

### Overview

Because the Optima Distribution Matrix is available in two sizes (2 RU and 3 RU) and various board configurations, the illustrations in this guide may differ from the model(s) you purchased. For complete documentation for this product (including individual board specifications), see the "Instruction Manual – Optima" at [www.amx.com](http://www.amx.com). This product supports full Device Discovery through AMX's AutoPatch Duet module (firmware v1.4.1 or higher is required).

General Specifications	
<b>Approvals</b>	CE, FCC Class A, UL, cUL, RoHS
<b>MTBF</b>	92,000 hours
<b>Operational Temperature</b>	32° F to 110° F (0° C to 43° C)
<b>Storage Temperature</b>	-22° F to 158° F (-30° C to 70° C)
<b>Humidity</b>	0 to 90% non-condensing
2 RU Enclosures	3 RU Enclosures
<b>AC Power</b> 100 VAC to 240 VAC single phase (50 Hz to 60 Hz) 1.8 A @ 100 to 240 VAC (max.)	<b>AC Power</b> 100 VAC to 240 VAC single phase (50 Hz to 60 Hz) 3.3 A @ 115 VAC (max.) 1.6 A @ 230 VAC (max.)
<b>Power Consumption</b> 260 W per enclosure (max.) 110 W per loaded enclosure (typical)	<b>Power Consumption</b> 260 W per enclosure (max.) 150 W per loaded enclosure (typical)
<b>Thermal Dissipation</b> 887 BTU/hr (max.) 375 BTU/hr, fully loaded enclosure (typical)	<b>Thermal Dissipation</b> 887 BTU/hr (max.) 512 BTU/hr, fully loaded enclosure (typical)
<b>Dimensions</b> Approximately 12 in. (30.5 cm) depth 18.9 in. (48.0 cm) width with rack ears 17.4 in. (44.2 cm) width without rack ears 3.5 in. (8.9 cm) height	<b>Dimensions</b> Approximately 12 in. (30.5 cm) depth 18.9 in. (48.0 cm) width with rack ears 17.4 in. (44.2 cm) width without rack ears 5.2 in. (13.2 cm) height
<b>Weight</b> Approximately 10 lb. (4.54 kg) per loaded enclosure	<b>Weight</b> Approximately 12 lb. (5.44 kg) per loaded enclosure

### Installation

#### Rack Mounting

To rack mount an Optima enclosure:

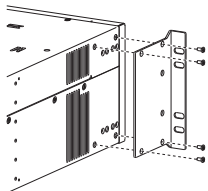


FIG. 1 Attach rack ears to sides of enclosure

1. Attach the rack ears as shown left (screws provided).
2. Install in a rack leaving a minimum of one empty rack unit above and below (required); three empty rack units above and below are recommended.

#### Linking Multiple Enclosures (if applicable)

If the system has multiple enclosures, cable(s) for linking and the "Matrix Switchers – Linking Enclosures QSG" have been provided. Link enclosures according to the guide.

#### Attaching Input and Output Cables/Wires

Before connecting all input and output cables/wires, attach only the first two inputs and outputs, apply power (see next page), and execute a test switch (see "Completing the Installation" on the next page). When the test switch is successful, attach the rest of the input and output cables and wires according to the **AutoPatch Connector Guide**. Follow the guide exactly; the system is configured to operate based on the guide.

#### Video I/O Boards – BNC

Video BNC connectors are used for standard video, wideband video, Hi-Z sync, HV Hi-Z sync, Y/c, SD-SDI, and HD-SDI signal types.

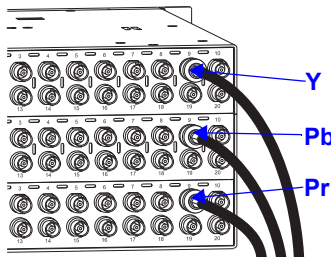


FIG. 2 Three BNC connectors are required for a three-component signal

**Note:** Component signals (e.g., Y/Pb/Pr) require more than one BNC connection. The example to the left shows three BNC cable connectors attached for routing a three-component signal through Output 9.

#### S-Video I/O Boards

S-Video boards are equipped with locking connectors, which lock on to AMX S-Video cables. Standard S-Video connectors may be used, but will not lock.

##### To fasten a locking S-Video connector:

1. Hold the connector at a slight angle to the right and push in.  
Or  
Pull back on the connector housing while pushing in.

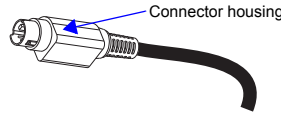


FIG. 3 Pull back on connector housing while pushing in

#### RGBHV/HD-15 I/O Boards

RGBHV/HD-15 boards use HD-15 connectors.

**Note:** 55 mA is supplied on Output Pin 9; power draw not to exceed 50 mA per port.

#### DVI I/O Boards

EDID Programmer software is provided for the 8x8 DVI boards to assist with in-field programming of custom EDIDs (4x4 DVI boards do not support this software). For information, see the "Instruction Manual – Optima."

