP Gateway to IP Network



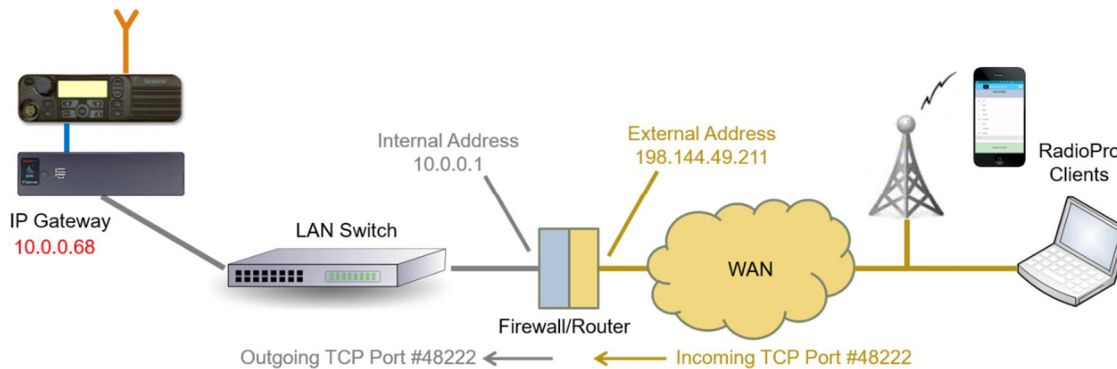
After a RadioPro IP Gateway has been configured using ICU, it is safe to connect to a local area network.

Connect the RadioPro IP Gateway module to the IP network using the following steps:

1. Connect one side of cable 89-10712 (or similar straight-through Cat 5 cable) to the RJ45 connector on the rear of the RadioPro IP Gateway module.
2. Connect the other end of cable 89-10712 to the network switch or router.



## Step 5. Configure Port Forwarding on Firewall Device



If RadioPro clients (such as Dispatch, Solo, Talk, or Talk for Mobile) will access an IP Gateway from a different IP network subnet, then the IT Administrator must configure port forwarding within the devices (firewalls or routers) that separate the RadioPro IP Gateway from RadioPro clients. A typical example of this is depicted in the figure above, where an IP Gateway is installed behind a firewall and a RadioPro client is using the Internet to connect to that IP Gateway.

The default IP port used by a RadioPro IP Gateway is **TCP Port 48222**. However, this may be changed using `ICU.exe` on the **Network** tab.

The default IP port used by RadioPro clients is **TCP Port 48222**. If this default port number is to be used, then the parameter entry for the IP address in a RadioPro client is simply the External Address of the Firewall or Router. If, on the other hand, some other port number is to be used, then the parameter entry for the IP address in a RadioPro client must also include that port number as follows:

198.144.49.211:7777

where:

