INSTALLATION INSTRUCTIONS

MicroComm DXL

ICE-600 Series VoIP Intercom Station

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1. Intent & Scope

This document describes the installation and setup procedures for the DXL ICE-600 Series of VoIP Intercom Stations including stations with enhanced option set. These include the ICE-620 2-gang, ICE-630 3-gang intercom stations as well as ICE-690 Custom VoIP stations. In the setup procedures a VoIP ICE-620, ICE-630 or ICE-690 station will be referred to as an ICE-600 intercom station.

2. Description

The ICE-600 is a half-duplex, Voice over Internet Protocol (VoIP) intercom station. It is suitable for use in high security areas and is designed for superb audio clarity in reverberant acoustic environments. The station implements the industry standard Session Initiation Protocol (SIP). The ICE-600 connects to an exchange via the inter-exchange Ethernet network.

The station consists of an integral loudspeaker/microphone, up to two faceplate mounted switches, an optional status indicator LED. An enhanced version has 2 additional switch inputs, a SPST status output, a line-level output and an auxiliary power input..

The station can be line powered using Power over Ethernet (PoE) compliant switch or with a separate external power supply in the enhanced version. The ICE-620 mounts in a standard two-gang electrical box while the ICE-630 mounts in a standard three-gang electrical box.

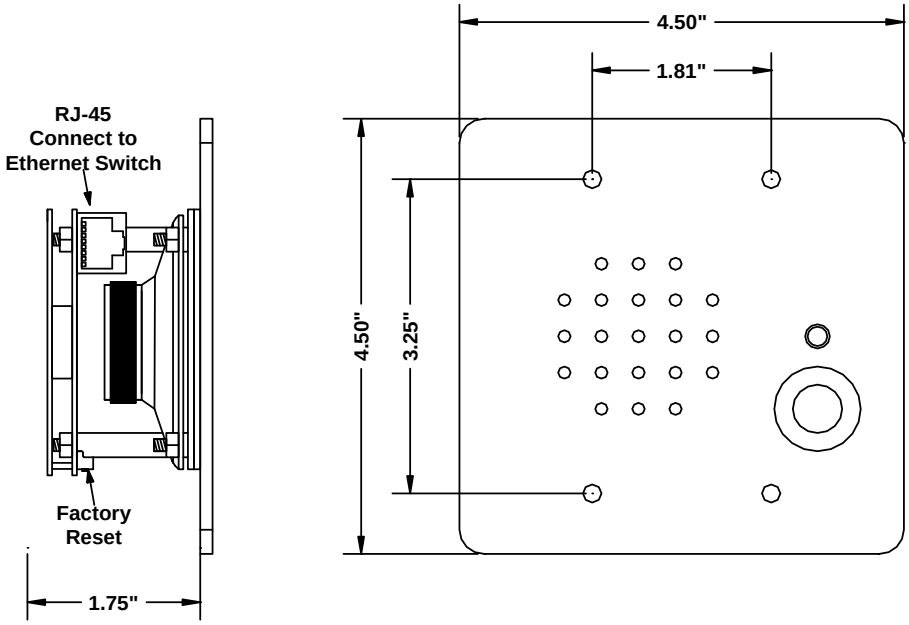


Figure 1: ICE-620

The ICE-600 has a single RJ-45 connector that connects to a PoE Ethernet switch

3. Ethernet Connection

An RJ-45 connector is used to connect the ICE-600 to an Ethernet switch which in turn is connected to the DXL Ethernet network. The RJ-45 includes both the network and power connections for the ICE and has the capability to accept power from either an endspan or midspan device.

RJ-45 Pins	Function
1	Tx+
2	Tx-
3	Rx+
4	48 Vdc Source
5	48 Vdc Source
6	Rx-
7	48 Vdc Return
8	48 Vdc Return

Table 1: Ethernet Network & PoE

4. Enhanced Option Set Connections

ICE-600 series stations ordered with the enhanced option set will have two MTA connectors (a 6 pin and a 2 pin connector) in addition to the RJ-45 Ethernet connector.

A back view of the 2-gang intercom station showing the two headers is shown in the following diagram.

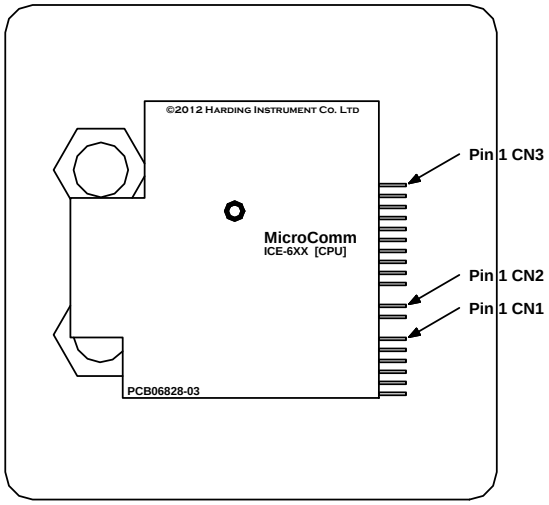


Figure 2: Enhanced ICE-620 showing CN1, CN2 and CN3

The enhanced version 6-pin header (CN1) provides for two additional switch inputs and a contact closure for a status output.

Pin	Function
1	Relay Output +
2	Relay Output -
3	Switch 3 Input +
4	Switch 3 Input – (GND)
5	Switch 4 Input +
6	Swith 4 Input – (GND)

Table 3: Pin Assignments for CN1

The Auxiliary Power is supplied via th 2-pin header (CN2)

Pin	Function
1	Aux Power +
2	Aux Power – (GND)

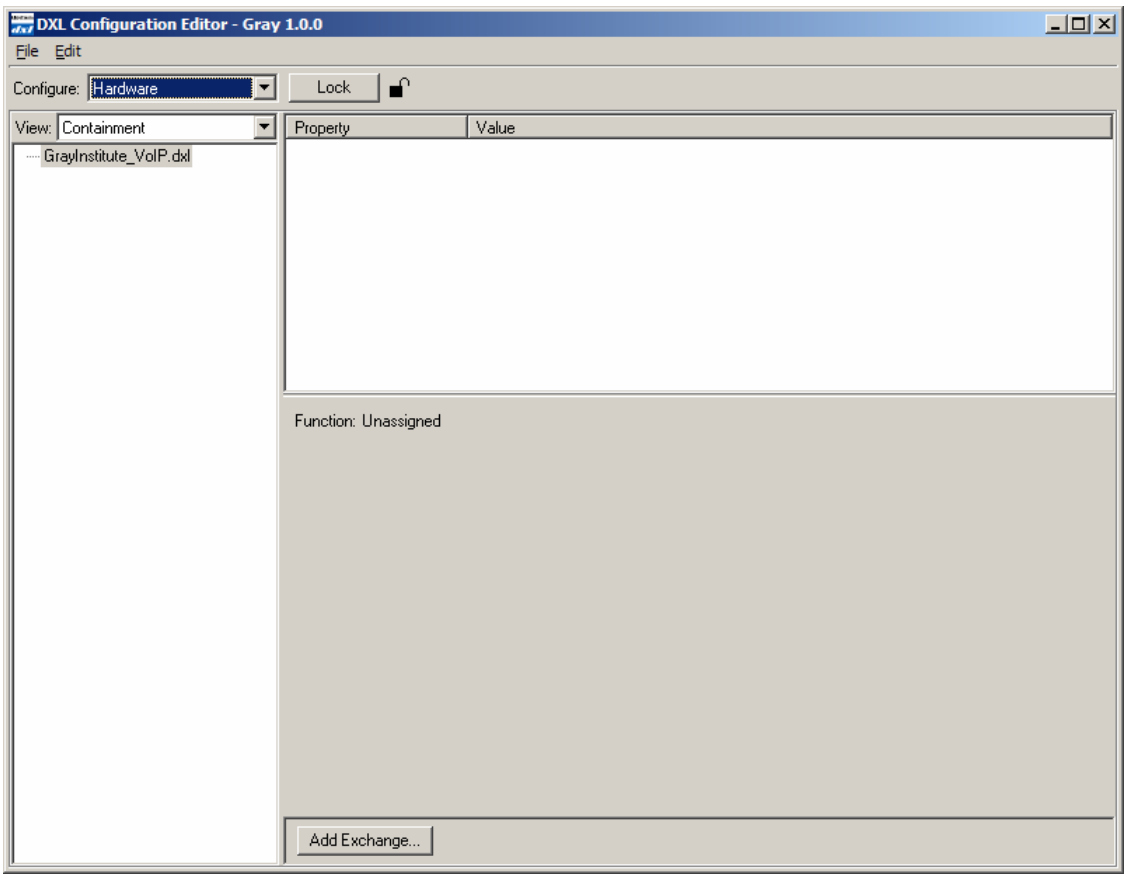
Table 4: Pin Assignments for CN2

The line level outpu is available on pins 1 and 2 of CN3

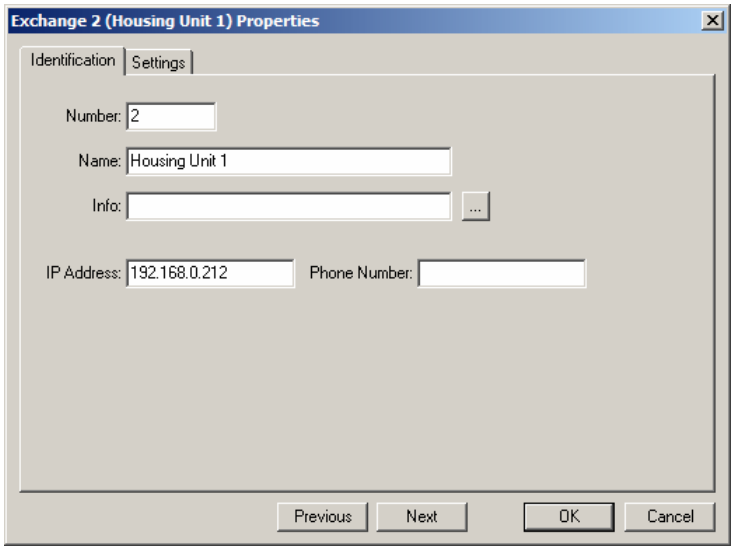
Pin	Function
1	Line Out +
2	Line Out -

5. Configuring a ICE-600 with the Administrator Software

The Administrator Software is used to create a configuration where a particular VoIP port must be assigned to each VoIP ICE-600 intercom station. 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.

