RadioPro™ IP Gateway

Installation Guide
for
Kenwood NEXEDGE
NX-7xx/8xx NX-37xx/38xx Radios

For Version 9 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 *Kenwood NEXEDGE NX-7xx/8xx and NX-37xx/38xx 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 Template

Use the System Planner Template on page *28* 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:

Control Station Radio	Cable Part #
Kenwood NEXEDGE NX-700/800/5700/5800	S2-61769
Kenwood NEXEDGE NX-720/820/3720/3820	S2-61890

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

Control Station Radio	Minimum Version	Programming Software
Kenwood NEXEDGE NX-700/800 or NX-720/820	3.21.00	KPG-111DN
Kenwood NEXEDGE NX-5700/5800	2.31.00	KPG-D1N

1.2.3 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.**

2. FEATURE AVAILABILITY

Kenwood NEXEDGE Systems

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

| System Type / Feature	Analog	Analog w/ FleetSync	Digital NXDN	Digital NXDN w/ call ack.	NXDN & LTR Trunking	NXDN Trunking (MsgTrnkd)
Voice Dispatch	✓	✓	✓	✓	✓	✓
Text Messaging	-	✓	✓	✓	✓	✓
GPS Mapping	-	✓	✓	✓	✓	✓
Status Updates	-	✓	✓	✓	✓	✓
Selective Calling	-	✓	✓	Not Currently Supported	✓	Not Currently Supported
Remote Monitor	-	✓	✓	✓	✓	✓
Remote Enable/Disable	-	✓	✓	✓	✓	✓

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 6. Following installation of the IP Gateway in Step 5, at least one Client must be installed from Step 6.

Step #	Description	Kenwood NEXEDGE NX-7xx/8xx NX-37xx/38xx
3.1.1	Configure Control Station Radio(s) for Voice	page *6* **Configure the Voice Radio**
3.1.2	Configure Control Station Radio(s) for Data	page *14* **Configure the Data Revert Radio**
3.1.3	Configure Subscriber Radios for ARS, GPS, and TMS	page *15* **Configure the Subscriber Radios**
3.2	Connect RadioPro IP Gateway to Control Station Radio	page *22* **Connect the IP Gateway to the Radio**
3.3	Configure RadioPro IP Gateway(s) using ICU.exe	page *24* **Configure the RadioPro IP Gateway**

Please Refer to the *RadioPro IP Gateway Installation Guide* for additional installation steps relevant for all radio system types.

## 3.1 Program the Control Station Radio

3.1.1 Configure the Voice Radio
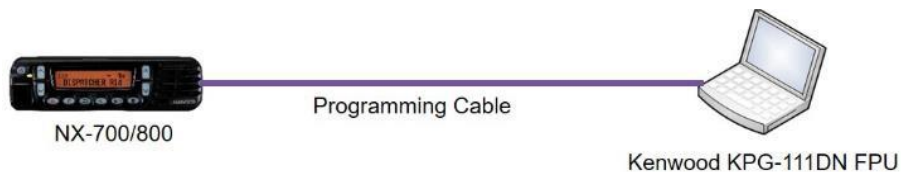
(For NX-5700/5800 radios see the *RadioPro IP Gateway Installation Guide for Kenwood NEXEDGE NX-57xx-58xx*)

Radio models NX-700/800, NX-720/820, or NX-3720/3820 can be used as a control station radio. The use of an NX-720/820 or 3720/3820 requires modification to the option jumpers located on the radio's Tx/Rx unit. Therefore, the NX-700/800 is easier to implement since it does not require internal modifications. See *Appendix - Radio Interface Cables* for more details.

Use the KPG-111DN **FPU** (Kenwood's NEXEDGE 'Field Programming Utility' configuration software for NX-700/800/720/820/3720/3820 radios) to configure NEXEDGE radio parameters using the following steps.

1. *Configure the control station as any other radio*

   a. Using a Kenwood programming cable, connect the NX-700/800 / NX-720/820 / NX-3720/3820 Control Station radio to a PC or Notebook that has the correct Kenwood FPU version (KPG-111DN in this case).

   b. Open the **KPG-111DN** FPU.

   c. Ensure that the correct COM port is selected by going to the **Setup** > **COM Port** menu.

   d. Then, from the **Program** menu, select **Read Data from the Transceiver** as shown below.

   e. After the data has been read, use **File** > **Import** to load all of the previously saved settings required for the radio system. Parameters may also be entered manually.
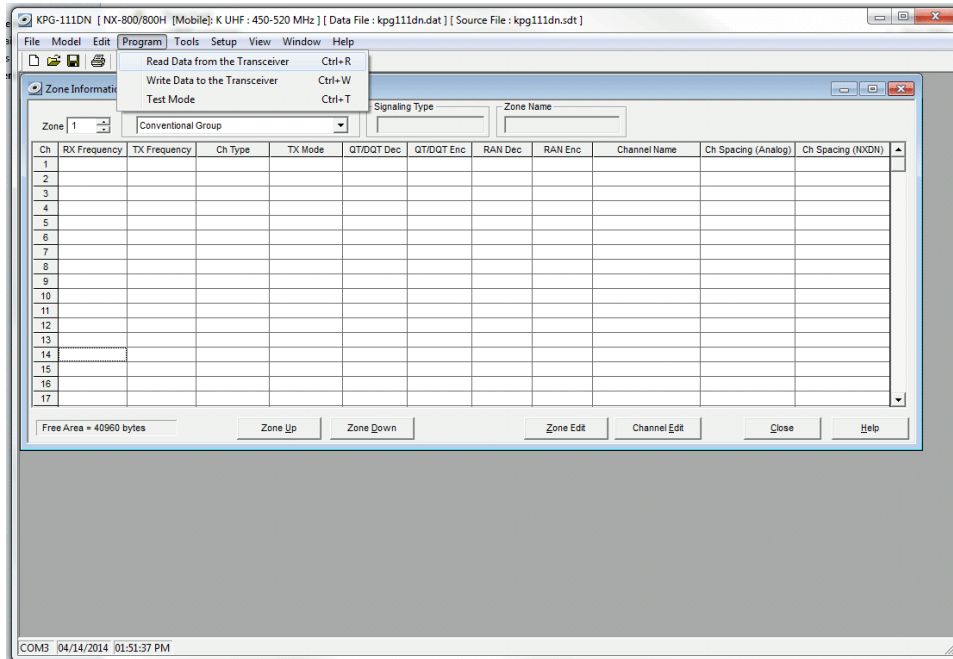
2.   Configure the Data Port

    a.   Open the **Option Features 1** settings window using the menu commands:
    Edit > **Optional Features** > **Optional Features 1**.

    b.   Select the **Common Page 3** tab, and then under the **Function** column for **COM port 1** in the table as shown below, select **Data + GPS Data Output**.

    c.   For the **PC Interface Protocol** parameter, select **Version 2**.
    Note: Selecting "Version 1" will prevent the IP Gateway from functioning properly.
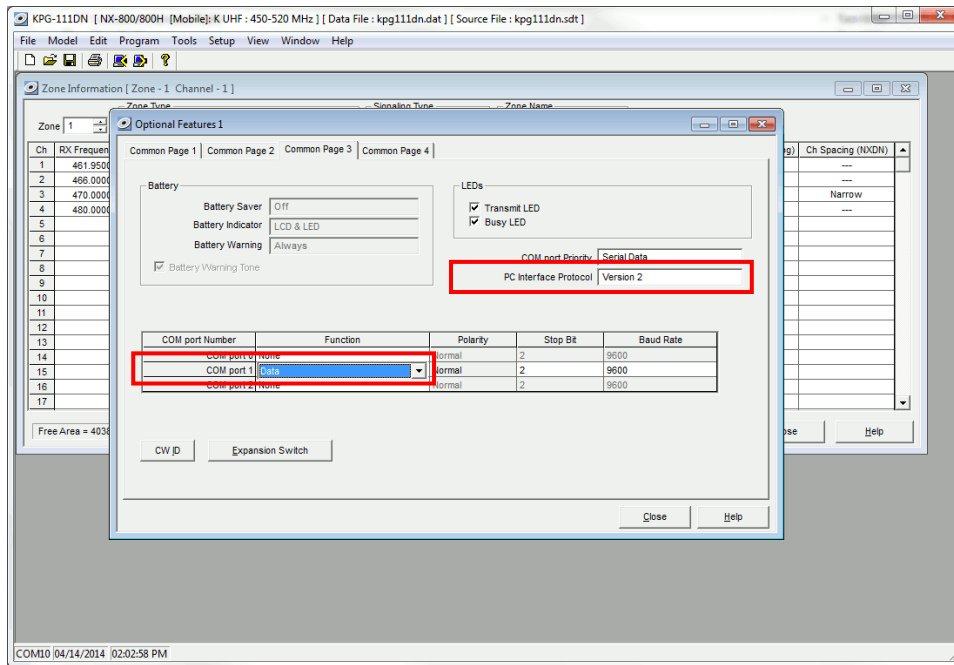

    d.   Select the **Common Page 4** tab.

