



Broadcast Electronics

4100 North 24th Street, Quincy, Illinois 62305 USA • Phone (217) 224-9600 • Fax (217) 224-9607 • www.bdcast.com • bdcast@bdcast.com



XPi 10 to XPi 10esp Exporter Upgrade Application Guide

597-0542-011 Revision B
06/7/2011

XPi 10 to XPi 10esp Exporter Upgrade Application Guide

©2011 Broadcast Electronics. All rights reserved.

The information in this publication is subject to improvement and change without notice. Although every effort is made to ensure the accuracy of the information in this manual, Broadcast Electronics Inc. accepts no responsibility for any errors or omissions. Broadcast Electronics Inc. reserves the right to modify and improve the design and specifications of the equipment in this manual without notice. Any modifications shall not adversely affect performance of the equipment so modified.

Proprietary Notice

This document contains proprietary data of Broadcast Electronics Inc. No part of this publication may be reproduced, transmitted, transcribed, stored in a retrieval system, translated into any other language in any form or by any means, electronic or mechanical, including photocopying or recording, for any purpose, without the express written permission of Broadcast Electronics Inc.

Trademarks

Broadcast Electronics and the BE logo are registered trademarks of Broadcast Electronics Inc.

All other trademarks are property of their respective owners.

Contents

1. XPI 10 esp Upgrade.....	3
1.1 Exciter Minimum requirements.....	4
1.2 Tools / Items Needed	4
1.3 Estimated Time for System Upgrade.....	4
1.4 Sequencing	5
1.5 Record Previous settings	5
1.6 Work sheets	6
1.7 Prepare for Installation of the XPI 10esp Exporter	14
• System Cabling	14
1.8 Power down the XPI 10.	14
1.9 Remove existing XPI.....	14
1.10 Connect the New XPI 10 esp.....	15
1.11 Setup XPI 10esp	15
2. Diagrams	17
3. Software Upgrades	17
3.1 Procedure - Upgrading XPI 10esp Software	17
4. RF Technical Service Contact Information	19

Figures

Figure 1 - HD Radio™ System Architecture (Typical Installation).....	3
Figure 2. System\System Configuration screen.	6
Figure 3. System\System Configuration\View Configuration screen.	6
Figure 4. System\GPS Data screen.	7
Figure 5. System\Local Time screen.	7
Figure 6. Platform\Link Configuration screen (1/2).....	8
Figure 7. Platform\Link Configuration screen (2/2).....	8
Figure 8. Station\Station Information Schedule screen (1/2).....	9
Figure 9. Station\Station Information Schedule screen (2/2).....	9
Figure 10. Station\Station Information screen (1/2).	10
Figure 11. Station\Station Information screen (2/2).	10
Figure 12. Station\Station Default PAD screen.	11
Figure 13. Audio\Analog Audio Diversity screen.	11
Figure 14. Audio\Audio Bypass screen.	12
Figure 15. Audio\Audio Level Control screen.	12
Figure 16. Audio\Digital Audio Configuration screen.....	13
Figure 17. XPI 10esp rear panel	16



1. XPi 10 esp Upgrade

Broadcast Electronics XPi 10esp Exporter and FXi 60/250 Exciter (w/Engine card) together enable the next Generation of HD Radio™ System Architecture. For detailed instructions regarding the hardware installation of the XPi 10esp Exporter please see “XPi 10esp Exporter Quick Installation Guide, 597-0542-XM4”. This document is accessed on the B.E. website using the link:

<http://www.bdcast.com/information-center/manuals/>

The Remote Graphical User Interface Java Application “XPi.jar” and the latest versions of embedded software are included in the USB drive that is shipped with the XPi10esp package. This software can also be downloaded from the B.E. website at the link here:

<http://www.bdcast.com/information-center/product-information>

The main function of the XPi 10esp Exporter is to receive audio and data from the IDi 20 Data Importer and/or other audio processing equipment, then compress this audio and data for delivery via Ethernet to the Engine card in the FXi 60/250 Exciter. The Engine card receives the compressed Ethernet audio and data and creates OFDM data carriers for HD Radio™. FM signals are then added to the OFDM carriers by the Exciter for reception by HD Radio™ receivers.

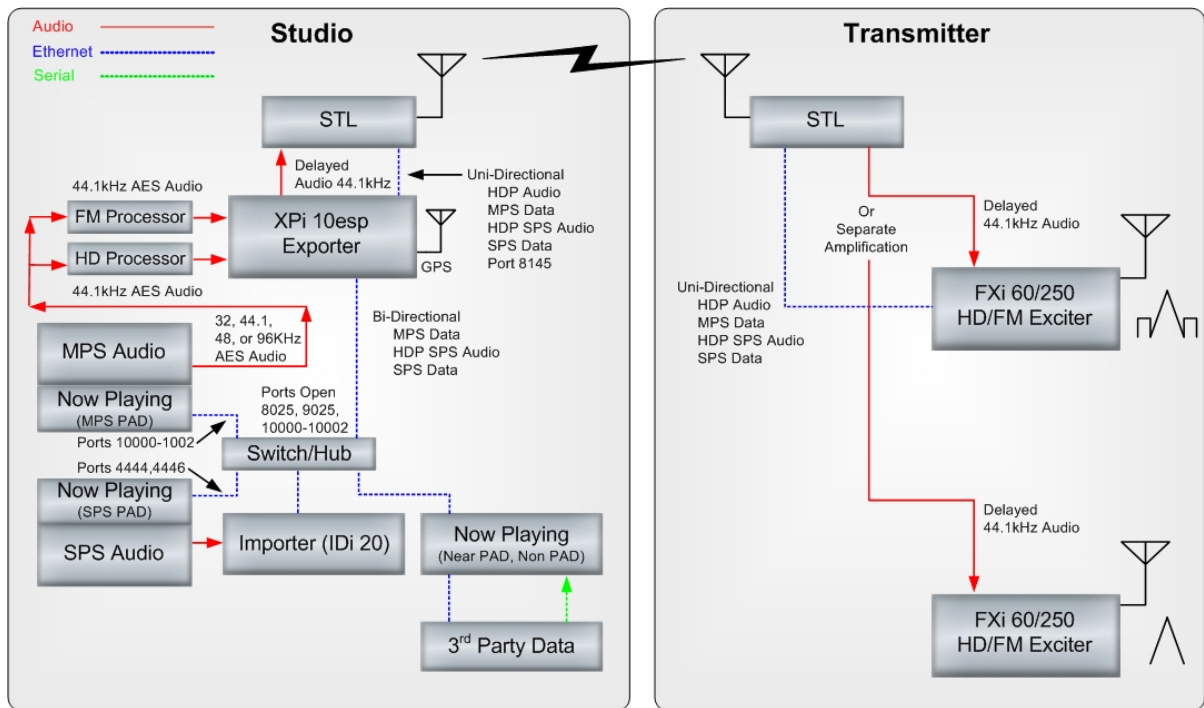


Figure 1 - HD Radio™ System Architecture (Typical Installation)

This application guide is targeted towards the user that is removing a legacy XPi-10 Exporter and replacing it with an XPi-10 esp in the same location. There are basically four different scenarios for installation; single or dual audio processors each with the exporter being installed at the studio, or at the transmitter site. Where the Exporter is located at does not significantly change the installation of the exporter relative to the other equipment with the exception of the dual processors that will be after the exporter instead of before it, however all criteria should be researched before reconfiguration of your system.

1.1 Exciter Minimum requirements

The Engine card in the exciter must have a minimum level of hardware and a minimum level of firmware to function with the XPi esp Exporter. Installations that utilized an FSi signal generator must have an Engine board in the exciter in place of the IBOC board, order kit 909-0600.

Before you begin replacing your Exporter with the XPi esp, ensure your exciter has these minimum requirements:

- Engine Software code to v4.0 or greater.
- Engine hardware revision B or greater. This is the hardware of the Engine board in the exciter. If you are running Engine software code v4.0 or greater, your hardware version is adequate by default.
- The FXi60/250 Controller code to be V02.xx.41 or greater, (xx is the clock oscillator code version and not relevant to this upgrade).

NOTE: It is necessary that your system be updated to these minimum system requirements. Successful conversion to the XPi 10esp is not possible without these minimum software and hardware requirements. Perform these system level updates as needed to verify operation prior to removal of the original XPi.

NOTE: It is highly recommended that the XPi 10esp be connected to a DEDICATED ETHERNET PORT.

To update the code on your Engine board refer to Applications Guide “[Engine Card \(for FXi 60/250\) FW Upgrade Application Guide](#)” 597-0541-006.

To update the code on your FXi Controller board refer to Applications Guide “FXi Controller v02.xx.41 Software Upgrade, 597-0541-005.”

To replace the FSi IBOC card with the Engine board refer to Application Guide “FXi 60 / 250 Engine Upgrade” 597-0545.

Application guides are available on the Broadcast Electronics web site at <http://www.bdcast.com/information-center/application-guides/>.

1.2 Tools / Items Needed

- ☐ #2 Philips screw Driver
- ☐ #1 Philips screw Driver

1.3 Estimated Time for System Upgrade

Providing that you have the tools listed above, it will take approximately 50 minutes to replace and set up your XPi-10 esp. If additional upgrades are required, the total procedure will be longer. The transmission will be off of the air during this process since you will be disconnecting the audio cables.



1.4 Sequencing

Ideally, an upgrade would allow you to change only one thing at a time and check to see if the upgrade works correctly. However, there are some instances where you may have to change two things at one time. Example: changing the Exporter that requires you also update the software in the Engine makes it more difficult to troubleshoot in the event something does not function properly. That being said, try to minimize the number of possibilities (system changes) that could lead to a need to troubleshoot the system.

