PTA-620 VoIP Paging/Talkback Amplifier

Section 1   Hardware Installation

1.1 Intent & Scope

This document describes the installation procedure for the PTA-620 VoIP Paging/Talkback Amplifier.

1.2 Description

The PTA-620 is a half-duplex Voice over Internet Protocol (VoIP) device that provides paging support (with talkback) and an Audio Level Alarm (ALA) feature for DXL intercom systems. The talkback feature allows a two-way conversation to be carried out over the loudspeakers, and the ALA feature provides continuous monitoring of the ambient room noise with alarm reporting (when abnormal sound levels are detected).

All models include line level input, line level output, two status inputs (for signaling call requests or alarm conditions) and a DPDT relay for controlling external paging amplifiers or providing a direction control signal for an external system.

Three versions of the PTA are available:

PTA-620-31   Provides 1 watt of power at 25 Vrms

PTA-620-35   Provides 5 watt of power at 25 Vrms

PTA-620-85   Provides 5 watt of power into an 8-ohm speaker

1.3 Mounting the PTA-620

A PTA-620 is designed to be mounted on a back board or on a standard top hat style DIN rail. The PTA-620-31 enclosure is slightly smaller the PTA-620-35 and PTA-620-85 enclosures.

1.3.1 PTA-620-31

The PTA-620-31 can be wall mounted with two #6 screws or on a standard DIN rail using two DIN rail clips (A Wago 209-188 Mounting Foot (Harding HDW0193) for mounting on standard DIN rails). The following diagram of the unit shows the location of the mounting holes.
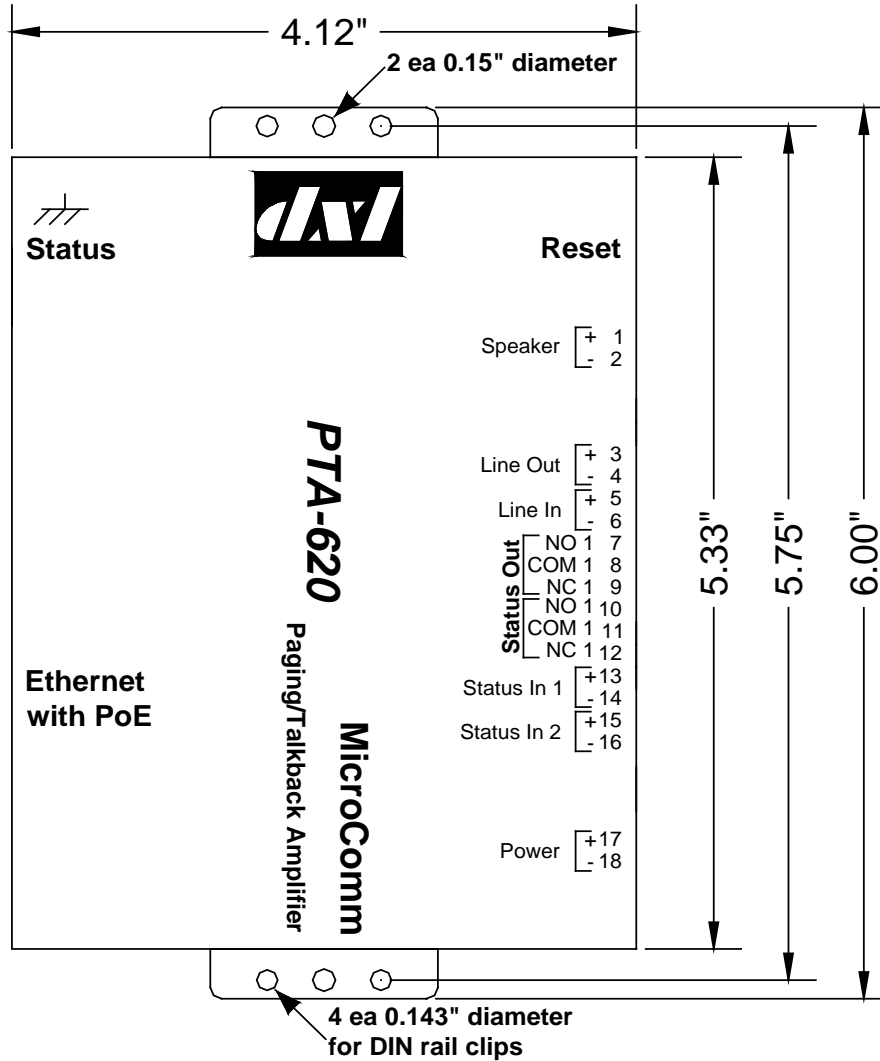

Figure 1 Mounting hole positions for the PTA-620-31

1.3.2 PTA-620-35 and PTA620-85

The PTA-620-35 and PTA-620-85 are packaged in the same size enclosure. The units can be wall mounted with two #6 screws or on a standard DIN rail using two DIN rail clips (A Wago 209-188 Mounting Foot (Harding HDW0193) for mounting on standard DIN rails). The following diagram shows the location of the mounting holes for these two units
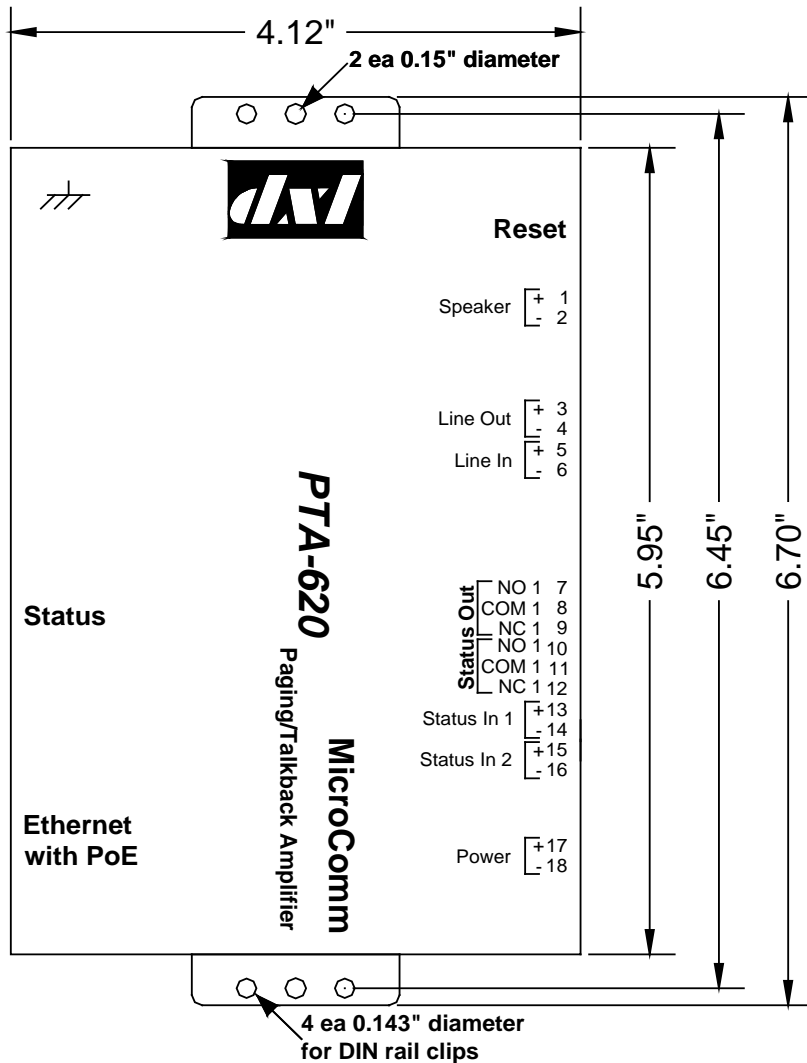
Figure 2 Mounting hole positions for the PTA-620-35 and PTA-620-85

1.4 Field Connection

The following diagram shows the location of the terminal blocks on a PTA-620-31. (The PTA-620-35 and PTA-620-85 have the same terminal blocks with the same labels).