        i.   **Enable Stack** options **Short Message Stack**, **Latest Received Message Stack**, and **Message Memory** by changing them to **Checked**.

        ii.   **Enable** all of the options for both the **Serial Output** and **Serial Input** groups by changing them all to **Checked**.
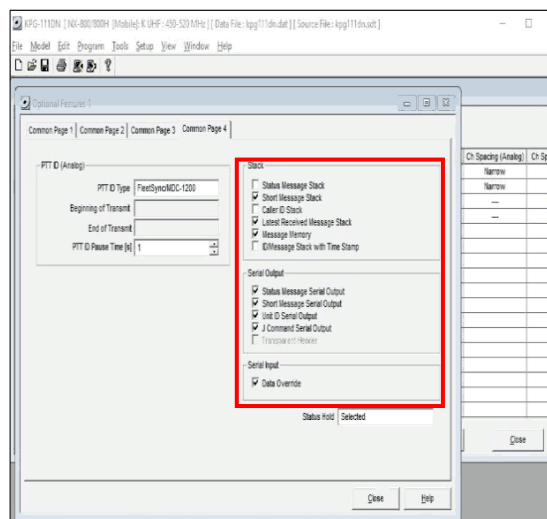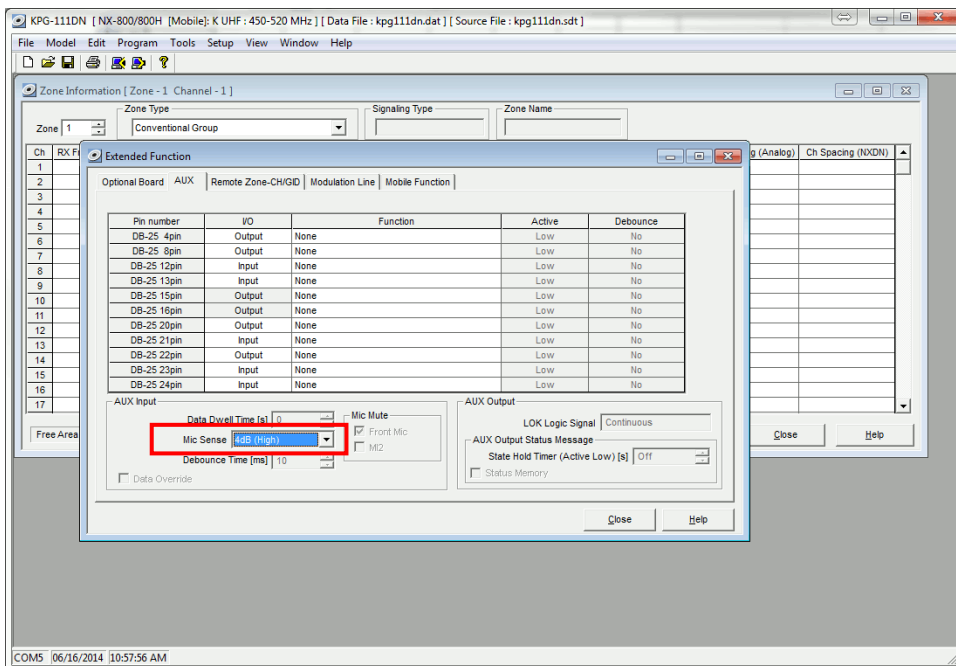
3. Configure Sound Options

    a.   Open the **Extended Function** window by using the menu commands**: Edit** > **Extended Function**.

    b.   In the **Modulation Line** tab, **MI2** column, and **Mic PTT** row, select **Connect** from the drop-down list as shown below.
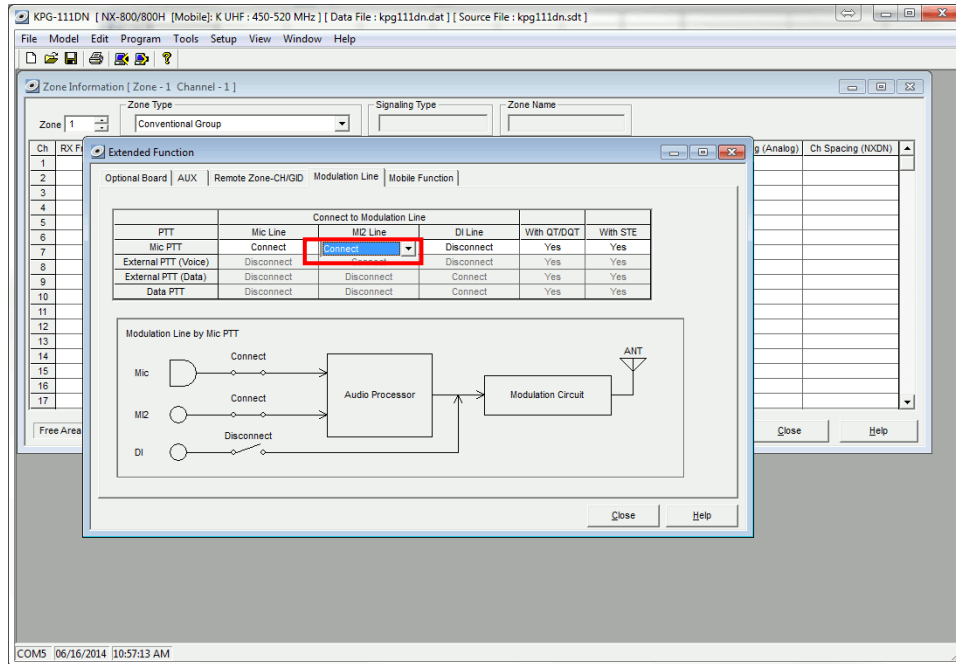
   c.   In the **AUX** tab, for **Mic Sense**, select **4dB (High)** as shown below.

d. In the **Mobile Function** tab, for **DEO Level** (the level coming into the computer), select **+5** as shown below. For either **DI** or **DEO** sound settings, levels may be adjusted as needed.
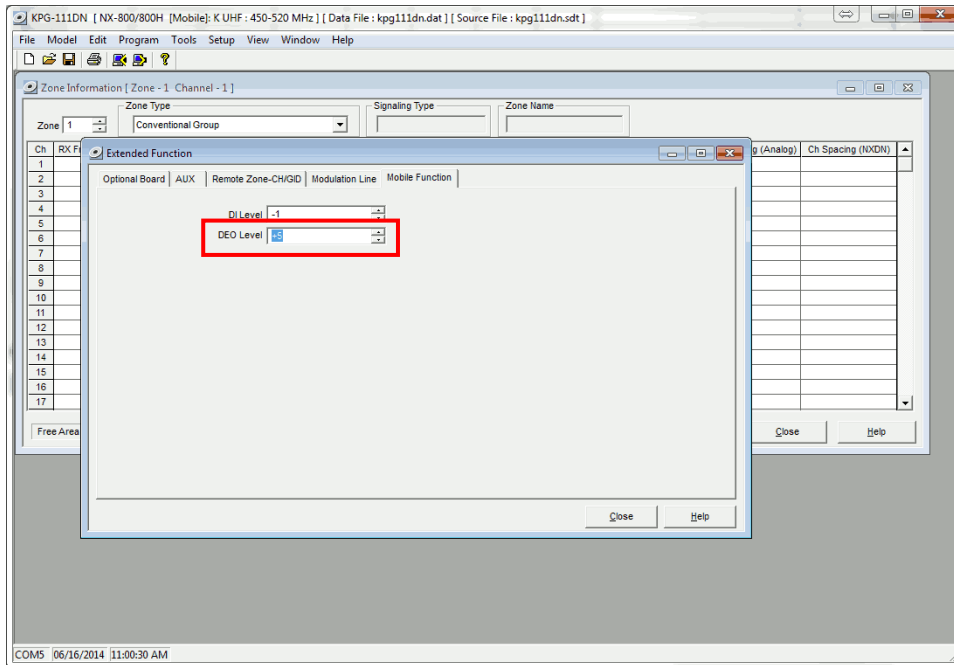
4. *Configure FleetSync settings*
    Note: Even if the radio is being used in analog mode without FleetSync, or in digital mode with NXDN, a FleetSync ID must be assigned. Not entering an ID will prevent RadioPro from functioning properly.