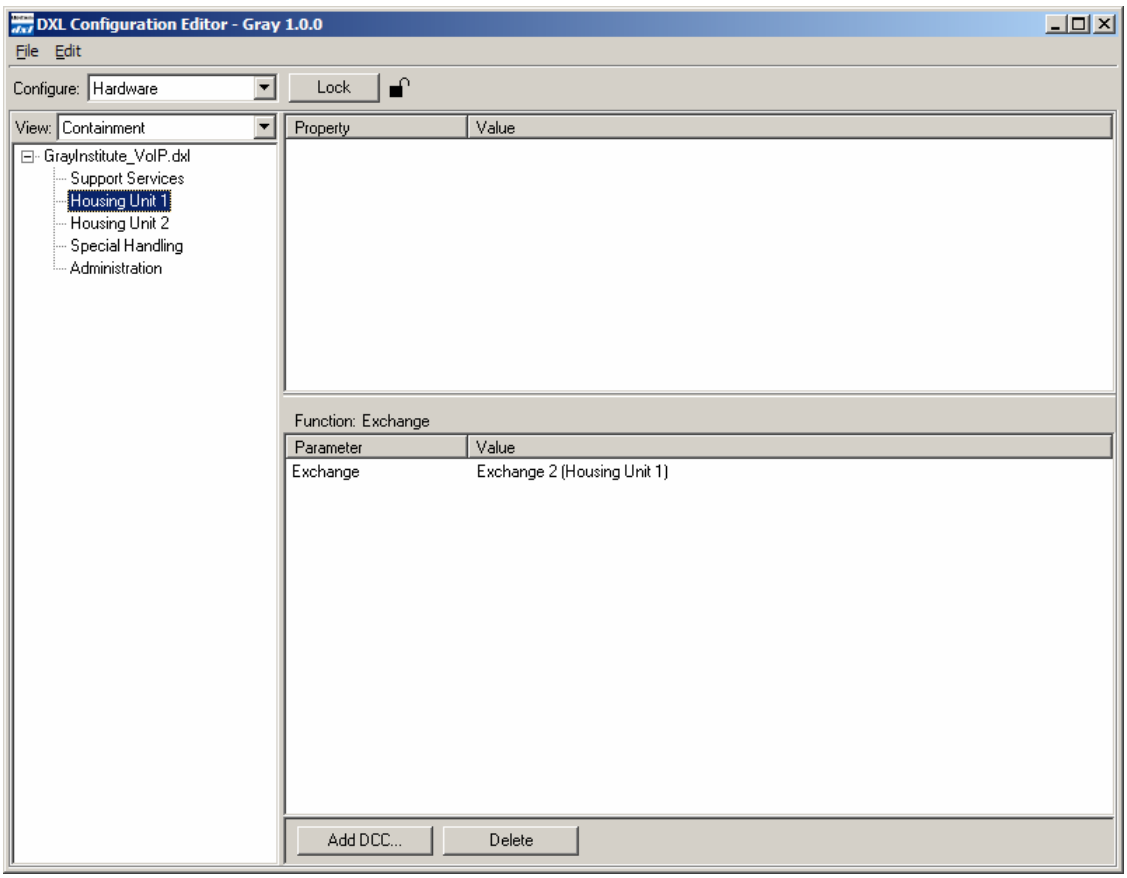


Click on the **Add Exchange…** button and the **Exchange Properties** text box with two tabs will pop up. In the **Identification tab** you need to type in a **Number:** for the exchange, the **Name:** of the exchange and assign a unique **IP Address:** to the exchange. Remember the IP address you set to the exchanges, you will need this later when configuring the intercom stations.

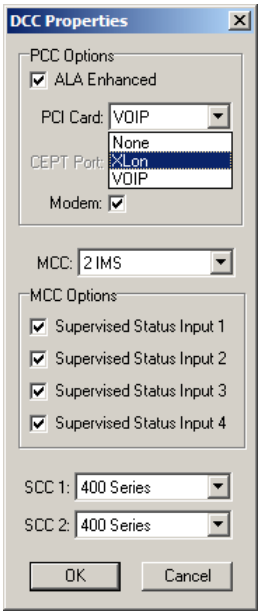


Once all the exchanges have been created each exchange requires a DCC. After the DCC has been configured, DCEs, TBEs and PZEs can be added to the exchange as required.

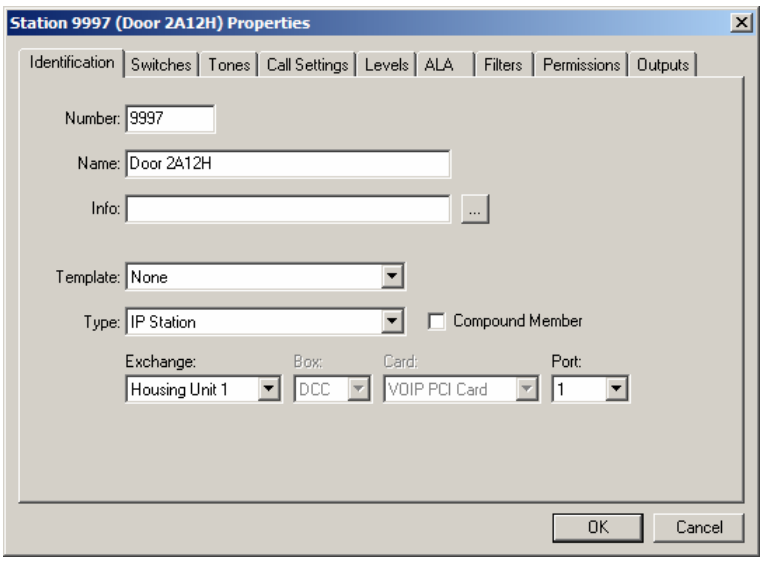
Using the pull-down menu and setting the **Configure:** entry to **Hardware** in the **DXL Configuration Editor** and selecting one of the Exchanges you can now add a DCC to the exchange.

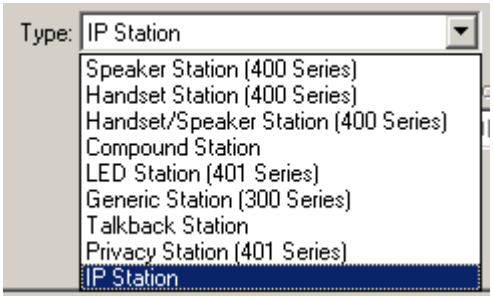


Click on the **Add DCC…** button to bring up a **DCC Properties** text box as shown on the right. Use the check boxes and pull-down menus to configure the DCC. In this example you are going to use VoIP intercom stations so the **PCI Card:** should be set to **VOIP**. Once you select **VOIP** the **CEPT 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 an ICE-600 VoIP intercom station 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 intercom station, a **Name:** for the intercom station and use the pull down menu to select the **Type:** of intercom station. In this case we need to specify that it is an **IP Station**.





You must specify the **Exchange:** associated with this station and assign a unique port number for the IP Station 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.

6. Determining the IP Address of ICE-600 Stations

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

Since the ICE-600 does not have any switches or keypad on it to set its address, it has to initially be given a temporary address from your network by using a DHCP server (Dynamic Host Configuration Protocol). In order to configure the stations you will need to have a computer or device (such as a router) that can assign DHCP addresses. **This is used for initial configuration only.** After the stations have been configured, they will use Static IP addresses, 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 ICE-600 to the network switch that the DHCP server is connected to. The network switch should assign an IP address to the ICE-600. Once the ICE-600 Link LED (see Figure 2) is on solid it indicates that the station is connected to the Ethernet network.

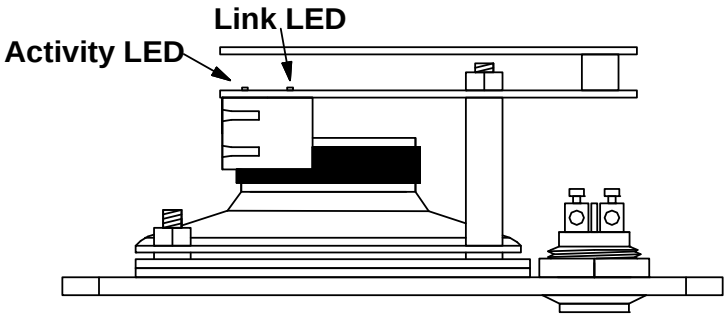


Figure 2: Activity and Link LEDs

You can determine the address of an ICE-600 in one of two methods.

6.1 Determining the IP Address Using the Station Voice Synthesizer

The first method is to go to the intercom station and quickly press and release the factory reset switch located along the edge of the bottom printed circuit board of the station (see Figure 1). Using a voice synthesizer, the ICE-600 should speak the IP address that was assigned to it by the DHCP server. Write this address down for use in the next step.

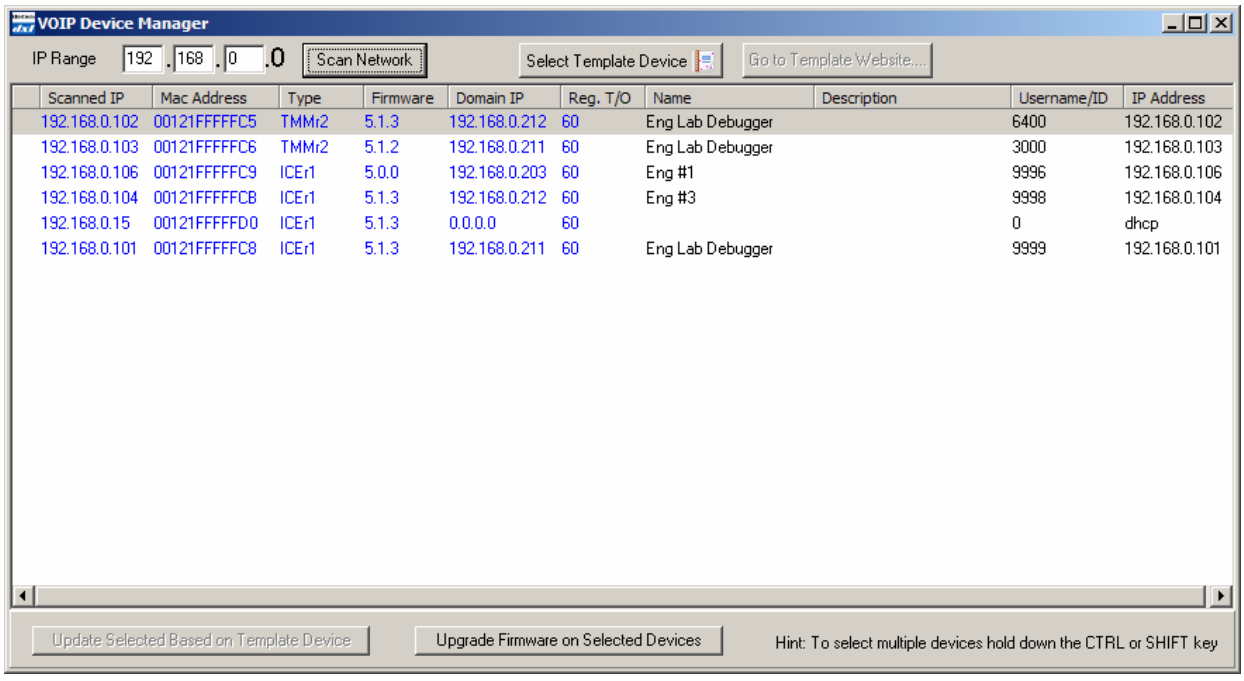
If the ICE-600 speaks a 12 digit Ethernet MAC address this means that the station has not received a DHCP address, indicating that there is probably no DHCP server on the network.

6.2 Determining the IP Address Using the VOIP Device Manager

You can also configure and determine the IP addresses of ICE-600 stations 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 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 TMM IP masters and ICE intercom stations. ICE-600 stations will have a Type starting with "ICE". The left column "Scanned IP" will show you the IP addresses of all recognized devices.

6.3 Resetting the IP Address Using the Factory Reset Switch

The factory reset switch located along the edge of the bottom circuit board of the station (see Figure 1) can be used to reset the station to its original factory set conditions. The switch must be depressed at the same time the Ethernet cable is plugged in.

7. Configuring the ICE-600

Once the IP address of the ICE-600 has been determined and connected to an Ethernet network, a PC on the same network can access the ICE-600 and use a web browser to set the remaining parameters necessary to make the ICE-600 work in a DXL system.

