4MX Series Transmitters
Software Upgrade Via I.P. Connection
Application Guide

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Table of Contents

1 Upgrading 4MX Software via an I.P. Connection

1.1 Overview

With Software Version 39.5.4.2.2.3 or later 4MX Series Transmitters have the capability to receive software upgrades via an I.P. connection. As software upgrades become available, customers will either receive the 4MX upgrade files via a CD or a notification with instructions to download the files from the B.E. Website.

1.2 Items/Tools required for the Software Upgrade Process

- [ ] Personal Computer with CD ROM Drive running either Windows 2000 or XP Operating System
- [ ] 4MX Software Upgrade CD from B.E. (4MX 25, 4MX 50, or 4MX 100)
- [ ] Crossover Ethernet Cable (if connecting directly to the transmitter)
- [ ] Straight-Thru Ethernet Cable (if connecting through an Ethernet switch)

1.3 4MX Software Version Labeling

Field #1: Exciter FPGA and NIOS

Field #2: Controller Control Micro (see **Note 1**)

Field #3: Controller Display Micro

Field #4: Power Amplifier (PA) Module Micro (see **Note 1**)

Field #5: Power Supply (PS) Module Micro (see **Note 1**)

Field #6: I.P. Module

Note 1: PA and PS Module Micro code is downloaded to the 4MX transmitter as part of the "Controller Control Micro" target. A secondary process is then used to update the PA and PS Modules.

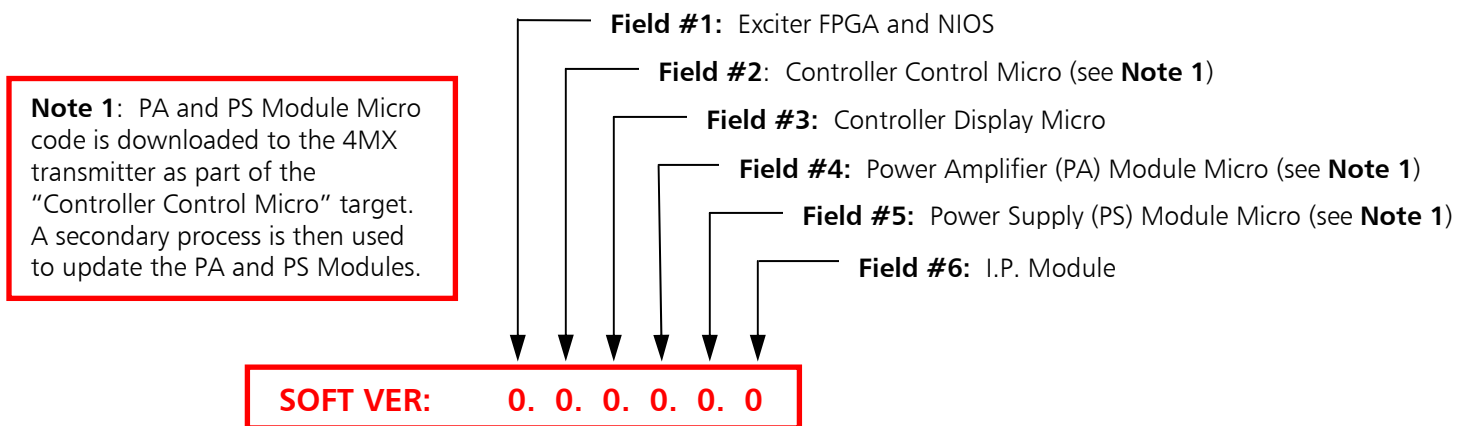**SOFT VER: 0. 0. 0. 0. 0. 0**

Figure 1 – Software Version Labeling

1.4 Determine the Current Software Version of the 4MX

From the Main Menu select **DIAG** and the Diagnostics menu will appear. Record the 4MX's current Software Version.
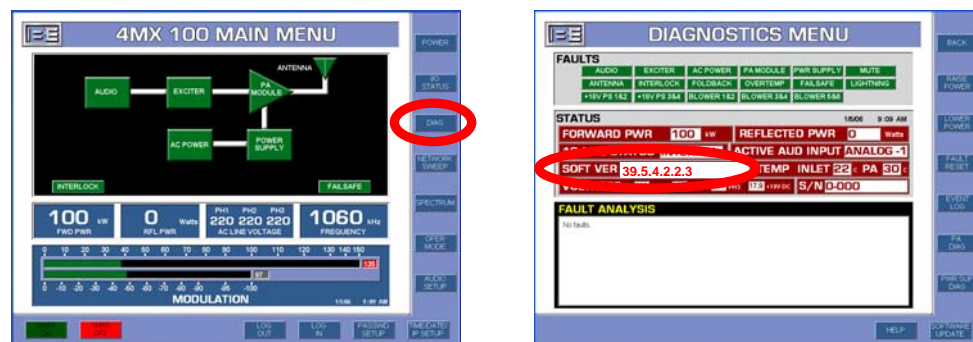

Figure 2 – Determine Current 4MX Software Version

1.5   4MX Software "Targets"

Compare the "Upgrade" Software Version Number with the "Current" Software Version Number of the 4MX (see sections 1.3 and1.4) to determine exactly which components need to be updated. With Software Version 39.5.4.2.2.3 or later 4MX Series Transmitters have the capability to receive software upgrades via an I.P. connection.