PTA-620-31
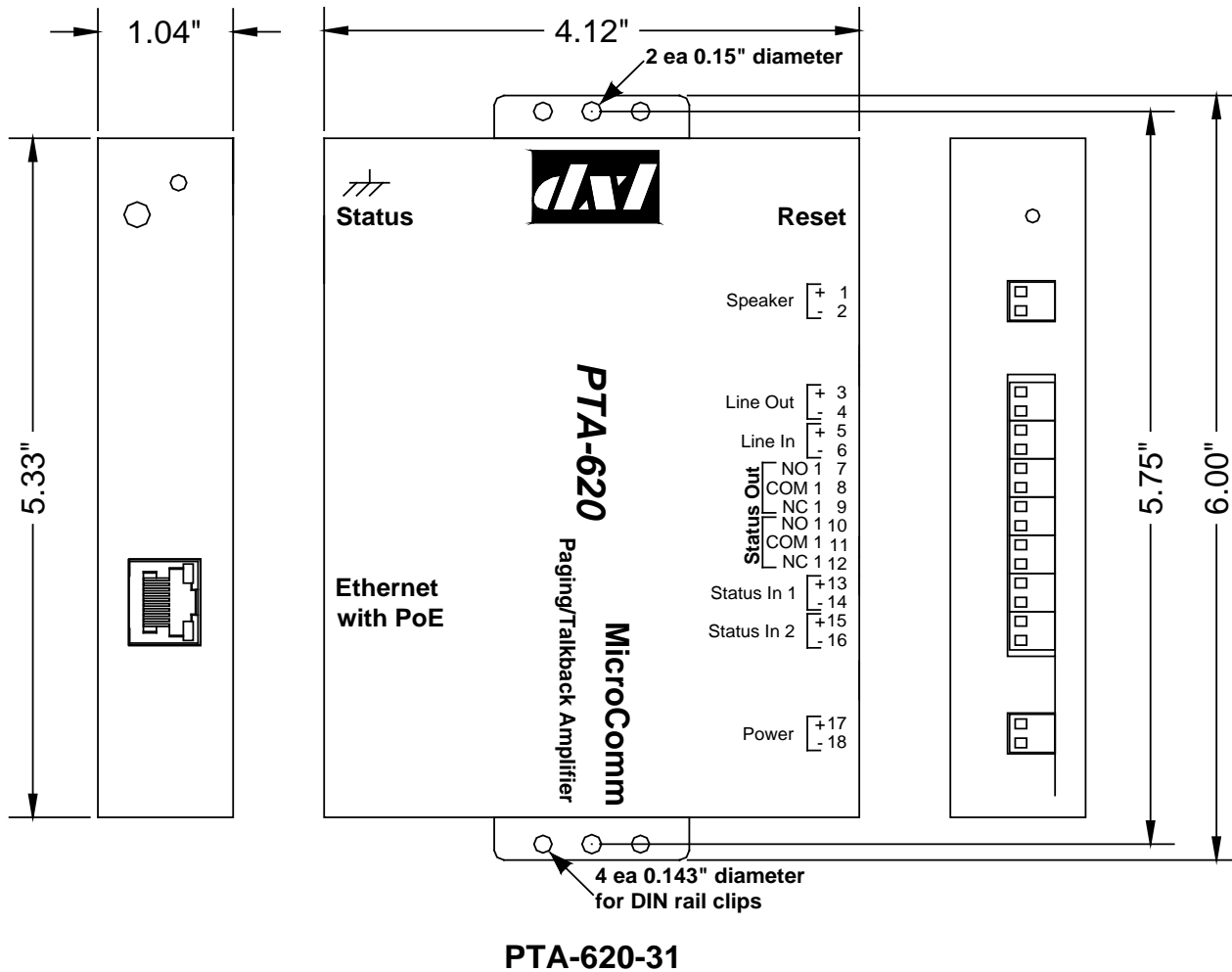
Figure 3 Terminal Block Locations for External Field Connections

1.4.1 Network Connections

The Ethernet connection is made via an 8-pin RJ-45 connector. Although the PSE (Power Source Equipment) must use the pin pairs assigned to an endspan or midspan (not both) the PD (Powered Device) accepts power from either the endspan or midspan device. The Ethernet RJ-45 includes both the network and power connections.

RJ-45 Pin	Function
1	Tx+
2	Tx-
3	Rx+
4	48Vdc (SRC)
5	48Vdc (SRC)
6	Rx-
7	48Vdc (RETURN)
8	48Vdc (RETURN)

Table 1 RJ-45 Ethernet & PoE

1.4.2 Other Connections

1.4.2.1   Speaker

External loudspeakers can be connected to the PTA-620 via a 1x2 terminal block labeled Speaker

TB-02	Function
1	Speaker +
2	Speaker -

Table 2 Speaker Connection

1.4.2.2   Line Input/Output

Two adjacent 1x2 terminal blocks provide connections for a line output and line input audio signals

TB-04	Function
3	Line Out +
4	Line Out -
5	Line In +
6	Line In – (Gnd)

Table 2 Line Level Input/Output

1.4.2.3   Status Output

A DPDT relay is used to provide a status output signal.

TB-06	Function
7	NO
8	COM1
9	NC
10	NO
11	COM2
12	NC

Table 4 Status Relay Contacts

1.4.2.4   Status Inputs

Two unsupervised switch inputs can be provide via two 1x2 terminal blocks.

TB-04	Function
13	Switch Input #1
14	Gnd
15	Switch Input #2
16	Gnd)

Table 5 Status Input

1.4.2.5   Auxiliary Power

If power to the unit is not available via a PoE connection an external power supply can be used to provide power to the unit through a 1x2 terminal block. The PTA requires a supply voltage of 20 Vdc – 36 Vdc, 0.6 Amps.

TB-02	Function
17	Input +
18	Input – (Gnd)

Table 3 Auxiliary Power

1.4.2.6   Earth Ground

A hole is available for the purpose of earth grounding the enclosure using a #6 self-tapping screw to attach a ground wire.

1.5 Reset Pin

A depressed reset pin is available, when pressed returns the operation of the unit to the factory set operating conditions.

