INSTALLATION INSTRUCTIONS

MicroComm DXL

TMM-640/641 VoIP Touchscreen Master Module

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1. Intent & Scope

This document describes the installation and setup procedures for both the DXL TMM-640 and TMM-641 VoIP Touchscreen Master Modules. The only differece between the TMMs is that the TMM-641 has a line level input jack to connect a third party external feedback suppressor or equilizer. In this document the notation TMM-64x is used to describe procedures that appliy to both the TMM-640 and TMM-641.

2. Description

The TMM-64x is a small desktop style intercom master station for use with a touchscreen terminal. It is aVoice over Internet Protocol (VoIP) device that implements the industry standard Session Initiation Protocol. The TMM-64x connects to an exchange via the inter-exchange Ethernet network.

The TMM-64x includes a speaker (c/w volume adjustment) an electret microphone, a push-to-talk(PTT) switch, and a LED status indicator. A front panel 2.5 mm jack allows a variety of wired headsets to be utilized.

The TMM-64x also provides contacts for an external PTT (foot) switch as well as a privacy handset, and includes a 3.5 mm stereo output jack to provide line-level signaling for external amplified speakers.

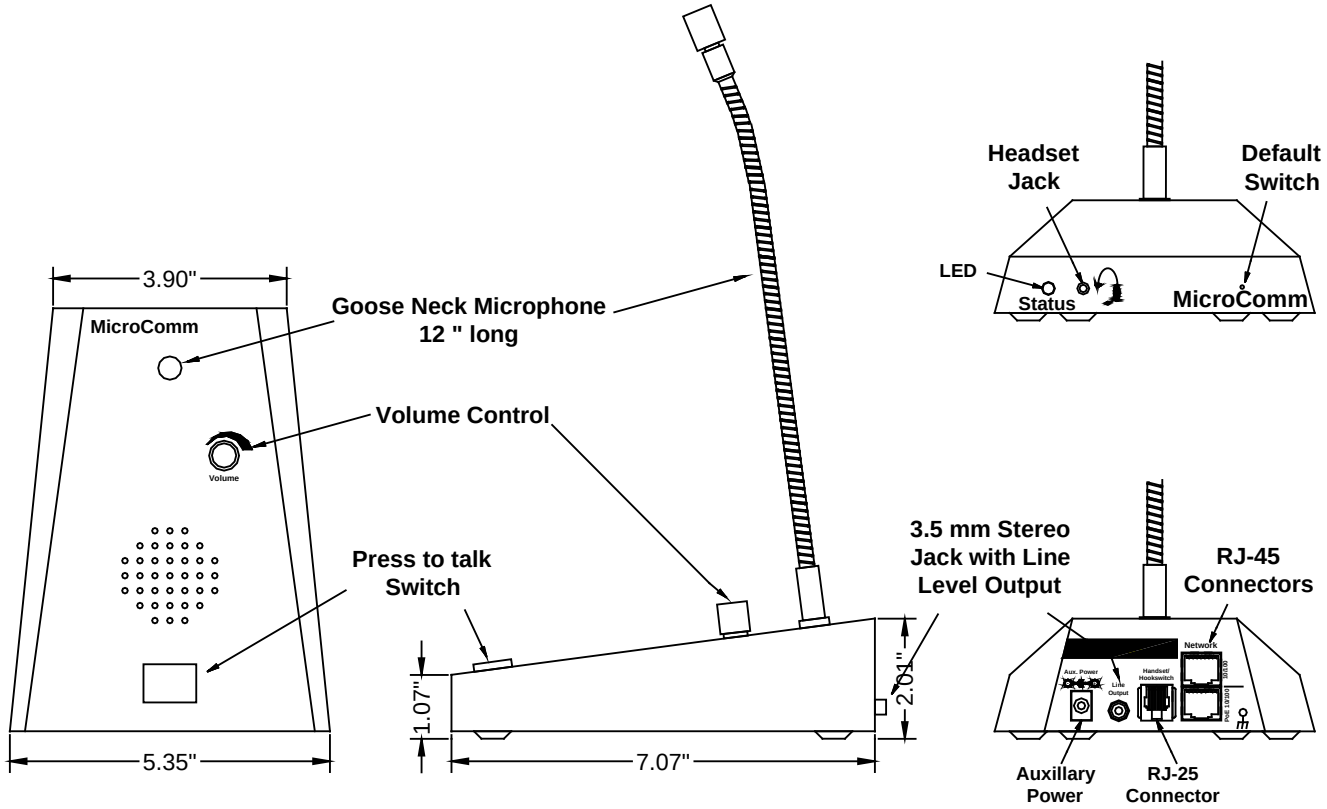
The TMM-641 (not the TMM-640) has a 3.5 mm line level input jack which allows a third party external feedback suppresor or equalizer to be connected.

The TMM-64x is powered by a wall adapter power supply (normally included with the TMM-64x or through Power over Ethernet (PoE) if you have a PoE capable network switch.

The functional operation of the TMM-64x in a DXL system is carried out using the Administrator Software and the DCC software. Three procedures are required to configure a TMM-64x master station:

1. Configuring an IP Master using the Administrator
2. Use DHCP to set the IP Address of the TMM-64x master station
3. Use a web browser to configure the TMM-64x master station to operate with the MicroComm system.

The following diagram shows the location of the connectors on the TMM-64x.



TMM-640 Showng Connector Locations

The TMM-64x has two RJ-45 connectors, an RJ-11 connector, a 3.5 mm stereo line-level output, and a 2.5 mm headset connector.

3. Ethernet Connection

Two vertically stacked RJ-45 connectors are used to connect the TMM-64x to a DXL system. The bottom RJ-45 includes both the network and power connections for the TMM and has the capability to accept power from either an endspan or midspan device.

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

Table 1: Lower Ethernet Network & PoE

The second RJ-45 includes only the network connections and can be used to facilitate connections to another device.

RJ-45 Pins	Function
1	Tx +
2	Tx -
3	Rx +
4	NC
5	NC
6	Rx -
7	NC
8	NC

Upper Ethernet Network

4. Handset Connector (or external push-to-talk switch)

An RJ-25 connector provides a means for a handset connection if call privacy is desired, but will require an external cradle with hookswitch. A resistor network is implemented to facilitate both the hookswitch and PTT inputs to one physical input.

RJ-11 Pins	Function
1	HS Mic +
2	Push to Talk
3	HS Spk +
4	HS Spk -
5	HS Status
6	HS Mic -

Handset Connections

The handset hookswitch is connected between HS Status (Pin 5) and HS Mic – (Pin 6).

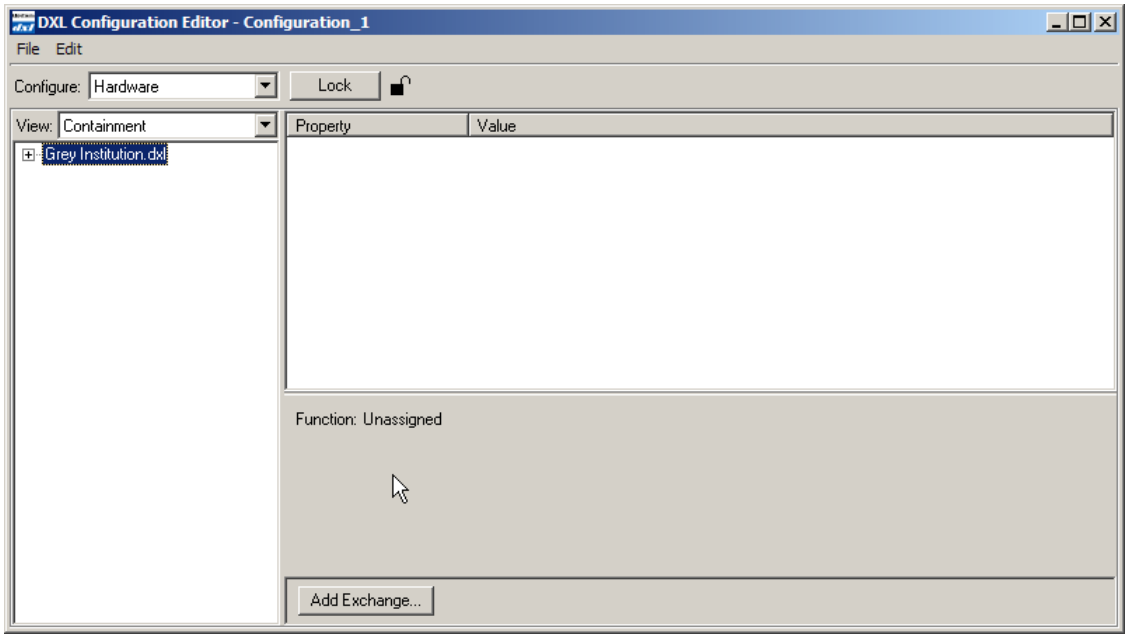
The external press-to-talk switch is a normally open switch that is connected between Push-to talk (Pin 2) and Mic – (Pin 6)