If **Field #1** has incremented, you will need to upload to the "**Exciter**" target.

If **Field #2** has incremented, you will need to upload to the "**Controller Control Micro**" target.

Please note that if the **PA** and **PS Modules** (Fields #4 & #5) are to be updated, their update code will be included in the Controller Control Micro target's download. A secondary step is then required to update PA and PS Module Software from the 4MX Software Update Menu as discussed is Steps 16 and 17 of Section 1.7.

If **Field #3** incremented, you will need to upload to the "**Controller Display Micro**" target.

If **Field #4** incremented, you will need to update PA Module Software from the 4MX GUI Software Update Menu. PA Module code is initially downloaded to the transmitter as part of the "Controller Control Micro."

If **Field #5** incremented, you will need to update PS Module Software from the 4MX GUI Software Update Menu. PS Module code is initially downloaded to the transmitter as part of the "Controller Control Micro."

If **Field #6** incremented, you will need to upload to the "**IP Module**" target.

1.6   DSP Exciter S4 Settings

If the DSP Exciter target is to be updated to version 46.X.X.X.X or greater, dip switch S4 must be changed or it will result in a DSP Exciter Board fault. S4 on the DSP Exciter needs to be set to 1=OFF, 2=OFF, 3=OFF, and 4=ON as shown below.
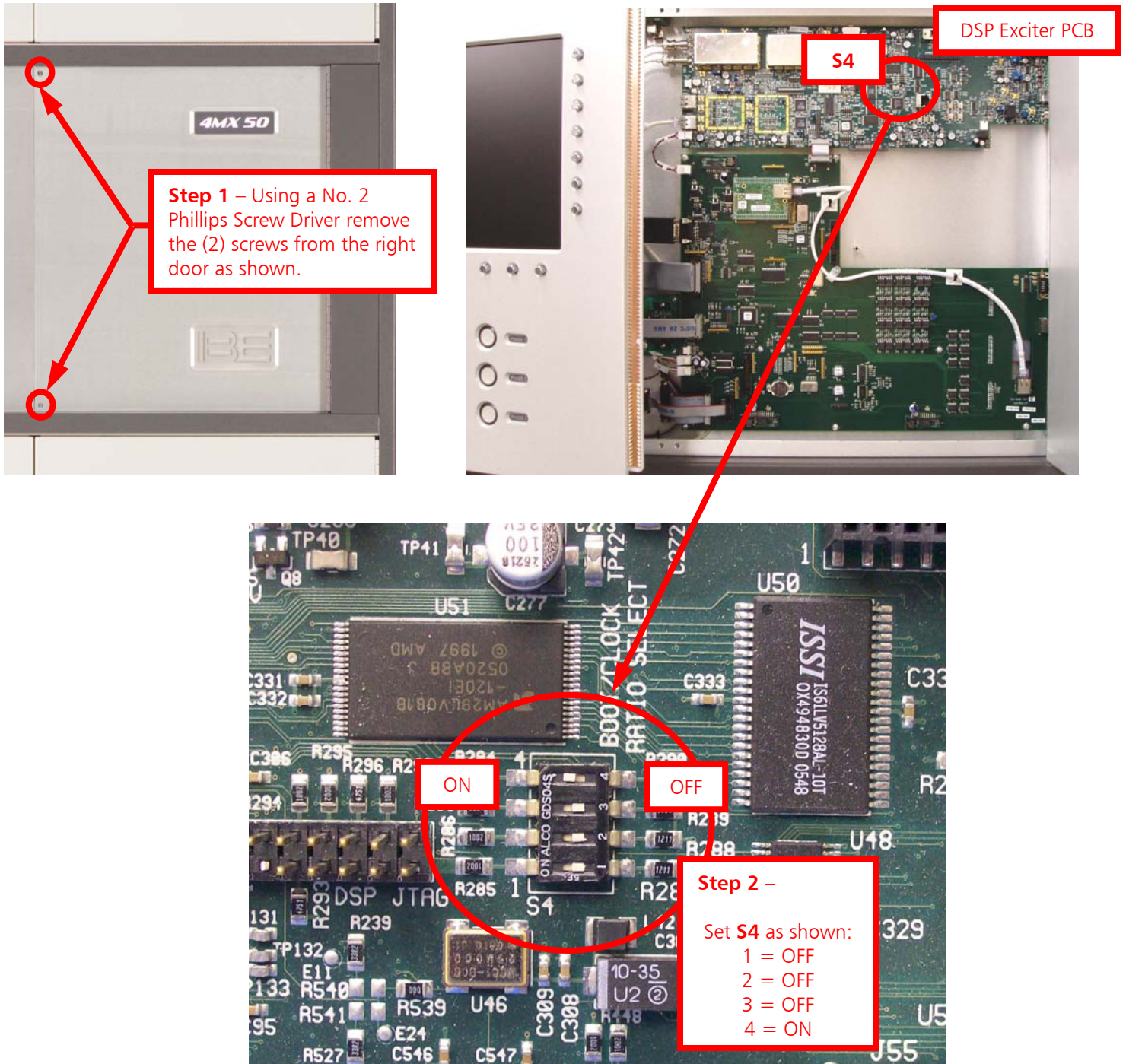

DSP Exciter PCB

S4

Step 1 – Using a No. 2 Phillips Screw Driver remove the (2) screws from the right door as shown.