    a. Open the **FleetSync** window by using the menu commands: **Edit** > **FleetSync**

    b. In the **General 1** tab, enter a value for **Fleet (Own)** and **ID (Own)**. (Note: These do not have to be used elsewhere, but they must have an assigned value.)
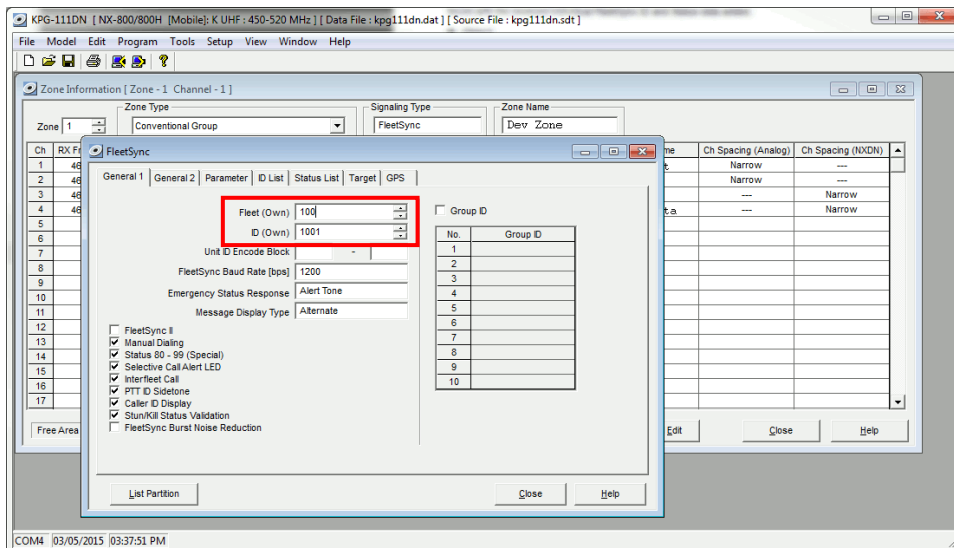
5. *Configure NXDN settings*
   Note: Even if the radio is being used in analog mode without FleetSync, a FleetSync ID must be assigned. Not entering an ID will prevent RadioPro from functioning properly.

   a. Open the **NXDN** window by using the menu commands: **Edit** > **NXDN**

   b. In the **General 1** tab, enter a value for **Unit ID (Own)**.
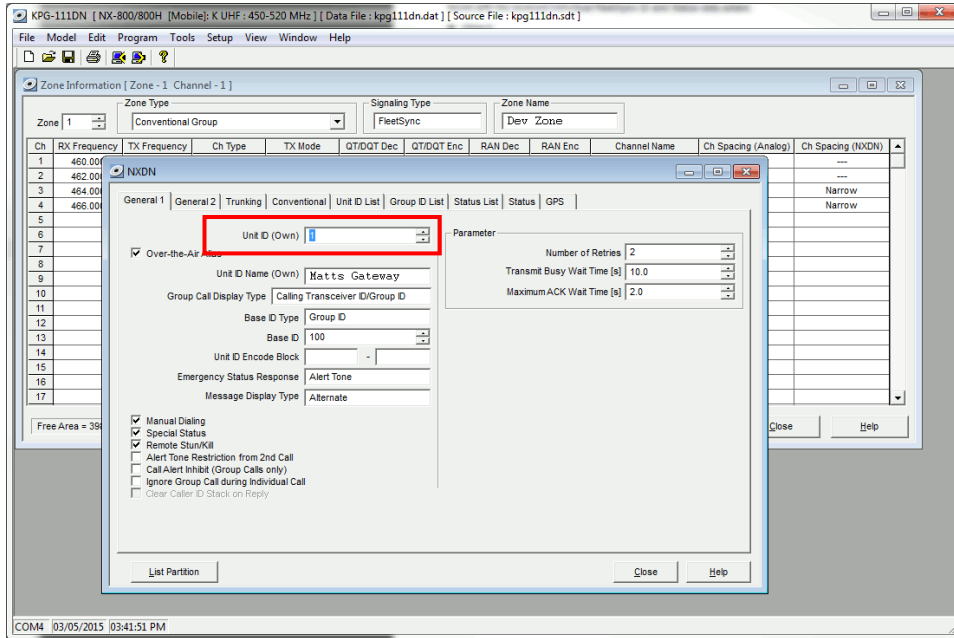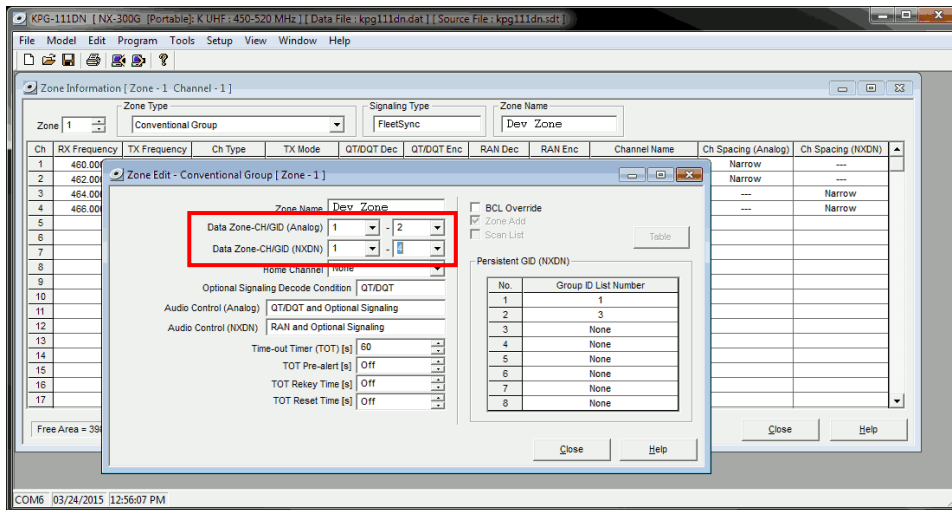

6. *Configure Data settings*
   a. For each zone listed in the **Zone Information** window, use the **Zone Edit** button to open the **Zone Edit** window.
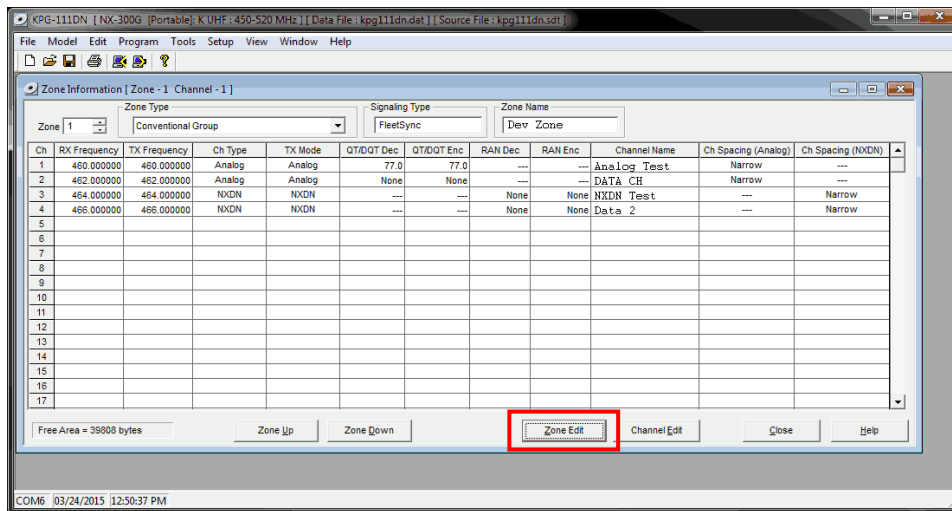
b. Specify the channel to use for data by assigning the **Data Zone-CH/GID (Analog)** and **Data Zone-CH/GID (Digital)** fields as required for your system.


   i. If using *FleetSync* in a conventional (non-trunked) system, ensure that the correct data will be sent to the Data Channel:

   - Open the **FleetSync** window by using the menu commands: **Edit** > **FleetSync**

   - In the **Parameter** tab, enable the desired message types to send across the **Data Zone-CH/GID** with a **Check**.
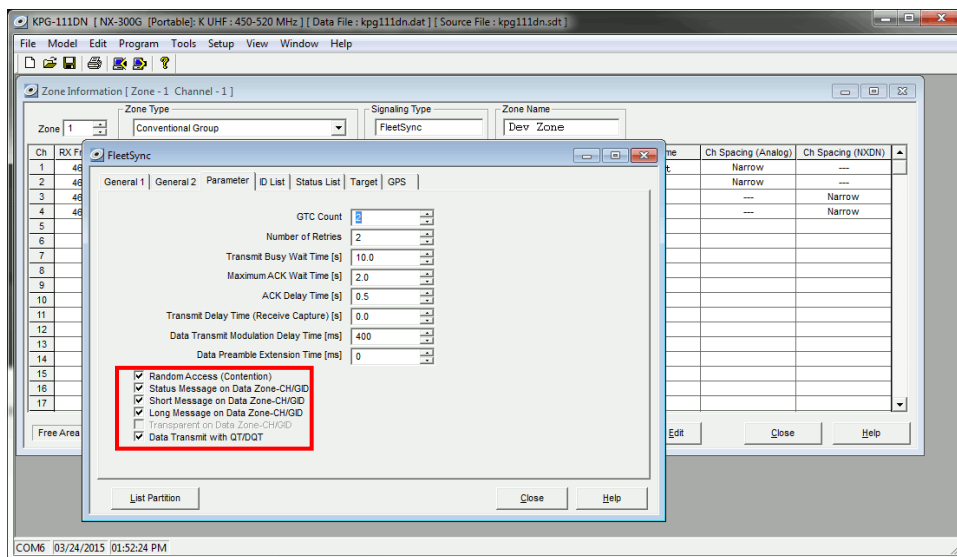
ii. If using *NXDN* in a conventional system, ensure the correct data will be sent to the Data Channel.