5. Power Supply

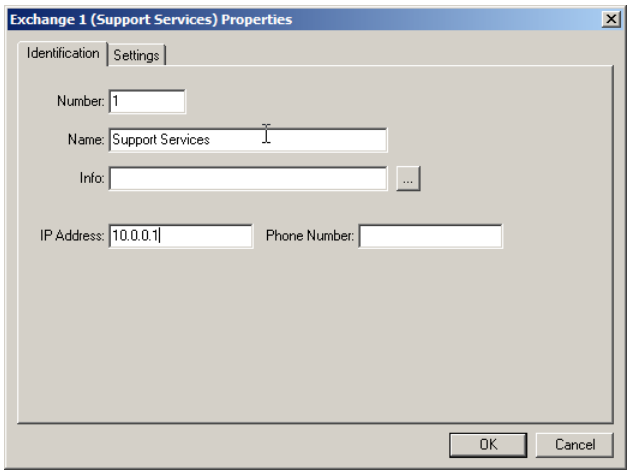
The TMM supports both PoE and line power inputs.

6. Configuring a TMM-64x with the Administrator Software

The Administrator Software is used to create a configuration where a particular VoIP port must be assigned to each VoIP TMM-64x master 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 Exchanges…** to the configuration

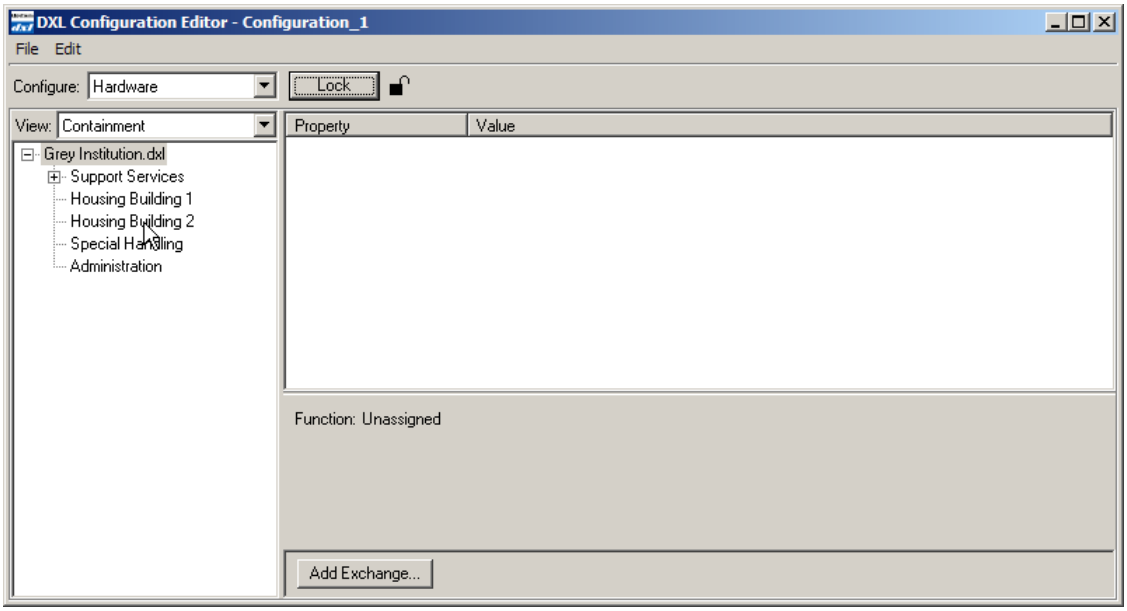


Click on the **Add Exchanges…** button and the **Exchange Properties** text box with two tabs will pop up. In the **Identification tab** you need to type in a **Number:** for the exchange, the **Name:** of the exchange and assign a unique **IP Address:** to the exchange.



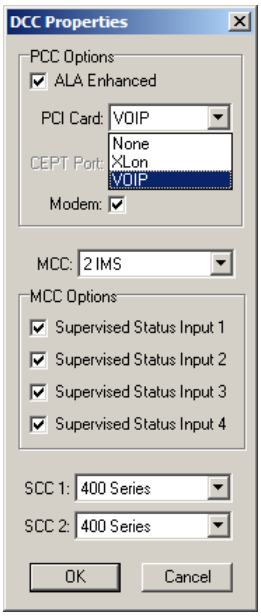
Once all the exchanges have been created each exchange requires a DCC. After the DCC has been configured, DCEs, TBEs and PZEs can be added to the exchange as required.

Using the pull-down menu and setting the **Configure:** entry to **Hardware** in the **DXL Configuration Editor** and

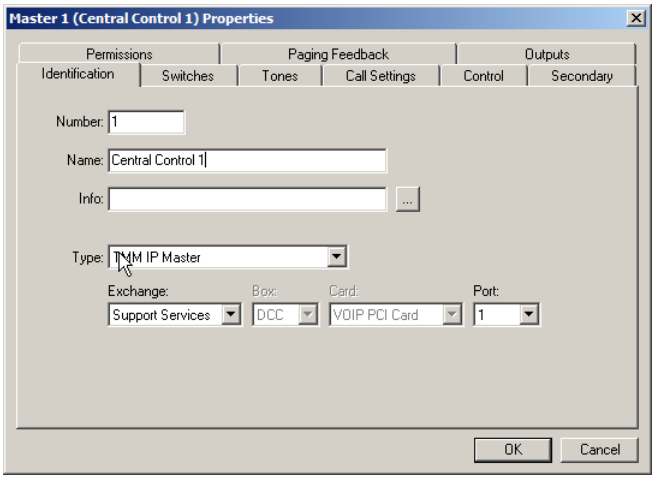


selecting one of the Exchanges you can now add a DCC to the exchange.

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 master 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 a TMM-64x VoIP master station set the **Configure:** entry of the **DXL Configuration Editor** to **Masters** then click on the **Add…** button to bring up a **Master Properties** dialog box. In the **Identification** tab you need to assign a **Number:** to the master station, a **Name:** for the master station and use the pull down menu to select the **Type:** of master station. In this case we need to specify that it is an **TMM IP Master**.



You must specify the **Exchange:** associated with this master and assign a unique port number for the IP Master using the **Port** pull-down menu. By default the next available port will be displayed.

7. Setting the IP Address for the TMM-64x

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

Since the TMM-64x 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 (Dynamic Host Configuration Protocol) server. In order to configure the masters you will need a computer or device (such as a router) that can assign DHCP addresses. **This is used for initial configuration only.** After the masters 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 bottom Ethernet port of the TMM-64x to the network switch that the DHCP server is connected to. The network switch should assign an IP address to the TMM-64x. Once the TMM-64x indicator LED on the front is blinking green (indicating it is on), press the PTT switch on the TMM-64x. Using a voice synthesizer, the TMM-64x 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 TMM-64x speaks a 12 digit Ethernet MAC address this means that the TMM has not received a DHCP address, indicating that there is probably no DHCP server on the network

The small opening in the front above the C in MicroComm can be used to activate a switch that will reset the TMM to the original factory set default values with the address set by the DHCP. The switch must be pressed at the same time the Ethernet cable is plugged into the TMM.

8. Using a web browser to configure the TMM-64x

Once the IP address of the TMM-64x has been determined and connected to an Ethernet network, a PC on the same network can access the TMM-64x and use a web browser to set the remaining parameters necessary to make the TMM-64x work in a DXL system.