It is recommended to update the Engine software (if needed) first, then try the system. The Exciter and Exporter could be set up on the workbench to more easily confirm the two work together fully. After the Exciter/Engine work together and the Importer also needs an upgrade due to the fact that the Exporter may have needed an update, then perform the Importer update and verification.

If your system has not been kept up to date on software revisions, it may require you to update all key components in the system; Engine software, Importer software and Exciter Controller code.

1.5 Record Previous settings

Navigate into the XPi-10 screens and record the user settings on the following screens. These settings will be entered into new/different screens of the XPi-10 esp. The fields in the following figures have been left blank to allow you a location to fill in the fields for reference during the new configuration. The path to each of the screens is written below each screen in the format of the first Home page button push, followed by a (\) then the subsequent screen button push or pushes.

Record these settings in the worksheets below for future reference when you set up your new XPi 10esp.

1.6 Work sheets

Fill in the worksheets below for setup reference on your new XPI 10esp.

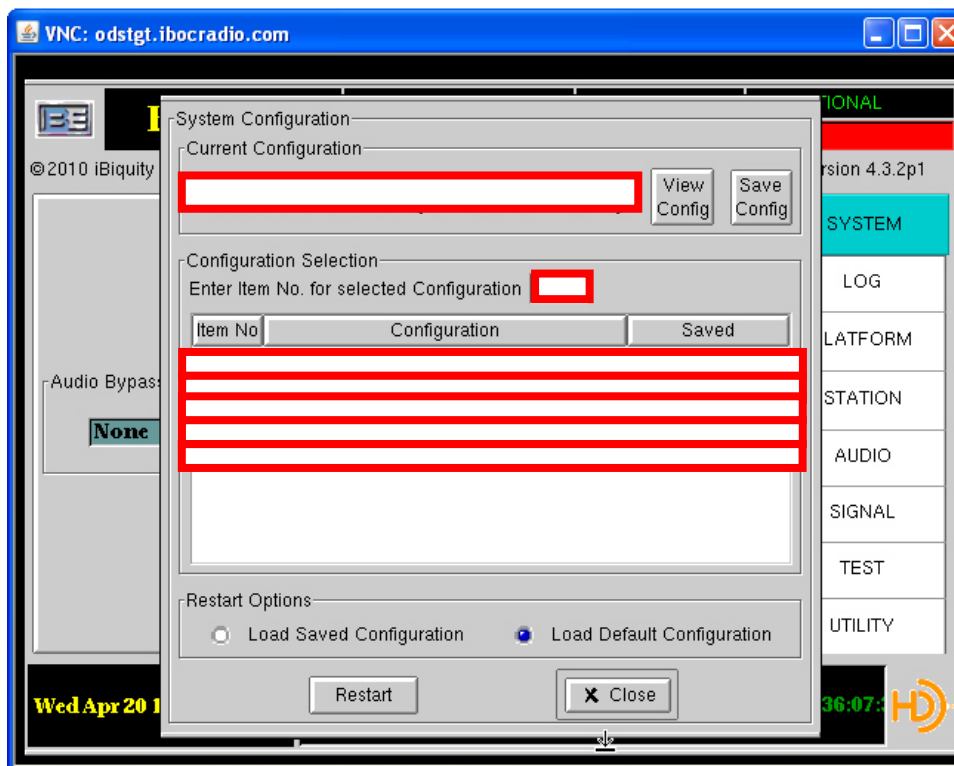


Figure 2. System\System Configuration screen.

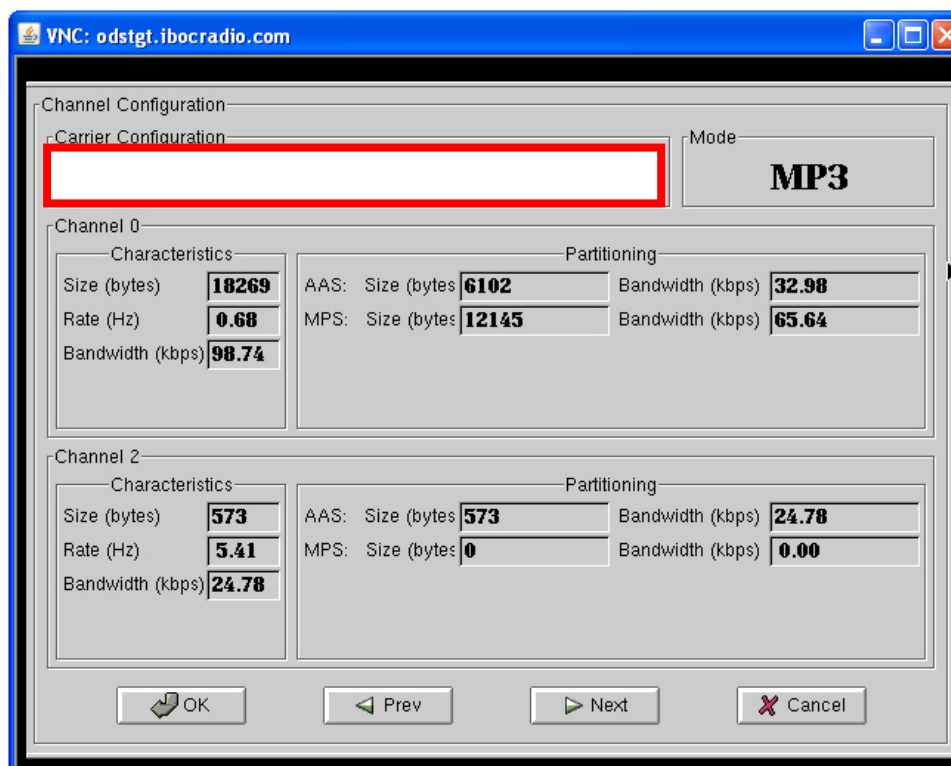


Figure 3. System\System Configuration\View Configuration screen.



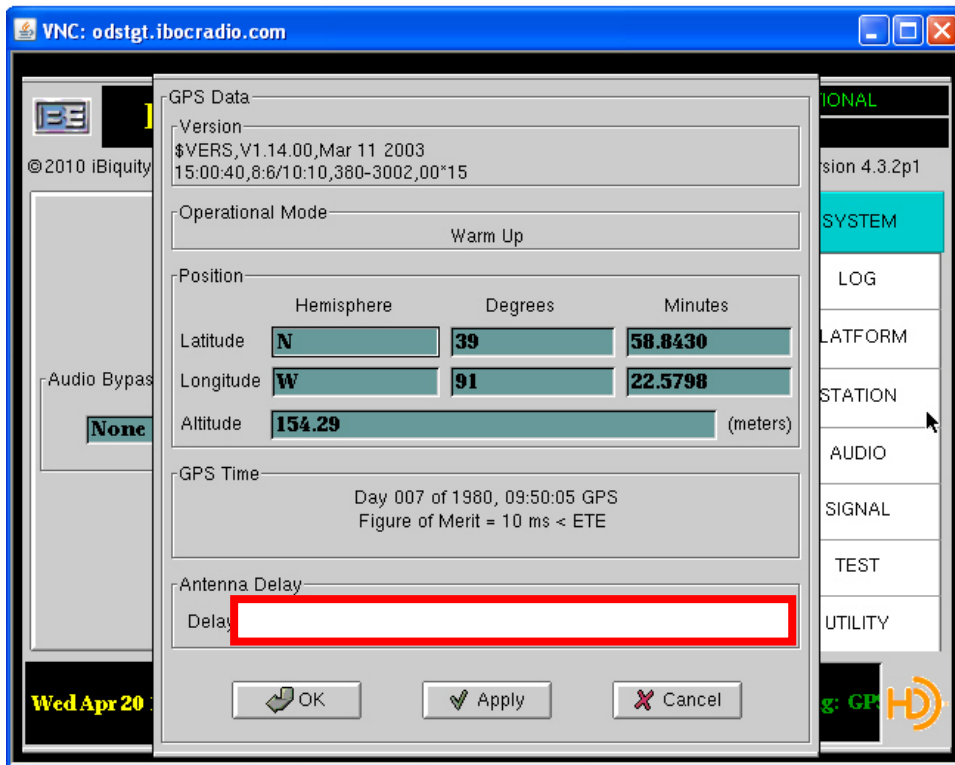


Figure 4. System\GPS Data screen.

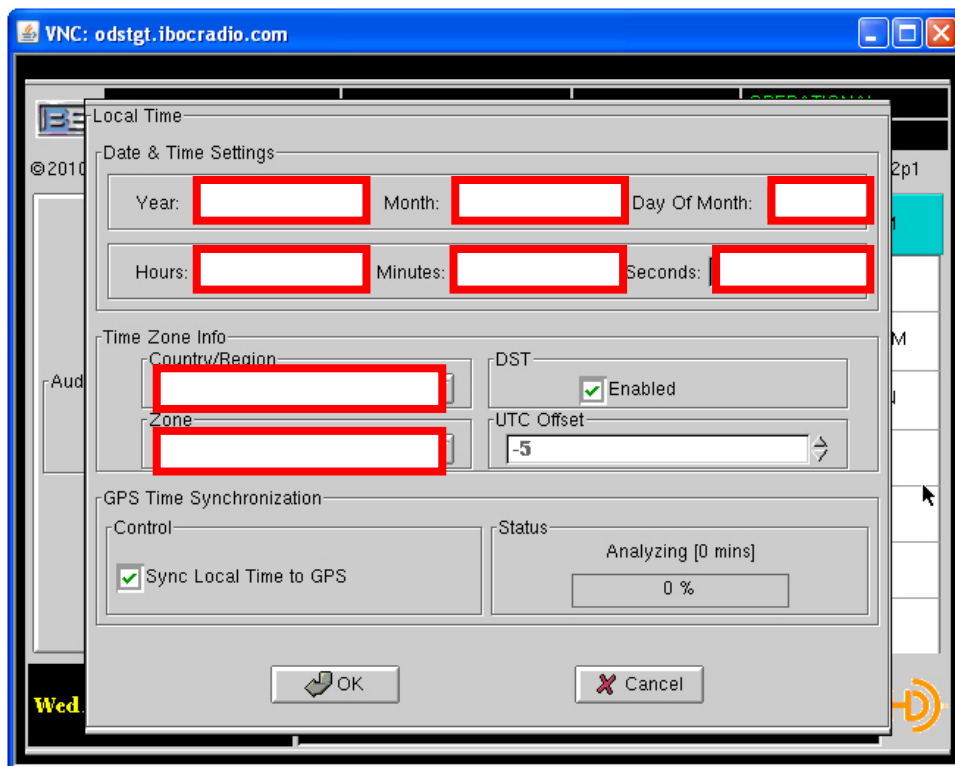


Figure 5. System\Local Time screen.