- Open the **NXDN** window by using the menu commands: **Edit** > **NXDN**

- In the **Conventional** tab, enable the desired messages to send across the **Data Zone-CH/GID** with a **Check**.
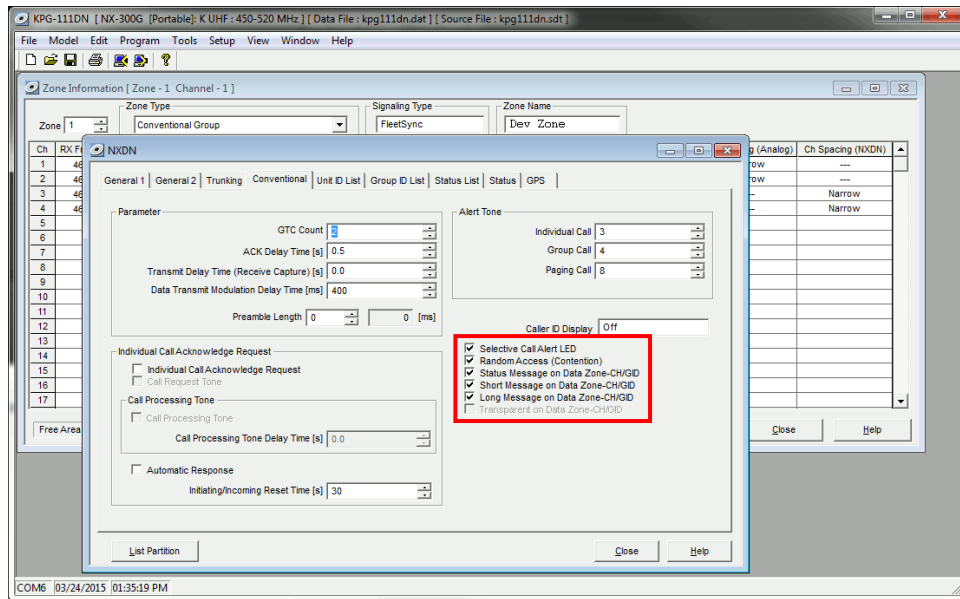

7. *Configure GPS settings*
   In order for RadioPro to process GPS information from subscriber radios, the control station radio must know what data to send to the IP Gateway.

   a. Open the **Optional Features 2** window by using the menu commands: **Edit** > **Optional Features 2**

   b. In the **GPS** tab, **Base Station Settings** section, enable the option for **$PKLDS/$PKNDS (KW)** with a **Check**.
   Note: Not selecting this option will result in GPS data not being sent to the RadioPro IP Gateway.
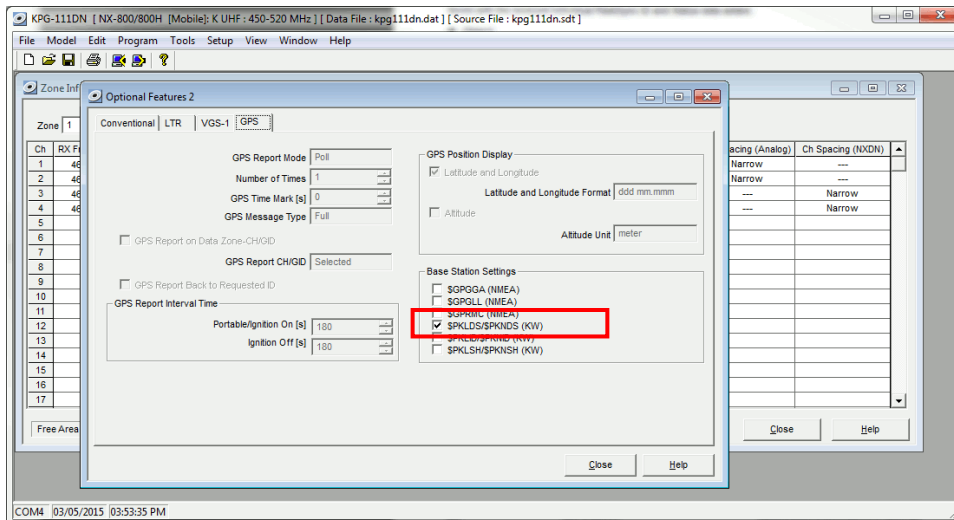
3.1.2 Configure the Data Revert Radio
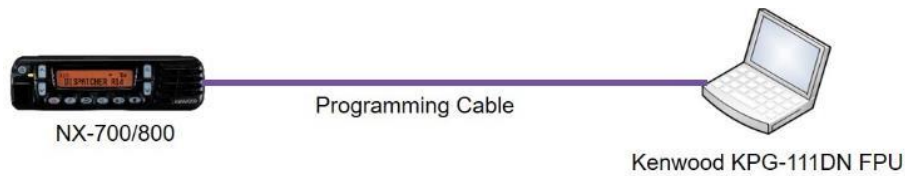
If you are using a Data Revert radio, follow the same steps for configuring the radio as you would for the Voice Radio with the following exceptions:

- Because the Data Revert Radio does not deal with audio, you may skip the steps on page *9* for *Configure Sound Options*.
- Because the Data Revert Radio will only receive GPS data, you may skip the steps on page *11* for *Configure Data settings*.
- **Be certain to follow steps described on page** *13*, *Configure GPS Settings***.**
- Because **Channel Steering** only affects the Voice Radio, program only the data channel into the radio.

3.1.3 Configure the Subscriber Radios

Programming Cable

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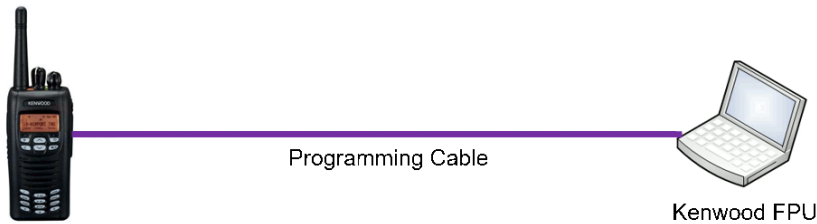
Use the **FPU** (Kenwood's NEXEDGE 'Field Programming Utility' configuration software) to configure NEXEDGE radio parameters using the following steps.

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

    a. Using a Kenwood programming cable, connect the Subscriber radio to a PC or Notebook that has the correct Kenwood FPU version (KPG-111DN in this case).

    b. Open the **KPG-111DN** FPU.

    c. Ensure that the correct COM port is selected by going to the **Setup** > **COM port** menu.

    d. Then, from the **Program** menu, select **Read Data from the Transceiver** as shown below.

    e. After the data has been read, use **File** > **Import** to load all of the previously saved settings required for your radio system. Parameters may also be entered manually.
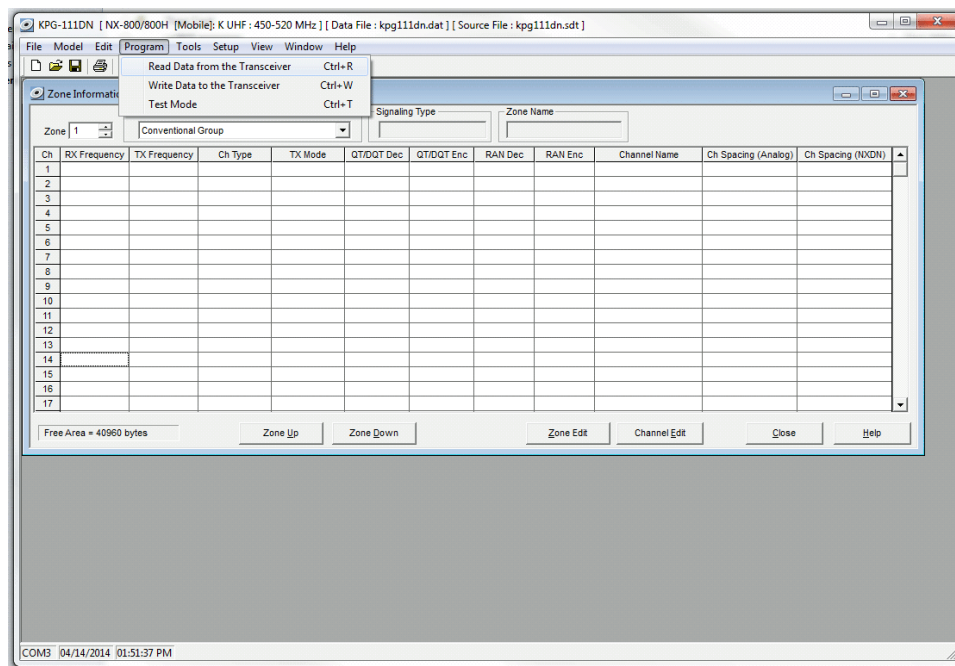
2. *Configure Target/Base ID settings.*