ON

OFF

Step 2 –

Set **S4** as shown:
1 = OFF
2 = OFF
3 = OFF
4 = ON

Figure 3 – DSP Exciter S4 Settings

1.7 Uploading Software to a 4MX Series Transmitter

Step 1 – Using Windows Explorer, copy all of the files from the 4MX Software Upgrade CD (or files downloaded from the B.E. Website) to a folder on the hard drive "C:\" of the personal computer that you are planning to use for the upgrade. Unzip the files (if they have been zipped) ensuring that all of the files remain in the "4MX Upgrade" directory.
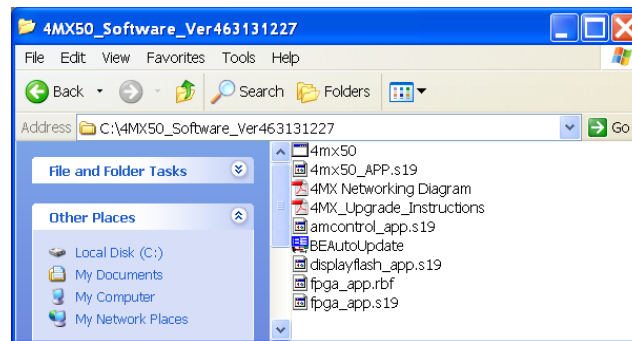

Figure 4 – 4MX Software Upgrade Files

NOTE: The factory default **I.P.** is **10.2.4.102** and the factory default **Subnet Mask** is **255.255.255.255**.

Step 2 – To establish communication via I.P. with the 4MX Transmitter, your PC must be setup in the same I.P. family. On your PC go to **Start -> All Programs -> Accessories -> Communications ->** and select **Network Connections**.
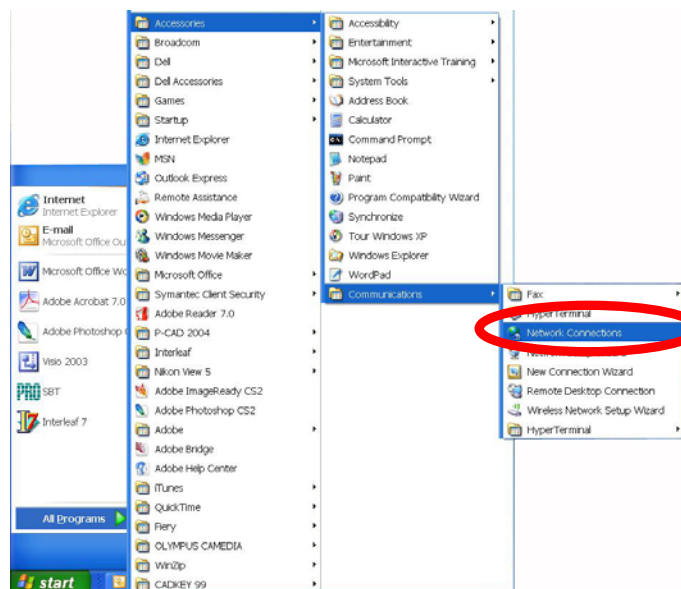

Figure 5 – PC Network Connection Menu

Step 3 – Right click on **Local Area Connection** and select **Properties.**
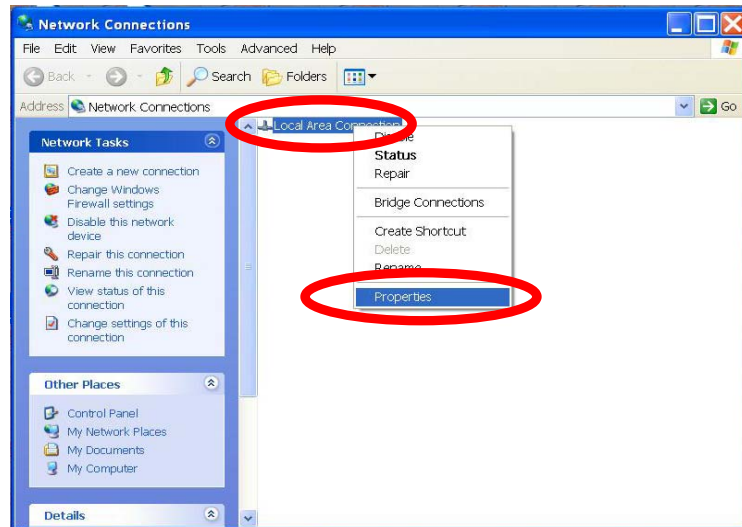