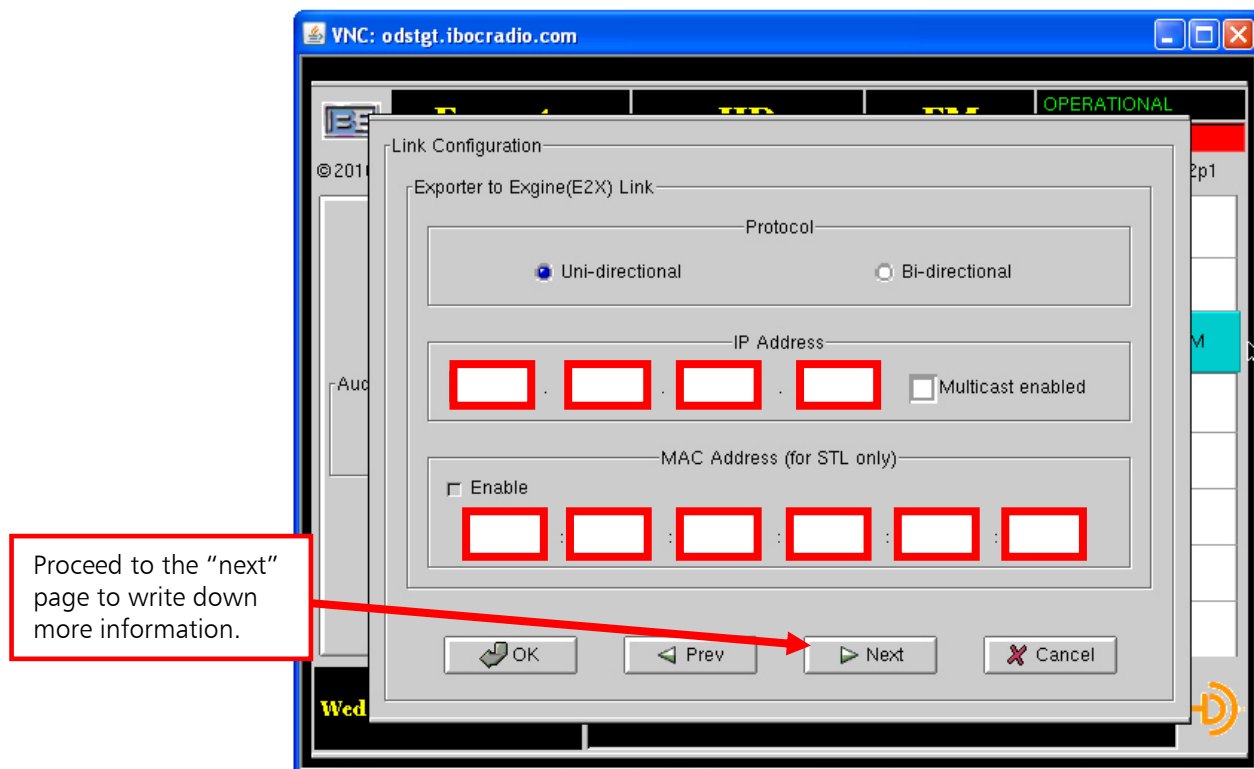


Figure 6. Platform\Link Configuration screen (1/2).

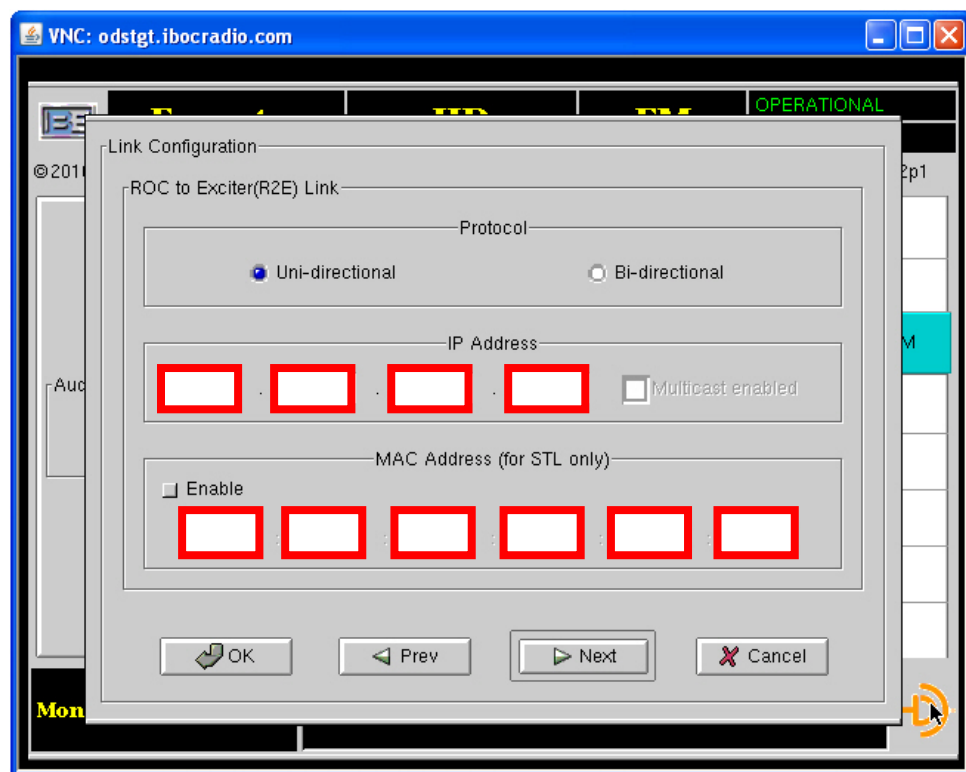


Figure 7. Platform\Link Configuration screen (2/2).

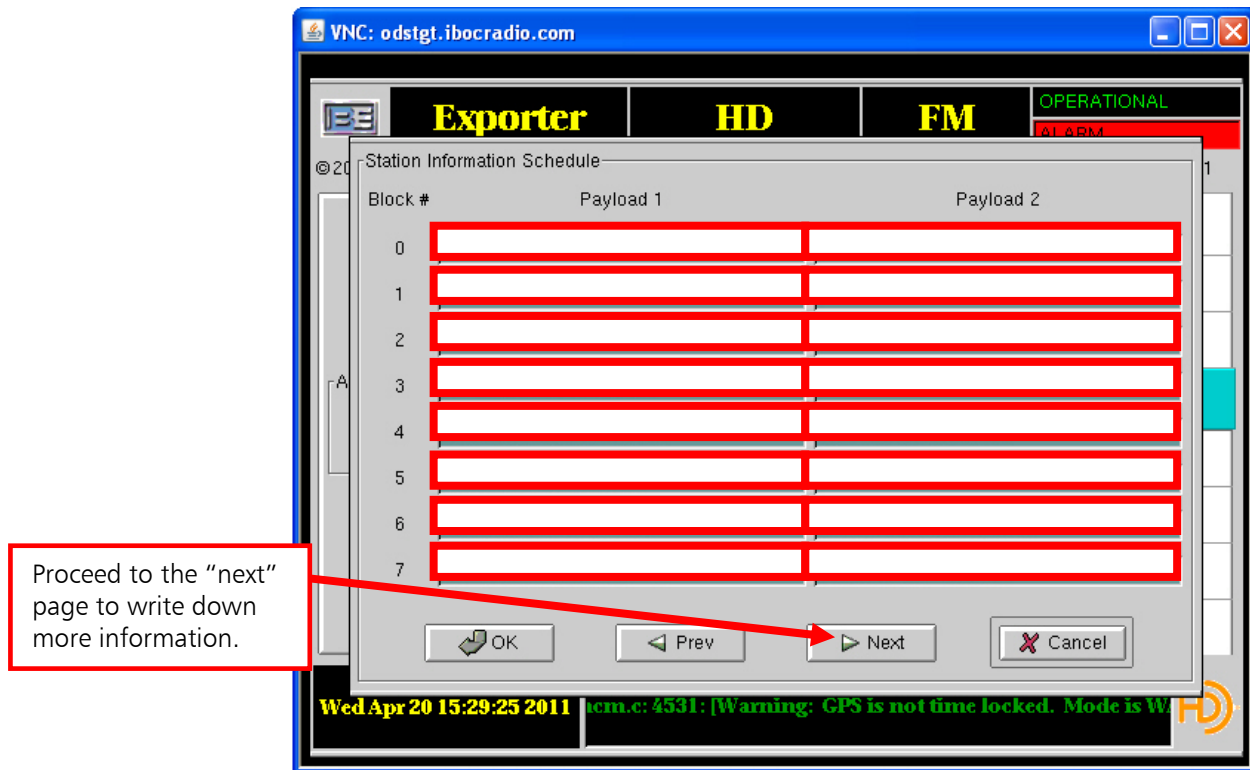


Figure 8. Station\Station Information Schedule screen (1/2).