DVI Output Pin 14 (+5 VDC out):

- On the 4x4 DVI board, Output Pin 14 supplies 55 mA; power draw not to exceed 50 mA per port.
- On the 8x8 DVI board, Output Pin 14 supplies 1000 mA shared total available on Output 1 through Output 4 and 270 mA shared total available on Output 5 through Output 8. For installation information for the High-Amperage Outputs on the 8x8 DVI board, see the "Instruction Manual – Optima."

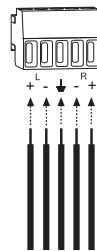
#### HDMI I/O Boards

The HDMI I/O board has 8 input and 8 output HDMI connectors. It is HDMI 1.3 compatible and fully HDCP compliant. Priming the system for InstaGate® technology\* (pre-authorization of all connected source and destination devices) significantly reduces HDCP latency (time required for authentication) in the matrix switcher for HDCP negotiations with all connected displays (see "Instruction Manual – Optima").

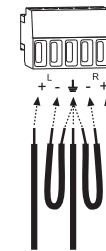
\* Some destination devices have a longer lag time than others between receiving a signal and displaying that signal. Although InstaGate® reduces latency in the matrix switcher, it cannot reduce the lag time inherent in a device.

If needed, EDID Programmer software is provided to assist with in-field programming of custom EDIDs (see the "Instruction Manual – Optima").

#### Stereo Audio I/O Boards – 5-Term



Balanced audio



Unbalanced audio

**Note:** Audio boards with 5-position terminal block connectors can be wired for balanced (differential) or unbalanced (single-ended) audio.

FIG. 4 5-Term stereo audio wiring

**Note:** When using shielded twisted-pair wire, connect the shield (ground) at one end only (recommend receiving end) to minimize low frequency noise (see FIG. 5 below).

Source and destination devices require either balanced or unbalanced connections. More than one of the options shown in FIG. 5 can be used in the same system.

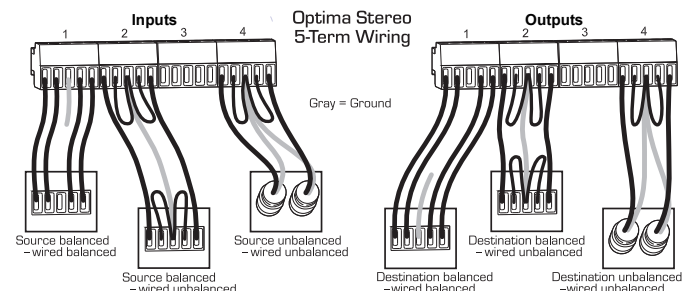


FIG. 5 Options for source-to-Optima-to-destination 5-Term wiring

## Digital Audio I/O Boards – S/PDIF and TosLink

S/PDIF connectors are coaxial, and TosLink connectors are optical (remove the protective caps from the TosLink jacks).

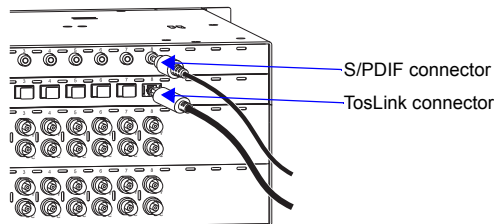


FIG. 6 Attach S/PDIF and TosLink connectors

## RGBHV+Stereo to CatPro I/O Boards – HD-15, 5-Term, and RJ-45

The outputs (RJ-45 connectors) on the Optima CatPro boards act as transmitters (TXs) and *must* be used in conjunction with a CatPro RGBHV+Stereo Receiver (RX) Module, FG1010-48-01, to complete the system. We recommend reading the system setup information in the "Instruction Manual – Optima," as well as the documentation for the module. CatPro supports Cat5, Cat5e, Cat6, Cat6e, and STP cables. Skew-free cable is *not* recommended for use with AMX equipment.

## Establishing Serial Control

The Optima can be controlled by attaching an external control device/system to the Control (RS-232 serial) port or to the Remote (XNNet) port, which uses AutoPatch XNNet protocol for AMX devices.

## Serial Control (PCs, AMX Control Devices, and third-party controllers)

Use the pinout in FIG. 7 when connecting a PC to the Optima Control port.

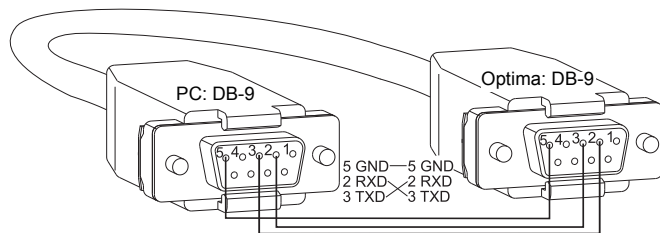


FIG. 7 Pin diagram for DB-9 connectors on RS-232 serial cable

### To establish external serial control:

1. Plug the null modem RS-232 serial cable into the enclosure's Control port.

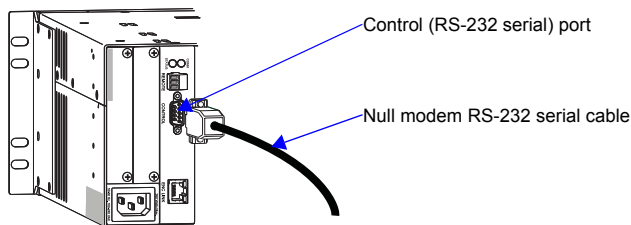


FIG. 8 Attach null modem RS-232 serial cable

2. Plug the other end of cable into the serial port on the serial controller/device.
3. Open serial communication software and set port settings to match the Optima default settings (baud rate = 9600, data bits = 8, stop bit = 1, parity = none, and flow control = none).