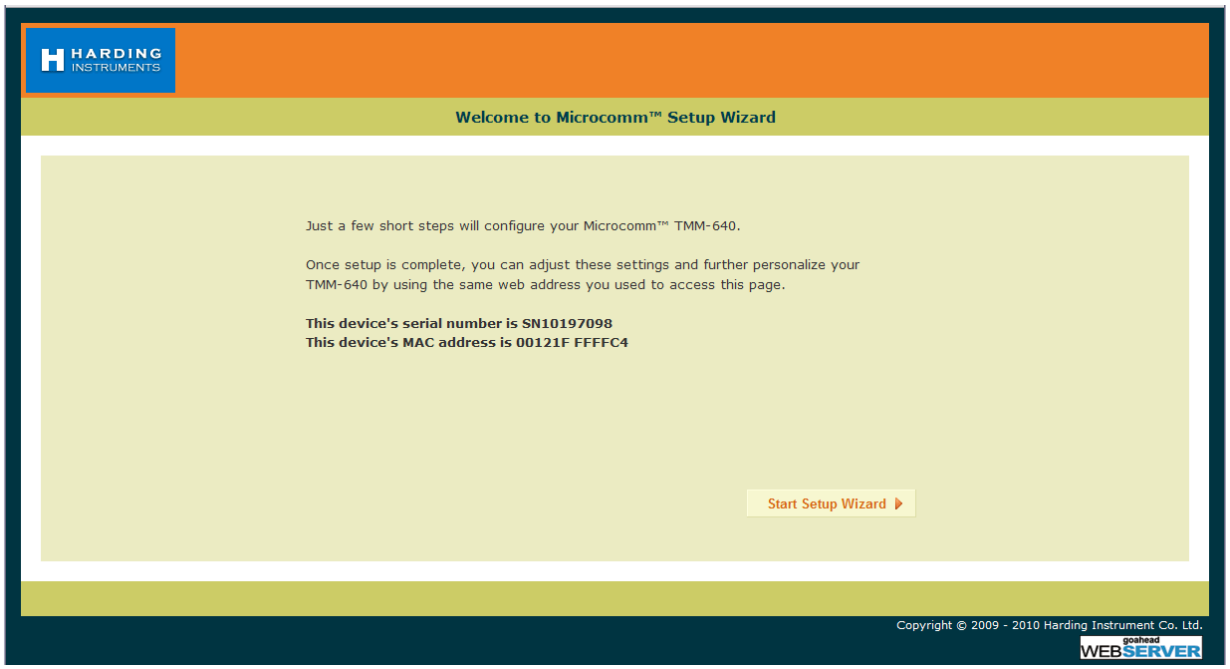
The first step is to hook up the bottom Ethernet port on the master to a network switch. Once the master has reset and the LED on the front is flashing green, you can bring up a web browser from a PC on the same network (that is assigned an IP address within the same network mask as the TMM-64x).

In the address bar, type "**http://<address of master>**". For example, if the master is 10.0.0.56, type "**http://10.0.0.56**". This will bring up a MicroComm DXL master setup page.

If this is not the first time that the web browser has been used to configure the TMM-64x after a factory reset, the TMM-64x 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.

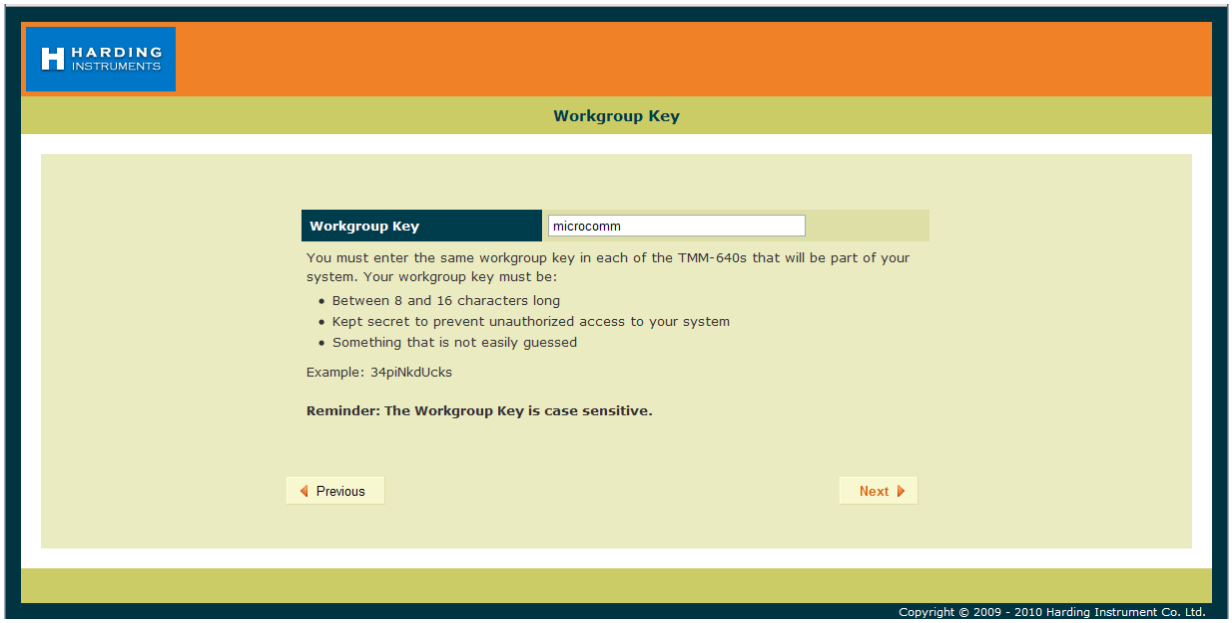
8.1 Using the MicroComm Setup Wizard

If this is the first time that the TMM-64x has been configured with a web browser, the following screen will come up. If this screen is not shown, then the TMM-64x was likely previously configured, in which case you can skip to the next section.



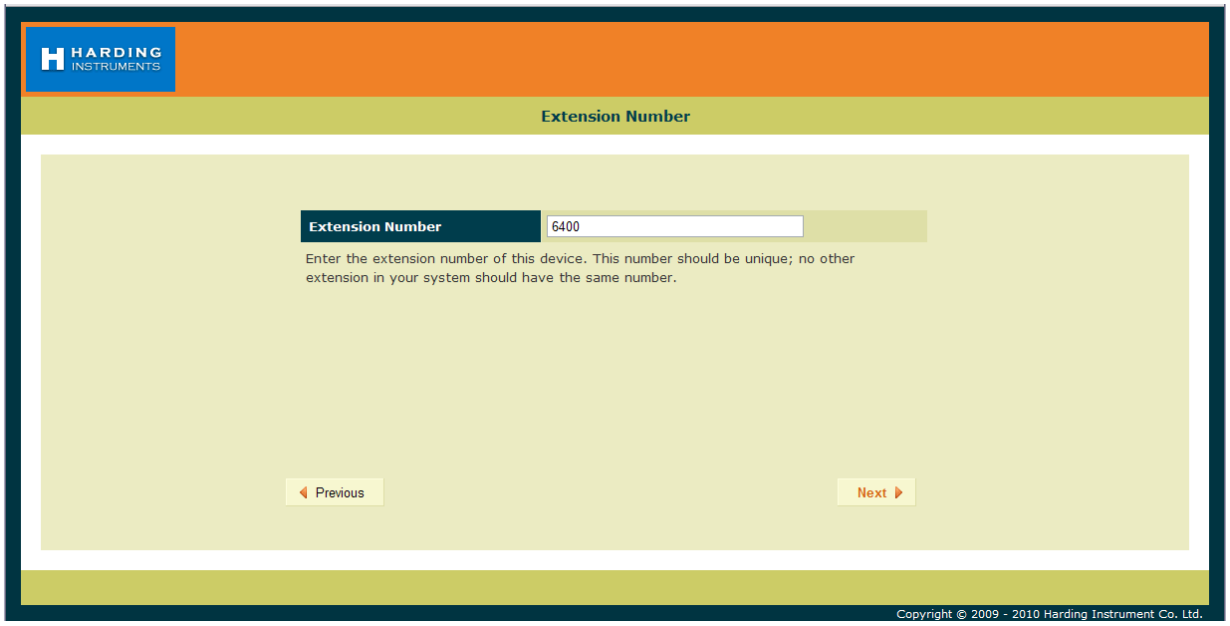
Click the "**Start Setup Wizard**" button to continue.

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 master 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.