The first step is to hook up the Ethernet port on the station to a network switch. Once the station 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 ICE-600).

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

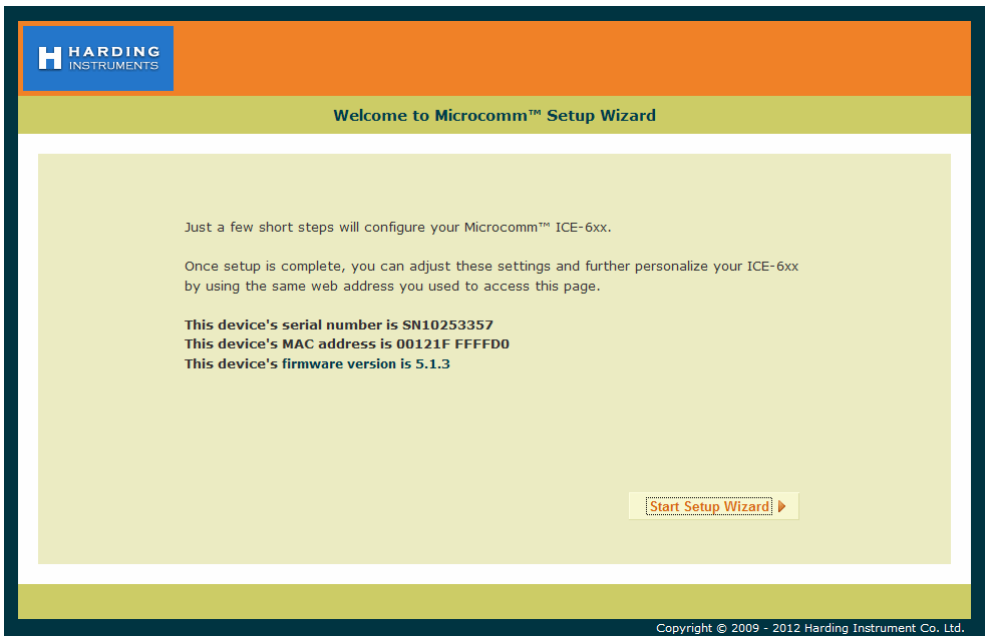
Alternatively, you can double-click on a station using the VOIP Device Manager utility after you have scanned the network for DXL VOIP devices, which will bring up your web browser at that station's settings page.

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

If this is not the first time that the web browser has been used to configure the ICE-600 after a factory reset, the ICE-600 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.

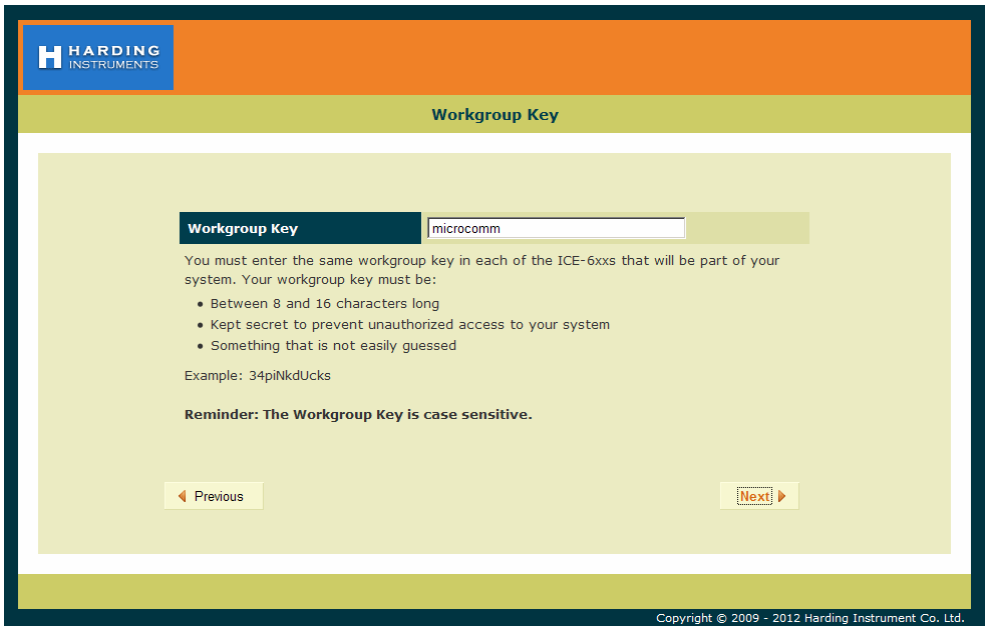
7.1 Using the MicroComm Setup Wizard

If this is the first time that the ICE-600 has been configured with a web browser, the following screen will come up. If this screen is not shown, then likely the ICE-600 was previously configured, in which case you can skip to the next section.



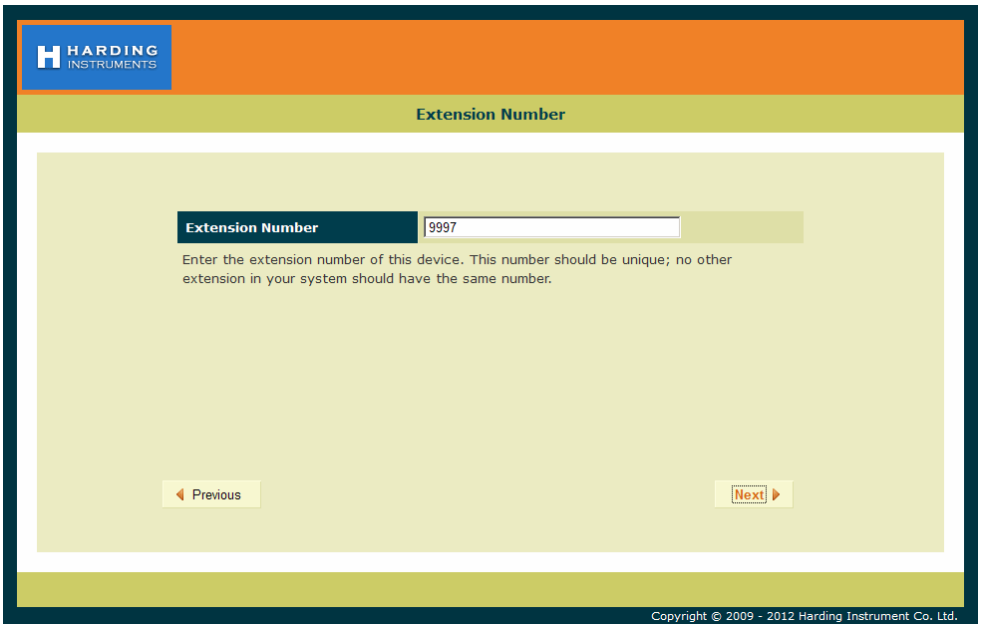
Click the "**Start Setup Wizard**" button to continue.

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 station 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 intercom station is used with a DXL intercom system.

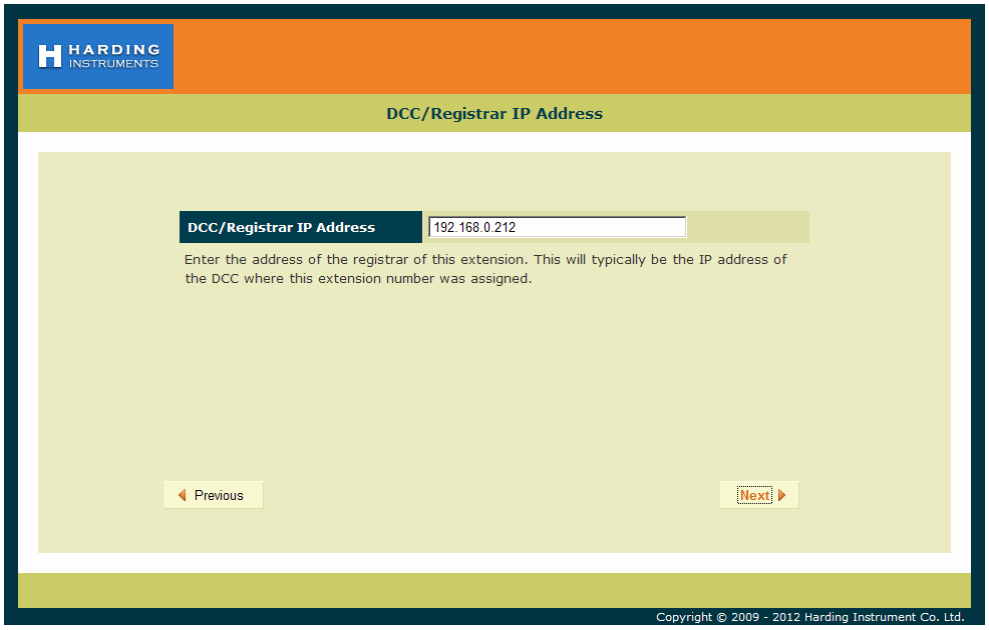


Next, enter the **Extension Name** and **Extension Description**. Enter a short name describing this station in the **Extension name** setting. In this case, "**ICE-600**" is used. Enter a long description for this station as **Extension Description** (or leave it blank). These descriptions are not normally used when intercom station is used with a DXL intercom system and are for reference purposes only. Click the "**Next**" button to continue.

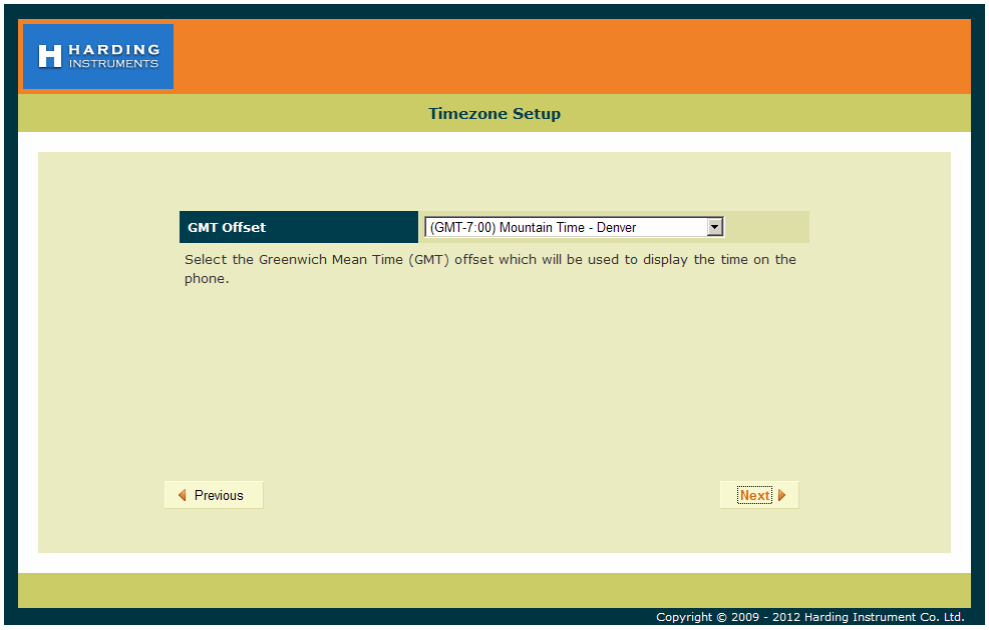
Next, enter the **Extension Number** for this ICE-600. This extension number must correspond to the IP station number configured in the DXL Administrator for this master. There can be only one IP station in the system that has this extension number. In this example, "**200**" was used as the ID number of the station in the DXL Administrator, so this must be entered as the **Extension Number** of this ICE-600. Click the "**Next**" button to continue once this has been entered.