## Establishing XNNet Control (SBCs, remote control panels, etc.)

XNNet connectors (labeled "Remote") are on the CPU for 3 RU enclosures and are available on an expansion board for 2 RU enclosures.

### Communication Cable Requirements:

- Two-conductor, 20 AWG, 7/28 strand cable with a drain wire or shield, such as Alpha 2412C (customer supplied)
- Maximum cable length: 1,000 ft. (305 m) total, including linked devices

On large control networks, termination may be required on the last linked device; for termination information, see the device's documentation.

### To establish external XNNet control:

1. Attach XNNet link cable to XNNet device according to the device's instructions.
2. Unplug the Remote connector on the Optima and loosen the screws.
3. Insert the XNNet link cable wires according to FIG. 9 (either wire can be inserted in either outside slot).
4. Tighten the screws and plug in the Remote connector.

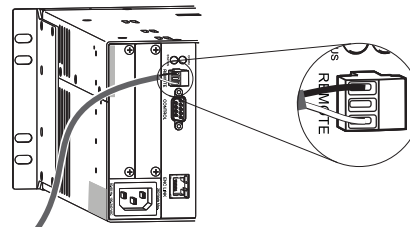


FIG. 9 Insert wires into Remote (XNNet) connector

## Applying Power

**Important:** We recommend attaching all power cords to a surge protector and/or an AC line conditioner.

### To apply power:

1. Attach power cord(s) and plug into power source (turn on power source if necessary). The Power Indicator on the front of the enclosure illuminates.
2. Apply power to any external devices (remote control panels, etc.) and then to the source and destination devices.

## Completing the Installation

Most Optima systems ship from the factory with an active switch (a switch that routes the signal from Input 1 to all outputs for testing purposes). Before using the system for normal operations, we suggest disconnecting all active switches and then executing a test switch to verify that the system is working properly. If you do any test switching using connections on an HDMI board, you may need to clear the board's sink key cache before completing the installation; see "Instruction Manual – Optima".

### To complete the installation:

1. Disconnect any active switches using one of the control options below.
2. Execute a test switch that routes Input 1 to Output 2. (Component signals require multiple connectors; all cables for that signal *must* be attached for the test switch.)
3. Attach the remaining source and destination devices.

## Startup Control Options and Test Switch

Signals may only be routed from the inputs on a board to the outputs on the same board because each board has its own switching matrix.

**Control Panel (front or remote)** – The LCD on the panel illuminates and displays the menu screen. For instructions on disconnecting any active switches and executing a test switch, see the control panel's "Quick Start Guide."

**AMX Control Devices** – The Optima is compatible with a number of AMX control devices. For control programming information, see the instruction manual for the specific interface.

**APControl 3.0** – Install and open the program. Follow the setup wizard, which will discover the system's configuration information and open the APControl Launchbar.

**To disconnect any active switches:** From the Launchbar menu, select Views/CrossBar and deselect all active crosspoints.

**To execute the test switch:** From the Launchbar menu, select Views/CrossBar and click on the crosspoint for Input 1 / Output 2.

**APWeb** – For APWeb expansion board information, see the "Instruction Manual – Optima." For APWeb Module installation, see the "Quick Start Guide – APWeb Server Module." For instructions on executing switches, see the "Instruction Manual – APWeb." Disconnect any active switches before executing a test switch.

**BCS Commands (terminal emulation program)** – When power is applied, a short splash screen appears.

**To disconnect any active switches:** enter `DL0I#T` (where # is the input number) into the terminal emulation program. When `DL0I#T` appears, the command is successful.

**To execute the test switch:** enter `CL0I1O2T` into the terminal emulation program (routes Input 1 to Output 2). When `CL0I1O2T` appears, the switch is successful.

**Note:** These commands use Level 0, which is normally the default level. If the commands do not work, check the **AutoPatch Connector Guide** to verify the level.

## Additional Information Covered in "Instruction Manual – Optima"

See the "Instruction Manual – Optima" at [www.amx.com](http://www.amx.com) for the following:

- Creating local presets
- Customizing channel names
- Using APWeb or XNNet expansion boards
- Adding or replacing I/O boards
- Splash screen – system component information for diagnostic purposes

## Reference Document for the Optima

The "Instruction Manual – BCS Protocol" is available at [www.amx.com](http://www.amx.com). BCS (Basic Control Structure) is a programming language used for programming control operations and for diagnostics purposes.