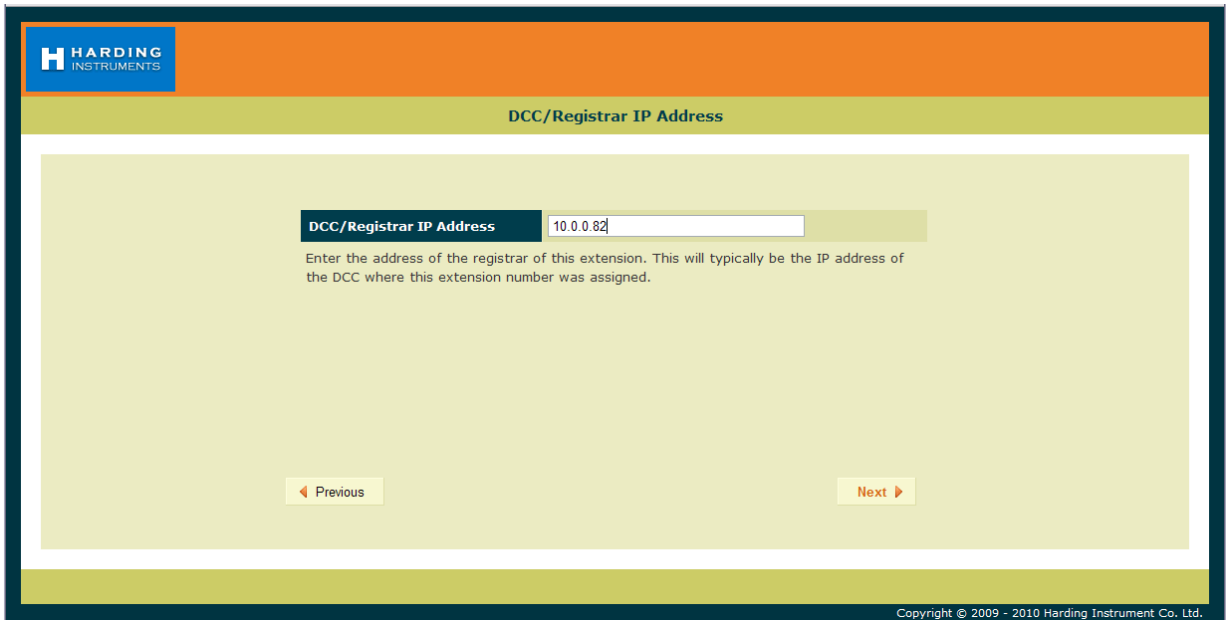


Next, enter the **Extension Name** and **Extension Description**. Enter a short name describing this master in the **Extension name** setting. In this case, "**TMM-64x**" is used. Enter a long description for this master as **Extension Description** (or leave it blank). Click the "**Next**" button to continue.

Next, enter the **Extension Number** for this TMM-64x. This extension number must correspond to the IP master number configured in the DXL Administrator for this master. There can be only one IP master in the system that has this extension number. In this example, "**64x0**" was used as the ID number of the master in the DXL Administrator, so this must be entered as the **Extension Number** of this TMM-64x. Click the "**Next**" button to continue once this has been entered.

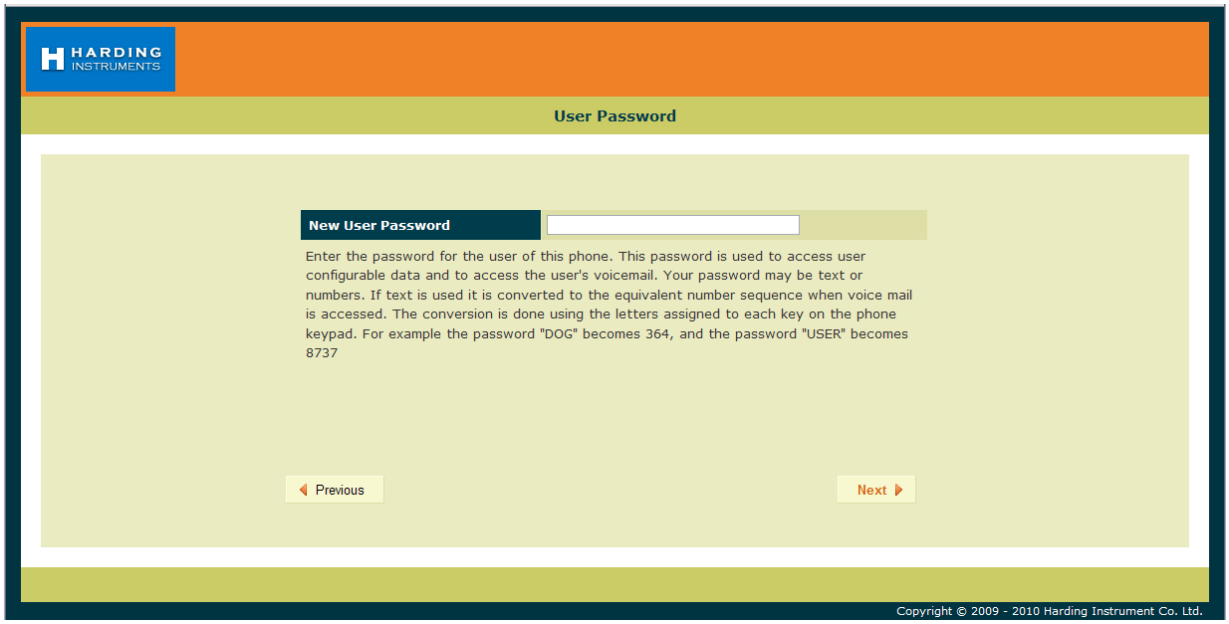


Set the **DCC/Registrar IP Address** to the IP address of the DCC that controls the exchange that the master associated with in the DXL Administrator. For example, in this case the IP address of the DCC of the exchange that the Master is associated with is "**10.0.0.82**". Once this is entered, click "**Next**".

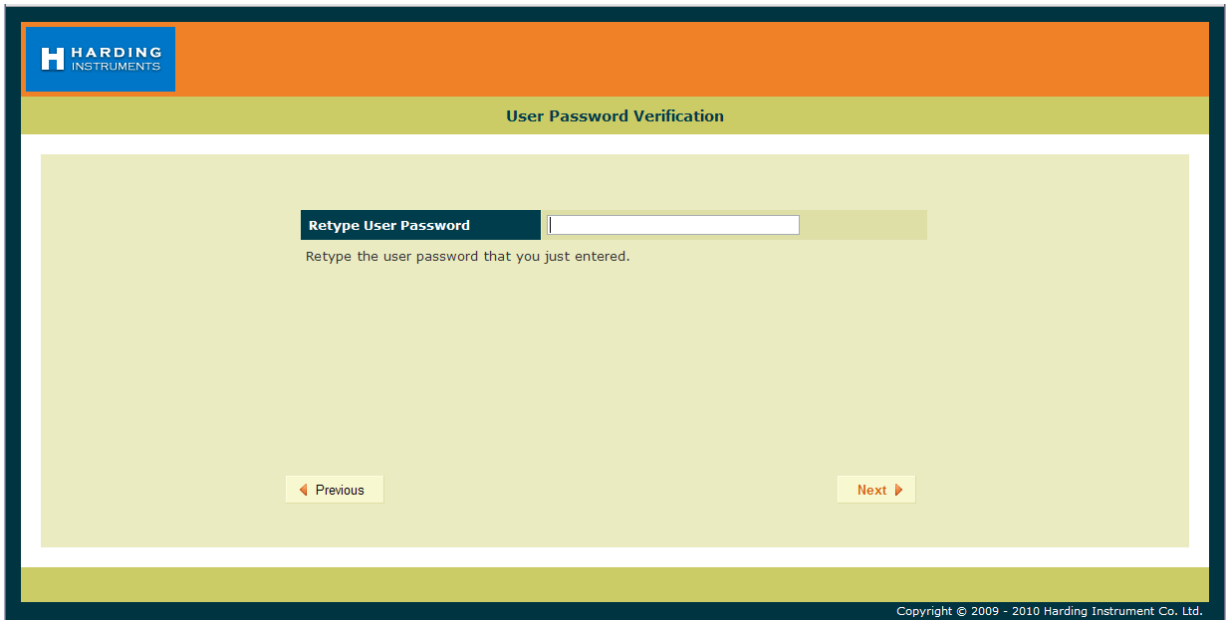


Now set the **GMT Offset** time zone setting to an appropriate time zone where the master will be used, then click "**Next**".