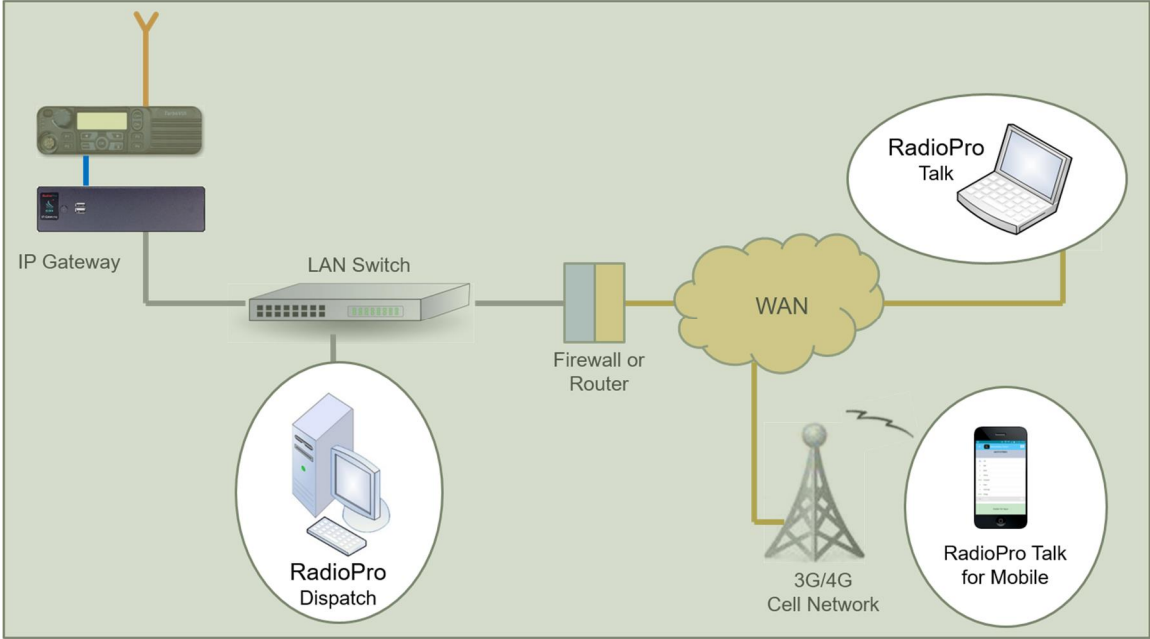
198.144.49.211 is the external or wide-area address of the firewall or router.

7777 is the external port of that firewall used for RadioPro IP Gateway.

If multiple RadioPro IP Gateways are located behind a firewall, they will each need a Port Forwarding rule. In this case, the external port numbers specified for each rule must be unique by specifying individual port numbers.

See [http://portforward.com/english/routers/port\\_forwarding/](http://portforward.com/english/routers/port_forwarding/) for detailed instructions for the specific router in use at your site.

**Step 6. Install and Configure RadioPro Clients/Apps**



See [Section 1 System Overview](#) on page 4 for a list of documents to be used for installing and configuring the RadioPro software clients for PCs and smart mobile devices.

## 5. RADIOPRO IP GATEWAY OPERATION

### 5.1 Power-up

The Power Button can be used to power up or power down the unit by pressing it momentarily.

A watchdog circuit built into the IP Gateway monitors program operation. If the watchdog circuit detects that the program is not functioning correctly, it will re-initialize the IP Gateway. This process may take up to two minutes. During this process, RadioPro Dispatch, Solo, Talk, or Talk for Mobile clients will not have a connection or communication with the Control Station radio.

### 5.2 Indicators

A blue LED located on the Power Button indicates that power is applied to the IP Gateway.

A red LED located internally, but viewable through the vents on the left side of the IP Gateway indicates the functioning of the Hardware Watchdog as follows:

- Slow Blinking (2 seconds per blink) indicates that the IP Gateway is rebooting. This will normally occur for a maximum of two minutes after power-up.
- Steady illumination indicates that the IP Gateway software and hardware is operating correctly, and follows the Slow Blinking boot-up period.
- Fast Blinking (1 second per blink) indicates that the watch-dog circuitry has detected a problem, and that re-booting will commence within 5 seconds.

## 6. APPENDIX

### 6.1 Appendix - RadioPro IP Gateway Specifications

#### **Mechanical and Environmental**

Dimensions:	9.0öw x 2.5öh x 7.7öd
Weight:	3 lbs.
Temperature Range:	0-50 °C
Humidity:	10-95% non-condensing

#### **Electrical**

AC Input (with included Power Adapter):	100ö240Vac, 60W max, 50-60Hz
DC Input, SNs before 3154:	11.5-12.5VDC Only
DC Input, SNs after 3154:	12-30VDC (with optional PS upgrade)

#### **Service Ports**

Port Forwarding (for firewall configuration)	TCP Port 48222 (default)
Ports used by ICU.exe during configuration	UDP Ports 48501 and 48502
Port for Network Time Protocol Service	UDP Port 123
Port used for Remote Desktop Service	TCP Port 48333 (used only when remote technical service is needed)

