Overview

Enova DGX 100 Series Digital Media Switchers are available in various configurations in increments of four up to 8x8, 16x16, 32x32, and 64x64. Therefore, the illustrations in this guide may differ from the model(s) purchased. Each enclosure contains an integrated NetLinx Central Control Processor. For complete documentation (including system and board specifications and supported resolutions), see the *Hardware Reference Manual – Enova DGX 100 Series Digital Media Switchers* at www.amx.com.

Installation

Rack Mounting

CAUTION: *To prevent overheating, avoid placing high heat-producing equipment directly above/below enclosure. The system requires a minimum of 1 empty rack unit above and below (3 empty rack units are recommended). Verify that the openings on the sides and top of the enclosure are not blocked and do not have restricted airflow.*

To rack mount a DGX 800/1600/3200 enclosure (3200* requires 2 people min.):
1. Position enclosure in rack and secure it with rack mounting screws.
2. Provided/recommended for DXLink Fiber Boards – Install cable management bars: Fasten bar with two screws on one end of board and one screw at the other (FIG. 2) (the long part of the bar is to right of holes); do not over tighten. **DGX 3200 only** – Remove number plate at rear top; replace when done.

* When fully loaded, the Enova DGX 3200 weighs approximately 73 lbs (33.1 kg).

To rack mount a DGX 6400 enclosure (requires 3 people minimum):
1. While shipping box is still on the pallet, cut and remove outer straps.
2. Remove cardboard tray from top of shipping box (note wheels on box).
3. Lift box off pallet. The DGX 6400 weighs approximately 150 lbs (68.0 kg) fully loaded. *Ensure all parties involved in lifting are prepared and follow local requirements.*
4. Unlock 4 latches on sides of shipping box. Lift top of box straight up and set aside.
5. Attach 2 handles provided for lifting; use 4 of 6 holes on side, in front or rear position.
6. Using bottom of shipping box, roll the enclosure into position. Lift onto temporary shelf/support in rack. Align as closely as possible and then remove lifting handles.
7. Lift into position and screw in rack ear screws.
8. **DXLink Fiber Boards only** – see Step 2 in the first set of instructions for installing cable management bars.

Attaching Input and Output Cables

Generally, any input board in an Enova DGX Switcher can route signals to any type of output board; signal format is automatically converted to match output board.

DXLink™ Twisted Pair I/O Boards require DXLink™ Twisted Pair TXs and RXs. DXLink™ Fiber I/O Boards require DXLink™ Fiber TXs and RXs. For details, see each product's *Quick Start Guide* or *Hardware Reference Manual*.

For testing purposes (via Control Panel or System Configuration interface), attach first two source and destination devices (and any required TXs and/or RXs).

Enova DGX ASB, AIE, HDMI, DVI, and DXLink Boards

Audio Switching Boards (ASB) – Support audio breakaway and downmixing for embedded or inserted audio with Digital Signal Processing capabilities on every output.

Audio Insert/Extract (AIE) Board – This board is documented separately. Before wiring, AIE boards must be uninstalled, have their DIP switches set, and be reinstalled. For directions, see the *Quick Start Guide - Enova DGX Audio Insert/Extract Board*.
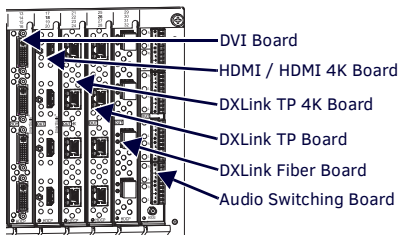

- DVI Board
- HDMI / HDMI 4K Board
- DXLink TP 4K Board
- DXLink TP Board
- DXLink Fiber Board
- Audio Switching Board

NOTE: *System setup for DXLink Twisted Pair Boards is similar to FIG. 2 right, except with DXLink Twisted Pair TXs and RXs installed between the DXLink Boards and the source and destination devices.*

FIG. 1 HDMI, DVI, DXLINK, AND ASB BOARDS SHOWN

HDMI and HDMI 4K Boards (HDCP 1.4) – Inputs and outputs incorporate HDMI® technology.

HDMI connectors route high-resolution HDMI or DVI signals with or without HDCP. For single-link DVI signals, use a cable adapter. 4K HDMI Boards require Category 2 high-speed cable for use with 4K content.