Section 2   Software Configuration

2.1 Configuring a PTA-620 with the Administrator Software

The Administrator Software is used to create a configuration where a particular VoIP port must be assigned to each VoIP PTA-620. The first step in creating a configuration is to create all the Exchanges in the system. The following **DXL Configuration Editor** screen allows you to add an exchange to the configuration with the **Add Exchange...** button.
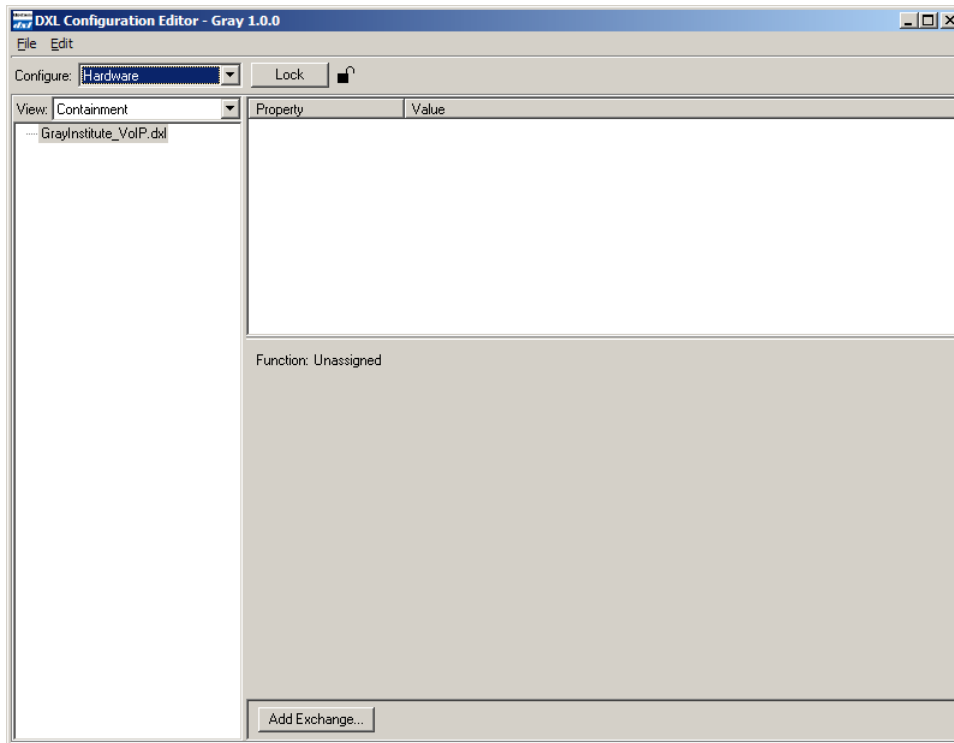
Click on the **Add Exchange...** button and the **Exchange Properties** text box with two tabs will pop up. In the **Identification tab** you need to type in a **Number:** for the exchange, the **Name:** of the exchange and assign a unique **IP Address:** to the exchange. You will require the IP Adress later when configuring the PTA.
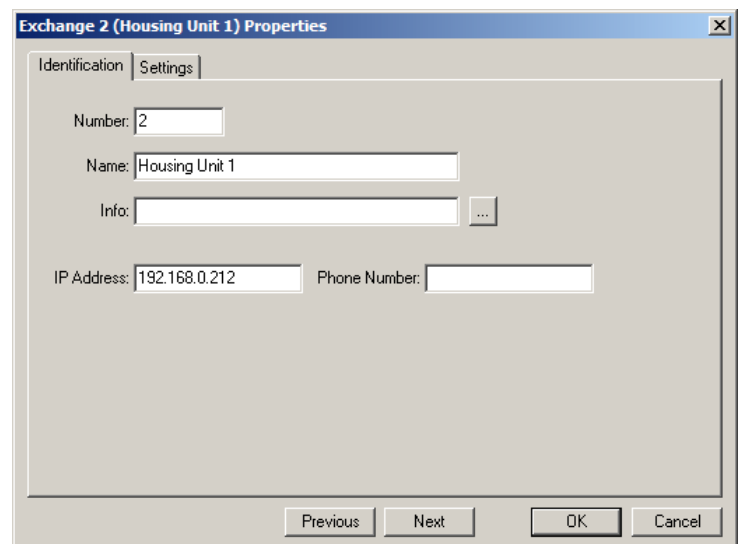
Once all the exchanges have been created each exchange requires a DCC. After the DCC has been configured, DCEs, TBEs and PZEs can be added to the exchange as required.

Using the pull-down menu and setting the **Configure:** entry to **Hardware** in the **DXL Configuration Editor** and selecting one of the Exchanges you can now add a DCC to the exchange.
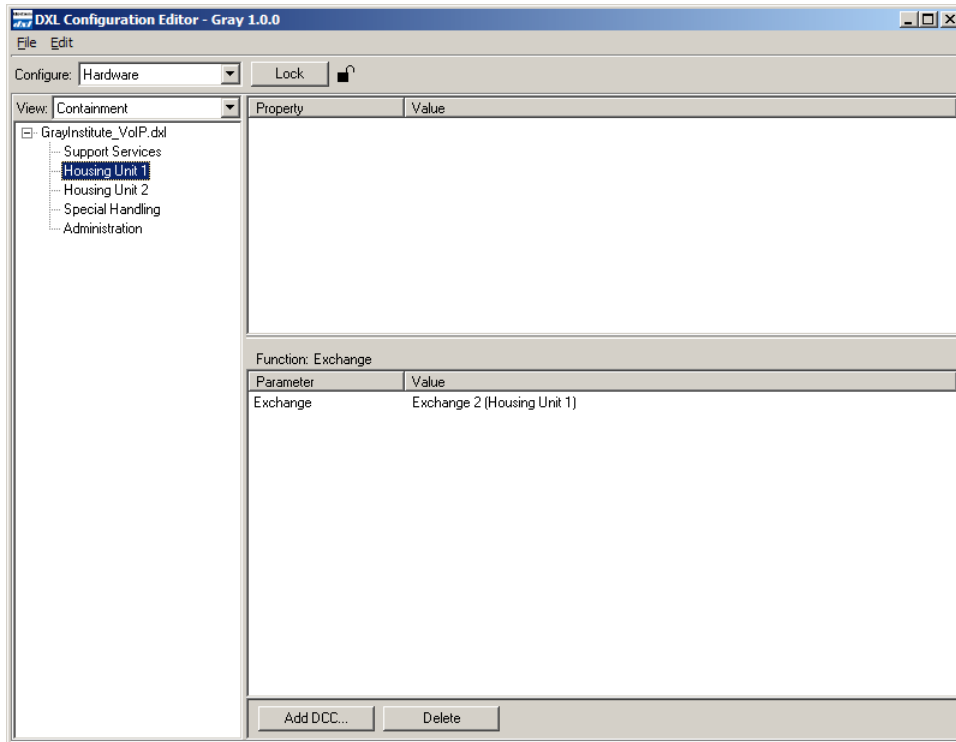
Click on the **Add DCC…** button to bring up a **DCC Properties** text box as shown on the right. Use the check boxes and pull-down menus to configure the DCC. In this example you are going to use VoIP devices so the **PCI Card:** should be set to **VoIP**. Once you select **VoIP** the **CEPT Port** entry will be dimmed and cannot be selected. When the parameters of the DCC have been set click on the **OK** button and return to the **DXL Configuration Editor**.
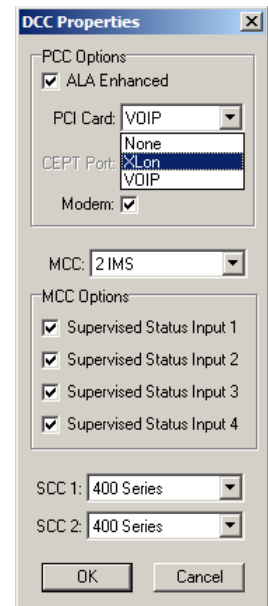
To add a PTA set the **Configure:** entry of the **DXL Configuration Editor** to **Stations** then click on the **Add...** button to bring up a **Station Properties** dialog box. In the **Identification** tab you need to assign a **Number:** to the PTA, a **Name:** for the PTA and use the pull down menu to select the **Type:** of the PTA. In this case we need to specify that it is an **IP Station**.
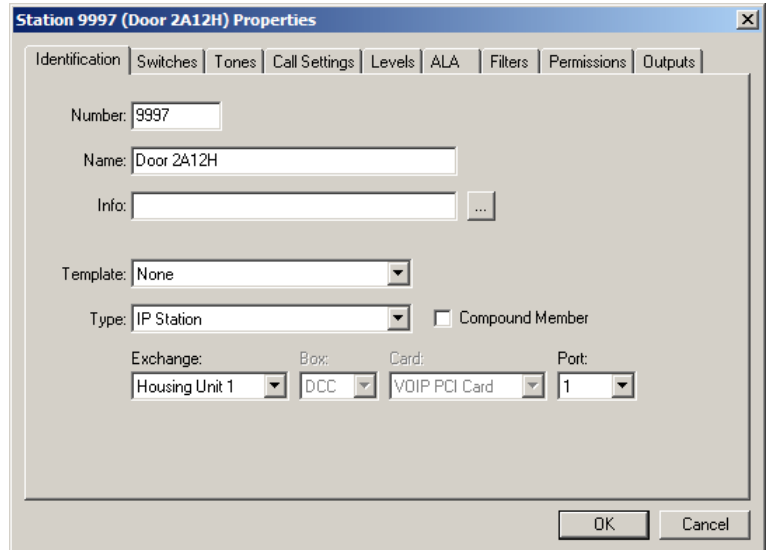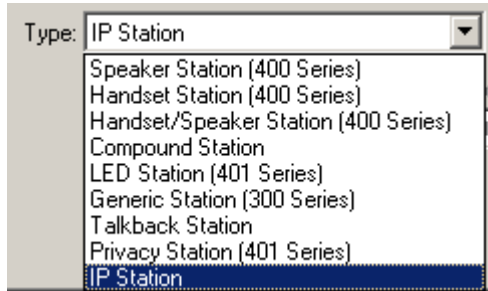
You must specify the **Exchange:** associated with this PTA and assign a unique port number for the PTA using the **Port** pull-down menu. By default the next available port will be displayed. In the case of stations, port numbers are assigned in groups of ten with no limits on the number of stations that can be associated with a particular exchange.