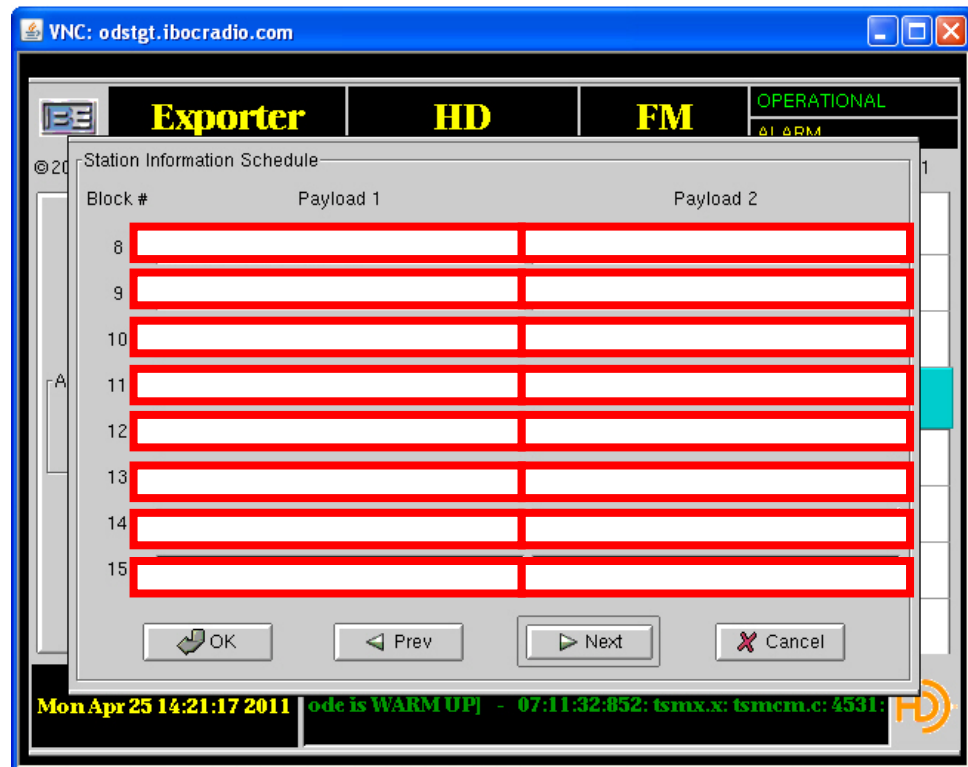


Figure 9. Station\Station Information Schedule screen (2/2).

VNC: odstgt.ibocradio.com

Station Information

Station Identification

FCC ID Country Code

Call Sign

Standard Universal

Append "-FM"

Station Slogan

Standard Universal

Enable both standard and universal formats

Station Message

High Priority

OK Cancel

Figure 10. Station\Station Information screen (1/2).

VNC: odstgt.ibocradio.com

Station Information

Station Identification

FCC ID Country Code

Call Sign

Standard Universal

Append "-FM"

Station Slogan

Standard Universal

Enable both standard and universal formats

Station Message

High Priority

OK Cancel

Figure 11. Station\Station Information screen (2/2).

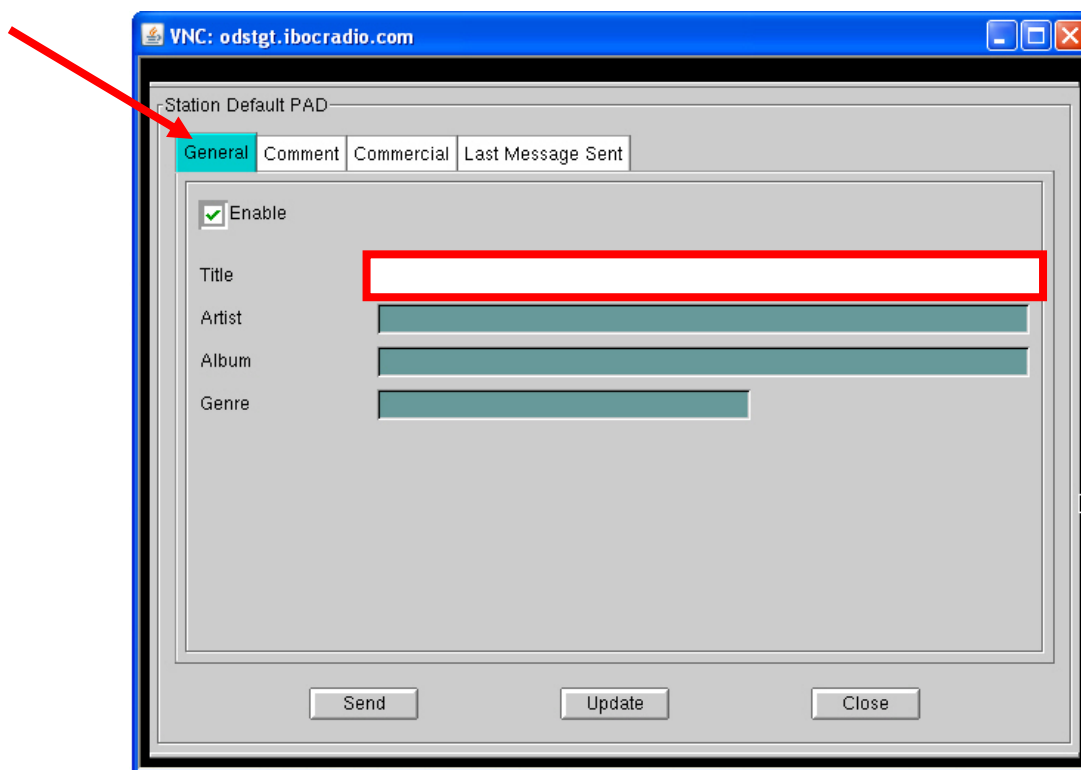


Figure 12. Station\Station Default PAD screen.

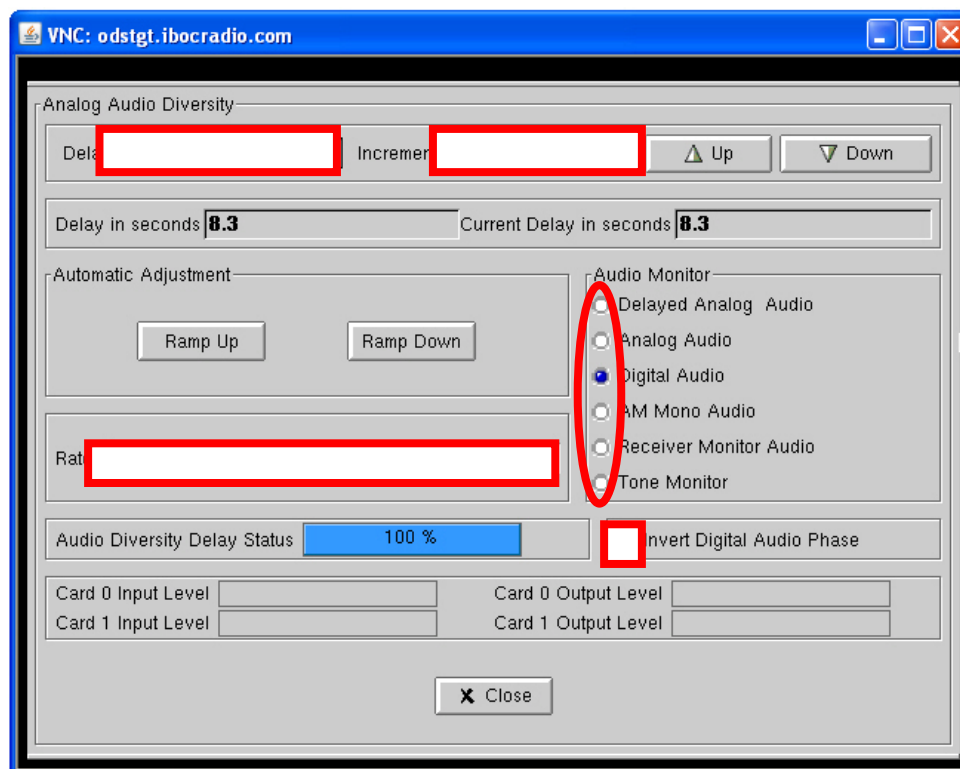


Figure 13. Audio\Analog Audio Diversity screen.



Figure 14. Audio\Audio Bypass screen.

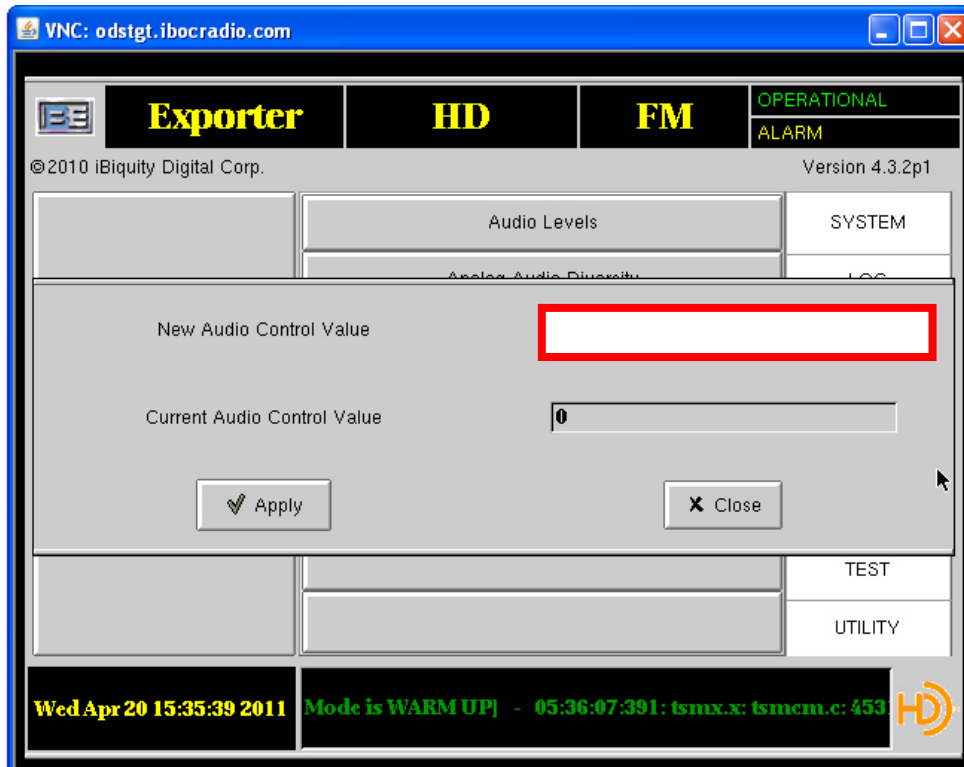


Figure 15. Audio\Audio Level Control screen.