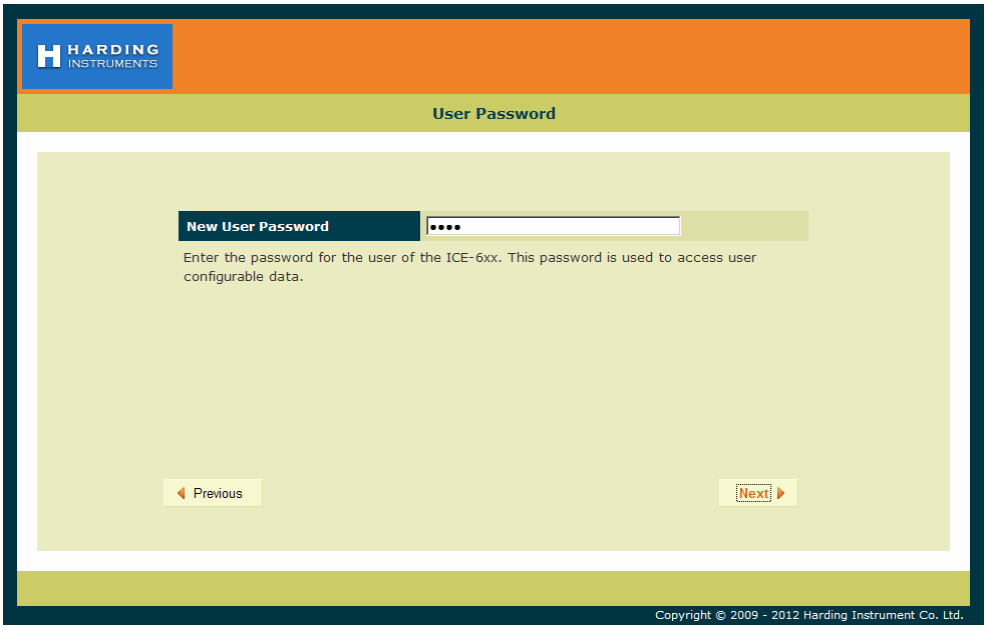
Set the **DCC/Registrar IP Address** to the IP address of the DCC that controls the exchange that the station is associated with in the DXL Administrator. For example, in this case the IP address of the DCC of the exchange that the Station is associated with is "**192.168.0.212**". Once this is entered,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



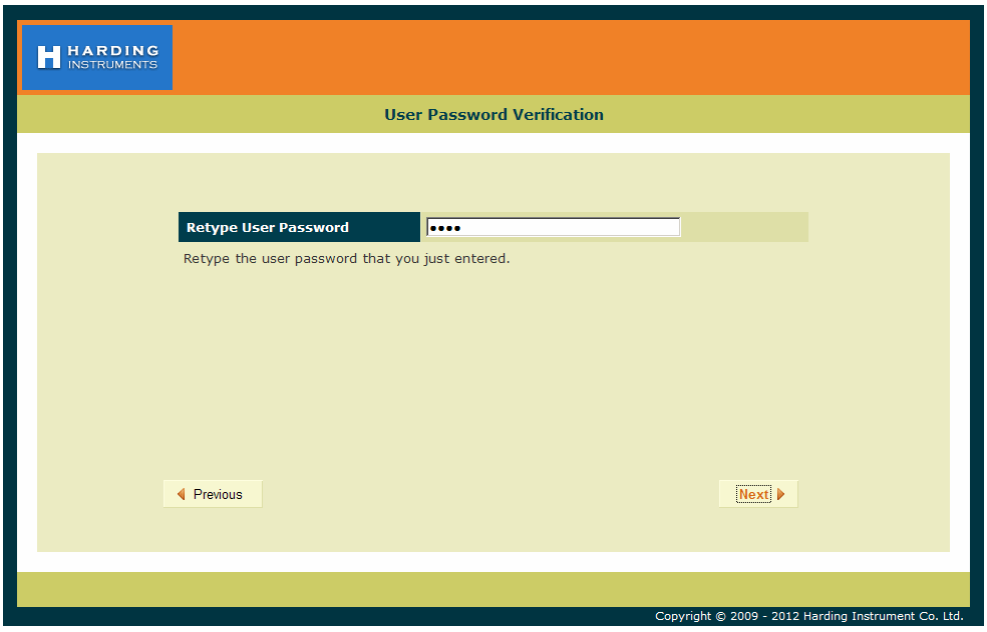
Now set the **GMT Offset** time zone setting to an appropriate time zone where the station will be used, then click "**Next**".



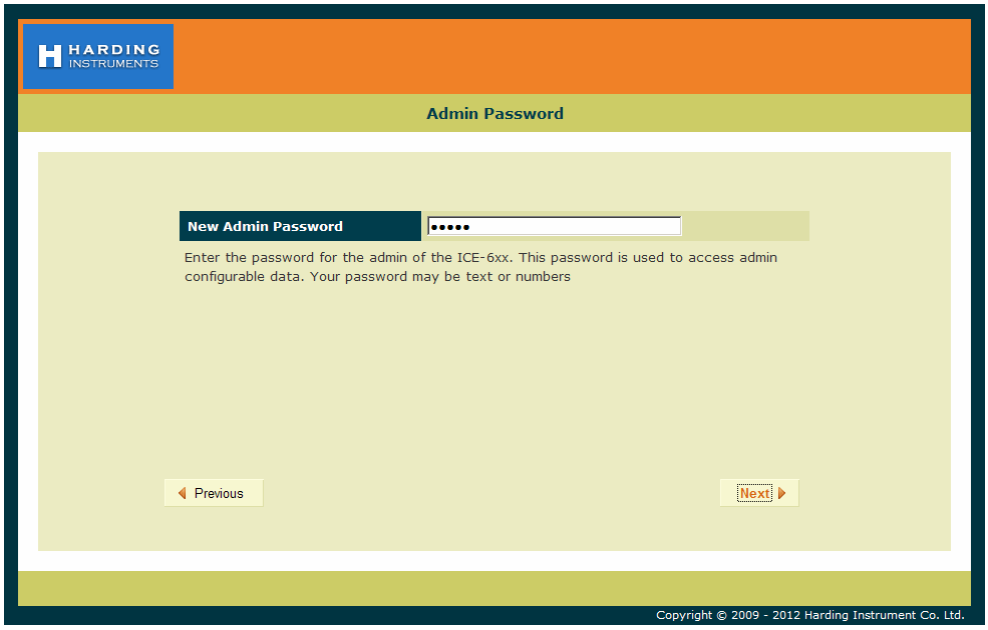
Next, enter a **User Password** for the user account on the station, then click "**Next**". This allows a separate account for install or maintenance technicians to examine the ICE-600 parameters, but not being able to modify them. Click "**Next**" after the password is entered.



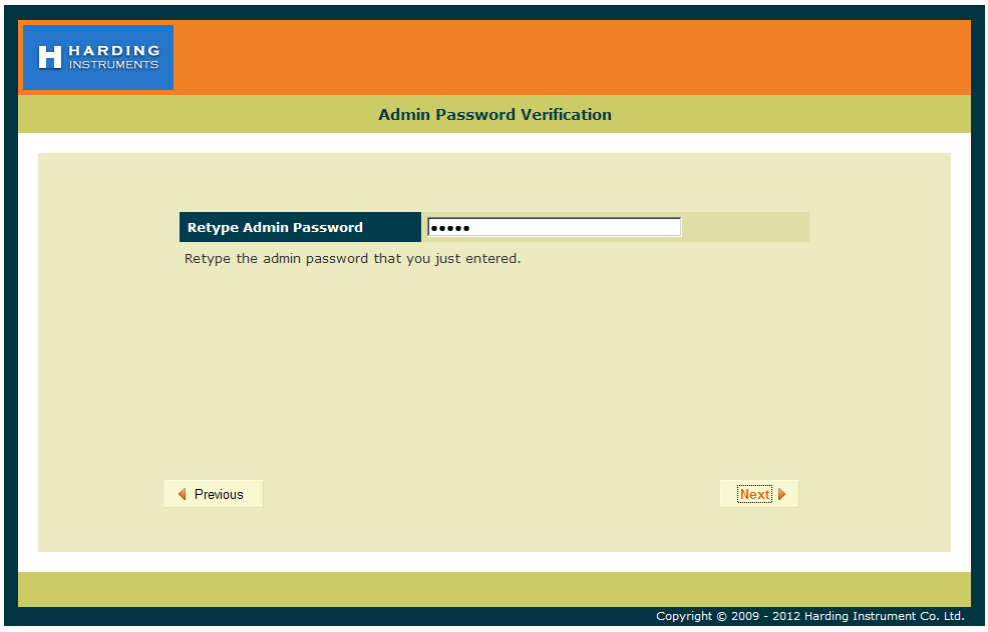
In the following screen, re-type the same **User Password** to verify it, and then click "**Next**".



Now enter an **Admin Password** for the administrator account on the ICE-600, 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).

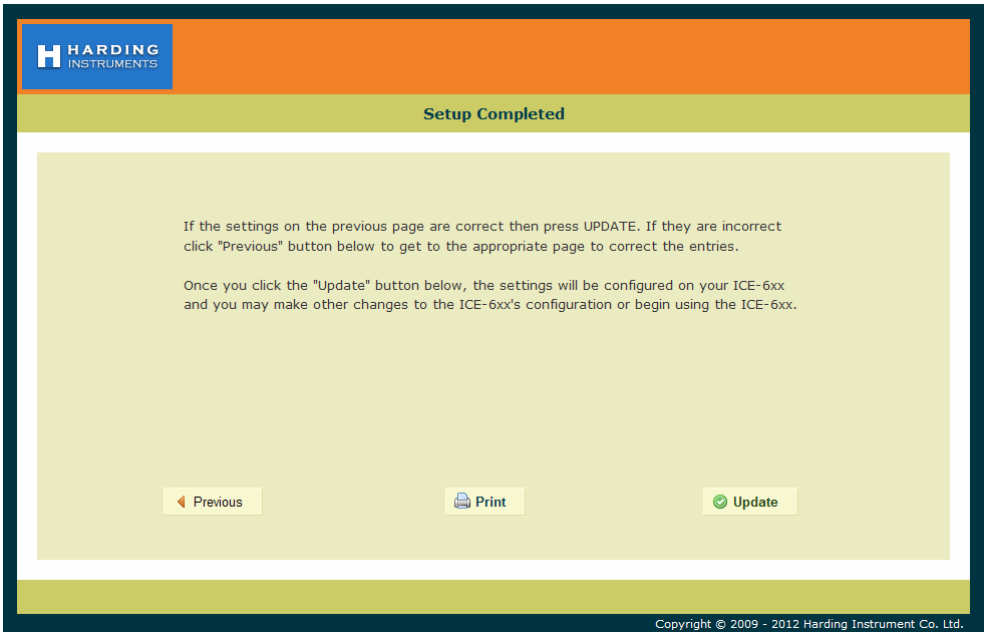


In the following screen, re-type the same **Admin Password** to verify it, and then click "**Next**".



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.