2.2 Determining the IP Address of PTA-620 Paging/Talkback Adapters

Every device connected to the inter-network Ethernet network in a DXL system must have a unique IP address.

Since the PTA-620 does not have switches or keypad to set its address, it has to initially be given a temporary address from the network using a DHCP server (Dynamic Host Configuration Protocol). In order to configure the PTA you need to have a computer or device (such as a router) that can assign DHCP addresses. **This is used for initial configuration only.** Once the PTA has been configured it will use a Static IP addresse, and DHCP will no longer be required.

After you have set up a computer or device which acts as a DHCP server, connect up the Ethernet port of the PTA to the network switch that the DHCP server is connected to. The network switch should assign an IP address to the PTA. Once the PTA Link LED is on solid it indicates that the PTA is connected to the Ethernet network.

You can then determine the address of a PTA in one of two methods.

2.2.1 Determining the IP Address Using the PTA-620 Voice Synthesizer

The first method is to quickly press and release the reset switch on PTA-620. Using a voice synthesizer, the PTA should speak the IP address that was assigned to it by the DHCP server. Write this address down for use in the next step.

If the PTA speaks a 12 digit Ethernet MAC address this means that the PTA has not received a DHCP address, indicating that there is probably no DHCP server on the network.

2.2.2 Determining the IP Address Using the VoIP Device Manager

You can also configure and determine the IP addresses of PTA-620 devices using the DXL Administrator VoIP Device Manager utility. This is available in the DXL Administrator starting in version 1.5.0b2.

First, open the DXL Administrator and open a project file. Go into the Diagnostics menu, and use the menus "View", "VoIP Device Manager".
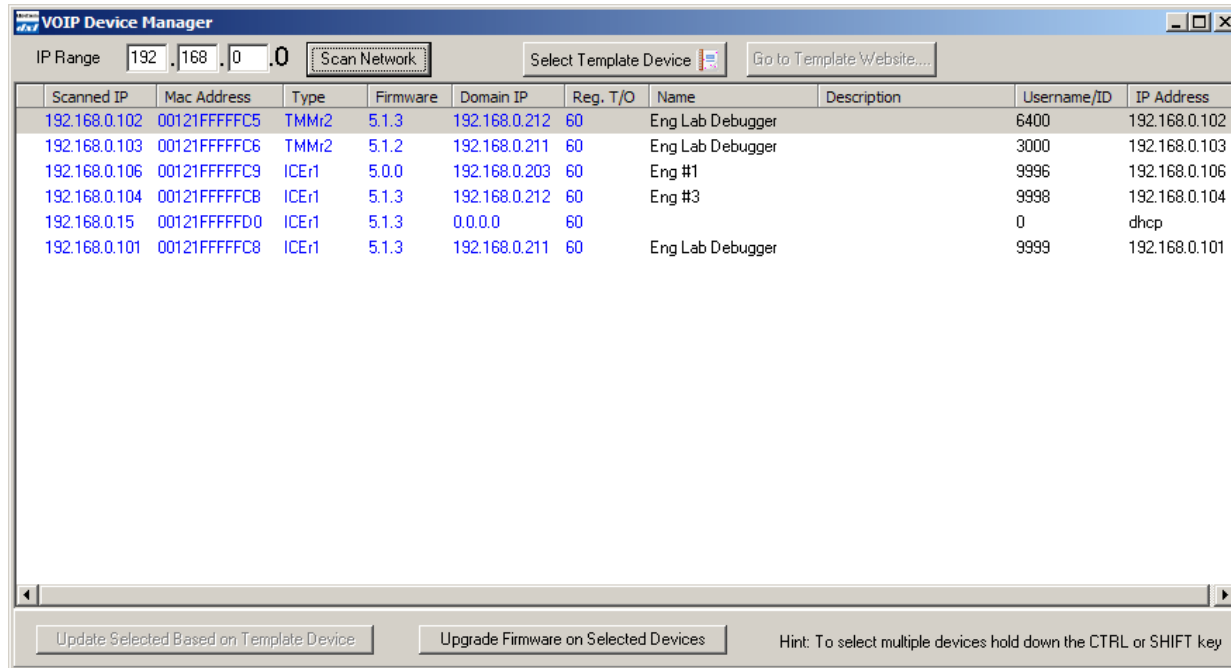
Select the IP range that your DHCP server assigns addresses in and click the "Scan Network" button. The VoIP Device Manager will scan the network looking for DXL VoIP devices and display a list of recognized IP devices. PTA devices will have a Type starting with "PTA". The left column "Scanned IP" will show you the IP addresses of all recognized devices.

2.2.3 Resetting the IP Address Using the Reset Switch

The reset switch can be used to reset the PTA-620 to its original factory set conditions. The switch must be depressed at the same time the Ethernet cable is plugged in.

2.3 Configuring the PTA-620

Once the IP address of the PTA-620 connected to an Ethernet network has been determined and, a PC on the same network can access the PTA and use a web browser to set the remaining parameters necessary to make the PTA work in a DXL system.

The first step is to hook up the Ethernet port on the PTA to a network switch. Once the PTA has reset and the Link LED is flashing red, you can bring up a web browser from a PC on the same network (that is assigned an IP address within the same network mask as the PTA).

In the address bar, type "**http://<address of PTA>**". For example, if the PTA is 192.168.0.15, type "**http://192.168.0.15**".

Alternatively, you can double-click on a PTA using the VoIP Device Manager utility after you have scanned the network for DXL VoIP devices, which will bring up your web browser at that PTA's settings page.

In either case, this will bring up a MicroComm DXL PTA setup page in your web browser.