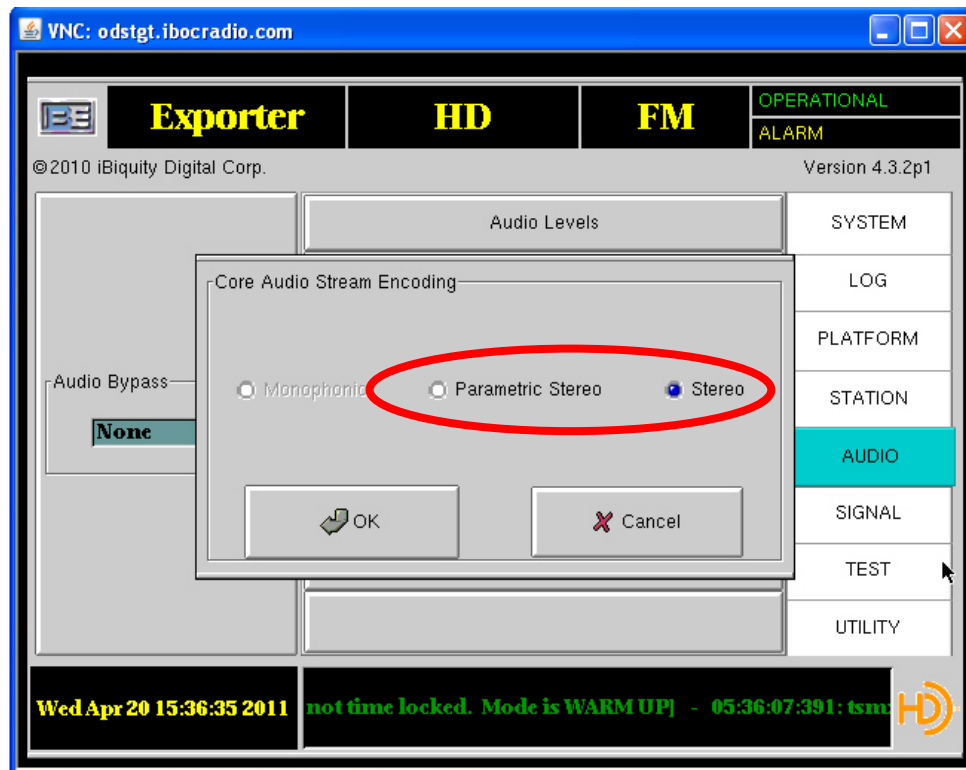


Figure 16. Audio\Digital Audio Configuration screen.

1.7 Prepare for Installation of the XPi 10esp Exporter

- **System Cabling**

The Upgrade Kit for the XPi 10esp Exporter contains the necessary System Interconnect Cables for the Audio Paths.

The Upgrade Kit does not contain the Ethernet cables, Ethernet switches, or hubs.

Refer to the HD Radio™ System Interconnect Diagrams for additional information regarding the type of system you are implementing as well as cable identification.

Also refer to the XPi 10esp Exporter Quick Installation Guide 597-0542-XM4 for the different cable configurations.

1.8 Power down the XPi 10.

Properly shutdown and turn off the power to the XPi. Referring to the tables and the diagrams at the end of this guide, first remove the cables attached to the XPi 10 exporter noting the location of where the cables went. Depending on your site configuration and ancillary equipment, in some cases, you will remove the AES Splitter 809-0830 and not reuse it.

Remove the cables connected to the following ports on the rear of the XPi:

- 44.1 KHZ WORDCLOCK (studio installations only)
- GPS ANT ON (transmitter installations only)
- IBOC AES OUT
- IBOC AES IN
- STUDIO AES IN
- BYPASS STUDIO AES IN
- FM AES OUT TO STL/TX

In addition, you will need to remove the following from the rack:

- AES SPLITTER
- Audio cable going into the AES SPLITTER at the FM/HD Audio Processor.

1.9 Remove existing XPi

Remove the XPi from the rack. You typically will need a #2 Philips screw driver to remove the 4 rack mount screws from the front. Use caution when pulling it out of the rack to ensure you are supporting it before pulling it fully out of the rack.

Install the new XPi 10esp into the rack space previously holding the XPi 10. The new Exporter is 2 RU high, so you may want to install a 2 RU filler panel (not provided) to fill the space left by the original XPi.



1.10 Connect the New XPI 10 esp

Referring to the figures at the end of this guide, or in the XPI 10esp manual, connect the cabling previously disconnected from the original unit. NOTE: that you may not use the AES Audio splitter in all applications. Refer to the figures at the end of the guide for an application that closely resembles your situation.

1.11 Setup XPI 10esp

Referring to the XPI 10esp Exporter Quick Installation Guide, connect a PC to the serial port. Turn on the XPI 10esp and setup the Remote GUI Port IP Information. Then using the XPI 10esp Exporter Quick Installation Guide setup procedure and the worksheets you filled out at the beginning of this guide, enter the user settings into the new screens.

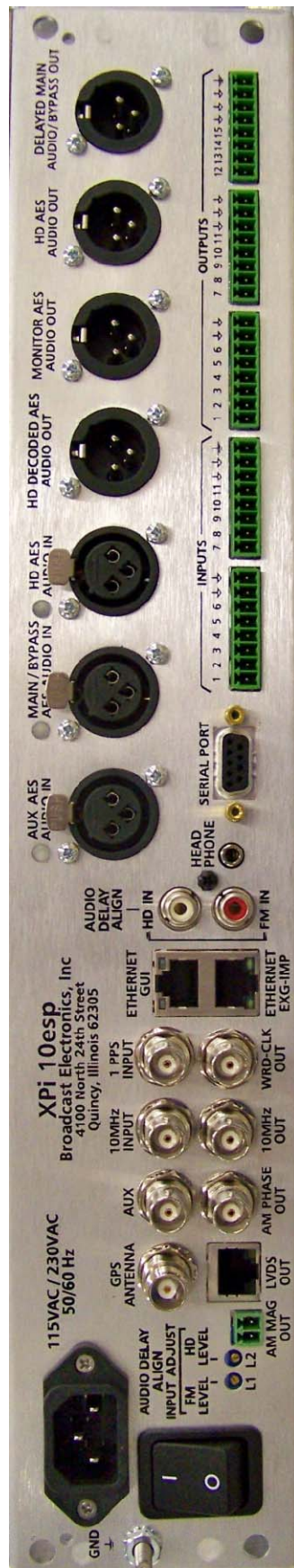


Figure 17. XPi 10esp rear panel

2. Diagrams

Shown below are the interconnect diagrams for various different configurations. Locate the drawing that best matches your installation.

3. Software Upgrades

The latest versions of software for the XPi 10esp Exporter are available from the Broadcast Electronics Customer Service website under the Registered User Login section:

<http://www.bdcast.com/information-center/product-information/>

Detailed instructions for any software upgrades are in the appropriate application guide:

<http://www.bdcast.com/information-center/application-guides/>

3.1 Procedure - Upgrading XPi 10esp Software

The XPi 10esp software can be upgraded in the field. The software is upgraded using the XPi 10esp AutoUpdate application.



NOTE: IT IS RECOMMENDED THE COMPUTER BE ON THE SAME LOCAL NETWORK AS THE XPi 10esp.



NOTE: DO NOT CYCLE THE AC POWER DURING THE UPDATE PROCESS. ENSURE THE CODE HAS BEEN INSTALLED BEFORE AC POWER IS CYCLED.

1. Connect the XPi 10esp GUI port to the PC or network/I.P. For normal network/I.P. connections, ensure a normal Ethernet patch cable is connected between the XPi 10esp GUI port and the network. If a PC is to be directly connected to the XPi 10esp, connect an Ethernet crossover cable between the PC Ethernet port and the XPi 10esp GUI port. For direct PC connections, the PC must be configured for the I.P. family of the XPi 10esp. Ensure the PC is configured for the XPi 10esp I.P. family.
2. Using Windows Explorer, copy all of the software files to a folder on the hard drive "C:\\" of the PC. Unzip the files (if they have been zipped) ensuring that all of the files remain in the "XPi 10esp Upgrade" directory.
3. On the PC, terminate all running programs.
4. Terminate all XPi 10esp I.P. users.
5. 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 **AutoUpdate.exe** application icon.
The AutoUpdate program will appear.
6. Once the **AutoUpdate** application has launched, enter the XPi 10esp GUI I.P. Address.



NOTE: DO NOT CYCLE THE AC POWER DURING THE UPDATE PROCESS.



NOTE: IF A PROBLEM OCCURS, SELECT CANCEL TO STOP THE DOWNLOAD.

7. Select DOWNLOAD.
The status bar presents the progress of the download and update process.
8. When finished, select QUIT.
9. Cycle the AC power (operate to off then on) to activate the code.



10. Access the DIAGNOSTICS menu and check the software.

If the download fails such as from a lost I.P. connection, repeat the procedure.