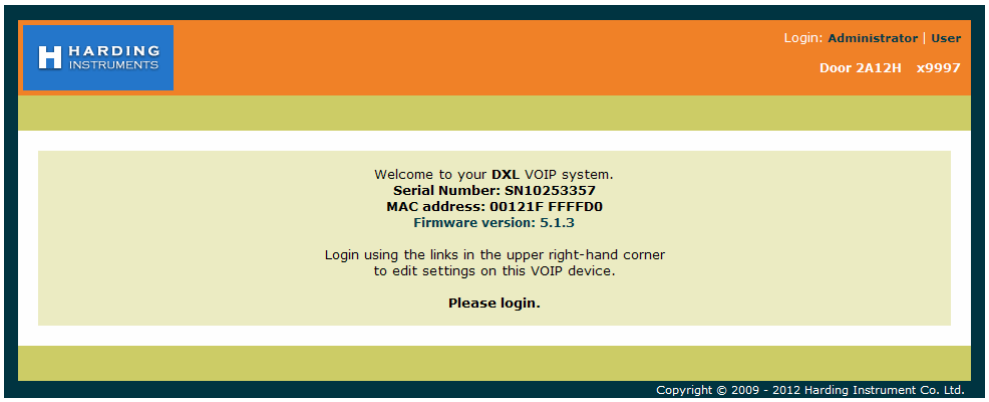


After this, the main configuration screens will be shown as in the next section.

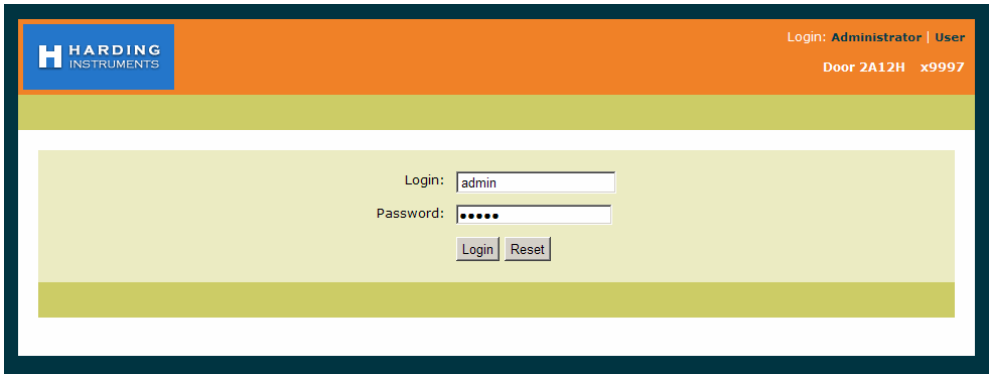
7.2 Setting the ICE-600 Operating Parameters

If the ICE-600 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 ICE-600's web page. To make changes, the user will have to sign as the administrator using the password previously assigned during the initial configuration.

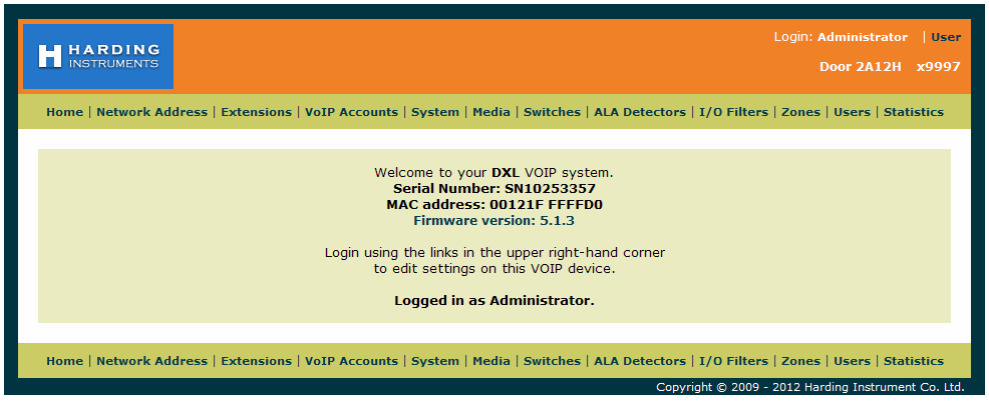
The initial web page for configuring the ICE-600 is as follows.



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:

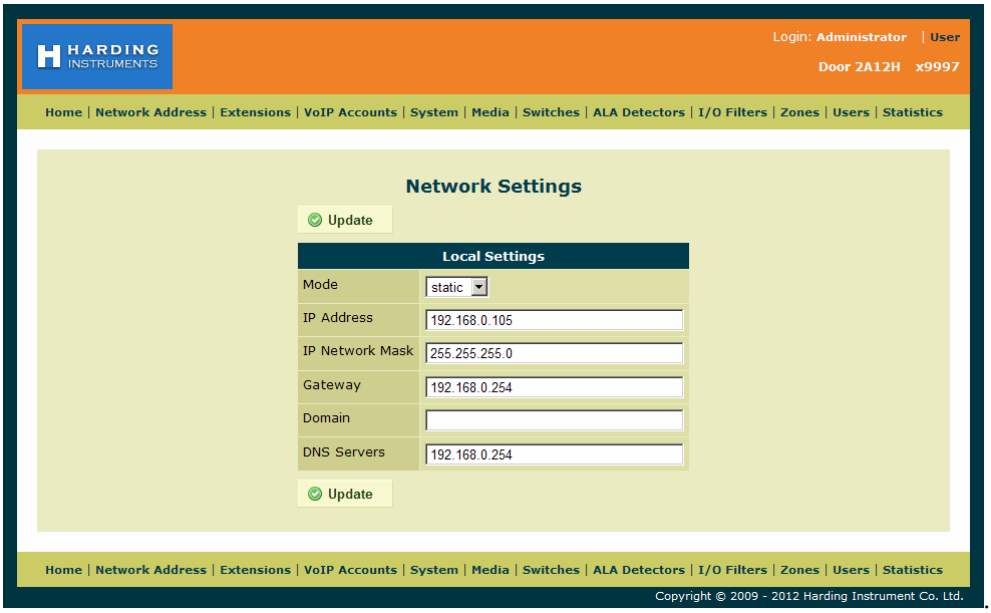
Set **Mode** to "**Static**" (to assign the station a static IP address). Static is recommended for all IP stations.

Set **IP Address** to the IP address for this station. It should be assigned by your network administrator, and must not conflict with other IP addresses on this system. In this case this station is assigned address "**192.168.0.105**"

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 page speakers, 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.

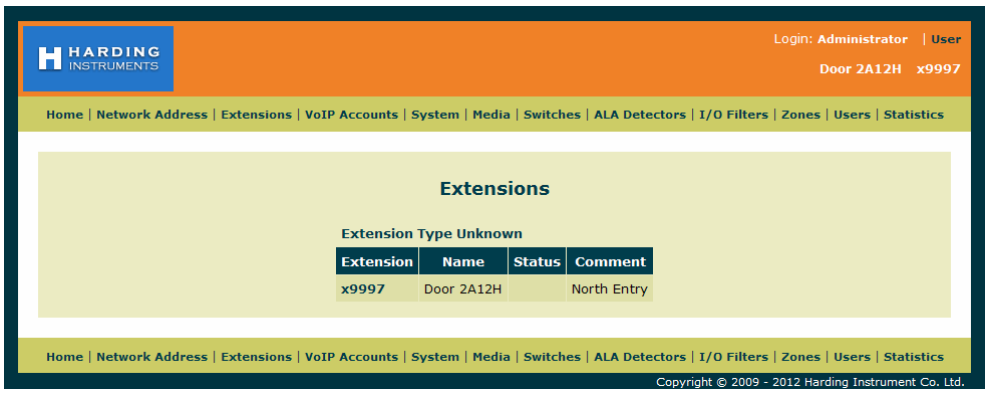
Once you have entered all of the settings you require, click the "**Update**" button.



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 station>**", 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 "**x9997**".



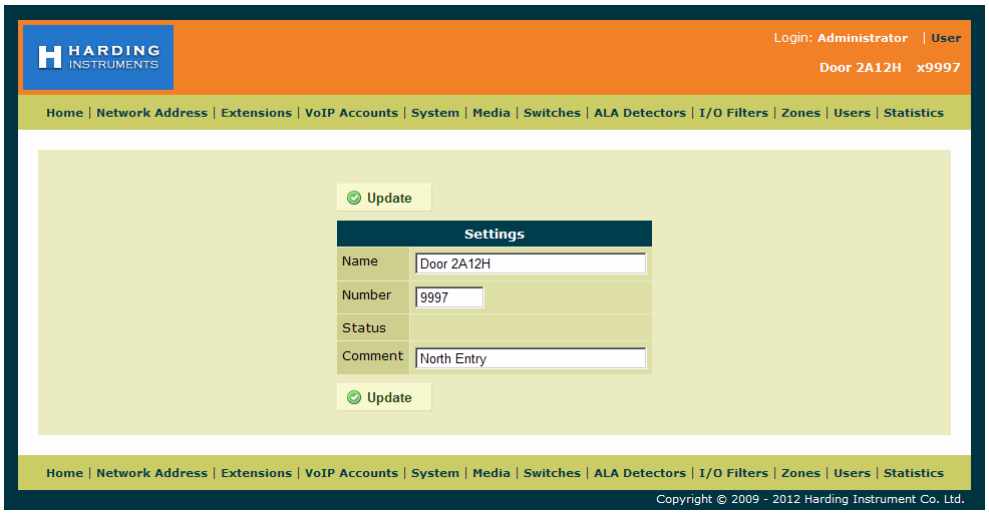
The settings for **Extensions** were previously entered in the MicroComm Setup Wizard, but a brief description of the settings is below if you need to change them after the initial setup.

Name is a short descriptive name of this intercom station; in this case "**Door 2A12H**" is used.

Number is the station number for this intercom station (this must be the same number as the Station **Number** entered in the DXL Administrator software for the intercom station). 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 "**9997**".

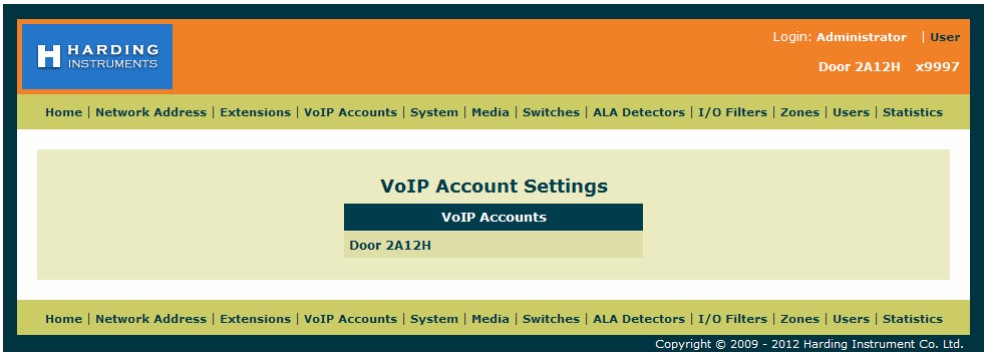
Comment is an optional long description of this intercom station, and can be left blank if desired.

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 station under **VoIP Accounts** (in this example, the name given during setup was "**Door 2A12H**" so in this case you would click the text "**Door 2A12H**"). This brings up the **VoIP Account Settings** screen for this master.



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 station is associated with in the DXL Administrator.