If this is not the first time that the web browser has been used to configure the PTA after a factory reset, the PTA will skip the MicroComm Setup Wizard screens and go directly to the web browser menus. The user will have to sign in as the administrator (using the password assigned during initial configuration) to make changes to these settings. If this is the first setup after a factory reset then the user will have to enter some information before being allowed to go directly to the web browser menus. The following section describes the MicroComm Setup Wizard screens and how to configure them. The section after that describes the settings to make in the web browser menus.

2.3.1 Using the MicroComm Setup Wizard

If this is the first time that the PTA-620 has been configured with a web browser, the following screen will come up. If this screen is not shown, then likely the PTA was previously configured, in which case you can skip to the next section.
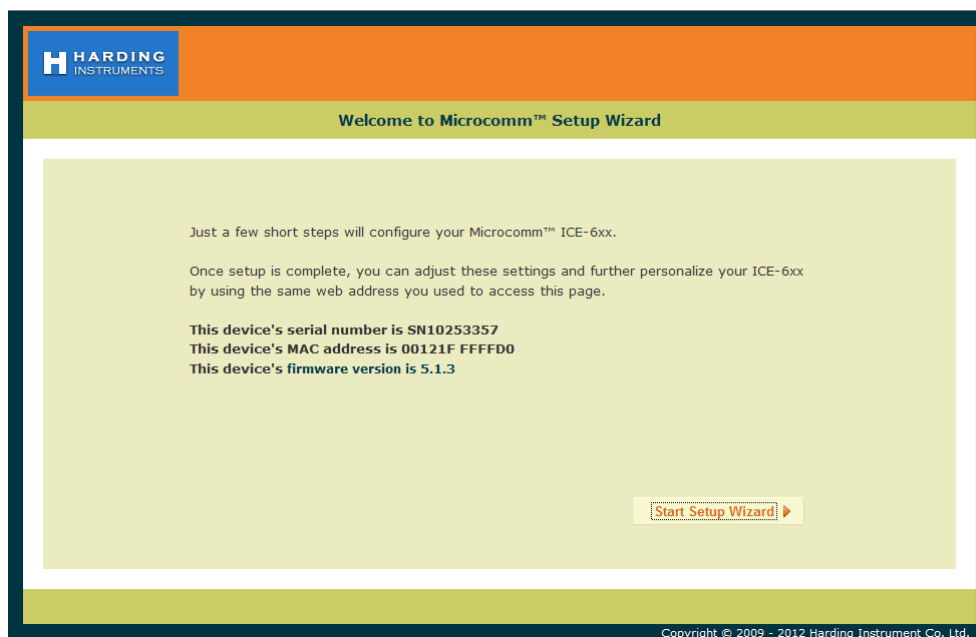
Click the "**Start Setup Wizard**" button to continue.

On the first page, assign a **Workgroup Key**. This key can be any value you choose, but the same key should be entered on every IP device in the MicroComm system. In this example, "**microcomm**" is used for the **Workgroup Key** for this system. Once this is entered, click "**Next**" to continue. This value is not normally used when the PTA is used with a DXL intercom system.

Next, enter the **Extension Name** and **Extension Description**. Enter a short name describing this PTA in the **Extension name** setting. In this case, "**Door 2A12H**" is used. Enter any additional description for this PTA as **Extension Description** (or leave it blank). These descriptions are not normally used when the PTA is used with a DXL intercom system and are for reference purposes only. Click the "**Next**" button to continue.
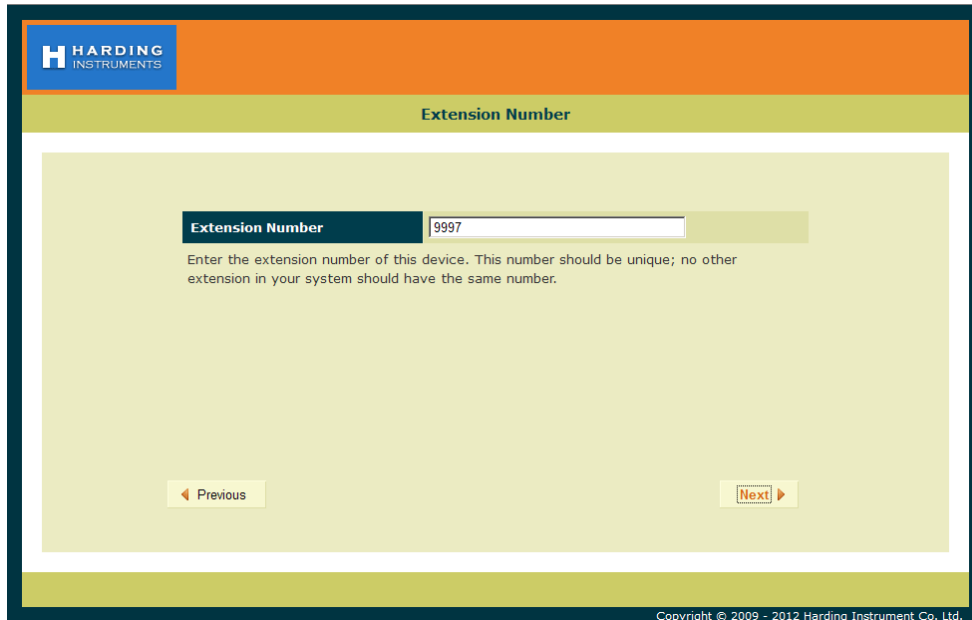
Next, enter the **Extension Number** for this PTA. This extension number must correspond to the IP station number configured in the DXL Administrator for this PTA. There can be only one IP station in the system that has this extension number. In this example, "**200**" was used as the ID number of the PTA in the DXL Administrator and this same number must be entered as the **Extension Number** of this PTA. Click the "**Next**" button to continue once this has been entered.

Set the **DCC/Registrar IP Address** to the IP address of the DCC that controls the exchange that the PTA is associated with in the DXL Administrator. For example, in this case the IP address of the DCC of the exchange that the PTA is associated with is "**192.168.0.212**". Once this is entered, click "**Next**".

Now set the **GMT Offset** time zone setting to an appropriate time zone where the PTA will be used, then click "**Next**".

Next, enter a **User Password** for the user account on the PTA, then click "**Next**". This allows a separate account for install or maintenance technicians to examine the PTA parameters, but not being able to modify them. Click "**Next**" after the password is entered.

In the following screen, re-type the same **User Password** to verify it, and then click "**Next**".

Now enter an **Admin Password** for the administrator account on the PTA, then click "**Next**". The Administrator account and password will be used to change as well as examine settings. In this case the password "**admin**" is used (this will be used later on in the configuration settings).
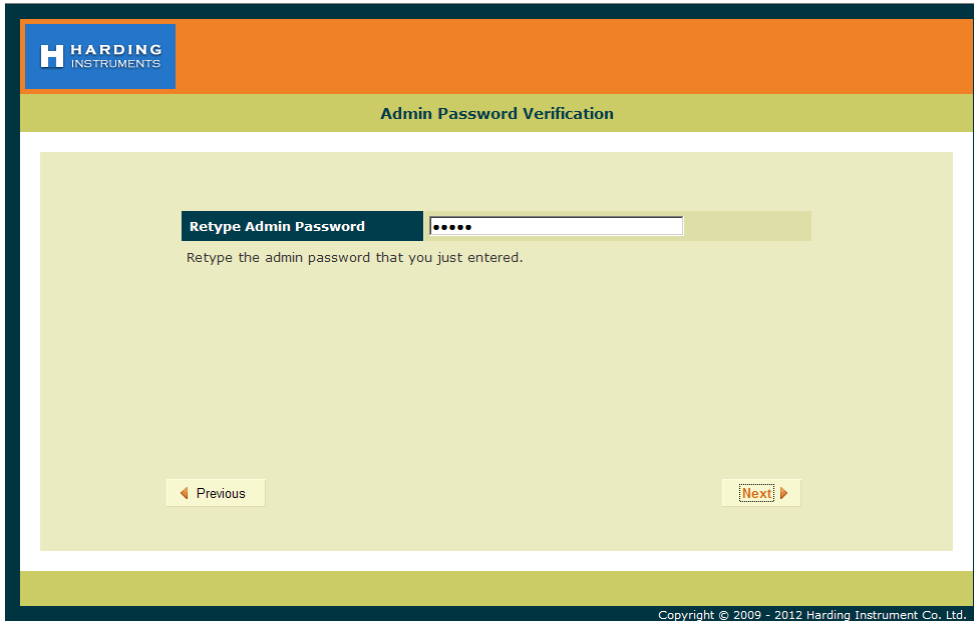
In the following screen, re-type the same **Admin Password** to verify it, and then click "**Next**".