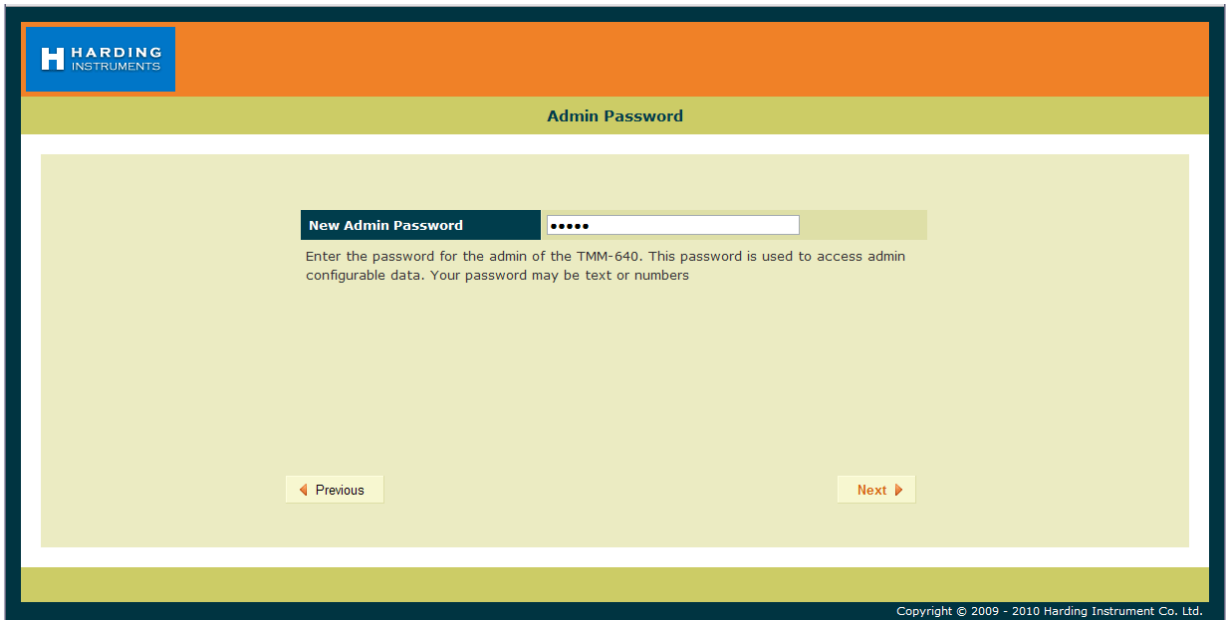
Next, enter a **User Password** for the user account on the TMM, then click "**Next**". This allows a separate account for install or maintenance technicians to examine the TMM-64x parameters, yet while not being able to modify them. Click "**Next**" after the password is entered.



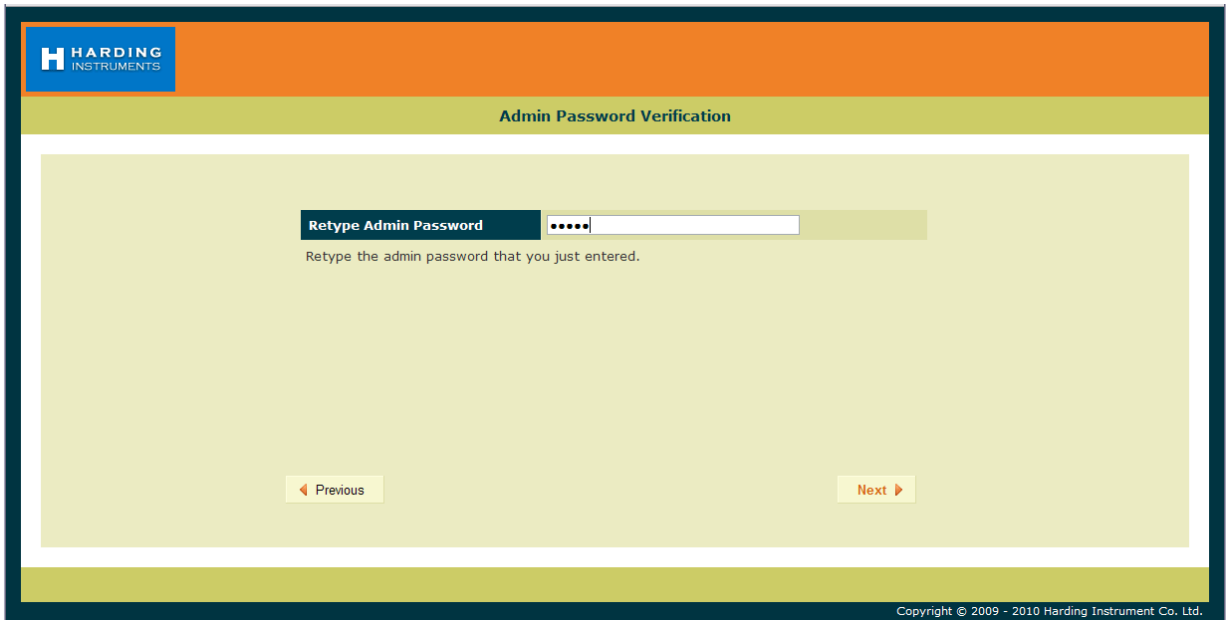
In the following screen, re-type the same **User Password** to verify it, and then click "**Next**".



Now enter an **Admin Password** for the administrator account on the TMM-64x, 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).

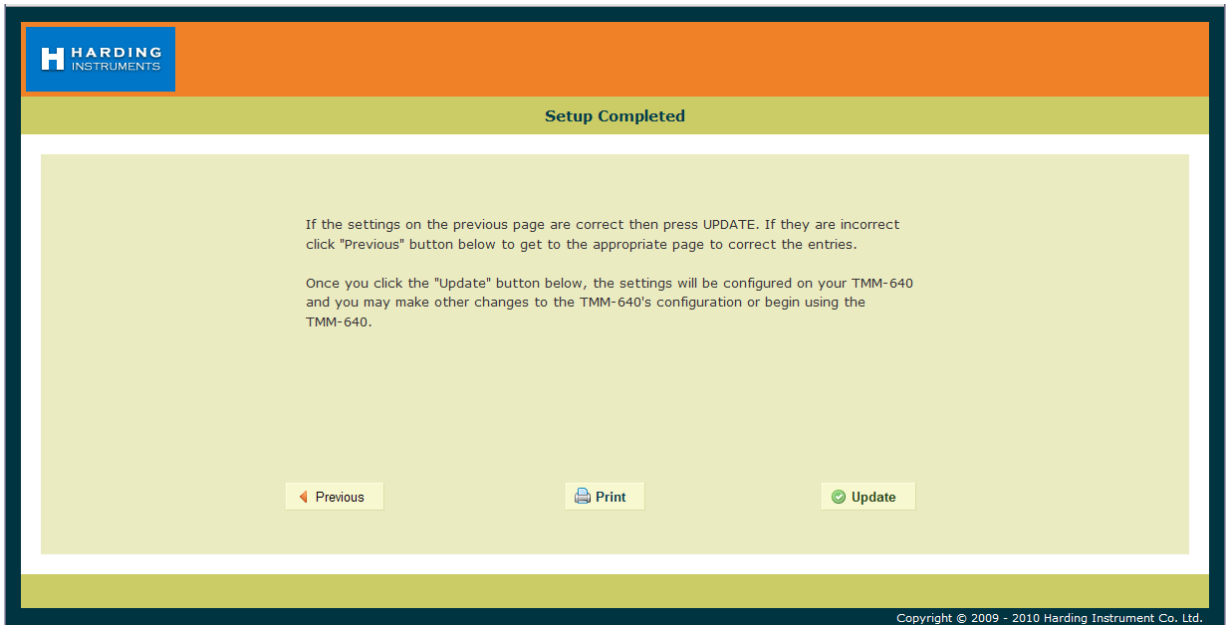


In the following screen, re-type the same **Admin Password** to verify it, and then click "**Next**".



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.