Figure 6 – Local Area Connection Properties

Step 4 – Since the I.P. Address of the 4MX in this example is 10.2.4.102 with a Subnet Mask of 255.255.255.255, we configure the PC with an I.P. of 10.2.4.10 and 255.255.255.0 for the Subnet Mask.
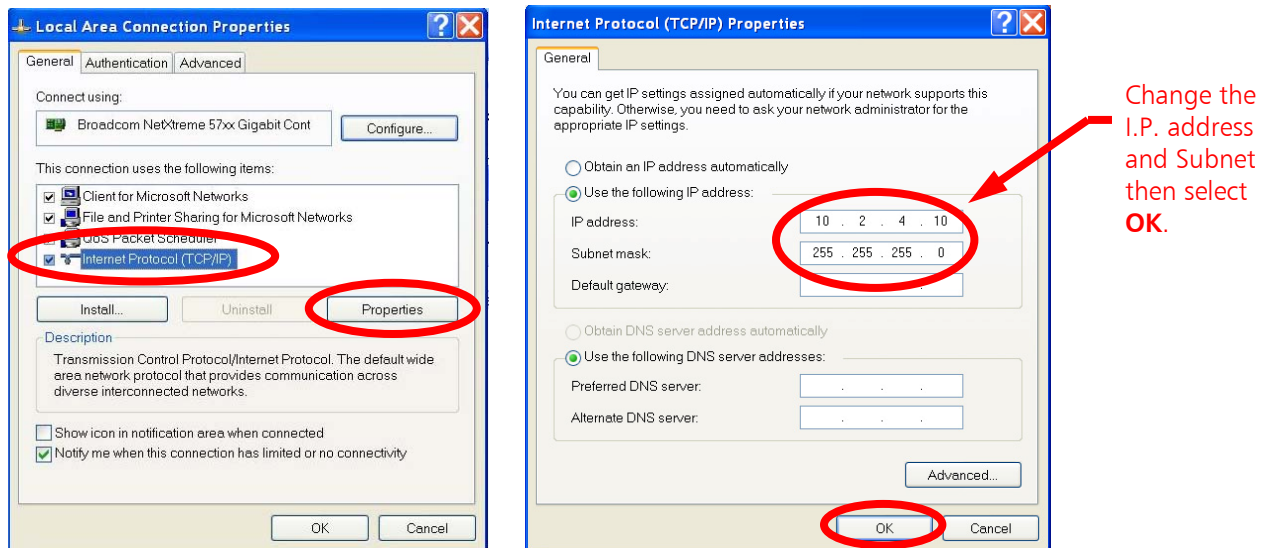

Change the I.P. address and Subnet then select **OK**.

Figure 7 – Configure the I.P. Address of the Personal Computer

Step 5 – Remove the 4MX 's remote control access panel to gain access to the transmitter's Ethernet Port.

Step 5a – Using a No. 2 Phillips Screw Driver remove the (2) screws from the right door as shown.

Step 5b – Using a No. 2 Phillips Screw Driver remove the (3) screws from the hinge area as shown
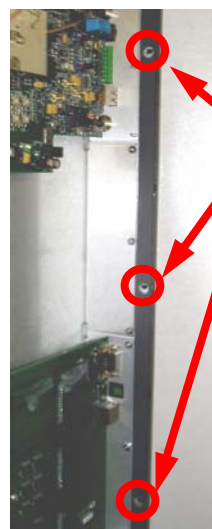
Step 5c – Use the fold-out handle to remove the Remote Control I/O and Audio Input Access Panel

Ethernet Port

Figure 8 – Remote Control I/O Access Panel Removal

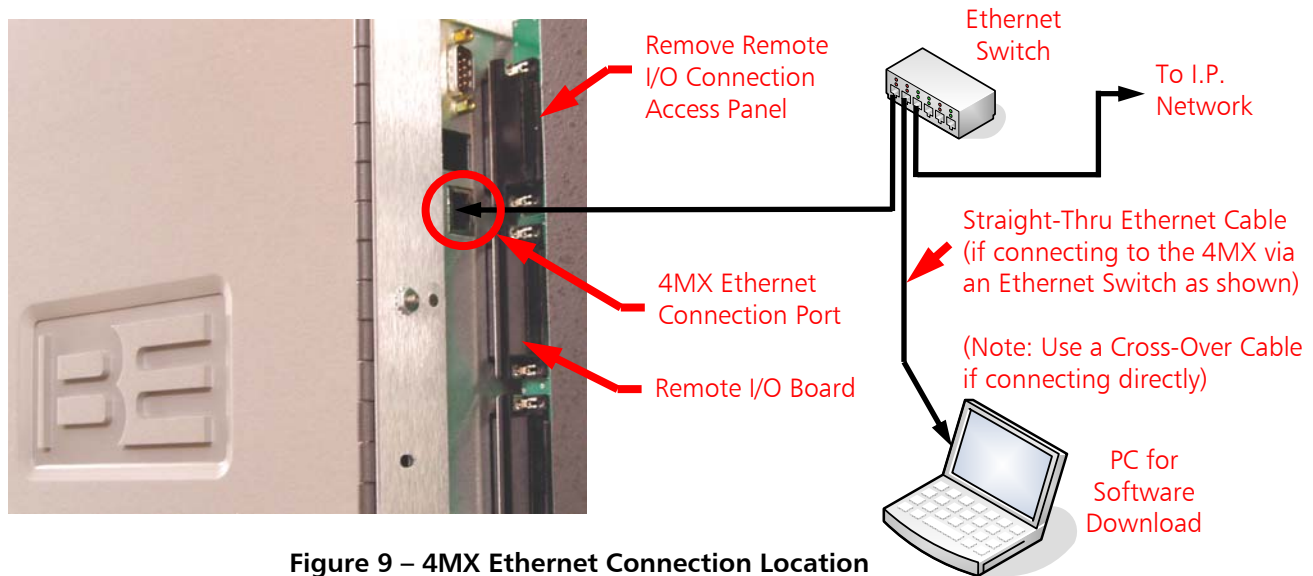**Figure 9 – 4MX Ethernet Connection Location**

Step 6 – Next, connect an Ethernet cable from your PC to the 4MX. If connecting to the transmitter via a network switch or hub, use a Straight-Thru Ethernet cable as illustrated. If connecting directly from the PC to the 4MX, use a Cross-Over Ethernet cable (in high RF environments route and wrap the cable through a ferrite ring).