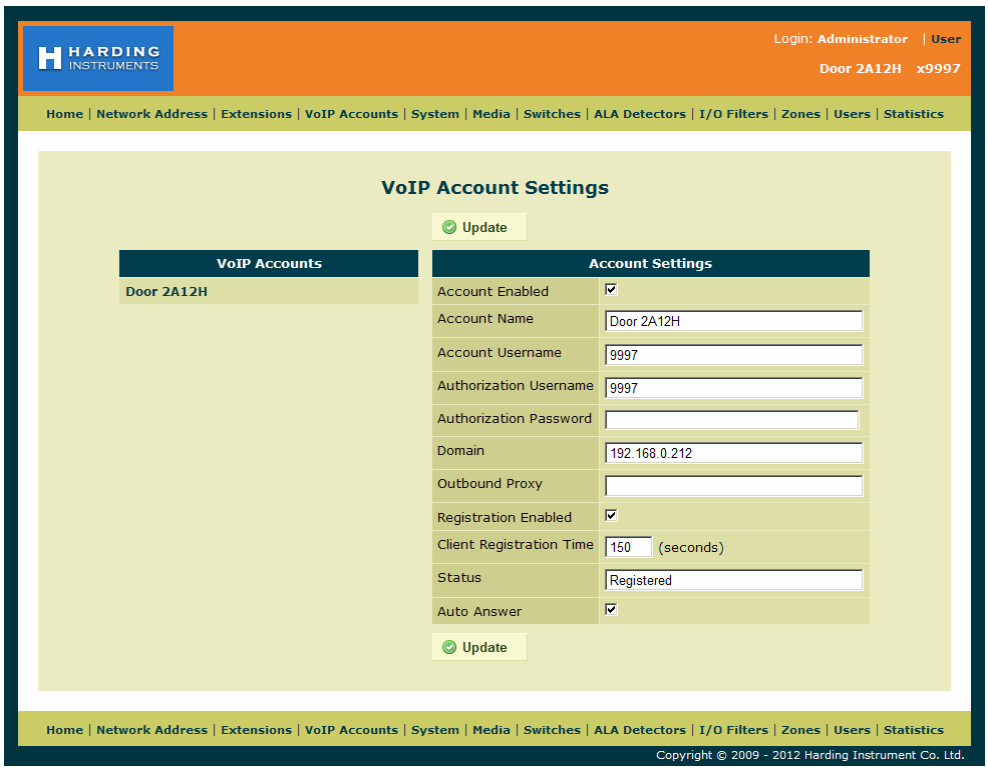
Authorization Username and **Authorization Password** are not used for a DXL system, so should be left at the defaults or set to blank.

Outbound Proxy settings are only used when the ICE-600 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 intercom station will attempt to communicate with the SIP registrar (the DCC) to initially establish communications. For systems with a large number of intercoms, 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 intercom station. **Registered** means that the intercom station is communicating with the DCC controller and that the DCC controller has recognized the station. **Not registered** means that the intercom station 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.

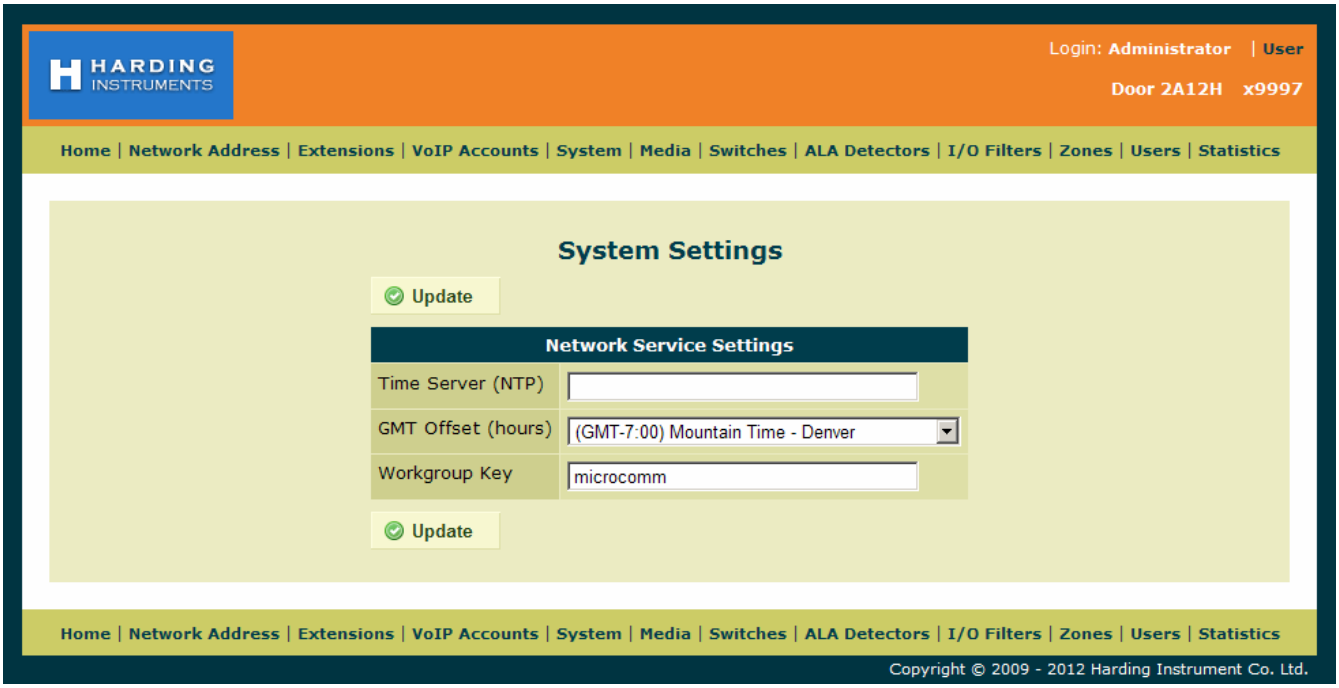
Most of these **System Settings** were previously entered in the MicroComm Setup Wizard, but a brief description of the settings is below if you need to change them after the initial setup.

Time Server (NTP) is the IP address or Domain Name of a Network Time Protocol (NTP) server. This can be used by the ICE-600 station 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 ICE-600 will be used in.

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

Full Duplex Handsfree Speaker/Microphone should only be checked if you are using a full duplex station (which is not the standard intercom station). For almost all intercom stations this should be left un-checked.

Lineout Enabled should only be checked if you have an intercom station with line out option, and you are using the line out (for call recording, for an external speaker/amplifier, etc.).

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

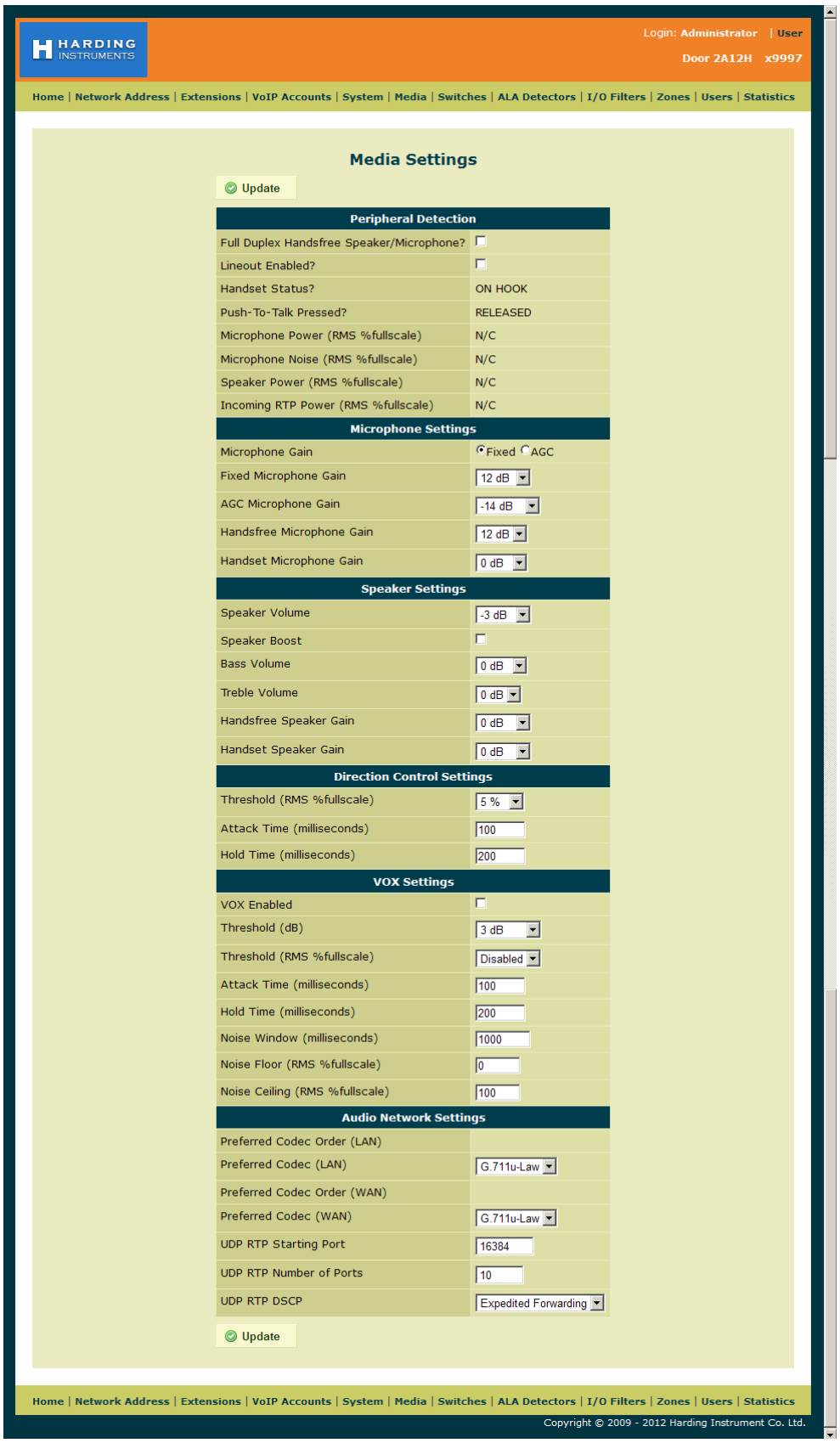
For the settings under **Microphone Settings** and **Speaker Settings,** the Gain and Volume settings are 0 dB for mid-range, negative values to make it quieter than normal, and positive values to make it louder than normal.

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 and **Handset Microphone Gain** settings are the gain settings for the built-in microphone and handset microphone respectively.


HARDING INSTRUMENTS
Login: Administrator | User
Door 2A12H x9997
Home | Network Address | Extensions | VoIP Accounts | System | Media | Switches | ALA Detectors | I/O Filters | Zones | Users | Statistics
Media Settings
Update
Peripheral Detection
Full Duplex Handsfree Speaker/Microphone?
Lineout Enabled?
Handset Status? ON HOOK
Push-To-Talk Pressed? RELEASED
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
Handset Microphone Gain 0 dB
Speaker Settings
Speaker Volume -3 dB
Speaker Boost
Bass Volume 0 dB
Treble Volume 0 dB
Handsfree Speaker Gain 0 dB
Handset 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 Expedited Forwarding
Update
Home | Network Address | Extensions | VoIP Accounts | System | Media | Switches | ALA Detectors | I/O Filters | Zones | Users | Statistics
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Speaker Volume is the base gain adjustment for all speakers.

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

Handsfree Speaker Gain and **Handset Speaker Gain** settings are the gain settings for the built-in speaker and handset speaker respectively.

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 station 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 ICE-600 intercom station and should be left at the default values except for the **UTP RTP DSCP** setting.