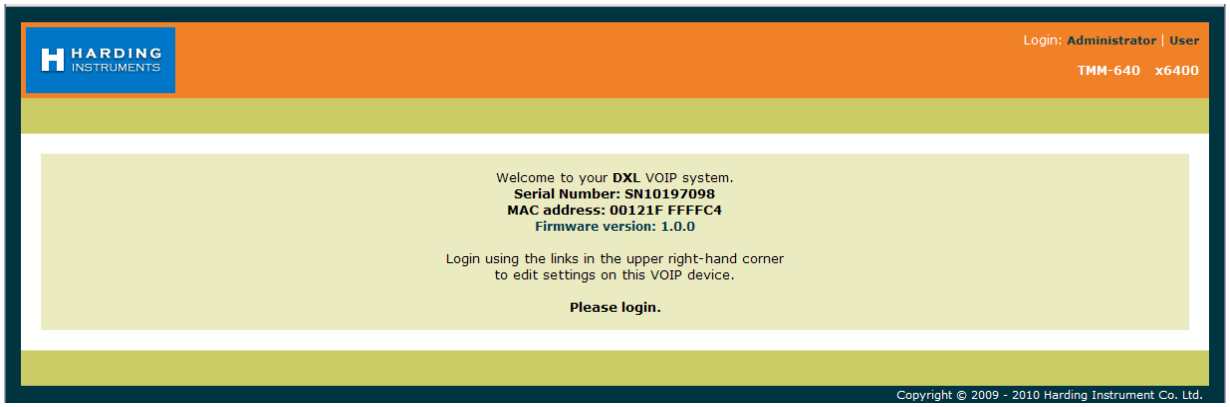


After this, the main configuration screens will be shown as in the next section.

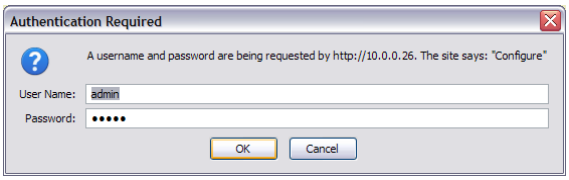
8.2 Setting the TMM-64x Operating Parameters

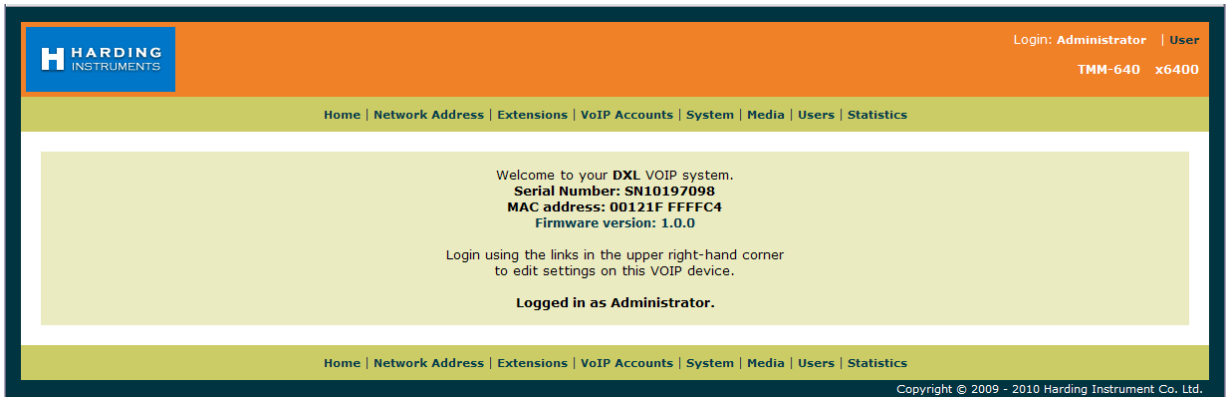
If the TMM-64x has been configured with the MicroComm Setup Wizard previously, it will skip the previous screens and go directly to the following screen when the web browser accesses the TMM-64x's web page. To make changes, the user will have to sign as the administrator using the password previously assigned during the initial configuration.

The initial web page for configuring the TMM-64x is as follows.



Click on the "Administrator" text at the top right corner of this page. This will bring up a login prompt text box. Use the user name "**admin**" and enter the password assigned to this master ("**admin**" was assigned in the above example), then click OK. 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:

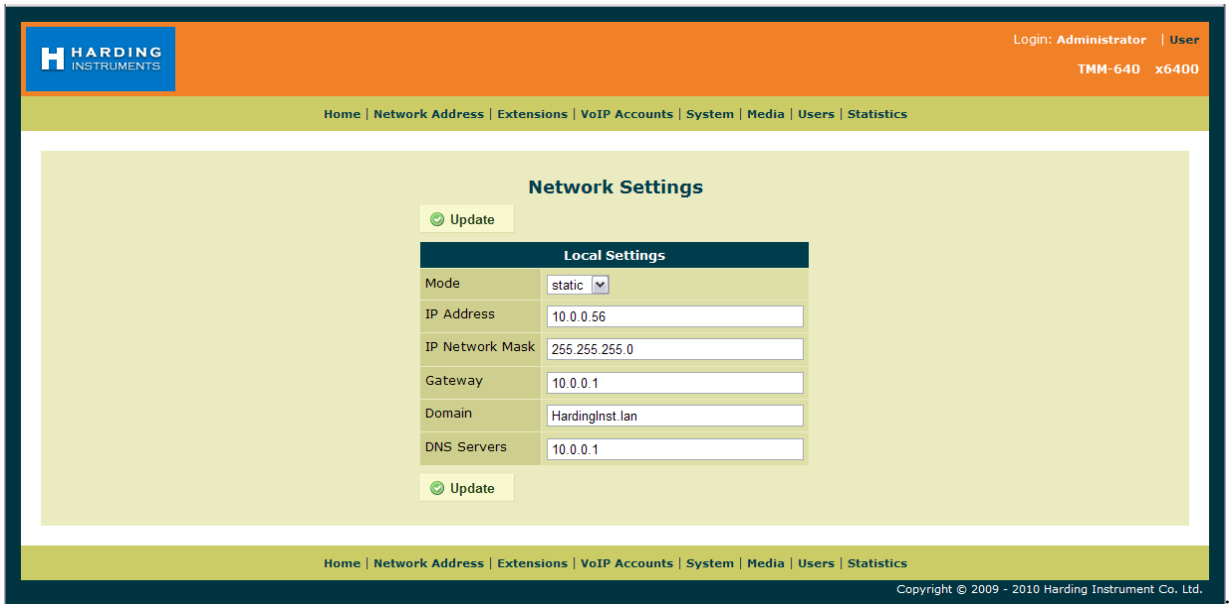
Set **Mode** to "**Static**" (to assign the master a static IP address). Static is recommended for all IP master stations.

Set **IP Address** to the IP address for this master. It should be assigned by your network administrator, and must not conflict with other IP addresses on this system. In this case this master was assigned address "**10.0.0.56**"

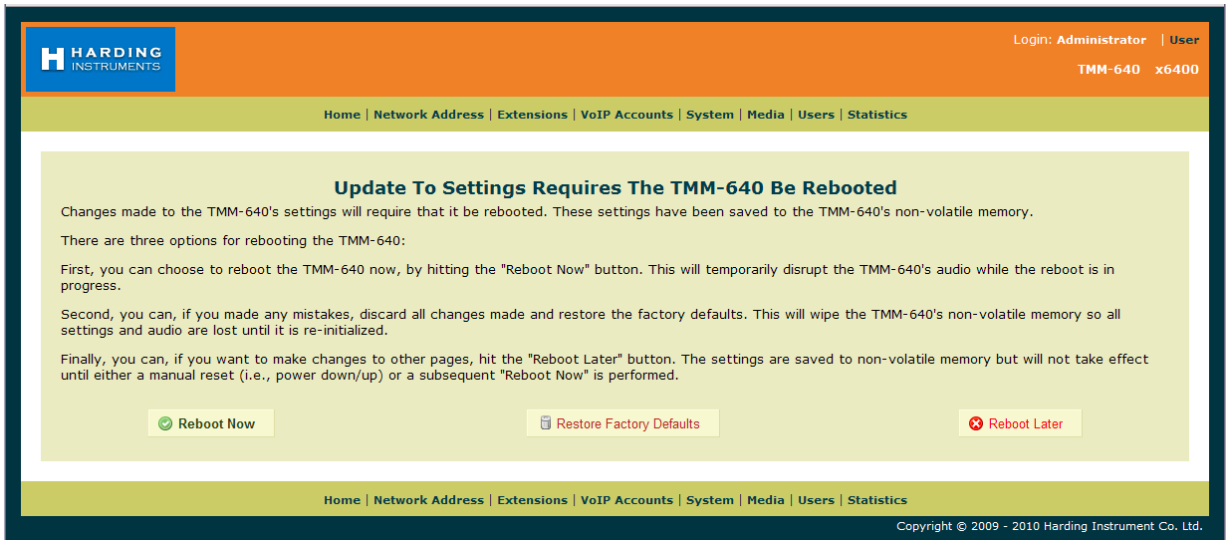
Set **IP Network Mask** to the Network mask for the network. This is also assigned by your network administrator, and should be the same network mask used for all DXL equipment including IP masters, IP stations, and IP page speakers, as well as the DXL DCC's. This example network is assigned "**255.255.255.0**"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