4. RF Technical Service Contact Information

RF Technical Service -

Telephone: (217) 224-9617

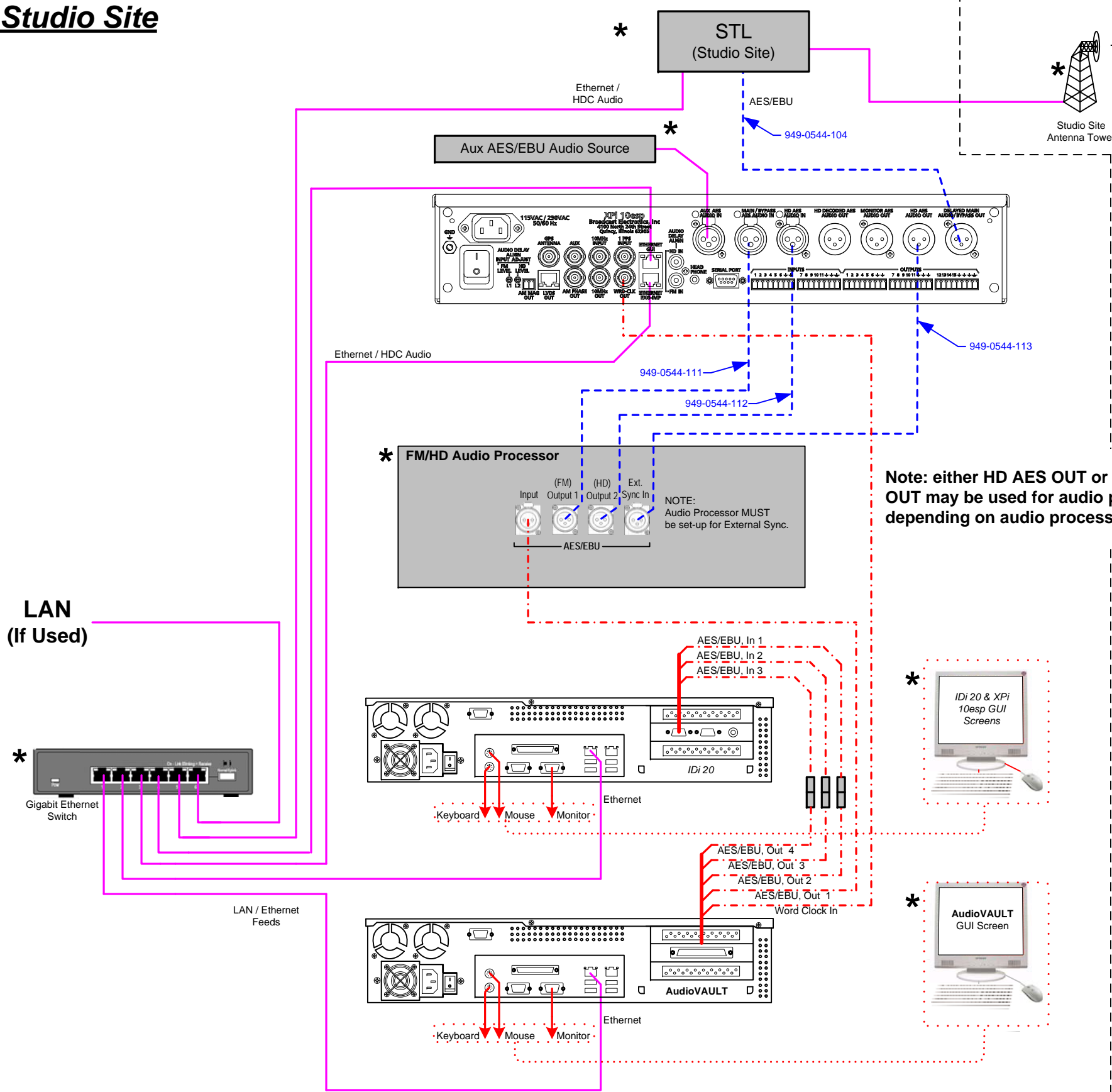
E-Mail: rfservice@bdcast.com

Fax: (217) 224-6258

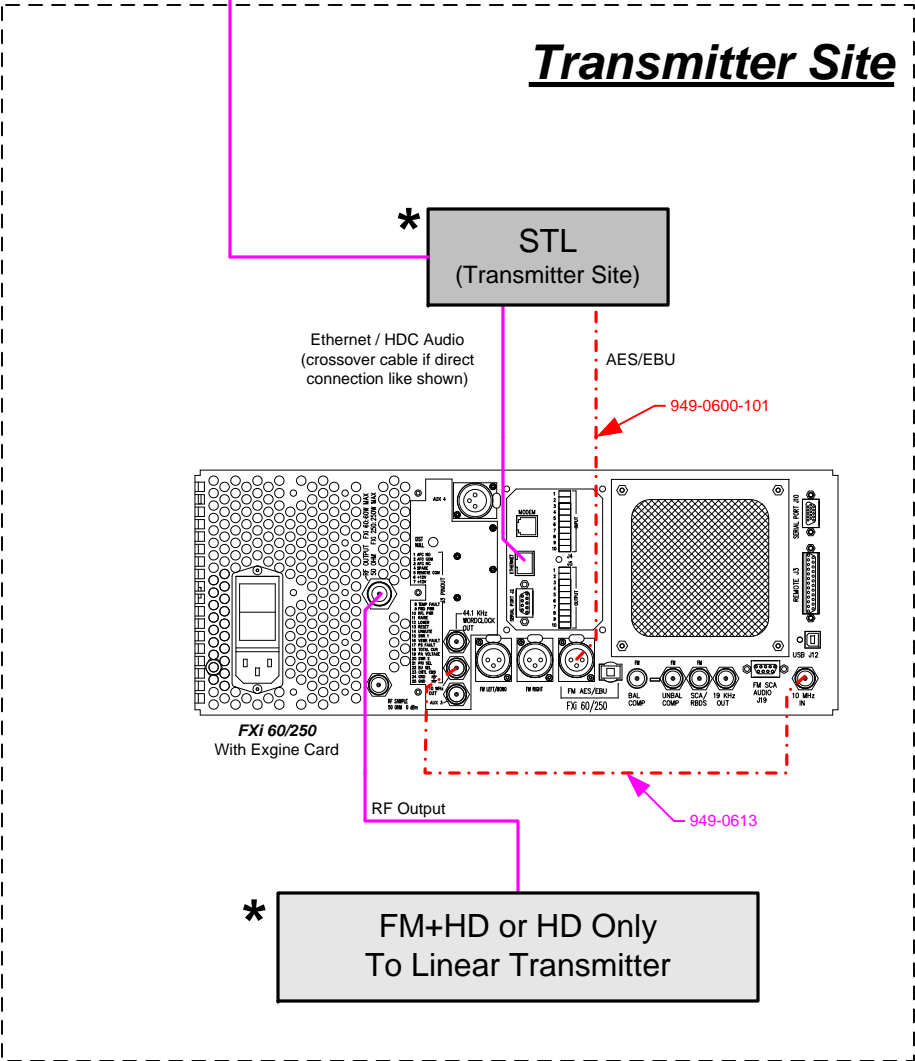
www.bdcast.com



Studio Site



Transmitter Site



Note: either HD AES OUT or HD DECODED AES OUT may be used for audio processor feedback depending on audio processing desired.

NOTE: Category 6 Ethernet Cables and Gigabit Ethernet Switches or Hubs are recommended for all Studio & Transmitter Site Ethernet / HDC Audio connections.