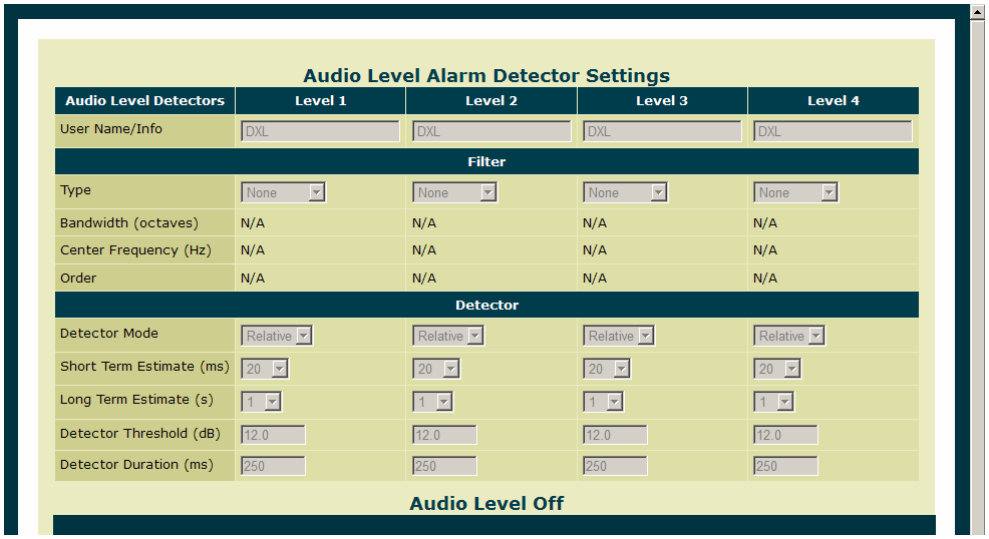
The **UTP RTP DSCP** is the Quality of Service priority of RTP Voice over IP (VoIP) traffic from this intercom station. This should be set to a priority level your network administrator has assigned to VoIP traffic, rather than the default setting of **Default**. Usually the best priority for this is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

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

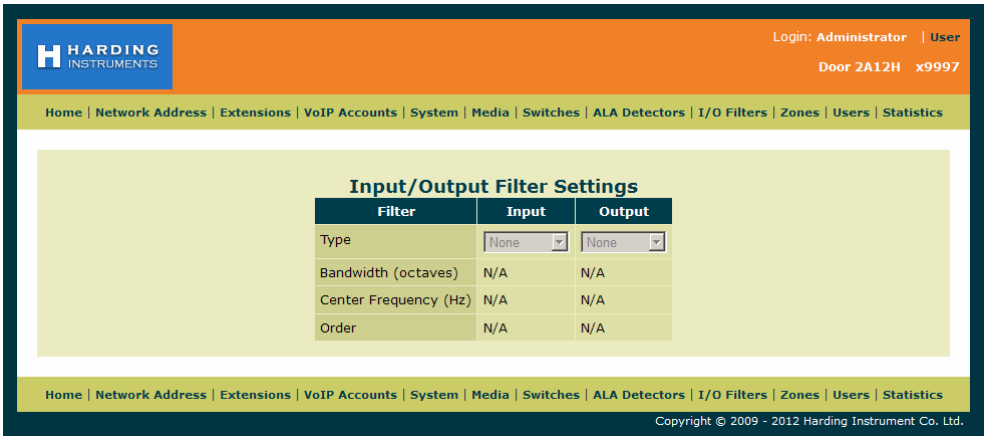
The rest of the settings pages are optional. While you will not need to normally change any of the following settings, the screens are shown below.

The **Switches** page shows the input status of the intercom station switches and outputs.

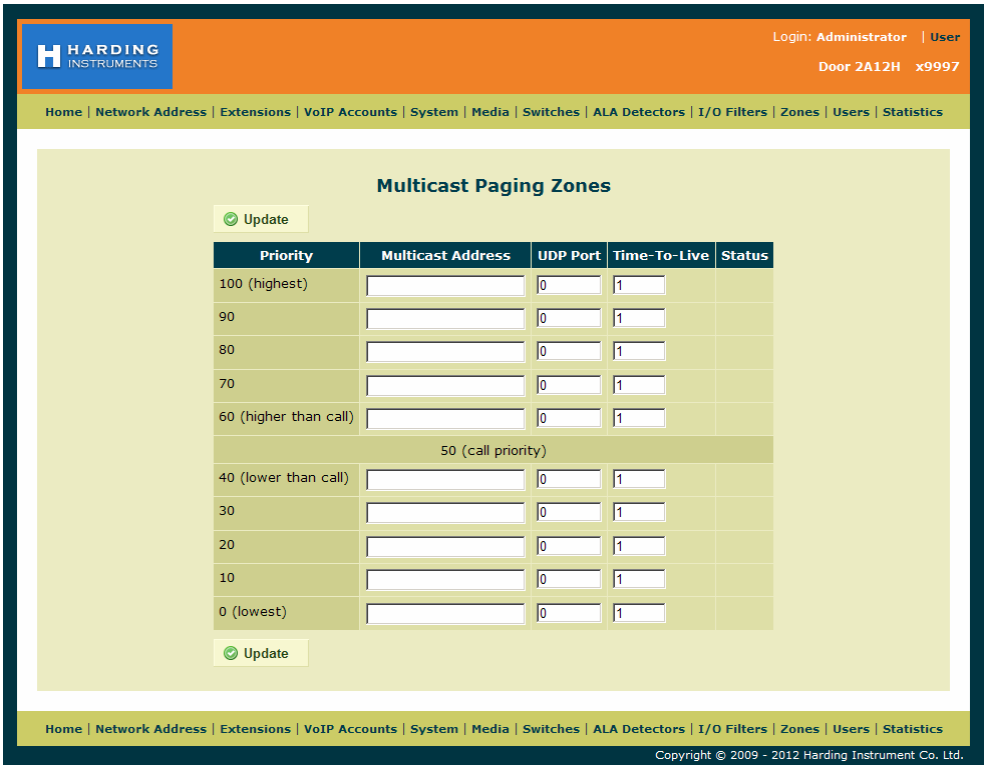
The **ALA Detectors** page allows you to view the Audio Level Alarm settings for the intercom station and current threshold settings in a graph (not shown on this example).



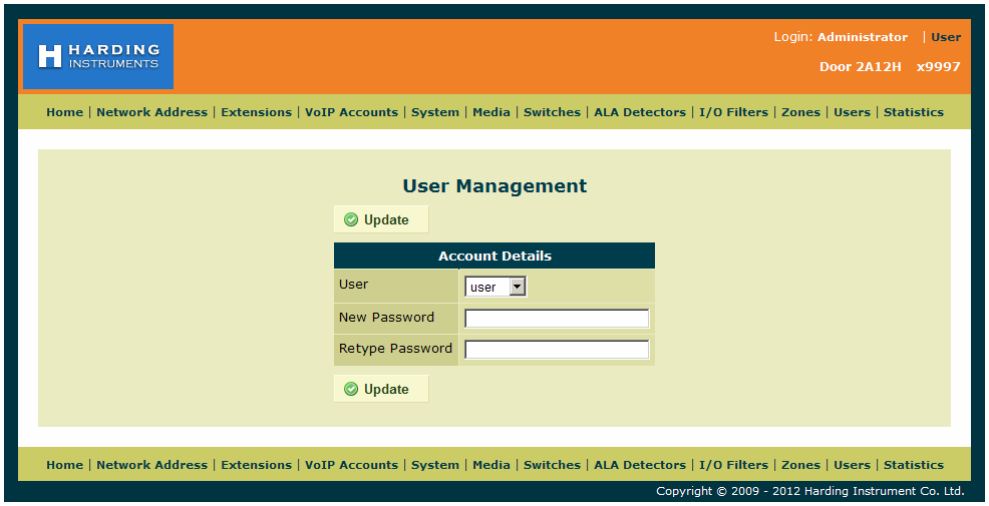
The **I/O Filters** page allows you to view the input (microphone) and output (speaker) filters.



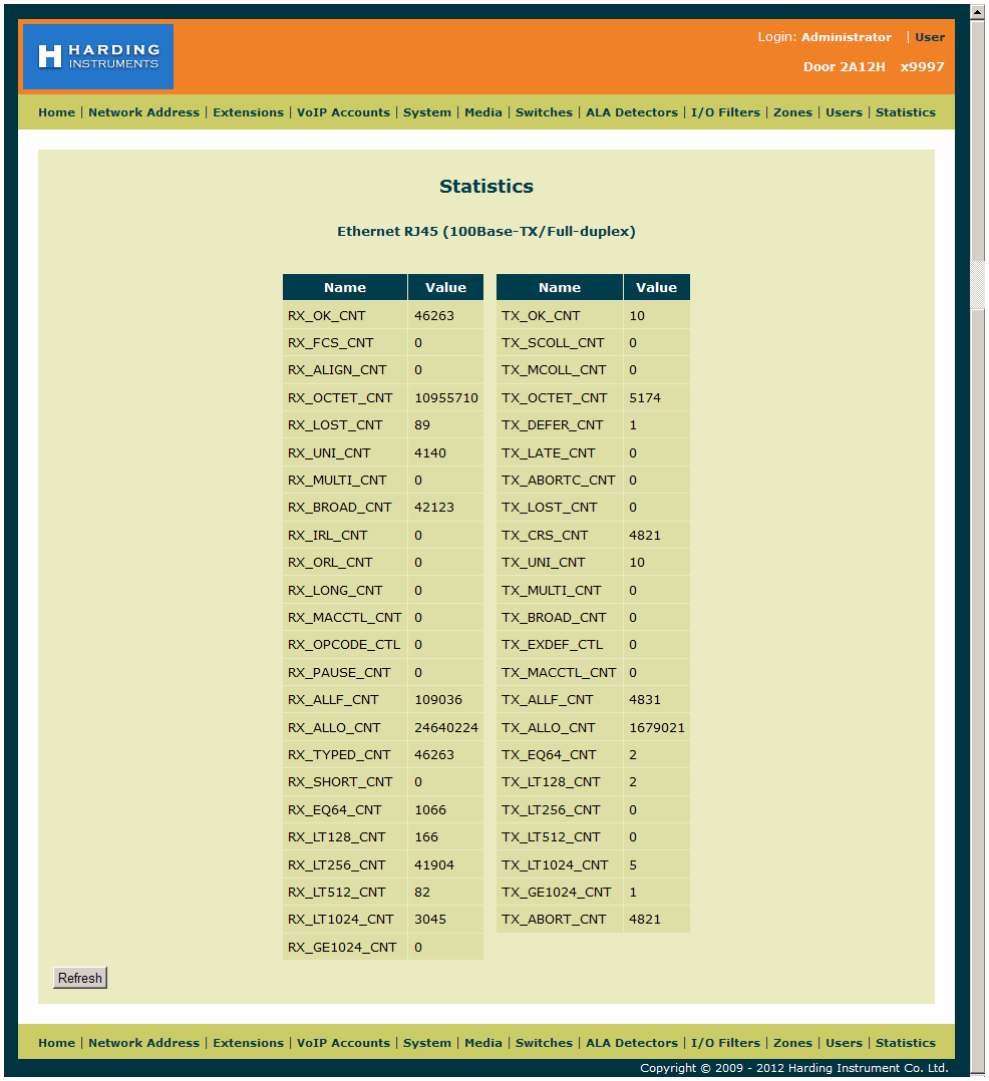
The **Zones** page allows you to set multicast addresses for the intercom to listen in on for VoIP multicast page announcements. This is only used when the ICE-600 intercom station is used as part of a digital telephone system rather than the DXL system.