Step 7 – To verify communication, type the transmitter's I.P. address into a web browser. If communication can be established a picture of the 4MX Transmitter Series will appear.

**Figure 10 – 4MX Webpage**

Step 8 – Close web browser.

Step 9 – Turn the transmitter's **RF Output Power OFF** either from the Main Menu or by depressing the front panel button.

⚠ **NOTE: The 4MX Transmitter's RF Output MUST be OFF during the entire Software Upgrade Process!**

⚠ **NOTE: Ensure that AC Power does remain ON during the Software Upgrade Process! After downloading software to the transmitter, AC Power to the transmitter MUST then be cycled for the upgrades to take effect. Customers should plan for the transmitter to be off of the air for approximately 30 minutes for the entire process.**
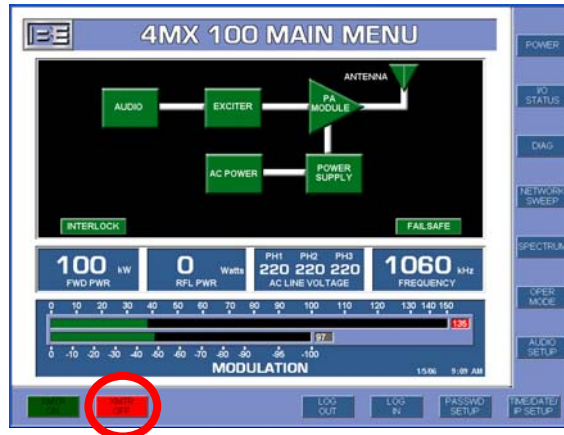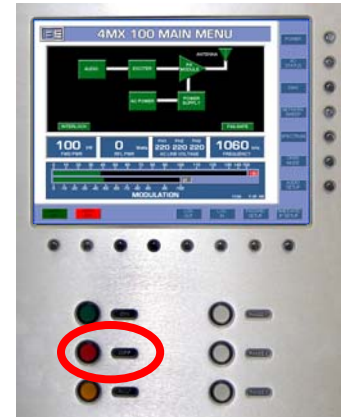

- OR -

Figure 11 – Turn the RF Output Power OFF

Step 10 – On the PC, using Windows Explorer, navigate to the directory on the hard drive of the PC where you copied the upgrade files to and double click on the **BEAutoUpdate** application icon.

Figure 12 – Software Update Application Icon

Step 11 – Once the **BEAutoUpdate** application launches, enter the I.P. Address of the 4MX Transmitter, select the desired "**Target**", and then select **Update**. Only one target may be selected at a time.

If more than one "**Target**" needs to be updated, ensure that they are loaded in the following order.

1) Controller PCB – Display Micro
2) Exciter
3) Controller PCB – Control Micro (includes PA & PS Modules update code)
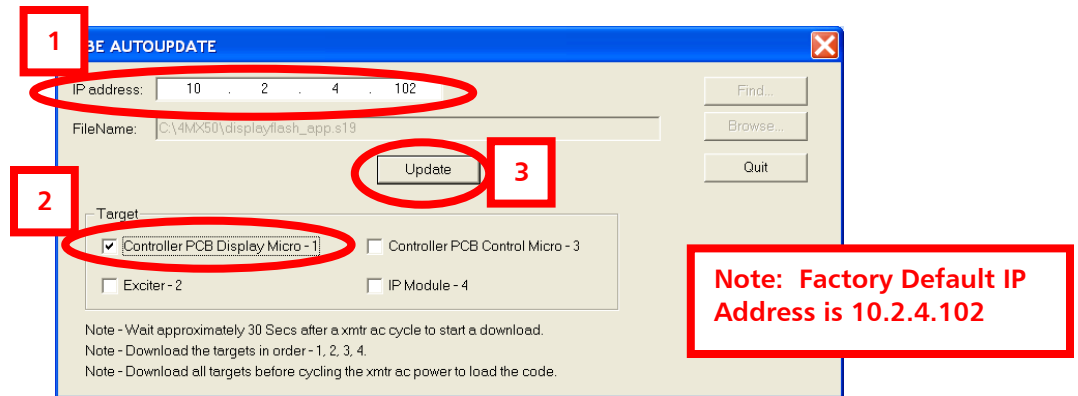4) IP Module

Figure 13 – Software Update Application

NOTE: Should the I.P. connection be lost during the Software Upgrade Process, see section 1.9 for instructions on how to proceed.