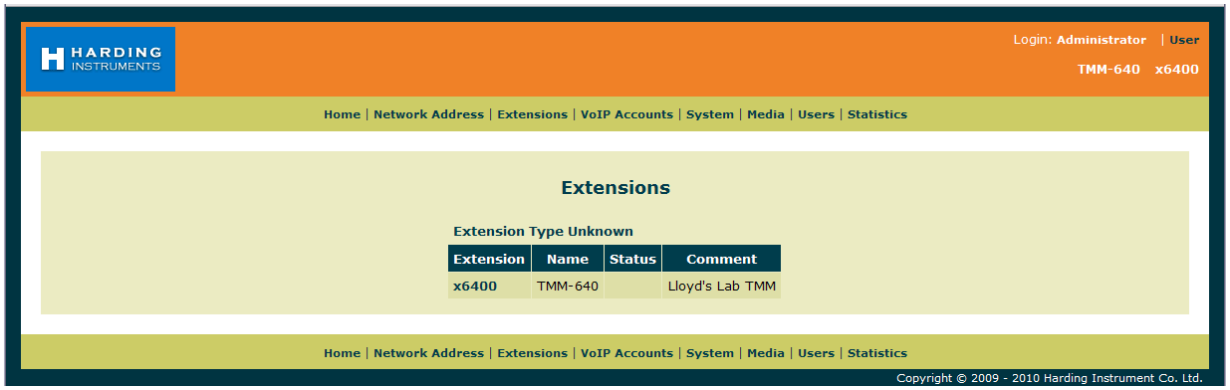


Note that changing the Network Settings will require a reboot for the settings to take effect. You can either use the "**Reboot Now**" option and re-establish the connection at the new IP address by typing "**http://<address of master>**", in your web browser, or use the "**Reboot Later**" option and 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 "**x64x0**".



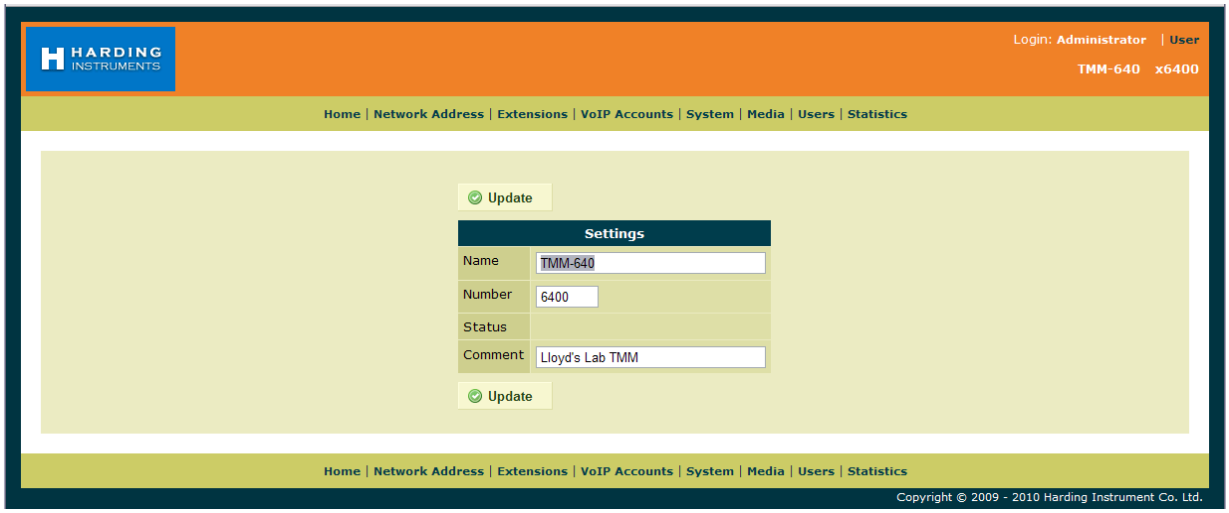
The settings for **Extensions** were previously entered in the MicroComm Setup Wizard, but a brief description of the settings is below if you need to change them after the initial setup.

Name is a short descriptive name of this master station; in this case "**TMM-64x**" is used.

Number is the master number for this master (this must be the same number as the Master **Number** entered in the DXL Administrator software for the master station). This master number cannot be the same number as any other master in the system. In this case the master number is "**64x0**".

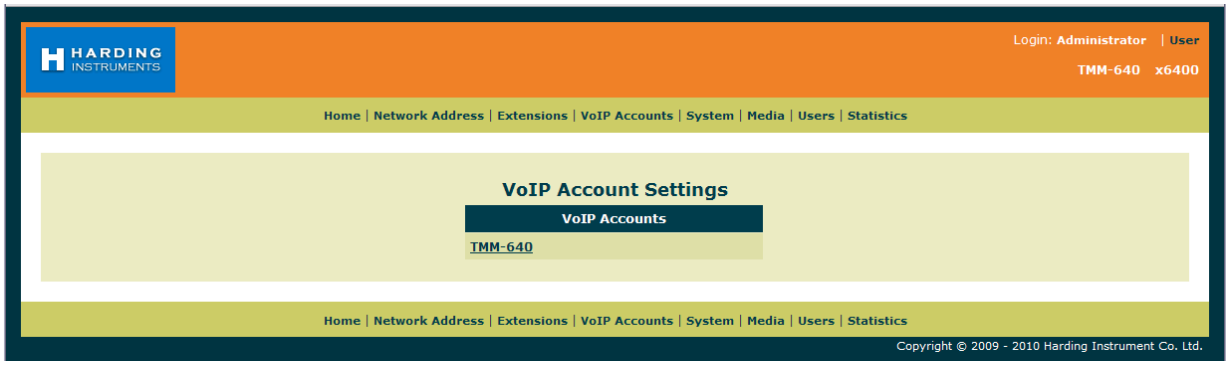
Comment is an optional long description of this master station, and can be left blank if desired.

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 master under **VoIP Accounts** (in this example, the name given during setup was "**TMM-64x**" so in this case you would click the text "**TMM-64x**"). 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.

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 master number (same as the Master **Number** in the DXL Administrator).

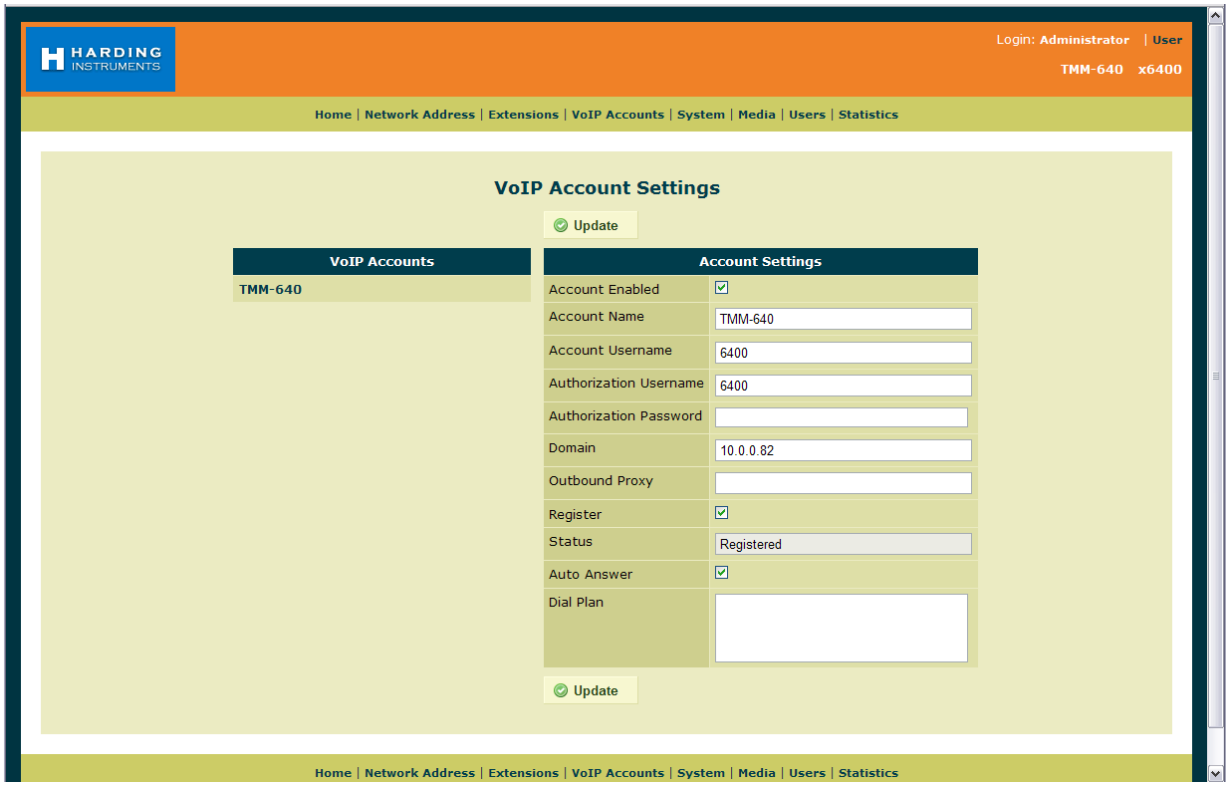
Domain must be set to the IP address of the DCC that controls the exchange that the master associated with in the DXL Administrator.