#### **Miscellaneous**

MOTOTRBO interface	DE-9 Female & USB, Cable S2-61431
NEXEDGE NX-7xx/8xx/57xx/58xx interface	DB-25 Female, Cable S2-61769
NEXEDGE NX-720/820 interface	DB-25 Female, Cable S2-61890
Transmit/Receive Impedance - MOTOTRBO	600 ohms
Transmit/Receive Impedance ó Kenwood	10k ohms
Clients Supported	80 Solo, Talk, or Talk for Mobile, plus 12 Dispatch
Power-On	Auto
Network Bandwidth (for each connected client)	2.2k Bytes per Second with audio compression enabled 22k Bytes per Second without audio compression

### 6.2 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 öIP Addressing and Subnetting for New Usersö, 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)

## 6.3 Appendix - Rack Mounting

### Rack Shelf

A rack shelf can be used to hold the RadioPro IP Gateway and Control Station radio in a standard 19ö wide rack. The two devices can be located next to each other on the same shelf. The following rack shelf is recommended, but others may be used that have a depth of at least 12ö:

Rack Shelf 2RU x 15ö, CTI Products # S2-61548,

also available as Cable Organizer # QES0319-0215:

<http://www.cableorganizer.com/computer-cabinets/rack-shelves/single-side-non-vented-shelves.html>

## 6.4 Appendix - System Compatibility Considerations

Use the following table to determine compatibility between RadioPro or TurboVUi IP Gateway and software clients:

	IP Gateway				
	v8.x.x	v7.0.x	v6.0.x	v5.1.x	v5.0.x
<b>Dispatch Client for PC</b>					
Dispatch v8.0.x (Windows 7 or 8)	Yes				
Dispatch v7.0.x (Windows 7 or 8)		Yes	Yes ❶		
Dispatch v6.0.x (Windows XP or 7)		Yes	Yes		
Dispatch v5.1.x (Windows XP or 7)		Yes	Yes	Yes	
Dispatch v5.0.x (Windows XP or 7)					Yes
<b>Solo or Talk Client for PC</b>					
RadioPro Talk (Windows 7 or 8)	Yes	Yes ❷			
TurboVUi Solo (Windows XP or 7)	Yes	Yes	Yes	Yes	Yes
<b>Talk Mobile App for iOS and Android</b>					
RadioPro Talk for Mobile (4 <sup>th</sup> generation)	Yes				

Notes: ❶ Channel-to-channel patching in RadioPro Dispatch is only available when both IP Gateway and Dispatch software are v7.0.x (or higher).

❷ RadioPro Talk requires minimum IP Gateway v7.0.10.

When upgrading to a new version where RadioPro Clients and IP Gateways are being upgraded, it is usually better to upgrade the IP Gateways before upgrading the Clients.

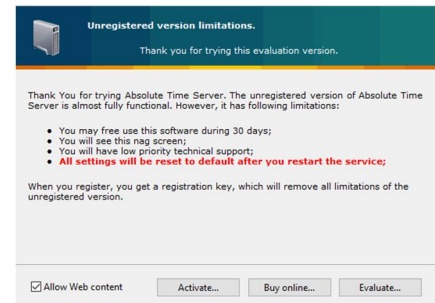
## 6.5 Appendix - Installing a Time Server

During installation of the IP Gateways, the IP address of a  $\delta$ NTP Server $\delta$  may have been specified using the ICU (IP Configuration Utility). In order for all IP Gateways to report the same time, and logging at the Dispatch client to have accurate times, the IP Gateways must all reference the same Time Server. This Time Server can be one of the following:

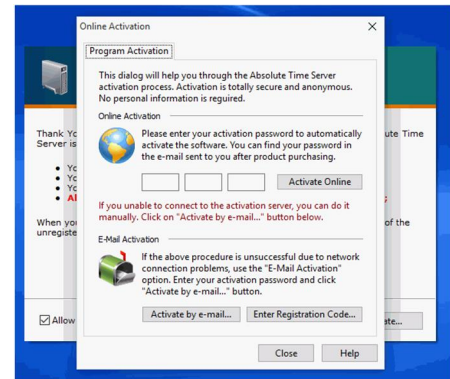
- An existing Time Server on the Local Area Network.
- Public domain Time Server accessed using the Internet.
- Local Time Server installed on a common PC, such as the Dispatch client console PC.

