Overview

The DXLink Multi-Format TX and HDMI RX Modules transmit HDMI, audio, and control over twisted pair cable. The TX also has an analog video input. DXLink Modules can be set up in one of three ways:

- Endpoint Mode (Switcher) – connect one or more to a switcher with an integrated Master.
- Endpoint Mode (Standalone) – connect TX/RX pair directly to each other with one connected to a NetLinx Central Controller via LAN or directly to Controller.
- Extender Mode (Standalone) – connect TX/RX pair directly to each other.

These Modules support InstaGate Pro® and SmartScale® Technology.

The *Hardware Reference Manual – DXLink Twisted Pair Transmitters/Receiver* contains complete documentation (including full specifications and supported input and output resolutions); for details, see www.amx.com.

System Setup

The Multi-Format TX and the RX work with a switcher that supports DXLink Technology for transmission of HDMI (or with a Central Controller) or as a stand-alone pair. The Transmitter receives an HDMI signal (or analog video on a Multi-Format TX) and embedded audio from the source. Both the video and embedded audio are transported over twisted pair cable to a DXLink Input Board (or connector). The signal is routed via the DXLink Output Board (or connector) to an RX. On the Transmitter, stereo audio or digital audio connections are provided as supplemental audio inputs. The RX also provides a stereo audio output. Both the Transmitter and the Receiver support RS-232 for serial data transfer, USB, IR, and Ethernet.
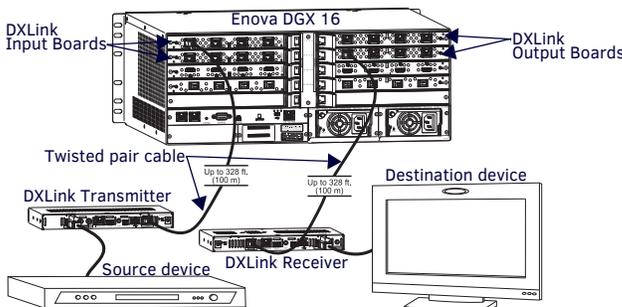

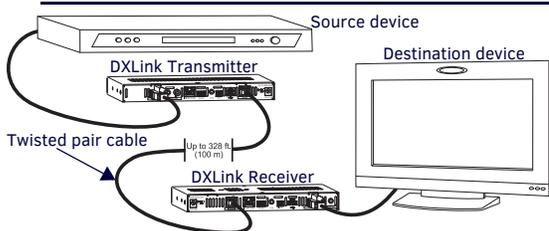**FIG. 1** DXLINK TX AND RX AS ENDPOINTS WITH COMPATIBLE DXLINK EQUIPMENT

FIG. 2 DXLINK TX AND RX AS EXTENDER SOLUTION

DIP Switch Toggles – Default OFF (for Auto-setup, see next page)

Before installing the units, find the scenario you are using in the table below and set the DIP switch toggles accordingly. Toggle #4 is reserved for future functionality.
For standalone pair upgrades, set Toggles #1-2-3 to ON and connect one unit to Master.

COMMON SCENARIOS	TOGGLES
Standalone Setup	**1 - 2 - 3**
AV signals only (plus serial/IR passthrough)	OFF - OFF - OFF
AV with Ethernet passthrough to networked device (plus serial/IR passthrough)*	ON - OFF - OFF
AV with NetLinx control of TX/RX unit and serial/IR ports**	ON - ON - ON
AV with NetLinx control of TX/RX unit and serial/IR ports, plus Ethernet passthrough to network device*	ON - ON - ON
Switcher Setup (TX/RX with Enova DGX/DVX /DGX 100 Series Switcher)	**1 - 2 - 3**
AV signals only	OFF - OFF - OFF
AV with Ethernet passthrough to networked device*	ON - OFF - OFF
AV with NetLinx control of TX/RX unit and serial/IR ports	OFF - OFF - ON
AV with NetLinx control of TX/RX unit and serial/IR ports, plus Ethernet passthrough to network device*	ON - OFF - ON

* Connect ICS LAN port of DXLink unit to network device (e.g., laptop, IP controlled projector, ICSLan Device). In standalone setup, connect ICS LAN port of other DXLink unit to network.