Authorization Username, Authorization Password, and Outbound Proxy settings are only used when the TMM-64x is used with a SIP Proxy server. This is not used for a DXL system, so should be set to blank.

Check-mark the **Register** and **Auto Answer** check boxes.

The remainder of the settings should be left at the default settings.

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



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

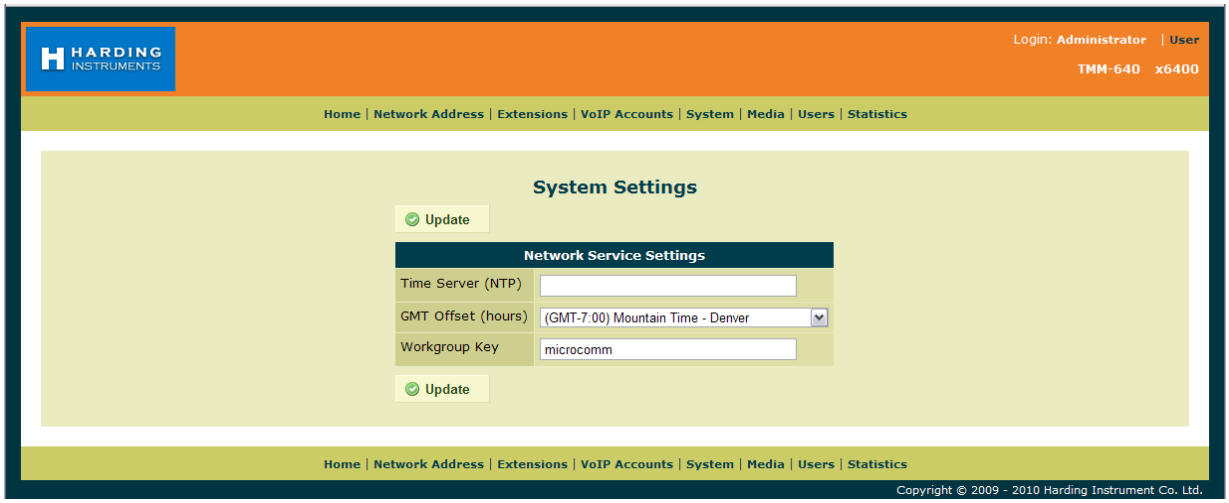
Most of these **System Settings** were previously entered in the MicroComm Setup Wizard, but a brief description of the settings is below if you need to change them after the initial setup.

Time Server (NTP) is the IP address or Domain Name of a Network Time Protocol (NTP) server. This can be used by the TMM-64x master 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 TMM-64x will be used in.

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

Gain 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 – Fixed setting has a fixed microphone gain, **AGC** setting (Automatic Gain Control) will automatically adjust microphone volume to be relatively consistent even with operators who talk louder or quieter than average.

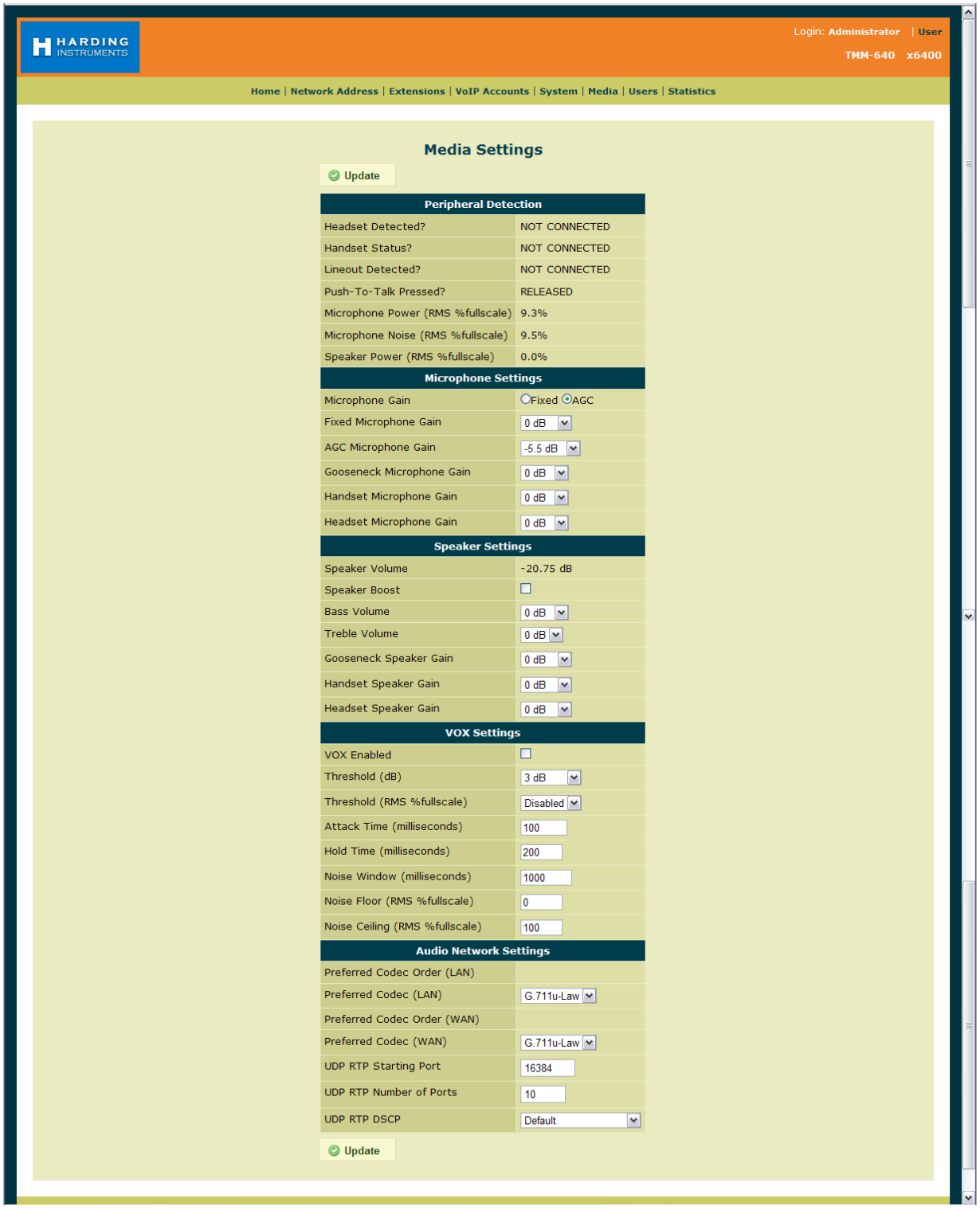
Fixed Microphone Gain is the base gain adjustment for all microphones when **Microphone Gain** is set to **Fixed**.

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.

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

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

Gooseneck Speaker Gain, **Handset Speaker Gain**, and **Headset Speaker Gain** settings are the gain settings for the built-in speaker, handset speaker, and headset speaker respectively.



VOX Enabled allows the master to use automatic voice switching (Voice Operated Switching) for hands-free operation without requiring the use of the Push To Talk button. However for control room operation 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 TMM-440 master station and should be left at the default values.

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

This concludes the settings for one TMM-64x master.

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

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.