Step 12 – Once a "**Target**" has been updated, the following screen will appear. Click **OK** to dismiss.
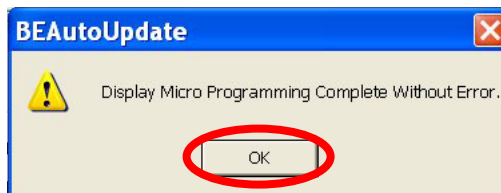

Figure 14 – Software Update Complete

Step 13 – Repeat **Steps 10 thru 12** for each "**Target**" to be updated.

Step 14 – Close the **BEAutoUpdate** application by selecting **"Quit".**

Step 15 – After **ALL** desired targets have been updated, you **MUST** then turn the Transmitter's AC Power **OFF**, and then back **ON** for the software updates to take affect.

Turn the AC Breaker **OFF** and then back **ON** after **ALL** desired targets have been updated

Figure 15 – Turn the 4MX AC Breaker OFF then back ON after ALL Targets Have Been Updated

Step 16 – If the 4MX Software Upgrade included new versions of PA Module Micro and/or PS Module Micro Software proceed to **Step 17** (determined by comparing the current version number **Fields #4 and #5** to the upgrade version number) if not, proceed to **Step 16a**.
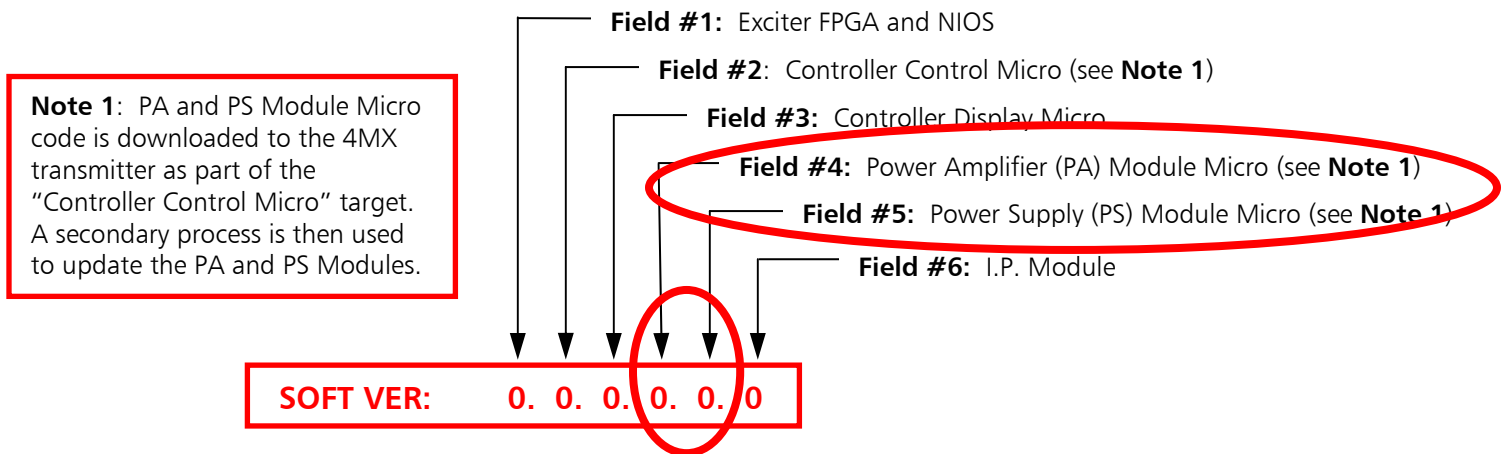
Field #1: Exciter FPGA and NIOS

Field #2: Controller Control Micro (see **Note 1**)

Field #3: Controller Display Micro

Field #4: Power Amplifier (PA) Module Micro (see **Note 1**)

Field #5: Power Supply (PS) Module Micro (see **Note 1**)

Field #6: I.P. Module

Note 1: PA and PS Module Micro code is downloaded to the 4MX transmitter as part of the "Controller Control Micro" target. A secondary process is then used to update the PA and PS Modules.

SOFT VER: 0. 0. 0. 0. 0. 0

Figure 16 – Software Version Labeling

Step 16a – If the Software Upgrade did **NOT** include new versions of PA Module Micro and/or PS Module Micro Software, turn the transmitter's RF Output back ON from either Main Menu or Front Panel button. The transmitter will return to the RF Output Power level that the transmitter was set at prior to the Software Upgrade Process. This concludes the Software Upgrade process and no further steps are needed.
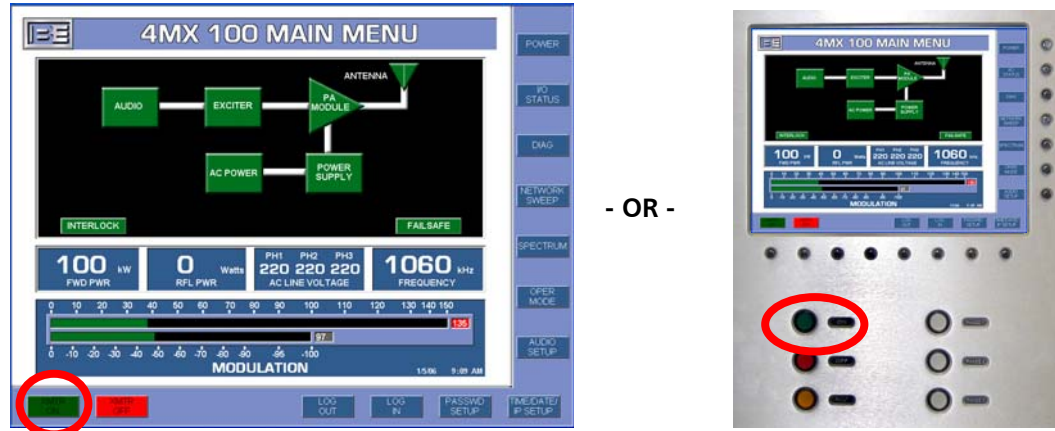