** In standalone setup using NetLinx control of DXLink serial/IR ports, only one of the DXLink units should be connected to network (the unit with #1 Toggle enabled).
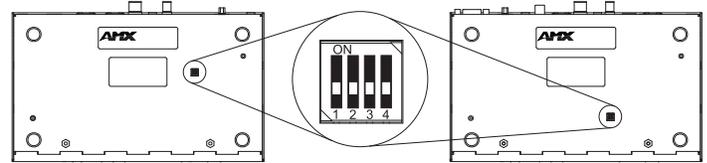

FIG. 3 DIP SWITCH TOGGLES ENABLE/DISABLE SPECIAL FUNCTIONALITY

Mounting Options (Rack Trays and Mounting Brackets)

For details on the four versatile mounting kit options for V Style modules (rack tray, rack tray with fill plates, surface mount, and pole mount), see www.amx.com.

IMPORTANT: *When mounting under a surface, the module should be mounted upright and lowered in the mounting bracket slots to provide an airflow gap between the surface and the vent holes. If not using V Style brackets, be sure to leave a gap between the top of the unit and the surface for heat to escape.*

Twisted Pair Cable Pinouts and RJ-45 LEDs

The DXLink and ICS LAN 10/100 ports both use twisted pair cable. FIG. 4 shows two pinouts that can be used for either port. FIG. 5 shows the LEDs for each port.
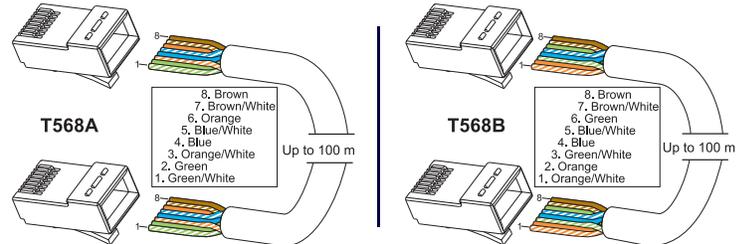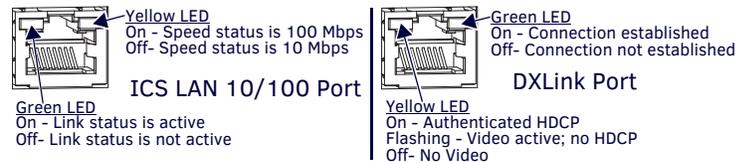

FIG. 4 RJ-45 PINOUTS

FIG. 5 RJ-45 PORTS

Attaching Signal, Transport, and Control Cables

Important Twisted Pair Cabling Requirements and Recommendations:

- DXLink cable runs require shielded category cable (STP) of Cat6 (or better).
- DXLink twisted pair cable runs for DXLink equipment shall only be run within a common building.*
- DXLink (RJ-45) connectors must *not* be used for connecting to a standard Ethernet Network. The connector is used for signal transport.
- Do *not* create a network (Ethernet) loop. A network loop is created when the enclosure and one or more of its DXLink Modules are connected to a common LAN (or a standalone pair when both endpoints connect to the same network).
- DXLink delivers 10.2 Gb/s throughput over shielded category cable. Based on this bandwidth requirement, we recommend following industry standard practices designed for 10 Gigabit Ethernet when designing and installing the cable infrastructure.
- The cables should be no longer than necessary to reach the end-points. We recommend terminating the cable to the actual distance required rather than leaving any excess cable in a service loop.
- For complete cable specifications, see the *Hardware Reference Manual – DXLink Twisted Pair Transmitters/Receiver.*

* "Common building" is defined as: Where the walls of the structure(s) are physically connected and the structure(s) share a single ground reference.

For more details and helpful cabling information, reference the white paper titled "Cabling for Success with DXLink" available at www.amx.com or contact your AMX representative.

Grounding

If the system is experiencing problems with delivery of DXLink signals to/from an Enova DGX Digital Media Switcher or Enova DVX Solution, adding a ground wire from the TX/RX to the switcher may improve performance. Technically this type of grounding is only required when a DXLink Transmitter or Receiver is connected to an ungrounded device, but this added grounding measure can be used at the discretion of the installer (for instructions, see the product manual).

IMPORTANT: *If one DXLink Transmitter or Receiver is grounded, any remaining ungrounded units that are connected to the same board on an Enova DGX Switcher must also be grounded.*

To attach signal, transport, and control cables to the Transmitter:

HDMI In — Stereo Audio In — Digital Audio In — ICS LAN 10/100 port — DXLink output — Ground screw