A local time server is available for use if needed, and can be found on the Dispatch client distribution CD, in the -Absolute Time Server $\delta$  folder. Perform the following steps to install this time server:

1. Double-click on the file "Absolute-Time-Server-vx.x.xxx.msi".  
The window shown at right will be displayed:



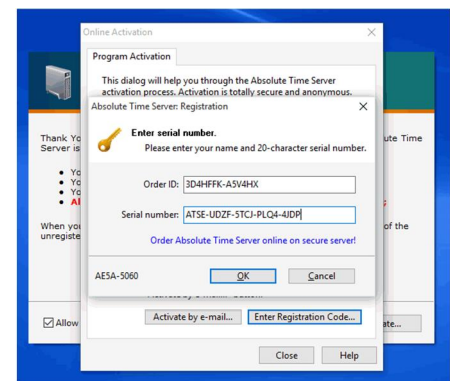
2. On the above window, click the **Activate** button to display the **Activation** window shown at right.



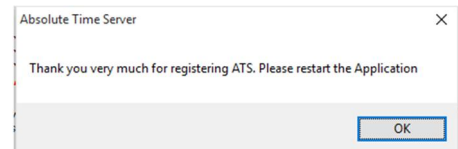
3. On the above window, click the **Enter Registration Code** button to display the registration windows shown at right. Enter the following parameters:

**Order ID:** 3D4HFFK-A5V4HX

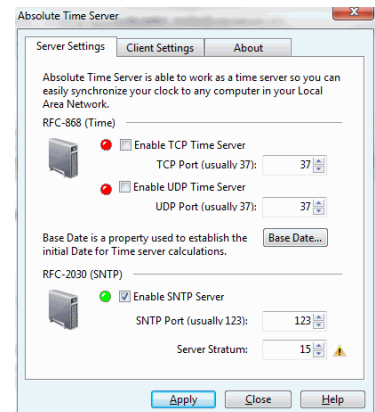
**Serial Number:** ATSE-UDZF-5TCJ-PLQ4-4JDP



4. Click the **OK** button to display the confirmation page shown at right.



5. Close all of the windows pertaining to installation and registration.
6. Open the Absolute Time Server application by performing one of the following:
  - a. For Windows 7:  
Click on the Windows **Start** button, type "absolute time server" in the search box, and then choose "Absolute Time Server Manager" from the list to display the window shown to the right.
7. **Disable** both **RFC-868 (Time)** time servers, and **enable** the **RFC-2030 (SNTP)** time server as shown. Then click the **Apply** button.
8. Restart the PC.



## 6.7 Appendix - Radio Interface Cables NEXEDGE NX700/800/5700/5800

### **Kenwood NEXEDGE NX-700/800/5700/5800 Voice Radio**

#### Interface Cable # S2-61769

<i>Signal Name</i>	<i>IP Gateway DE-9* Pin #</i>	<i>NXx00 Radio DB-25 Pin #</i>
Tx+ (Mic audio to radio) Transformer isolated, 600 ohms	4	6
Tx- (Mic audio to radio)	5	25
Rx+ (Speaker audio from radio) Transformer isolated, 600 ohms	8	17
Rx- (speaker audio from radio)	9	18
Tx Data (from radio)	1	3
Rx Data (to radio)	6	2
Digital Ground	3	7