    a. If using *FleetSync*, ensure that the **Target Fleet** and **Target ID** specify the Control Station radio using the following steps:

        i. Open the **FleetSync** window by using the menu commands: **Edit** > **FleetSync**

        ii. In the **Target** tab, 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.
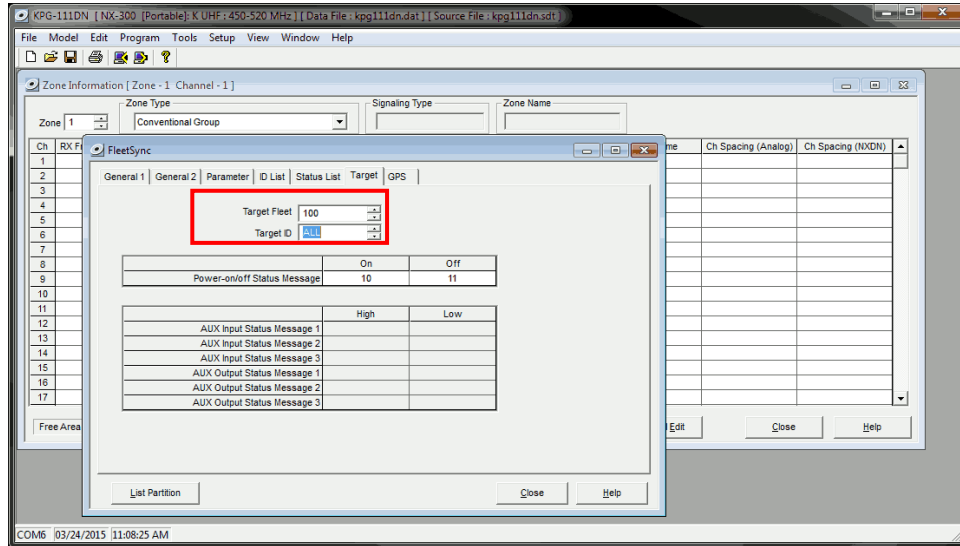
    b. If using *NXDN*, ensure the **Base ID** specifies the Control Station radio using the following steps:

        i. Open the **NXDN** window by using the menu commands: **Edit** > **NXDN**

        ii. In the **General 1** tab, enter a value for **Base ID Type** and **Base ID**.
        Note: If the Base ID does not include the Control Station(s), data will not be sent to RadioPro clients.
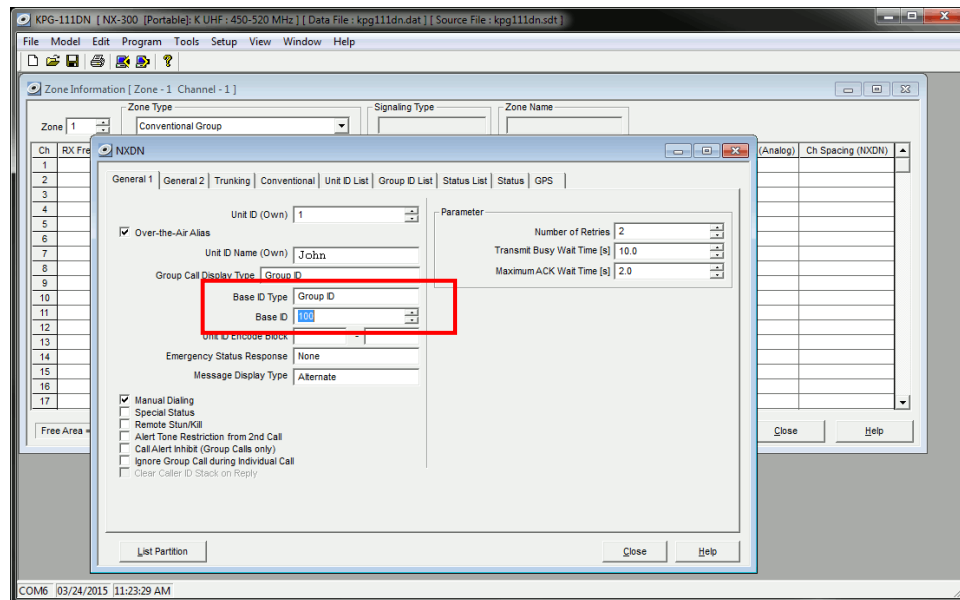
3. *Configure Data settings.*

    a.   For each zone listed in the **Zone Information** window, use the **Zone Edit** button to open the **Zone Edit** window.
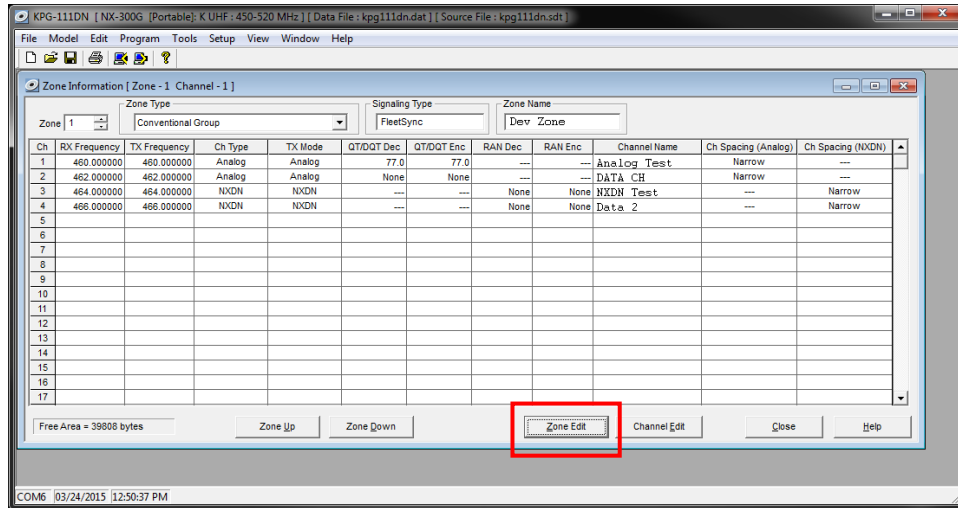
    b.   Specify the channel to use for data by assigning the **Data Zone-CH/GID (Analog)** and **Data Zone-CH/GID (Digital)** fields as required for your system. Ensure that the specified channels are the same as specified for the Control Station radio in Step 1a.6.b.

i. If using *FleetSync* on a conventional (non-trunked) system, ensure that the correct data will be sent to the Data Channel:

-   Open the **FleetSync** window by using the menu commands: **Edit** > **FleetSync**

-   Open the **Parameter** tab.

-   Enable the desired messages to send across the Data Zone-CH/GID with a **Check**.