DVI Boards (HDCP 1.4) – Inputs and outputs are HDMI compatible. If required, DVI-specific EDID is available via the EDID Library at www.amx.com.

NOTE: *If an HDCP signal is switched from an HDMI or DVI Output Board to a destination which does not support HDCP, display of a dark red image indicates authentication failure. For HDCP signals switched via DXLink hardware, an orange image indicates authentication failure.*

DXLink Twisted Pair Boards (HDCP 1.4) – Inputs and outputs incorporate HDMI technology. Use with DXLink Twisted Pair TX and RX units, which automatically adjust the scaling and image and almost always result in a quality image on the monitor. When used with DXLink Twisted Pair equipment, DXLink Twisted Pair 4K equipment adjusts to only provide support that matches the capabilities of the equipment. See the *Hardware Reference Manual – DXLink Twisted Pair 4K TXs/RXs* for compatibility.

DXLink Fiber Boards (HDCP 1.4) – Inputs and outputs incorporate HDMI technology. DXLink Fiber boards and units are available for duplex and simplex functionality (with multimode and single mode options for each) for various system requirements. Use with DXLink Fiber TX and RX units, which automatically adjust scaling and image, resulting in a quality image on the monitor. If the setup has special requirements or adjustment is needed, see the manual.

Recommended – Fasten cable management bars with 2 screws on one end of board and 1 screw at other (long part of bar is to right of holes); do not over tighten (FIG. 2 left).

WARNING: *DXLink Fiber units use laser transceivers, which are Class 1 Eye Safe per IEC 60825-1/CDRH requirements. Class 1 category indicates that invisible laser used is safe; we recommend avoiding direct eye exposure when using any optical fiber products.*

CAUTION: *DXLink Fiber Boards – we recommend using the provided cable management bars or another type of cable management system to avoid damage to fiber cables.*

IMPORTANT: *If not using auto-setup, DIP switches must be set on DXLink Transmitter and Receiver Modules before units are cabled to the switcher via their boards. For information on DXLink Transmitters and Receivers, see the unit's "Quick Start Guide."*
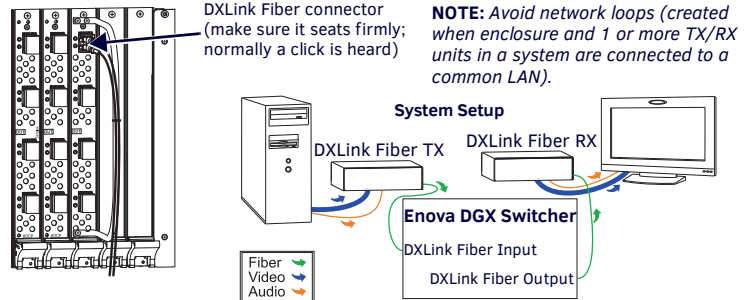

DXLink Fiber connector (make sure it seats firmly; normally a click is heard)

NOTE: *Avoid network loops (created when enclosure and 1 or more TX/RX units in a system are connected to a common LAN).*

System Setup

DXLink Fiber TX
DXLink Fiber RX

Enova DGX Switcher
DXLink Fiber Input
DXLink Fiber Output

Fiber
Video
Audio

FIG. 2 DXLINK FIBER CABLE ATTACHED TO INPUT; SYSTEM SETUP WITH DXLINK FIBER

Audio EDID Settings

HDMI, DVI, DXLink Twisted Pair Boards ship with a basic audio EDID configuration. DXLink Fiber Boards obtain EDIDs upon connection to their Transmitters. To optimize audio for your system, you may need to change the EDID settings using the System Configuration interface. Custom EDID files are available in the AMX_EDID_Library at www.amx.com. For information, see the manual.

Applying Power and Startup

DGX 800/1600/3200 systems each have two power supplies; DGX 6400 has four.

NOTE: *We recommend using a surge protector and/or an AC line conditioner.*

IMPORTANT: *If system is used to power DXLink Twisted Pair TXs/RXs, use the "Enova DGX Configuration Tool" at www.amx.com/enova to calculate power draw.*

Enova DGX 6400 only - If two or more power supplies are not receiving power, CPU and control panel will continue to operate. However, I/O boards will become inoperable and system will not send/receive signals until >3 power supplies resume functional status.

For proper redundant operations, all power supplies must be powered at all times.