The next screen shows a summary of the initial settings entered in the MicroComm Setup Wizard. Click "**Next**" to continue.

The last screen in the MicroComm Setup Wizard asks you to confirm the settings you entered. Click the "**Update**" button to complete the wizard.

After this, the main configuration screens will be shown as in the next section.

2.3.2 Setting the PTA-620 Operating Parameters

If the PTA-620 has been configured with the MicroComm Setup Wizard previously, it will skip the previous screens and go directly to the following screen when the web browser accesses the PTA's web page. To make changes, the user will have to sign as the administrator using the password previously assigned during the initial configuration.

The initial web page for configuring the PTA is as follows.
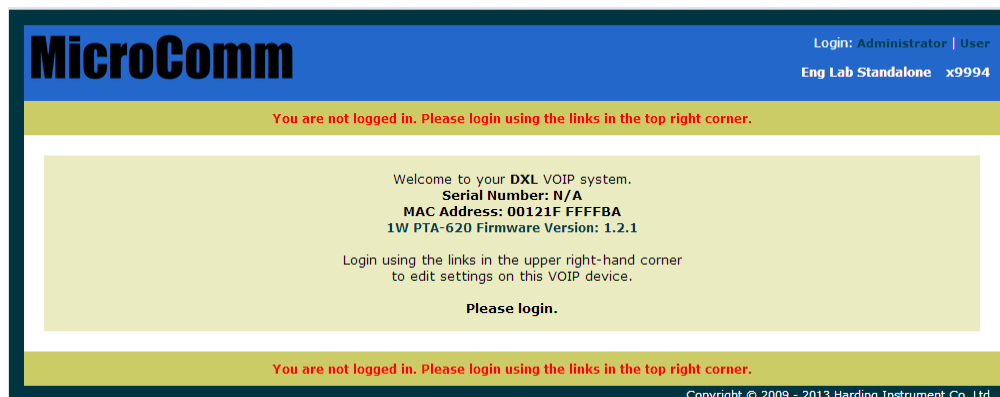
Click on the "Administrator" text at the top right corner of this page. This will bring up a login prompt box. Use the user name "**admin**" and enter the password assigned to this master ("**admin**" was assigned in the above example), then click Login.

Once you are logged in you will see more menu options.

Click on the **Network Address** menu tab on the menu bar to bring up the **Network Settings** menu.

In the **Network Settings** menu, set the following parameters:

Set **Mode** to "**Static**" (to assign the PTA a static IP address). Static is recommended for all IP devices.

Set **IP Address** to the IP address for this PTA. It should be assigned by your network administrator, and must not conflict with other IP addresses on this system. In this case this PTA is assigned address "**192.168.0.114**"

Set **IP Network Mask** to the Network mask for the network. This is also assigned by your network administrator, and should be the same network mask used for all DXL equipment including IP masters, IP stations, and IP PTAs, as well as the DXL DCC's. This example network is assigned "**255.255.255.0**" for the network mask.

The **Gateway**, **Domain**, and **DNS Servers** settings are typically used if your DXL system extends across one network. They are typically left blank, but you can assign the **Gateway** setting to your gateway server IP address for this network, the **Domain** setting to the domain name of your network, and the **DNS Servers** setting to the DNS server IP address for this network.

Once you have entered all of the settings you require, click the "**Update**" button.

Note that changing the Network Settings will require a reboot for the settings to take effect. You can either use the "**Reboot Now**" option and re-establish the connection at the new IP address by typing "**http://<address of PTA>**", in your web browser, or use the "**Reboot Later**" option and continue to change the settings and reboot after you have changed all of the settings.

Once you have rebooted and logged in, or have continued from the previous screen, select the "Extensions" menu bar option.

Click on the number under **Extension** (which is the extension number entered in the MicroComm Setup Wizard) to bring up the **Settings** screen. In this example, the extension number to click is "**x9994**".

The settings for **Extensions** were previously entered in the MicroComm Setup Wizard, but a brief description of the settings is below if you need to change them after the initial setup.

Name is a short descriptive name of this PTA; in this case "**Eng Lab Standalone**" is used.

Number is the station number for this PTA (this must be the same number as the Station **Number** entered in the DXL Administrator software for the PTA). This station number cannot be the same number as any other station in the system or any IP master in the system. In this case the station number is "**9994**".

Comment is an optional long description of this PTA, and can be left blank if desired.

If you have changed any settings, click "**Update**".

Next, click on the **VoIP Accounts** tab on the menu bar.

On the **VoIP Account Settings** screen, click the name of the PTA under **VoIP Accounts** (in this example, the name given during setup was "**Eng Lab Standalone**" so in this case you would click the text "Eng Lab Standalone"). This brings up the **VoIP Account Settings** screen for this PTA.

These **VoIP Account Settings** were previously entered in the MicroComm Setup Wizard, but a brief description of the settings is below if you need to change them after the initial setup.

Check-mark the **Account Enabled**, **Registration Enabled**, and **Auto Answer** check boxes.

Account Name is a short description for this SIP account; usually this should be the same as the **Extension Name**.

Account Username must be the station number (same as the Station **Number** in the DXL Administrator).

Domain must be set to the IP address of the DCC that controls the exchange that the PTA is associated with in the DXL Administrator.

Authorization Username and **Authorization Password** are not used for a DXL system, so should be left at the defaults or set to blank.

Outbound Proxy settings are only used when the PTA is used with a SIP Proxy server. This is not used for a DXL system, so should be left blank.

Client Registration Time is the interval at which the PTA will attempt to communicate with the SIP registrar (the DCC) to initially establish communications. For systems with a large number of IP devices, this should be set to a larger value than the default 60 seconds (such as 150 seconds) to reduce the network traffic.

Status is a display-only setting that shows the registration status of the PTA. **Registered** means that the PTA is communicating with the DCC controller and that the DCC controller has recognized the PTA. **Not registered** means that the PTA is not communicating with the DCC controller. This could mean that the Domain address is not the correct IP address of the DCC, the DCC is not online or not configured, or that the Account Username does not match an intercom number in the DCC configuration.

If you have made any changes, click "**Update**".

Next, click on the **System** tab on the menu bar.

Most of these **System Settings** were previously entered in the MicroComm Setup Wizard, but a brief description of the settings is below if you need to change them after the initial setup.

Time Server (NTP) is the IP address or Domain Name of a Network Time Protocol (NTP) server. This can be used by the PTA to set its clock time to same time as the NTP server. This should be left blank for most cases.

GMT Offset (hours) should be set to the time zone that the PTA will be used in.