ii. If using NXDN on a conventional system,

-   Open the **NXDN** window by using the menu commands: **Edit** > **NXDN**
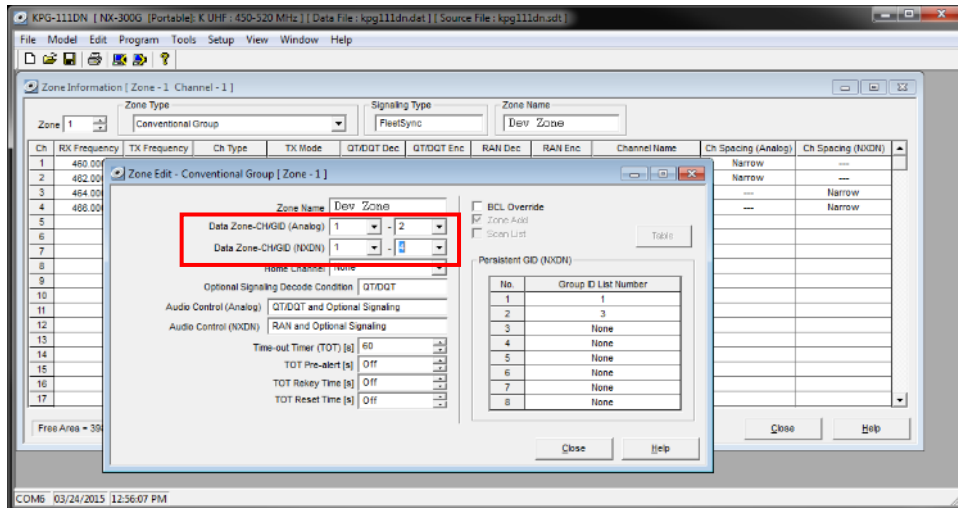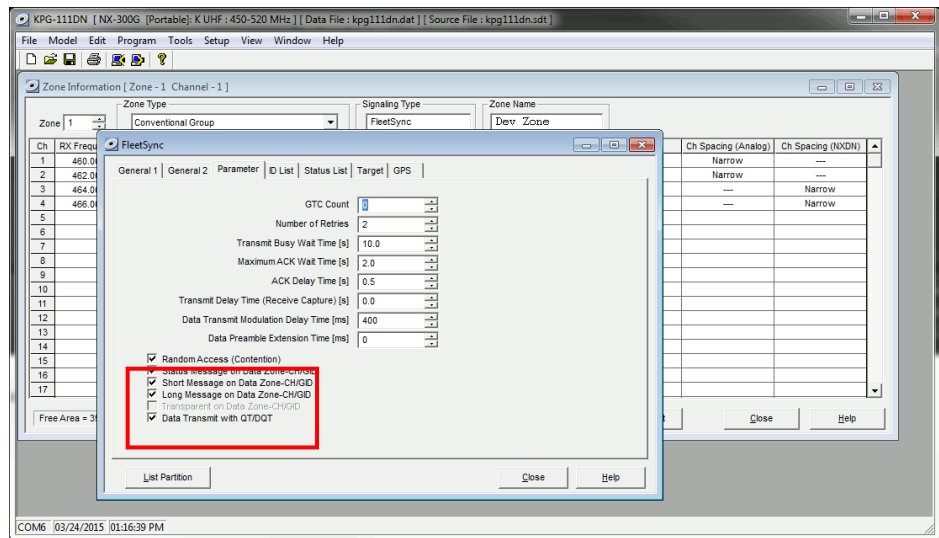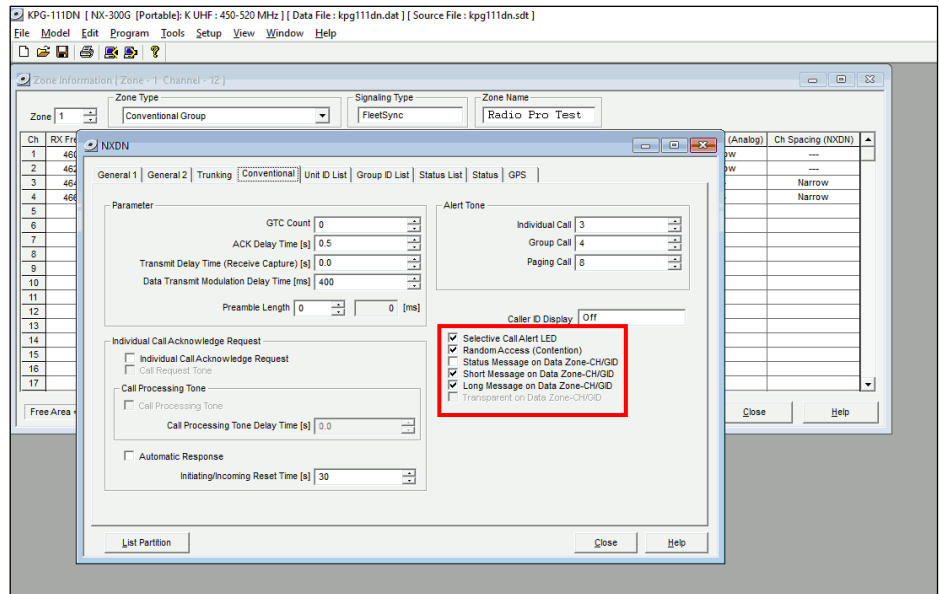
-   Open the **Conventional** tab

-   Enable the desired messages to send across the Data Zone-CH/GID with a Check.

-   Disabling "Status message on Data Zone-CH/GID" will keep the radio check on the voice channel.

4. *Configure Text Message Settings.*

    a.   Open the **Key Assignment** window by using the menu commands: **Edit** > **Key Assignment**

    b.   In the **Menu** tab, choose **Call** in the **Category List**, select **SDM (FleetSync/NXDN)** in the **Function List**, and then click the **Add** button.
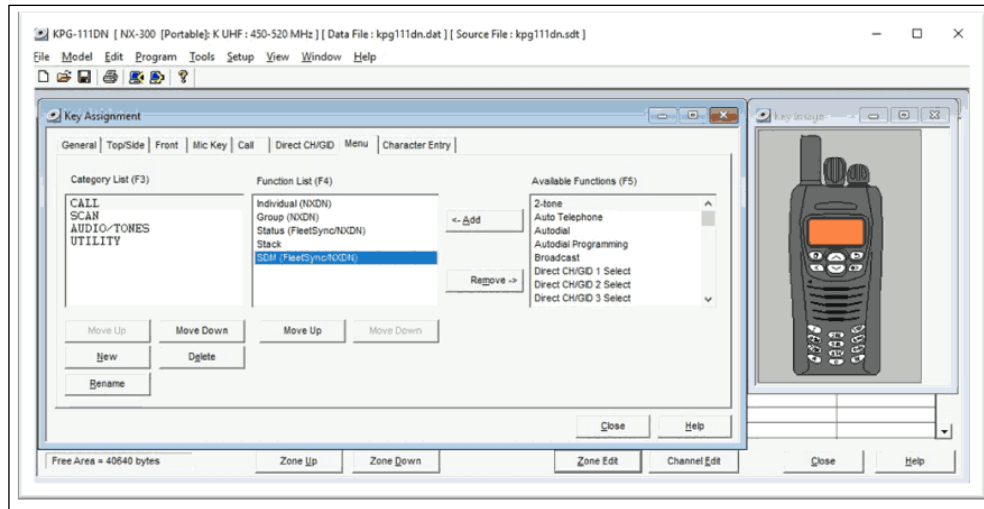
5. *Configure the GPS settings.*

    a.   If using GPS, configure the desired behavior for the radio by using the menu commands **Edit** > **Optional Features** > **Optional Features 2** and going to the **GPS** tab.

    b.   If GPS data should be sent on another channel, enable **GPS Report on Data Zone-CH/GID** with a **Check**, and then select the correct channel to use in the **GPS Report CH/GID** box.
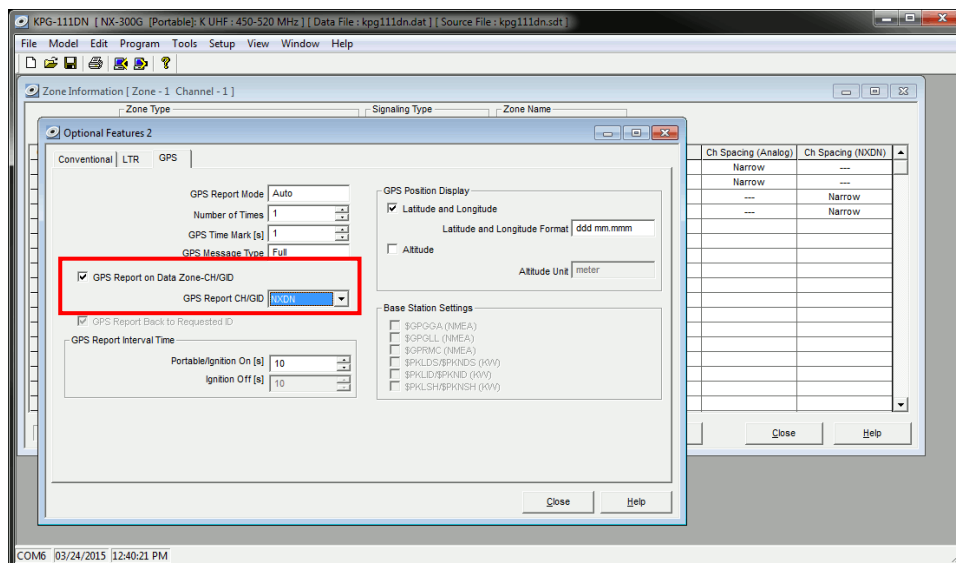
    c.   If using GPS with FleetSync, ensure the GPS Base Fleet and Base ID include the Control Station radio using the following steps.