- Enova DGX 800/1600 – Cable power via power strip to outlet connected to a single 20 A circuit.
- Enova DGX 3200 – Cable primary power feed to outlet connected to one 20 A circuit breaker. Cable redundant power feed to outlet connected to a second 20 A circuit breaker.
- Enova DGX 6400 – To provide adequate power for an N+1 redundant application, connect each of the four power supplies to its own circuit.

To apply power:
1. Plug power cords into *all power receptacles* (Enova DGX 6400 only – use provided AC power filtering clamp-on Ferrites on cords as close to the power supplies as possible).
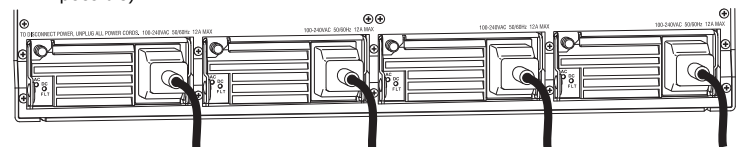

FIG. 3 POWER CORDS MUST BE PLUGGED INTO ALL POWER RECEPTACLES (DGX 6400 SHOWN)

2. Plug the other ends of the power cords into power sources.
3. Turn on the power strip and wait until the system status indicator flashes green.
4. Check the Indicator LEDs on front and rear of the enclosure; see table below.
5. For Enova DGX 800/1600/3200 systems with ASB Boards – Attach HSSI cable from SMA port on ASB Input Board to SMA port on ASB Output Board.
6. For systems with boards that require modules – Apply power to the modules.
7. Apply power to the source and destination devices.

NOTE: *If indicator lights do not respond with a normal display as stated in the following table, check power connections and see the troubleshooting information in the manual before contacting technical support.*

INDICATOR LEDS – NORMAL DISPLAY ON POWER UP		
Front Panel	Power – power status	Green (when all power supplies are working)
Power Supplies (DC is Tri-color)	AC power	Green
	• DC power • Temperature • Fault status	Green (amber = over temperature; red = fault state)
CPU	Status – system status	• Solid amber during boot load (10 sec) • Solid green during app load (1-4 minutes, depending on system configuration) • Flashing green when ready

Establishing a LAN Connection

The Enova DGX Switcher has an integrated NetLinx Central Control Processor with the server connection via the LAN 100/1000 port on the right-hand side of the CPU.

IMPORTANT: *(1) Enova DGX Switchers use DHCP by default. (2) Do not connect the LAN 100/1000 port on Enova DGX Switcher directly to a PC. It will not work.*

Cable Requirements for the LAN Connection

Connect the LAN 100/1000 port on the Enova DGX Switcher directly to a LAN (network) with an RJ-45 cable (crossover or straight-through; port automatically adjusts). A DHCP capable server *must* be in the network.

To connect an Enova DGX Switcher to a LAN:

1. If the system is not already powered, apply power according to the directions starting in the lower right-hand column on the first page.
2. Insert one end of an RJ-45 link cable into the LAN 100/1000 port.
3. Connect the other end of the RJ-45 link cable to a LAN hub or switch. The network will automatically assign a DHCP IP address.
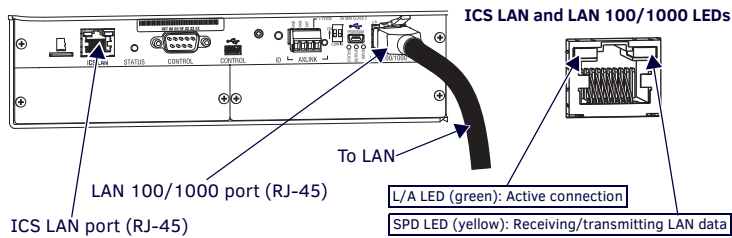
FIG. 4 CPU WITH LAN 100/1000 PORT (RJ-45) AND INDICATOR LEDS

4. Check the indicator LEDs on the LAN 100/1000 port (FIG. 5 right).

NOTE: *The Program port can be used to establish a connection from the integrated Master to a PC for NetLinx Studio control.*

IMPORTANT: *The ICS LAN port on the CPU is for communication via Telnet of endpoint devices connected to the integrated Master in Auto-setup Mode. The ICS LAN allows the DGX to provide Private IP addresses to all connected endpoints while only consuming a single IP address on the Public LAN. Please note, however, that the ICS LAN port serves DHCP addresses to any connected device. If the ICS LAN is inadvertently connected to the Public LAN, devices also on the Public LAN may experience DHCP address conflicts.*

Confirming Board Versions

Enova DGX enclosures and boards typically ship with the latest firmware available. If the firmware on any board installed in the enclosure does not match the firmware version the enclosure expects, a firmware mismatch occurs. To resolve a firmware mismatch, the latest available firmware .kit file (which contains firmware for both boards and enclosure) must be sent to the enclosure.