Workgroup Key should be set to the workgroup name used by all of the IP devices in the MicroComm system. While the **Workgroup Key** setting for the network can be any value you choose, all IP devices should have the same **Workgroup Key.**

If you have made any changes, click "**Update**".

Next, click on the **Media** tab on the top menu bar to access the **Media Settings** menu. Normally you can start with the default settings, but if you need to change the PTA's volume settings or VOX control you can make changes to these settings to adjust audio quality. A brief description of these settings is as below.

Line In/Out Enabled should be checked if you are using the line in or line out connections out (for call recording, for an external speaker/amplifier, etc.).

The rest of the settings displayed under **Peripheral Detection** indicate the audio power levels, and is only valid when the PTA is in an audio call.

For the settings under **Microphone Settings** and **Speaker Settings,** the Gain and Volume settings are 0 dB for mid-range, negative values to make it quieter than normal, and positive values to make it louder than normal.

Microphone Gain has two options. Using the **Fixed** setting will make the microphone have a fixed gain, while using the **AGC** setting (Automatic Gain Control) will automatically adjust microphone volume to be relatively consistent even with talkers who speak louder or quieter than average. The recommended default for most case is the **Fixed** setting.

Fixed Microphone Gain is the base gain adjustment for all microphones when **Microphone Gain** is set to **Fixed**.

AGC Microphone Gain is the target gain level for all microphones when **Microphone Gain** is set to **AGC**. This can increase or decrease the voice volume for loud or quiet talkers.

Handsfree Microphone Gain setting is the gain setting for the handsfree speaker when it is used as a microphone.

MicroComm

Home | Network Address | Extensions | VoIP Accounts | System | Media | Switches | ALA Detectors | I/O Filters | Zones | Users | Statistics

Media Settings

⊘ Update

Peripheral Detection	
Speaker Status	No Fault Found
Line In/Out Enabled?	☐
Microphone Power (RMS %fullscale)	N/C
Microphone Noise (RMS %fullscale)	N/C
Speaker Power (RMS %fullscale)	N/C
Incoming RTP Power (RMS %fullscale)	N/C

Microphone Settings	
Microphone Gain	◉ Fixed ○ AGC
Fixed Microphone Gain	12 dB ▾
AGC Microphone Gain	-14 dB ▾
Handsfree Microphone Gain	12 dB ▾

Speaker Settings	
Speaker Volume	-3 dB ▾
Speaker Boost	☐
Bass Volume	0 dB ▾
Treble Volume	0 dB ▾
Handsfree Speaker Gain	0 dB ▾

Direction Control Settings	
Threshold (RMS %fullscale)	5 % ▾
Attack Time (milliseconds)	100 ▴▾
Hold Time (milliseconds)	200 ▴▾

VOX Settings	
VOX Enabled	☐
Threshold (dB)	3 dB ▾
Threshold (RMS %fullscale)	Disabled ▾
Attack Time (milliseconds)	100 ▴▾
Hold Time (milliseconds)	200 ▴▾
Noise Window (milliseconds)	1000 ▴▾
Noise Floor (RMS %fullscale)	0 ▴▾
Noise Ceiling (RMS %fullscale)	100 ▴▾

Audio Network Settings	
Preferred Codec Order (LAN)	
Preferred Codec (LAN)	G.711u-Law ▾
Preferred Codec Order (WAN)	
Preferred Codec (WAN)	G.711u-Law ▾
UDP RTP Starting Port	16384
UDP RTP Number of Ports	10
UDP RTP DSCP	Default ▾

⊘ Update

Home | Network Address | Extensions | VoIP Accounts | System | Media | Switches | ALA Detectors | I/O Filters | Zones | Users | Statistics

Speaker Volume is the base gain adjustment for all speakers.

Bass Volume and **Treble Volume** adjust the frequency response of the PTA speaker output for low and high frequencies. These values are only acted on when the **Speaker Boost** setting is checked.

Handsfree Speaker Gain setting is the gain setting for the handsfree speaker when it is used as a speaker.

The settings under **Direction Control Settings** allow advanced adjustment of the direction control switching and should normally be left at the defaults.

VOX Enabled allows the PTA to use automatic voice switching (Voice Operated Switching) for hands-free operation without requiring the use of a Push To Talk button (this is only used for station to station calls or station to page zone calls). However, for these types of calls usually it is best to use PTT operation (VOX not enabled) for security and operational purposes since a PTT switch allows staff to only talk out when they are ready to talk rather than picking up possibly confidential background conversations or radio chatter.

Threshold (dB) is a VOX related setting that indicates how loud above the average room noise that voice has to be to trigger the microphone to be active.

The remainder of the **VOX Settings** affect the operational parameters of the VOX and are best left at the default values.

The **Audio Network Settings** affect the VoIP audio communication of the PTA and should be left at the default values except for the **UTP RTP DSCP** setting.

The **UTP RTP DSCP** is the Quality of Service priority of RTP Voice over IP (VoIP) traffic from thisPTA. This should be set to a priority level your network administrator has assigned to VoIP traffic, rather than the default setting of **Default**. Usually the best priority for this is **Expedited Forwarding**.

If you have made any changes, click "**Update**".

The rest of the settings pages are optional. While you will not need to normally change any of the following settings, the screens are shown below.

The **Switches** page shows the input status of the PTA switches and outputs.
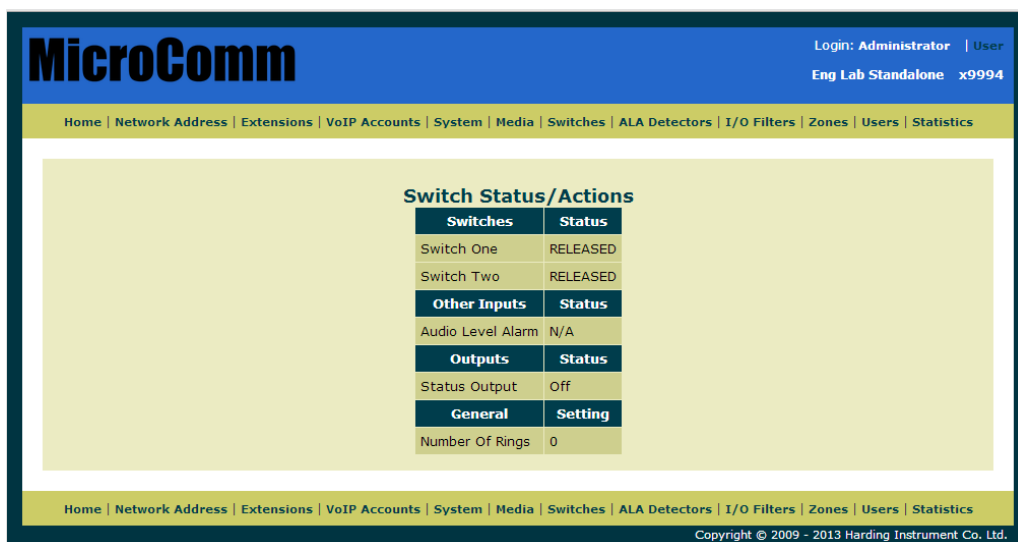
The **ALA Detectors** page allows you to view the Audio Level Alarm settings for the PTA and current threshold settings in a graph (not shown on this example).

The **I/O Filters** page allows you to view the input (microphone) and output (speaker) filters.

The **Zones** page allows you to set multicast addresses for the intercom to listen in on for VoIP multicast page announcements. This is only used when the PTA is used as part of a digital telephone system rather than the DXL system.

The **Users** page allows you to change the User or Admin passwords.

The **Statistics** page shows statistics and diagnostics about the PTA.

This concludes the settings for one PTA.