    d.   Open the **FleetSync** window by using the menu commands: **Edit** > **FleetSync**

e.   In the **GPS** tab, enter a value for **Base Fleet** and **Base ID**.
Note: If the Base ID does not include the Control Station(s), data will not appear in RadioPro.
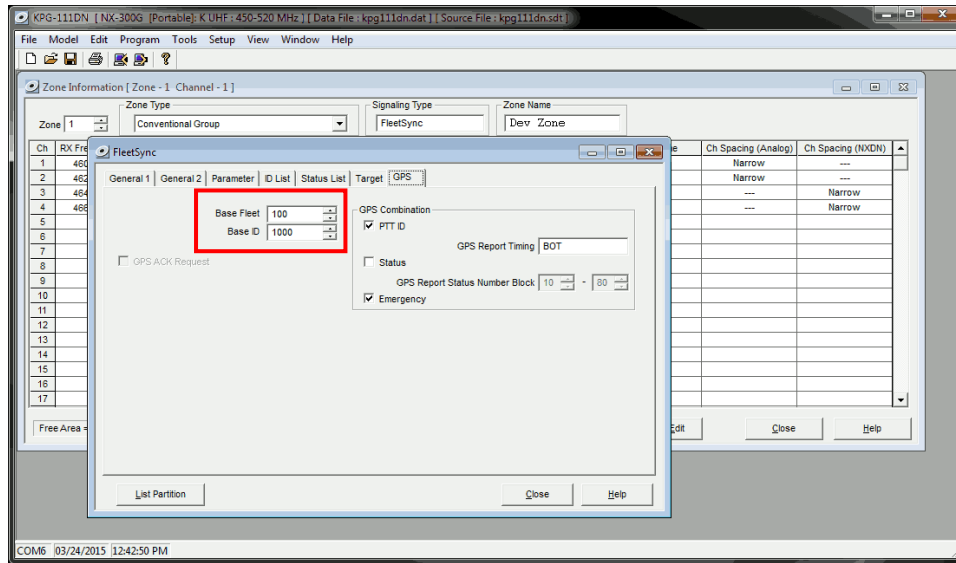
f.   If using GPS with NXDN, ensure the GPS Base ID includes the Control Station radio.

    i.   Open the **NXDN** window by using the menu commands: **Edit** > **NXDN**

ii.   In the **GPS** tab, enter a value for **Base ID Type (GPS)** and **Base ID (GPS)**.
Note: This is the ID the subscriber will to respond to, which will be the ID of the data revert control station radio.
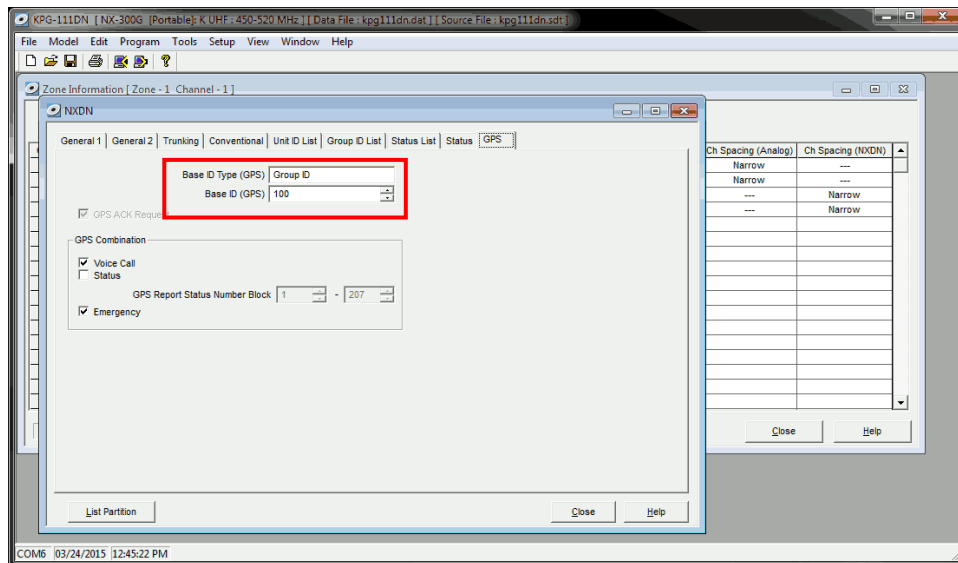
6. *Configure the Data Port*

a.   Open the **Option Features 1** settings window using the menu commands:
Edit > **Optional Features** > **Optional Features 1**.
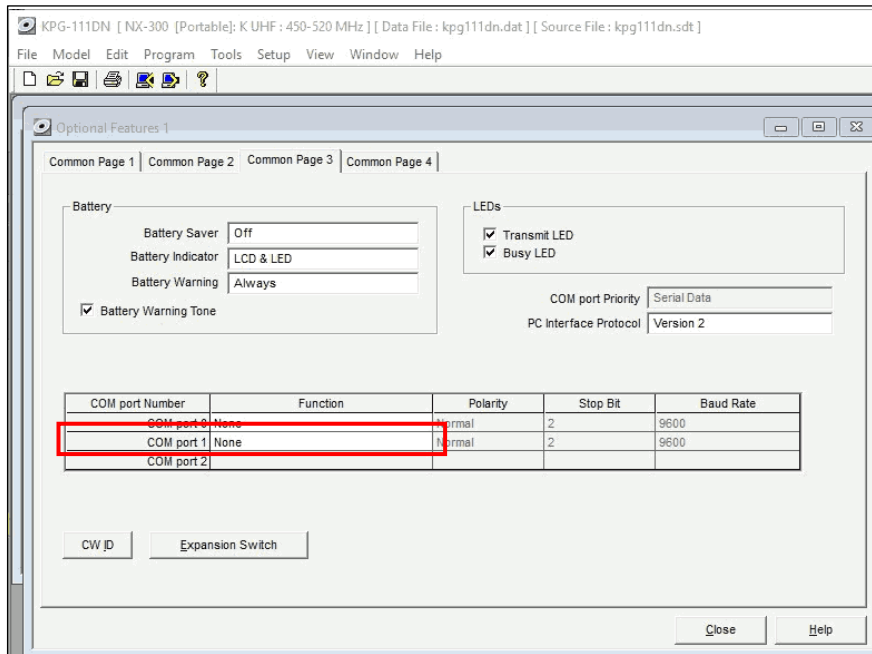
b.   Select the **Common Page 3** tab, and then under the **Function** column for **COM port 1**, select **None**.

c.   Select the **Common Page 4** tab, and then enable **Short Message Stack** with a **Check**.

3.2 Connect the IP Gateway to the Radio
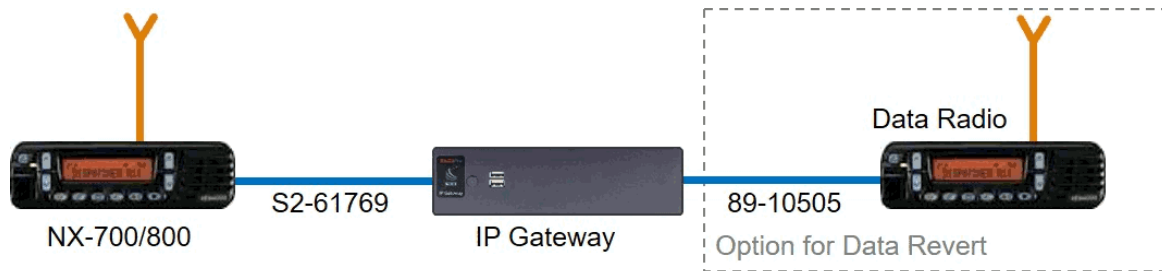
Note: Before continuing, ensure that the programming cable has been disconnected from the front mic connector.

See Section *4.1 Appendix – Radio Interface Cables*

Kenwood NEXEDGE NX-700/800 on Page *25* for interface cable details.

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

1. Connect the DB-25 male side of cable S2-617691 to the DB-25 female connector of the NX-700/800 radio.
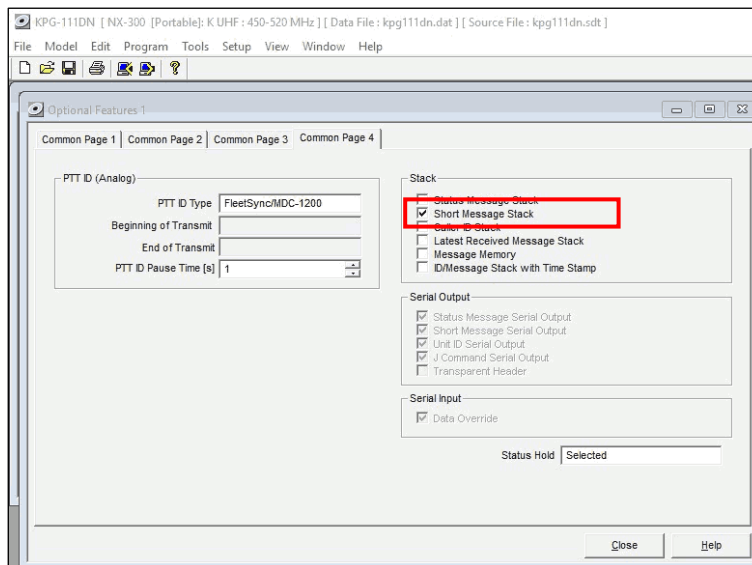

S2-61769

Kenwood
NX-700 / NX-800 / NX-5700 / NX-5800

- or -
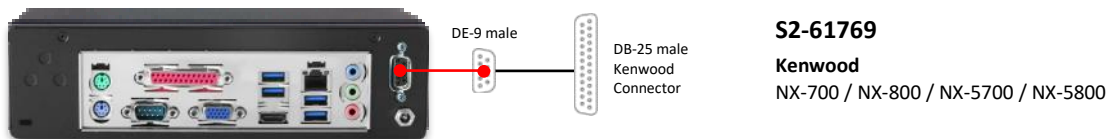
2. Connect the DE-15 male side of cable S2-61890 to the DE-15 female connector of the NX-720/820 radio.