To confirm board versions:

1. Launch NetLinx Studio and connect to the DGX Master.
2. Open the OnLine Tree tab, right-click in the Workspace Bar field and select Refresh System Online Tree.
3. Expand the 5002 device and confirm compatible board versions (or mismatch).
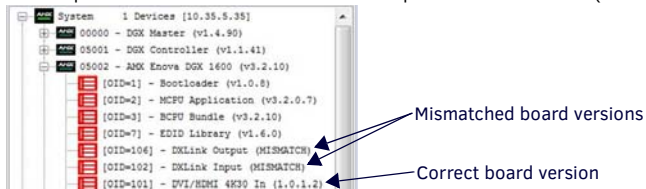
4. If a mismatch is present, send the latest firmware .kit file to the enclosure.

To send a firmware .kit file to the enclosure:

1. Navigate to your system's product page and download and unzip the "Enova DGX 100 Series Enclosure Firmware" .zip file.
2. Launch NetLinx Studio and navigate to the OnLine Tree.
3. Right-click on the 5002 device and select Firmware Transfer.
4. Click the Browse button and navigate to the downloaded file target directory.
5. Select the file for the Enova DGX from the Files list. Click Send.
   a. During the switcher's upgrade process, the 5002 device stays offline and the control panel and System Configuration interface (System/Devices/Switcher Update Status) display upgrade status messages.
   b. Once the upgrade is complete, the 5002 device comes back online and the System Configuration interface upgrade status reports that the system is rebooting.

System Setup via the System Configuration Interface

The System Configuration interface (onboard web pages) provides simplified setup and configuration of inputs, outputs, and endpoints, and complete switching, as well as status functionality.

IMPORTANT: *The System Configuration interface requires a browser running HTML5. Minimum web browser requirements are: Google Chrome 31, Internet Explorer 10, Firefox 25, or Safari 7. User experience may differ due to browser support for HTML5.*

TIP: *After the enclosure is connected to a network, the system's IP address displays on the Control Panel (Setup Options / Master Info / IP Address screen). Enter the IP address in a web browser to open the System Configuration interface.*

To execute a test switch via the System Configuration interface:

1. From the System Configuration Home page menu, open Switcher/Switching.

NOTE: *The default Username is "administrator" and default Password is "password." After initial setup, defaults should be changed to ensure system security.*

2. In the Inputs section, click Input 1.

3. In Outputs section, click the Deselect All button.
4. Click the Take button. The default switch of "1 to all" is disconnected.
5. Click Input 1, Output 2, and then click Take button to execute test switch.

When done, attach remaining sources/destinations. For products requiring TXs/RXs, install modules between boards/devices. For details on system setup of the Master via the System Configuration interface, see the *WebConsole & Programming Guide – NX-Series Controllers.* For Input/Output configuration (scaling, EDID, DSP, etc.) via the System Configuration interface, see the switcher's *Hardware Reference Manual.*

Additional Information Covered in Hardware Reference Manual

For information on the following, see the *Hardware Reference Manual - Enova DGX 800/ 1600/3200/6400 Digital Media Switchers* at www.amx.com.

• Input & Output Board specifications and signal support; adding/replacing boards
• NetLinx programming and firmware upgrades
• System Configuration interface – full switching/configuration/status information
• Setup for complete power redundancy with redundant power supplies

Reference Documents

• *Hardware Reference Manual – DXLink Twisted Pair 4K Transmitters and Receivers*
• *Hardware Reference Manual – DXLink Twisted Pair Transmitters/Receiver*
• *Hardware Reference Manual – DXLink Fiber Transmitters and Receivers*
• "Cabling for Success with DXLink" (on DXLink Twisted Pair product pages)
• *WebConsole & Programming Guide – NX-Series Controllers*

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/

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