- OR -

Figure 17 – Turn the RF Output Power ON

Step 17 – If the 4MX Software Upgrade included new versions of PA Module Micro and/or PS Module Micro Software, from the Main Menu Screen select **DIAG**. After the Diagnostics Menu Screen appears, select **SOFTWARE UPDATE**.
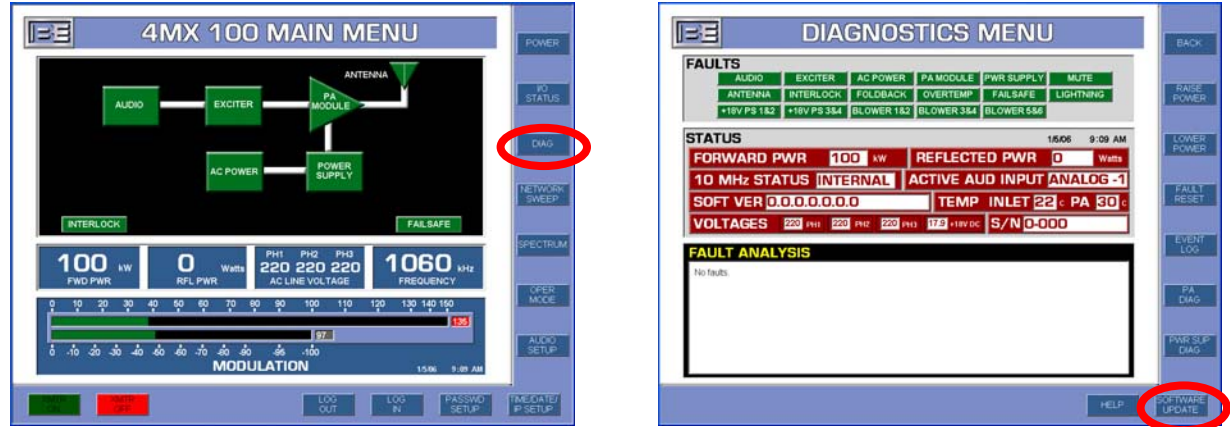

Figure 18 – Diagnostics Menu

Step 18 – After selecting **SOFTWARE UPDATE**, the login screen will appear. Only the "Chief Engineer" login (factory default is **123456**) has permission to the Software Update Menu.

Select **UPDATE PA** to update software in all of the 4MX PA Modules.

Select **UPDATE PS** to update software in all of the 4MX PS Modules.

Figure 19 – Software Update Menu

NOTE: See section 1.8 for PA and PS Software Update problem resolution.

Step 19 – Once all of the PA Modules and/or PS Modules have been updated, turn the Transmitter's AC Power OFF, and then back ON for the software updates to take affect.
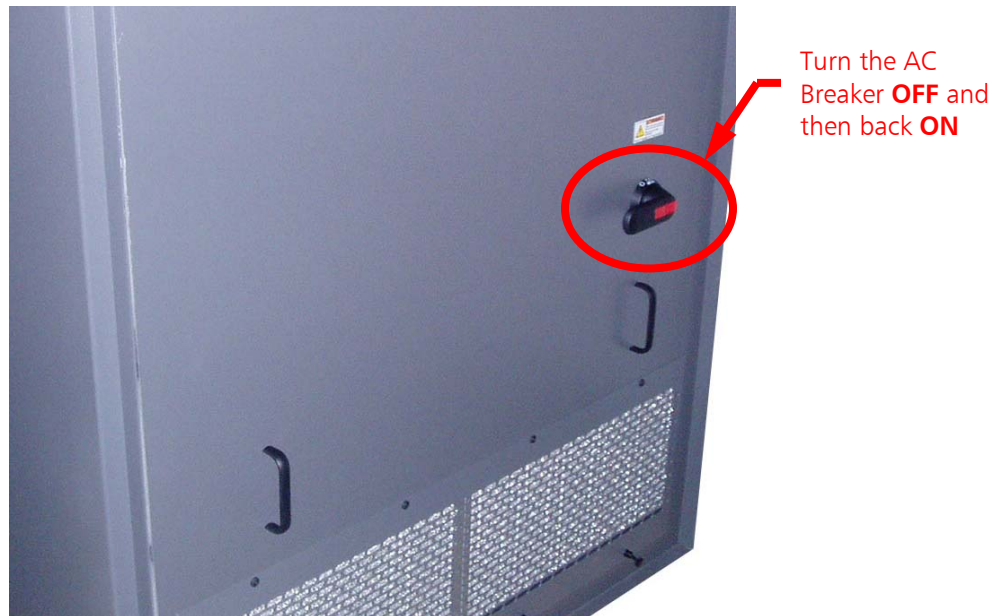

Figure 20 – Turn the 4MX AC Breaker OFF then back ON

Step 20 –   Verify that the Software Version has changed.