S2-61890

Kenwood
NX-720 / NX-820 / NX-3720 / NX-3820

3. Connect the DE-9 male side of the cable to the DE-9 female connector on the rear of the IP Gateway.

4. 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 male side of cable 89-10505 to the DB-25 female connector of the NX-700/800 radio.

DE-9 female

DB-25 male
Kenwood
Connector

89-10505

Kenwood
Data Revert (NX-700 / NX-800 / NX-5700 / NX-5800)

- or -

2. Connect the DE-15 male side of the cable S2-61891 to the DB-25 female connector of the NX-720/820 radio.

DE-9 female
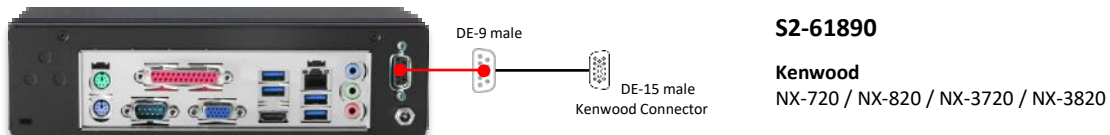
DE-15 male
Kenwood Connector

S2-61891

Kenwood
Data Revert (NX-720 / NX-820 / NX-3720 / NX-3820)

3. Connect the DE-9 female side of the cable to the DE-9 male connector on the rear of the IP Gateway.

4. 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.

3.3 Configure the RadioPro IP Gateway

NX-700/800   Ethernet Cable   ICU.exe

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 C**onfiguration **U**tility) 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 NEXEDGE specific settings: (Once connected to the IP Gateway with the ICU Utility)

> ### NEXEDGE Radio tab
>
> > Enter the appropriate radio ID values for the fields on this tab.
> >
> > The **Receive PTT ID timeout (ms)** field is used to give the transmitting radio time to transmit its PTT ID before the default PTT ID is used.
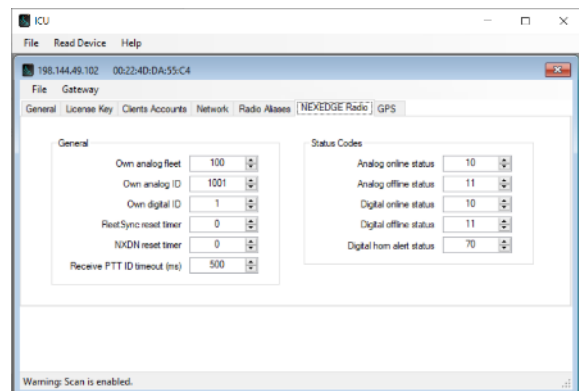
> ### GPS tab
>
> > If mapping locations of subscribers is required, place a check mark next to **Start GPS polling when online status received**. Leave this unchecked if GPS mapping is not needed, or if subscriber radios have been programmed to start GPS polling on their own.
> >
> > Then choose a **Report interval time** 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.
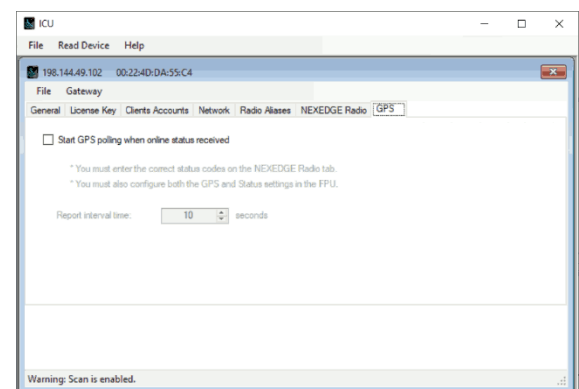
> Refer to the *RadioPro IP Gateway Installation Guide* for instructions on how to connect the RadioPro IP Gateway to an IP Network, configure Port Forwarding, and installing RadioPro Clients.

4. APPENDIX

4.1 Appendix – Radio Interface Cables

Kenwood NEXEDGE NX-700/800

Voice Radio

Interface Cable # S2-61769

Signal Name	IP Gateway DE-9* Pin #	Kenwood Radio DB-25 Pin #
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.

Data Radio

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

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

* Interface cable requires DE-9 female to connect to the IP Gateway male serial port connector.

Kenwood NEXEDGE NX-720/820 NX-3720/3820

Voice Radio

Interface Cable # S2-61890

Signal Name	IP Gateway DE-9* Pin #	Kenwood Radio HD-15 Pin #
MI2 (Tx+ Mic audio to radio)	4	5
Audio Ground	5	15
AF0 (Rx+ Speaker audio from radio)	8	4
Audio Ground	9	15
Tx Data (from radio)	1	6
Rx Data (to radio)	6	7
Digital Ground	3	15

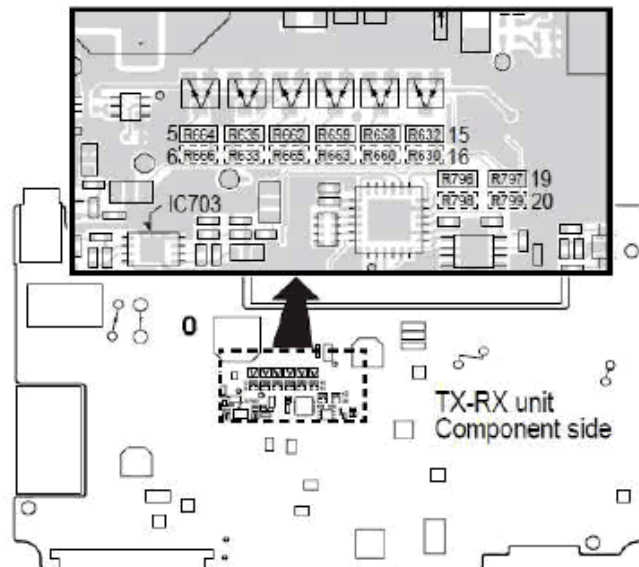* Interface cable requires DE-9 Male to connect to the IP Gateway female connector.

Data Radio

Interface Cable

Signal Name	IP Gateway DE-9* Pin #	Kenwood Radio HD-15 Pin #
Tx Data (from radio)	2	6
Rx Data (to radio)	3	7
Digital Ground	5	15

* Interface cable requires DE-9 female to connect to the IP Gateway male serial port connector.

Additional modifications to internal Tx-Rx unit of NX-720/820

Out	In	Description
R664	R666	Change FNC1 (TXD) and FNC2 (RXD) of HD-15 (DE-15) Connector from TTL level to RS-232C level
R635	R633	
R662	R665	
R796	R798	Change signal output from DEO to AFO
R797	R799	Change signal input from DI to MI2

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RadioPro IP Gateways

Parameters Common to all IP Gateways

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

Parameters Unique to each IP Gateway

GPS = GPS Data Revert. Each IP Gateway supports 1 Voice & 1 GPS Data Radio.	Name IP Gateway name has max 2 lines, 24 chars per line	Serial #	IP Address	Subnet Mask	Default Gateway
IP Gateway A	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	
IP Gateway B					
Voice Radio B0					
GPS Radio B1					
IP Gateway C					
Voice Radio C0					
GPS Radio C1					
IP Gateway D					
Voice Radio D0					
GPS Radio D1					
IP Gateway E					
Voice Radio D0					
GPS Radio D1					
IP Gateway F					
Voice Radio D0					
GPS Radio D1					
IP Gateway G					
Voice Radio D0					
GPS Radio D1					
IP Gateway H					
Voice Radio D0					
GPS Radio D1					
IP Gateway J					
Voice Radio E0					
GPS Radio E1					

If additional IP Gateways are needed, copy this page.

SYSTEM PLANNER TEMPLATE   PAGE 2 OF 2

RadioPro Dispatch Clients

See *RadioPro Dispatch Installation and Configuration Guide* for more information.

**Parameters Common
to all Dispatch clients**

| Administrator Password
for Edit Mode |
| --- |
| |

**Parameters Unique
to each Dispatch client**

PC Name	IP Address	License #	Licensed IP Gateway Connections

RadioPro Solo, Talk, and Mobile Clients

See *RadioPro Solo Client Installation Guide* for more information.

Parameters Common to all Talk Clients

| Administrator Login Name
Not Editable | Administrator Password
default is "admin" |
| --- | --- |
| admin | |

| User Login Name
default is "user" | User Password
default is "user" |
| --- | --- |
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If additional Solo, Talk, or Mobile client logins are needed, copy this page.