FIGURE 2 – XPi 10 esp at Studio Site

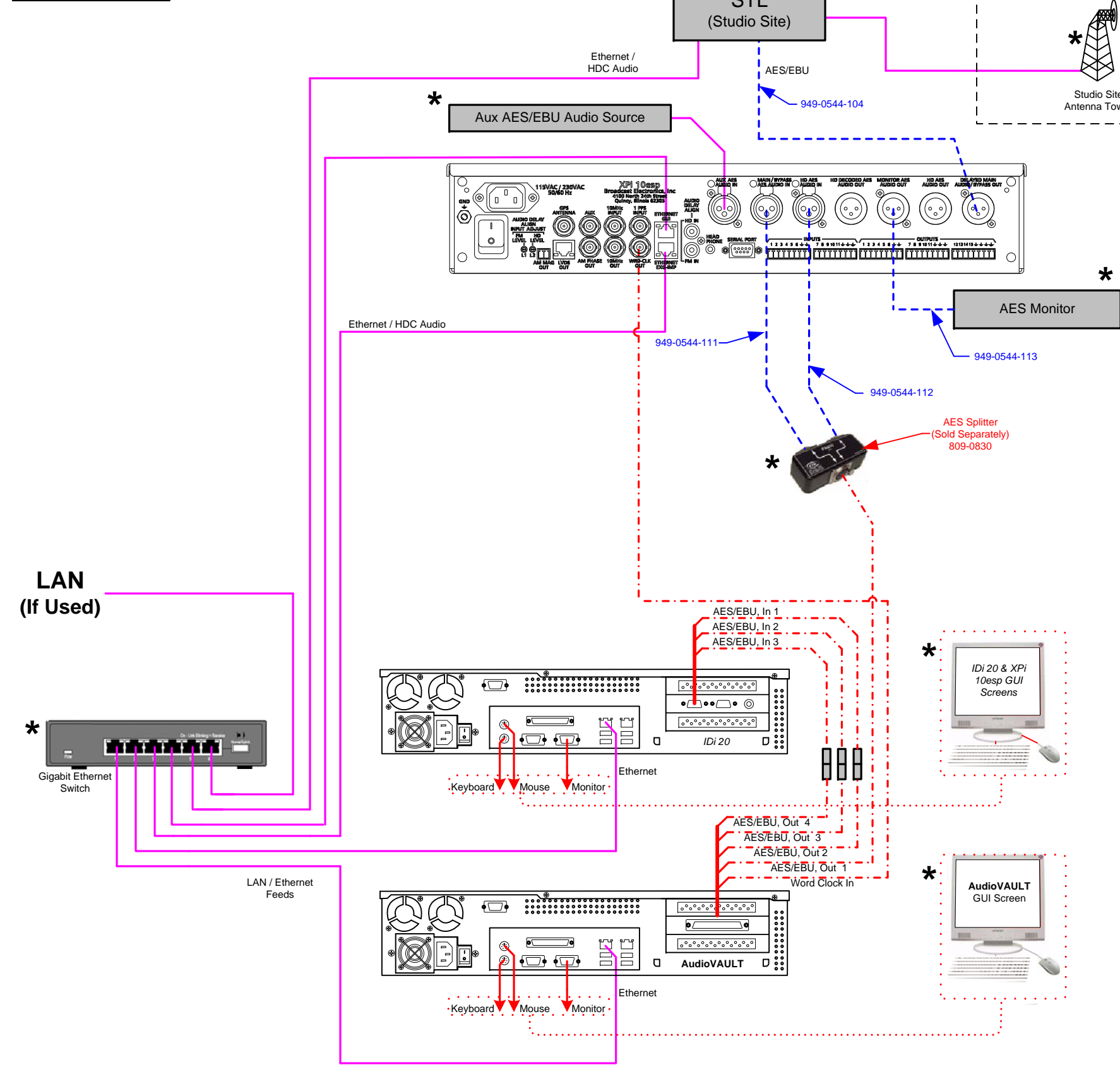
- Cable Legend -

- Supplied in XPi 10 esp Installation Kit (979-6100) (Blue dashed line)
- Supplied in Other Product Installation Kits (Subject to Change) (Red dashed line)
- STL, GPS, Networking Cables/Equipment Supplied by the Customer (Magenta solid line)

Broadcast Electronics, Inc.
IDI 20 Importer with MPS & 3 SPS Channels
Single Audio Processor
XPi 10esp Exporter
FXi 60/250 Exciter (w/Exigine)

* : Equipment may not be manufactured by Broadcast Electronics, Inc.

Studio Site

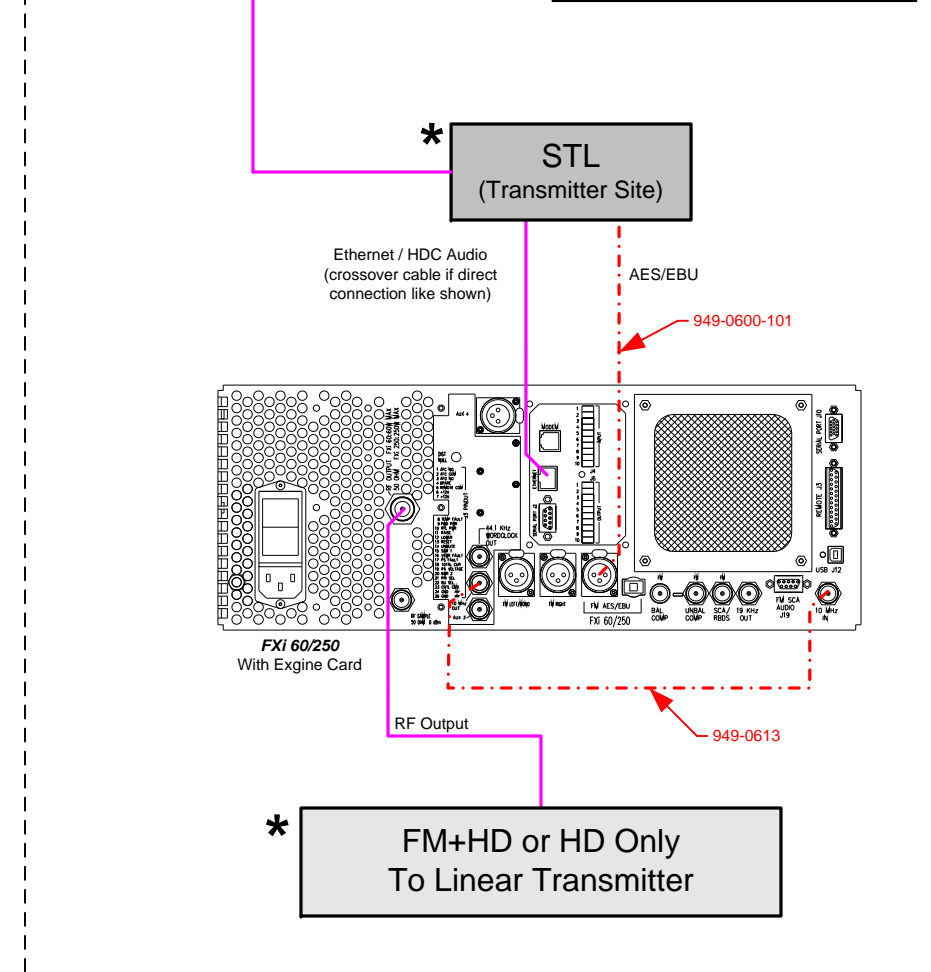


* : Equipment may not be manufactured by Broadcast Electronics, Inc.

STL May Be Uni-Directional



Transmitter Site



NOTE: Category 6 Ethernet Cables and Gigabit Ethernet Switches or Hubs are recommended for all Studio & Transmitter Site Ethernet / HDC Audio connections.

FIGURE 3 – XPi 10 esp at Studio Site

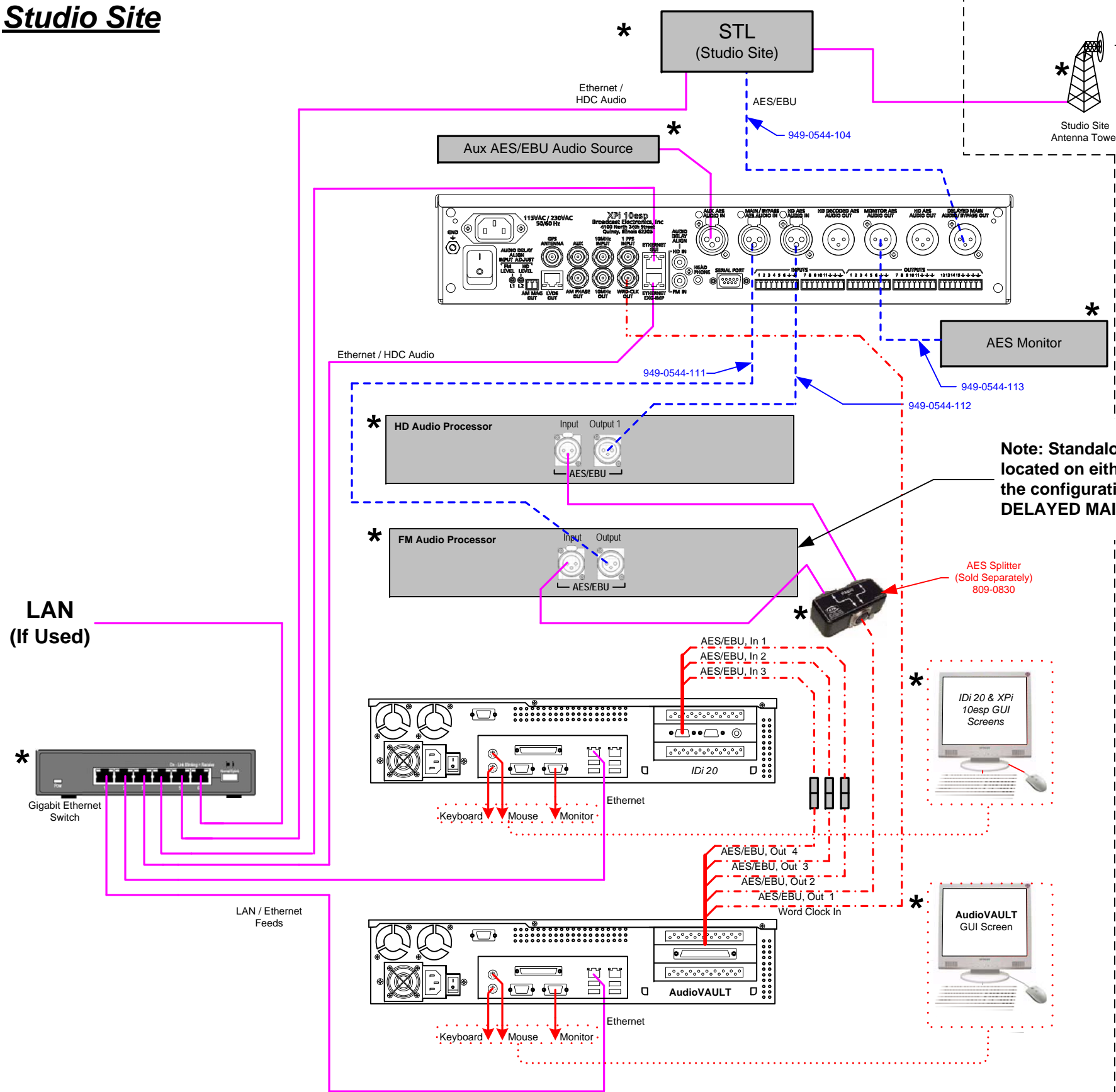
- Cable Legend -

- Supplied in XPi 10 esp Installation Kit (979-6100) -----
- Supplied in Other Product Installation Kits (Subject to Change) -----
- STL, GPS, Networking Cables/Equipment Supplied by the Customer -----

Broadcast Electronics, Inc.
IDi 20 Importer with MPS & 3 SPS Channels
XPi 10esp Exporter
Fxi 60/250 Exciter (w/Exigine)

DRAWING NOT TO SCALE
 ©2011 BROADCAST ELECTRONICS, INC.