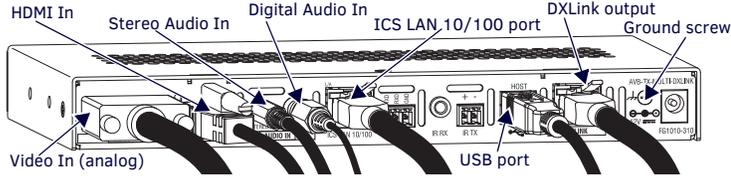Video In (analog) — USB port

FIG. 6 ATTACH SIGNAL, TRANSPORT, AND CONTROL CABLES

1. Set DIP switch toggles if necessary (for settings, see the previous page).
2. Attach HD-15 cable from source to Video In connector.
3. HDMI In – Attach an HDMI cable from the source to the HDMI In connector.*
4. DXLink connector – Attach a twisted pair cable to the DXLink output and to a DXLink input connector on the switcher (or on the RX for a standalone pair).
5. Stereo Audio In jack (optional) – Insert analog audio cable from source.
6. Digital Audio In jack (optional) – Insert S/PDIF plug on digital audio cable from source.
7. ICS LAN10/100 port (optional) – Use to attach twisted pair cable to LAN.

* DVI cable can be used via a cable adapter; however, advanced audio support from HDMI will not be available.

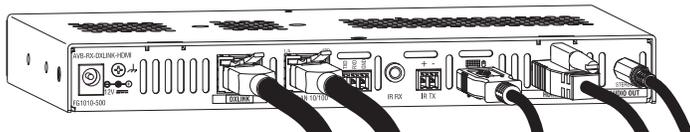## To attach signal, transport, and control cables to the Receiver:

FIG. 7 ATTACH SIGNAL, TRANSPORT, AND CONTROL CABLES ON DXLINK HDMI RECEIVER

1. Set DIP switch toggles if necessary (for settings, see previous page).
2. DXLink input connector – Attach a twisted pair cable from the DXLink output connector on the switcher (or on a TX) to the DXLink input.
3. HDMI Out – Attach HDMI cable from this port to the destination.
4. Stereo Audio Out jack (optional) – Connect analog audio cable from port to destination.

Applying Power

A desktop power supply is provided with each module. Power can be supplied to DXLink Twisted Pair Modules by DXLink Power sourcing devices as follows:

- To a TX or RX module from an Enova DGX Switcher or PS-POE-AT-TC (FG423-84) or PDXL-2 (FG1090-170).*
- To a TX module from a DVX-3156HD, DVX-3155HD, or DVX-2155HD.
- To an RX module from a DVX-2155HD, DVX-2150HD, or an SDX-501M-DX.

Power Budget: For TXs and/or RXs connected to an Enova DGX, use the Enova DGX Configuration Tool (www.amx.com/enova) to determine power requirements of a configuration and if any DXLink TXs or RXs should use the local power. The tool contains instructions on how to use it.

* To use PS-POE-AT-TC or PDXL-2 as a power source, the TX requires firmware v1.2.40 (or later) and the RX v1.0.80 (or later).

NOTE: *Local power takes precedence over DXLink power (via DXLink port) from switcher.*

IMPORTANT: *If a desktop power supply is used to power the unit, it must be the one provided, which must not be altered in any way. AMX does not support use of any other power supplies or PoE injectors as they may potentially damage the DXLink equipment.*

To apply power to the Transmitter (or Receiver):

1. Plug the cord from the desktop power supply (provided) into the power jack on rear of the TX (or RX) (2.1 mm DC jack for 12 V local power).
2. Plug the desktop power supply into an AC external power source. The Power LED on the front of the TX (or RX) illuminates green, indicating a ready state.

This table shows LED states on initial power up. If not normal, check connections.

INDICATOR LEDS	NORMAL POWER UP	INDICATES
Power	Green	Power is applied
Digital Video and Audio	Green	Video and HDMI embedded audio are present
Multi-Format - C, Y/C Y/PB/PR, RGB RGBHV, RGBS	Green or Off (only one of the three can be green at a time)	Corresponding signal is present
RX - Scaling: Bypass/Auto/Manual	One green, two off	Current scaling mode*
232 (serial) TX / 232 (serial) RX	Red/Yellow	Serial activity
NetLinx Link/Act	Green (Blinking - #3 Toggle OFF)	Active LAN connection to an AMX Network
NetLinx Status	Green	LAN activity
CEC	OFF	Not currently supported
USB	Yellow	Connected to device

* At power up, the RX defaults to Auto. Press the Scaling button to change the mode.

DXLink Auto-setup with Enova DGX 100 Series Switchers

Auto-setup is the default for using DXLink Modules with Enova DGX 100 Series Switchers. When all of the following conditions are met, the modules automatically go into Auto-setup Mode and can communicate through the ICS LAN port with the integrated Master via Telnet:

- Endpoints must be set to DHCP Mode (default) and use the NDP Master connection mode (default).
- Endpoints must not be bound to a Master.