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



The **Statistics** page shows statistics and diagnostics about the ICE-600 intercom station.



Name	Value	Name	Value
RX_OK_CNT	46263	TX_OK_CNT	10
RX_FCS_CNT	0	TX_SCOLL_CNT	0
RX_ALIGN_CNT	0	TX_MCOLL_CNT	0
RX_OCTET_CNT	10955710	TX_OCTET_CNT	5174
RX_LOST_CNT	89	TX_DEFER_CNT	1
RX_UNI_CNT	4140	TX_LATE_CNT	0
RX_MULTI_CNT	0	TX_ABORTC_CNT	0
RX_BROAD_CNT	42123	TX_LOST_CNT	0
RX_IRL_CNT	0	TX_CRS_CNT	4821
RX_ORL_CNT	0	TX_UNI_CNT	10
RX_LONG_CNT	0	TX_MULTI_CNT	0
RX_MACCTL_CNT	0	TX_BROAD_CNT	0
RX_OPCODE_CTL	0	TX_EXDEF_CTL	0
RX_PAUSE_CNT	0	TX_MACCTL_CNT	0
RX_ALLF_CNT	109036	TX_ALLF_CNT	4831
RX_ALLO_CNT	24640224	TX_ALLO_CNT	1679021
RX_TYPED_CNT	46263	TX_EQ64_CNT	2
RX_SHORT_CNT	0	TX_LT128_CNT	2
RX_EQ64_CNT	1066	TX_LT256_CNT	0
RX_LT128_CNT	166	TX_LT512_CNT	0
RX_LT256_CNT	41904	TX_LT1024_CNT	5
RX_LT512_CNT	82	TX_GE1024_CNT	1
RX_LT1024_CNT	3045	TX_ABORT_CNT	4821
RX_GE1024_CNT	0		

This concludes the settings for one ICE-600 station.

Repeat this process for each IP station, making sure that the IP address for each station is unique. Fill in this station'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

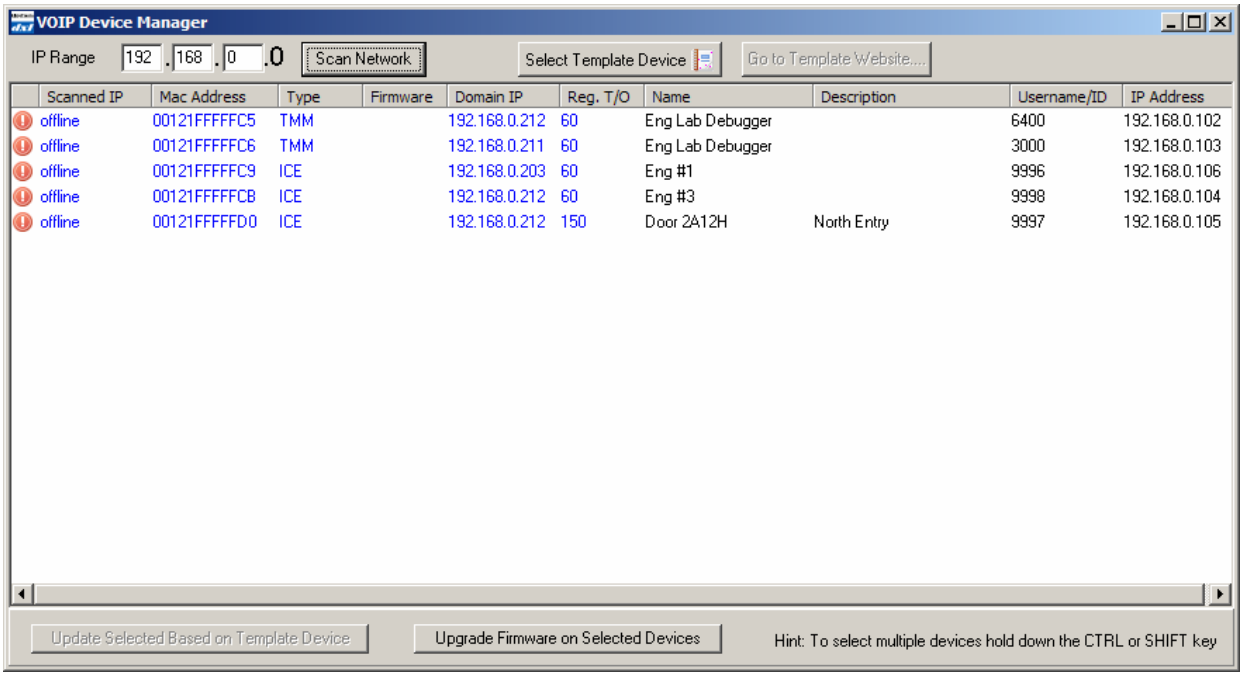
8. Using the DXL VOIP Device Manager to Configure Multiple Stations

Once you have used the web page settings to configure one ICE-600 intercom station, you can use the DXL VOIP Device Manager to configure multiple stations using the same basic settings entered for the first intercom.

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

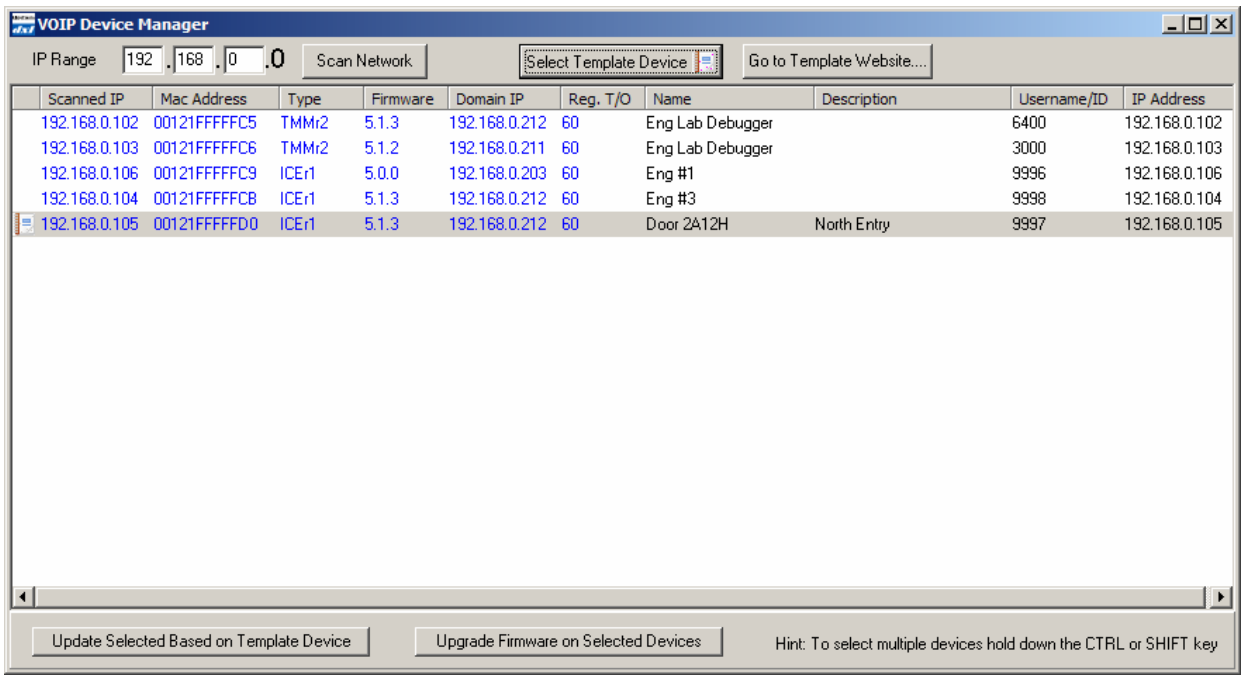
First, open the DXL Administrator and open a project file.

Go into the Diagnostics menu, and then use the menus "View", "VOIP Device Manager".



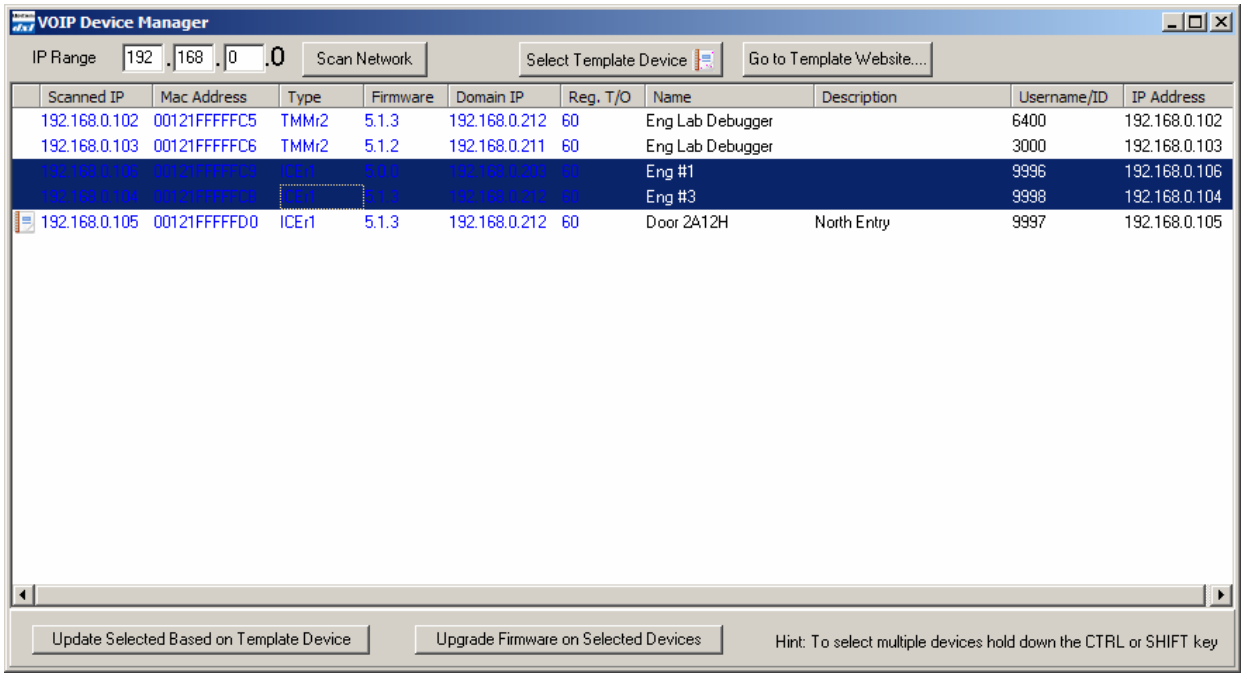
Select the IP range that your DHCP server assigns addresses in and click the "Scan Network" button. The VOIP Device Manager will scan your network looking for DXL VOIP devices and display a list of available TMM IP masters and ICE intercom stations. ICE-600 stations will have a Type starting with "ICE". The left column "Scanned IP" will show you the IP addresses of all recognized devices.

Change one station's parameters following the instructions in Section 7 above (if you have not done this yet), then select the station 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 stations as desired from the VOIP Device Manager.

Then multiple select the destination intercoms by control-clicking individual stations to select individual stations or select a range by clicking one intercom, then shift-clicking the last intercom 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 stations, except for the Name, Description, Username/ID, and IP address which will be from the VOIP Device Manager settings.