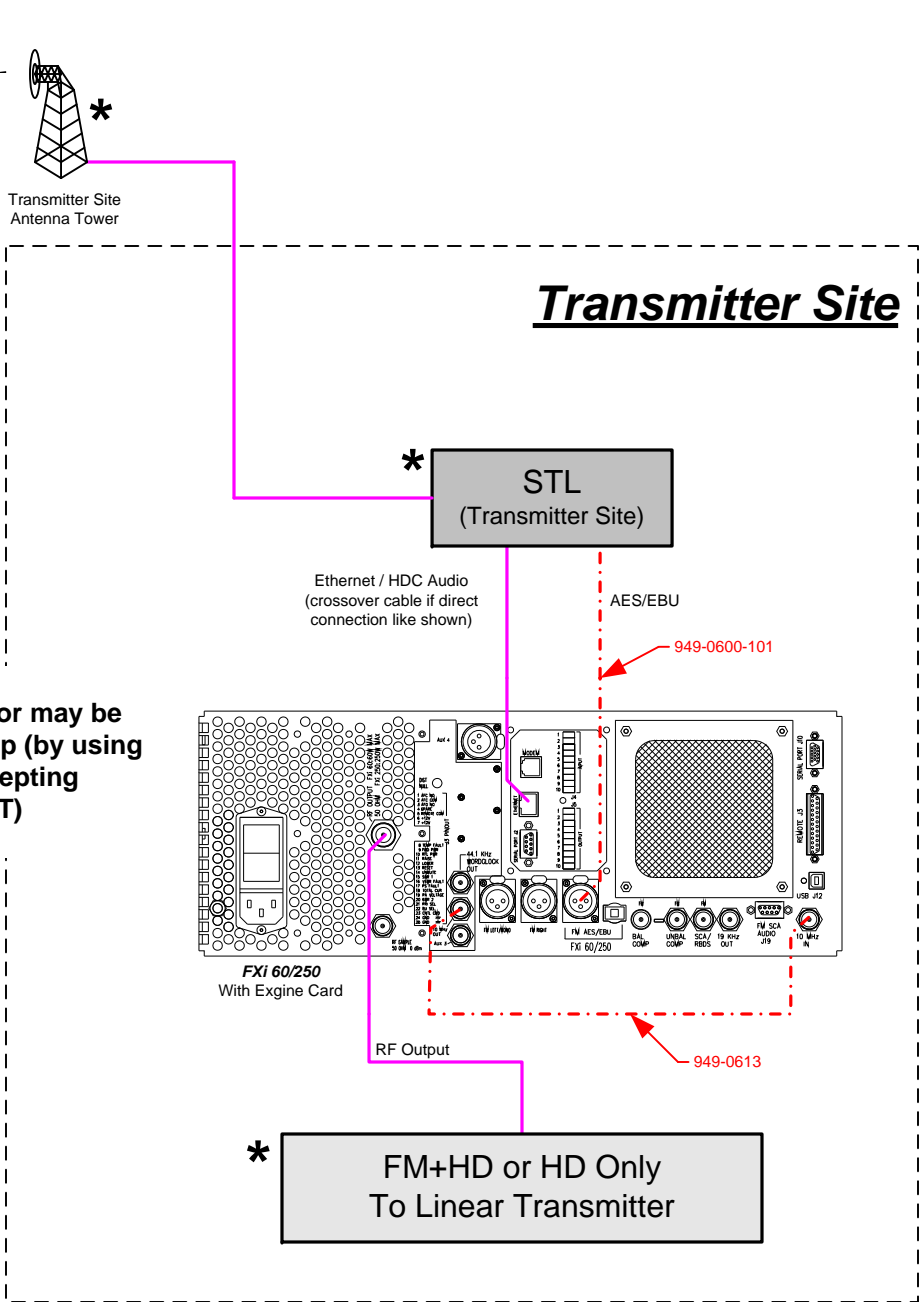
Studio Site



Note: Standalone FM Audio Processor may be located on either side of the XPi10esp (by using the configuration shown or by intercepting DELAYED MAIN AUDIO/BYPASS OUT)

STL May Be Uni-Directional

Transmitter Site



NOTE: Category 6 Ethernet Cables and Gigabit Ethernet Switches or Hubs are recommended for all Studio & Transmitter Site Ethernet / HDC Audio connections.

FIGURE 4 – XPi 10 esp at Studio Site

- Cable Legend -

- Supplied in XPi 10 esp Installation Kit (979-6100) ---
- Supplied in Other Product Installation Kits (Subject to Change) ---
- STL, GPS, Networking Cables/Equipment Supplied by the Customer ---

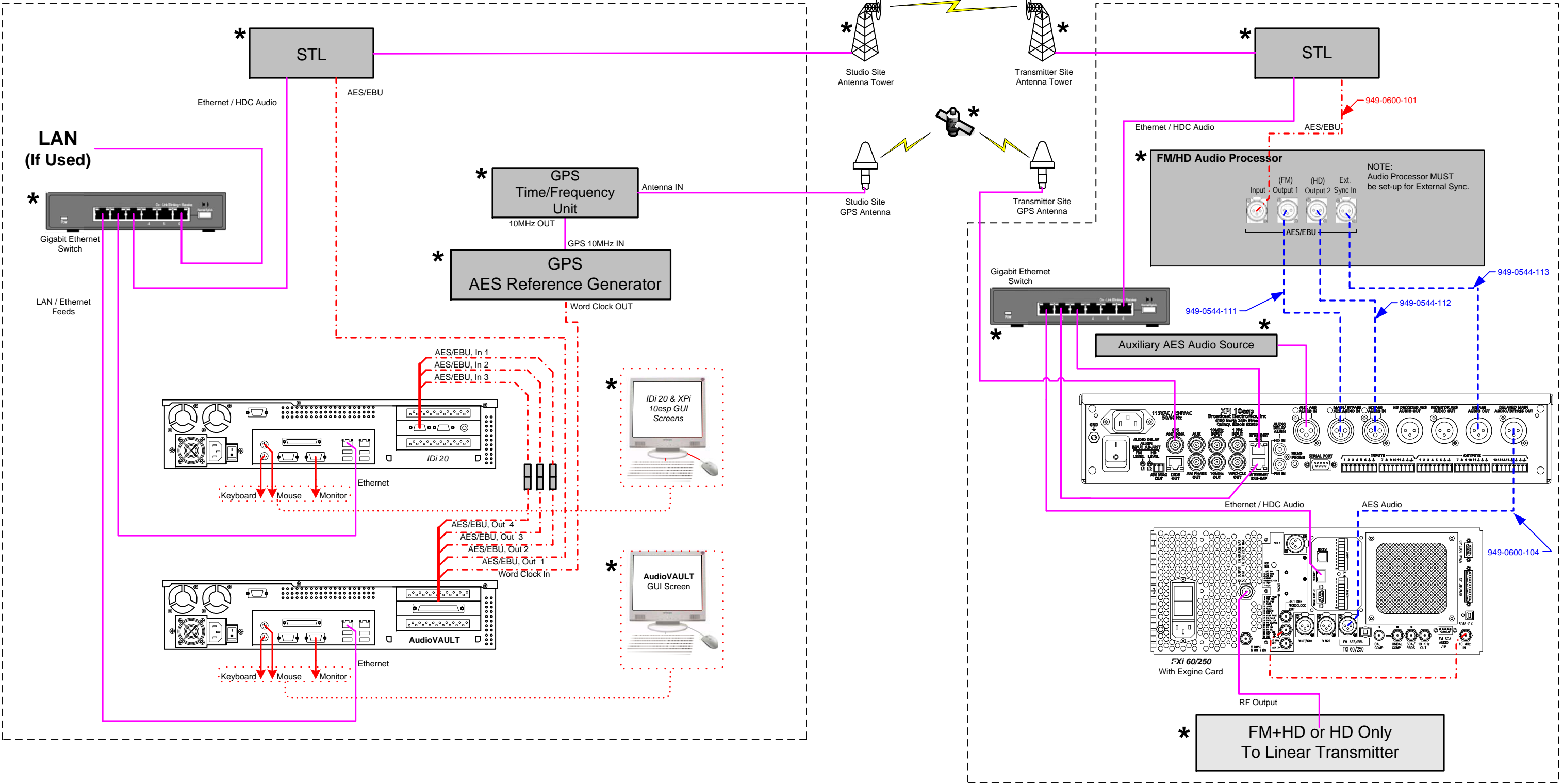
Broadcast Electronics, Inc.
Idi 20 Importer with MPS & 3 SPS Channels
Dual Audio Processors
XPi 10esp Exporter
FXi 60/250 Exciter (w/Exgine)

DRAWING NOT TO SCALE
©2011 BROADCAST ELECTRONICS, INC.

* : Equipment may not be manufactured by Broadcast Electronics, Inc.

Studio Site

Transmitter Site



NOTE: Category 6 Ethernet Cables and Gigabit Ethernet Switches or Hubs are recommended for all Studio & Transmitter Site Ethernet / HDC Audio connections.

* : Equipment may not be manufactured by Broadcast Electronics, Inc.

- Cable Legend -

- Supplied in XPI 10 esp Installation Kit (979-6100) [dashed blue line]
- Supplied in Other Product Installation Kits (Subject to Change) [dashed red line]
- STL, GPS, Networking Cables/Equipment Supplied by the Customer [solid magenta line]

FIGURE 5 – XPI 10 esp at Transmitter Site

Broadcast Electronics, Inc.
IdI 20 Importer with MPS & 3 SPS Channels
single Audio Processor
XPI 10esp Exporter
FXi 60/250 Exciter (w/Exgine)

DRAWING NOT TO SCALE
©2011 BROADCAST ELECTRONICS, INC.