IMPORTANT: *On the switcher, the ICS LAN port acts as a DHCP server (private LAN) and the LAN 100/1000 port acts as a DHCP client (public LAN) with each port on a separate network. In order to avoid a Network Loop, do not connect any device on the private network to any branch on the public network.*

IP Addressing Modes

DHCP Mode (enabled when #3 Toggle is flipped ON)

In DHCP Mode, the Module attempts to get a DHCP lease (consisting of an IP address, gateway, and other network parameters). If the attempt fails, the Module configures itself for a link-local address, but periodically re-tries DHCP and re-assigns the IP to a valid DHCP grant if successful. At any time, if the Module determines that its IP address has changed, it will disconnect and reconnect to the Master.

Static IP Mode (set with ID button or Telnet command)

With #3 Toggle set to ON, press ID button for 10 seconds to assign address of 192.168.1.2 or use a Telnet command to set unit to Static IP Mode (see the manual).

Enova DGX/DVX and DXLink IP Setup (systems without auto-setup)

The following procedure is intended to outline the steps necessary for network setup of DXLink Twisted Pair TX and/or RX with an Enova DGX 8/16/32/64 or Enova DVX switcher. These steps require familiarity with NetLinx Studio. If unfamiliar with NetLinx Studio, complete instructions are included in the *Hardware Reference Manual – DXLink Twisted Pair Transmitters/Receiver*.

To setup DXLink Module(s) with an Enova DGX 8/16/32/64 or Enova DVX:

1. Set the DIP switches on the DXLink Module(s).
2. Apply power to the DXLink Module(s).
3. Connect DXLink Module(s) to the Enova DGX or Enova DVX.
4. Optional – Configure a Static IP address (for each connected Module).
5. Configure the Device ID (for each connected Module).
6. Connect (Bind) the DXLink Module(s) to the Enova DGX or Enova DVX.

RS-232 Serial Data (Optional)

The 232 port label is relative to data flow. Data enters at RX label on the Transmitter, is sent via a DXLink cable through the switcher, and leaves at TX label on Receiver. Flow is vice versa from Receiver to Transmitter. Applies to all DXLink modules – wire RS-232 port for serial data transfer according to pinout above connectors (TXD-RXD-Ground).

IR Control (Optional)

The IR Receiver (FG-IR03) connects to the IR RX port on the Transmitter and the IR Emitter (FG10-000-11) connects to the IR TX port on the Receiver or vice versa, depending on the installation. The signal is sent via DXLink cable through the switcher. When a Transmitter and Receiver are used as a standalone pair, IR control acts as a passthrough.

USB Host and Keyboard/Mouse Ports (Rear)

If needed, the Host (USB-B) port on the TX and the K/M port (USB-A) on the RX provide HID support for a keyboard, mouse, and HUB. For a list of supported HID devices (keyboards and mice), see the Receiver's product page at www.amx.com.

Program Port (Front)

This USB mini-B port on the Transmitter supports DGX Configuration Software for programming a customer VGA EDID (for modules connected to an Enova DGX 100 Series Switcher, use the System Configuration interface; see the switcher's manual).

ID Button (Front)

The ID button on the front can be used to toggle between static and DHCP IP addressing, assign a device address, reset the factory defaults, and restore the factory firmware image (for details, see the manual).

Additional Information Covered in Manual

For information on the following, see the *Hardware Reference Manual – DXLink Twisted Pair Transmitters/Receiver* at www.amx.com:

- Audio precedence; pinouts for VGA, component, S-Video, and composite
- NetLinx control and programming commands; Telnet commands
- IR file transfers; upgrading firmware image; restoring factory default settings

Reference Documents

- Instruction Manual – Enova DGX 8/16/32/64 Digital Media Switchers
- Hardware Reference Manual – Enova DGX 100 Series Digital Media Switchers
- Instruction Manual – Enova DVX-315XHD/21XXHD All-in-One Presentation Switchers
- White Paper: Cabling for Success with DXLink
- WebConsole & Programming Guide – NX-Series Controller

3000 RESEARCH DRIVE, RICHARDSON, TX 75082 AMX.com | 800.222.0193 | 469.624.8000 | +1.469.624.7400 | fax 469.624.7153
AMX (UK) LTD, AMX by HARMAN - Unit C, Auster Road, Clifton Moor, York, YO30 4GD United Kingdom • +44 1904-343-100 • www.amx.com/eu/

Last Revised: 12/15/2015