Repeat this process for each IP device, making sure that the IP address for each device is unique. Fill in this PTA's number and the Domain IP address of the controlling DCC in the appropriate places above.

Alternatively, you can use the DXL VoIP Device Manager. See the section below for details

2.4 Using the DXL VoIP Device Manager to Configure Multiple PTA-620s

Once you have used the web page settings to configure one PTA-620, you can use the DXL VoIP Device Manager to configure multiple PTAs using the same basic settings entered for the first PTA.

This is available in the DXL Administrator starting in version 1.5.0b2.

First, open the DXL Administrator and open a project file.

Go into the Diagnostics menu, and then use the menus "View", "VoIP Device Manager".
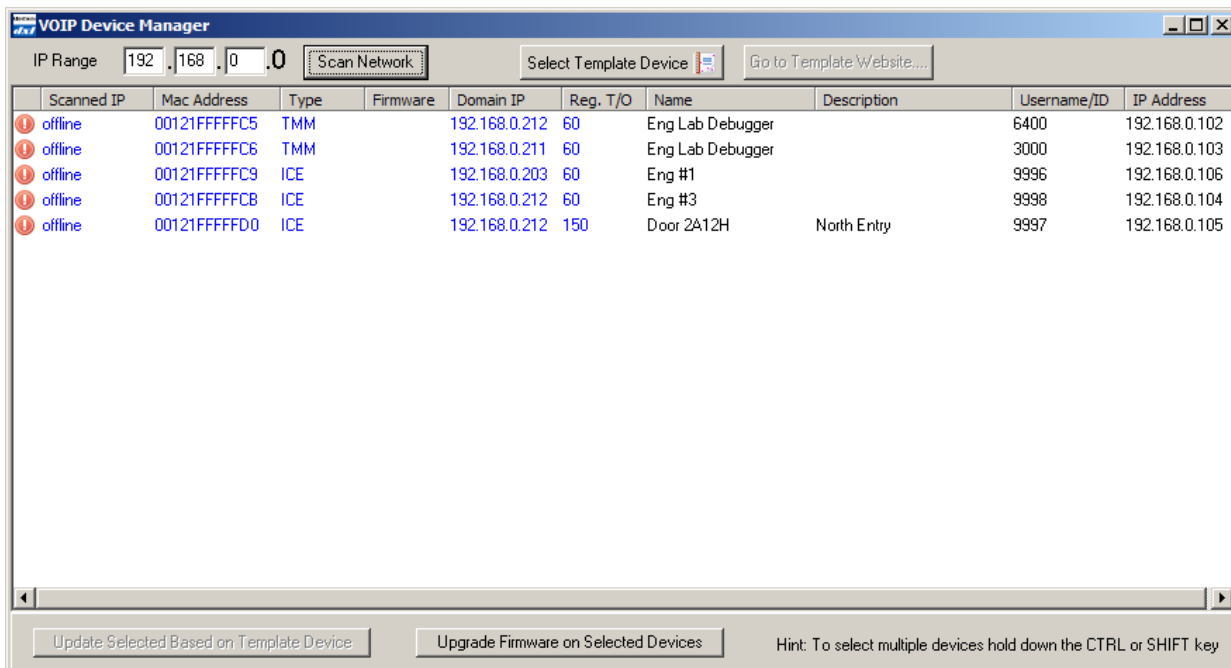
Select the IP range that your DHCP server assigns addresses in and click the "Scan Network" button. The VoIP Device Manager will scan your network looking for DXL VoIP devices and display a list of available MicroComm VoIP devices. PTA devices will have a Type starting with "PTA". The left column "Scanned IP" will show you the IP addresses of all recognized devices.

Change one PTA's parameters following the instructions in Section 2.3 above (if you have not done this yet), then select the PTA and click "Select Template device". The template device will have an icon set beside the device indicating it will be used as a template.
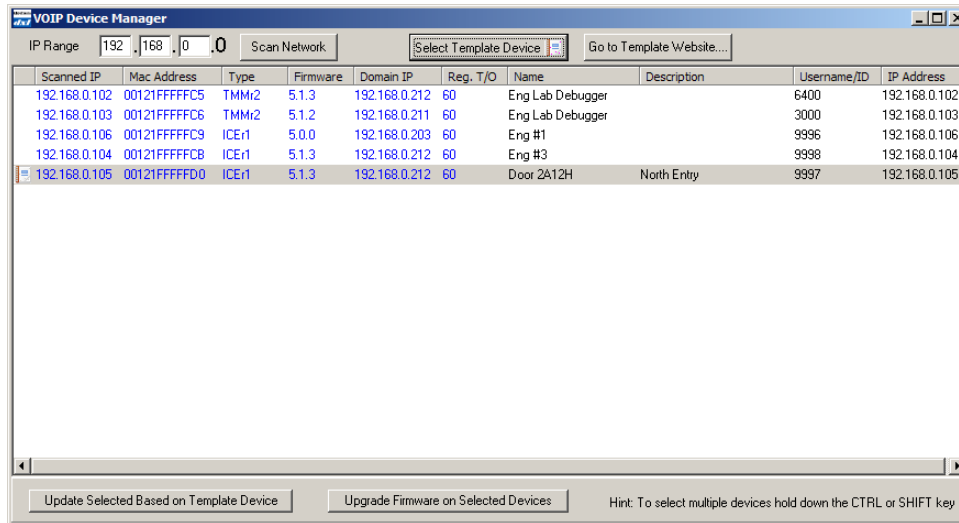
Set the desired Name, Description, Username/ID, IP address, and Domain IP for the other PTAs as desired from the VoIP Device Manager.

Then multiple select the destination PTAs by control-clicking individual PTAs to select individual PTAs or select a range by clicking one PTA, then shift-clicking the last PTA in the range to select.
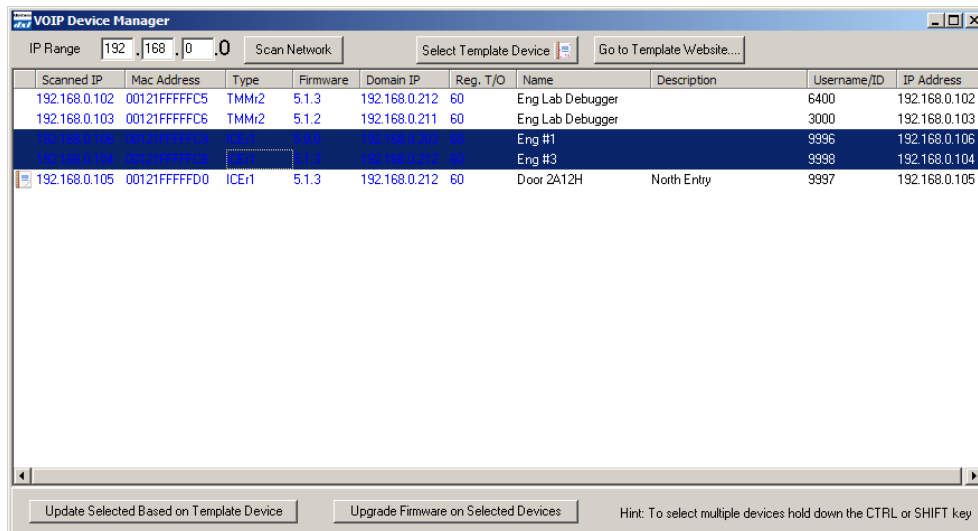
Then click the "Update Selected Based on Template Device" button to copy all of the settings from the template device to the selected PTAs, except for the Name, Description, Username/ID, and IP address which will be from the VoIP Device Manager settings.