From the Main Menu select **DIAG** and the Diagnostics menu will appear. Compare the Software version to what was previously recorded in Section 1.4.
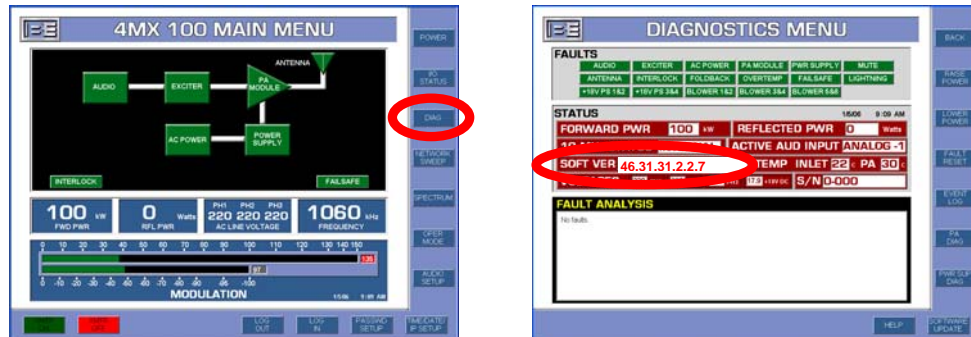

Figure 21 – Determine Current 4MX Software Version

Step 21 –   Turn the transmitter's RF Output to ON.
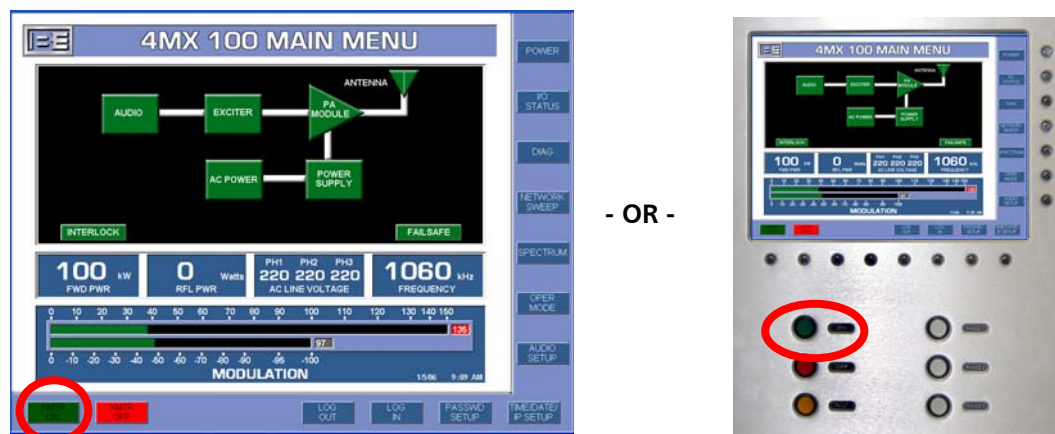

- OR -

Figure 22 – Turn the RF Output Power ON

1.8   PA and PS Software Update Problem Resolution

If a failure is encountered during the update of **PA Software**, do the following:
1) Ensure that the problematic PA Module is installed in the transmitter.
2) Ensure that the Ethernet Cable to the problematic PA Module is secure.
3) Reselect "Update PA" from the Software Update GUI Menu.
4) Turn the Transmitter's AC Power OFF and then back ON.

If a failure is encountered during the update of **PS Software**, do the following:
1) Ensure that the problematic PS Module is installed in the transmitter.
2) Reselect "Update PS" from the Software Update GUI Menu.
3) Turn the Transmitter's AC Power OFF and then back ON.

1.9   Loss of I.P. Connection During Download

There are (2) loss of I.P. connection scenarios that must be considered and handled differently. It is very important to differentiate between these scenarios before deciding which course of action to take.

1.9.1   Loss of I.P. Connection BEFORE the Target receives the new code

If you should loose the I.P. connection and the following "Programming Failed …" screen appears, start the process over.
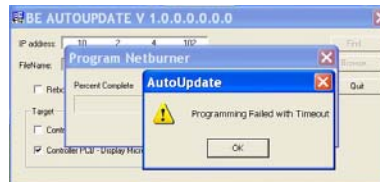

Figure 23 – Programming failed with Timeout Screen

1.9.2   Loss of I.P. Connection AFTER the Target receives the new code

If you should loose the I.P. connection to the transmitter while the "Downloading Code To …" target screen is present, do the following:

1) Wait approximately 5 minutes (this allows the code to finish the programming process).
2) Turn the transmitter's AC Power OFF then back ON.
3) Close the software download tool on the PC.
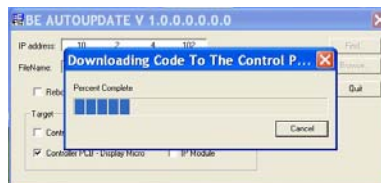4) Proceed with PA and PS Updates (if required).

Figure 24 – Downloading Code to "Target" Screen

2   RF Customer Service Contact Information

RF Customer Service -

Telephone: (217) 224-9617
E-Mail: rfservice@bdcast.com
Fax: (217) 224-6258