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

### **Kenwood NEXEDGE NX-700/800/5700/5800 Data Radio**

#### Interface Cable # 89-10505 (standard DE-9 to DB-25 serial cable)

<i>Signal Name</i>	<i>IP Gateway DE-9* Pin #</i>	<i>NXx00 Radio DB-25 Pin #</i>
Tx Data (from radio)	2	3
Rx Data (to radio)	3	2
Digital Ground	5	7

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



---

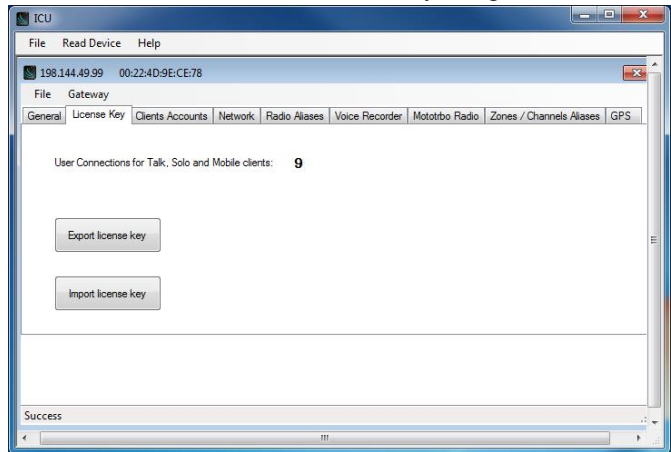
## 6.7 Appendix - Converting a Timed-license to Non-expiring

A RadioPro IP Gateway may have a timed-license duration of 120 days. (The Packing List will indicate Part # S2-61612 if the timed-license is active.) If the Timed-License is active, and following the 120-day period, the RadioPro IP Gateways will not connect to a RadioPro Dispatch, Solo, Talk, or Talk for Mobile client for longer than five minutes. See instructions below for converting the timed-license to a non-expiring license.

Following receipt of payment to CTI Products for ordered items, a request may be made to convert a timed license to a non-expiring license. Use the following steps to convert the license:

1. Use instructions for

2. *Step 3. Configure RadioPro* IP Gateway on Page 27 to initiate a connection to the IP Gateway using `ICU.exe`.
3. Click on the **License Key** tab. This tab is used to transfer the License File between the IP Gateway and CTI Products when an upgrade to the License is purchased.
4. Click the **Export License Key** button, and then choose a location to store the license file.
5. Send the license file, along with the IP Gateway serial number in the subject line, to [support@ctiproducts.com](mailto:support@ctiproducts.com). If you are requesting non-expiring licenses for multiple RadioPro IP Gateways, choose unique file names for each license file.
6. Following receipt of the updated license file from CTI Products, repeat steps 1 and 2 listed above, click the **Import License Key** button, and then choose the location where the updated license file was saved.



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**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
Voice Radio A0	Example Radio VR A0		192.168.10.1	255.255.255.0	
GPS Radio A1	Example Radio GPS A1		192.168.11.1	255.255.255.0	
<b>IP Gateway B</b>					
Voice Radio B0					
GPS Radio B1					
<b>IP Gateway C</b>					
Voice Radio C0					
GPS Radio C1					
<b>IP Gateway D</b>					
Voice Radio D0					
GPS Radio D1					
<b>IP Gateway E</b>					
Voice Radio D0					
GPS Radio D1					
<b>IP Gateway F</b>					
Voice Radio D0					
GPS Radio D1					
<b>IP Gateway G</b>					
Voice Radio D0					
GPS Radio D1					
<b>IP Gateway H</b>					
Voice Radio D0					
GPS Radio D1					
<b>IP Gateway J</b>					
Voice Radio E0					
GPS Radio E1					

If additional IP Gateways are needed, copy this page.

See next page for System Planner Template Page 2 of 2

**SYSTEM PLANNER TEMPLATE** **PAGE 2 OF 2**

**RadioPro Dispatch Clients**

See RadioPro Dispatch Installation and Configuration Guide, document # 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 [TurboVUi Solo Installation Guide, Document # 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.