



INSTRUCTION MANUAL

MODERO X SERIES® MULTI PREVIEW AND MULTI PREVIEW LIVE

MXA-MP, MXA-MPL



IMPORTANT SAFETY INSTRUCTIONS

1. READ these instructions.
2. KEEP these instructions.
3. HEED all warnings.
4. FOLLOW all instructions.
5. DO NOT use this apparatus near water.
6. CLEAN ONLY with dry cloth.
7. DO NOT block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. DO NOT install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. DO NOT defeat the safety purpose of the polarized or grounding type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wider blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. PROTECT the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. ONLY USE attachments/accessories specified by the manufacturer.



12. USE ONLY with a cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
13. UNPLUG this apparatus during lightning storms or when unused for long periods of time.
14. REFER all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
15. DO NOT expose this apparatus to dripping or splashing and ensure that no objects filled with liquids, such as vases, are placed on the apparatus.
16. To completely disconnect this apparatus from the AC Mains, disconnect the power supply cord plug from the AC receptacle.
17. Where the mains plug or an appliance coupler is used as the disconnect device, the disconnect device shall remain readily operable.
18. DO NOT overload wall outlets or extension cords beyond their rated capacity as this can cause electric shock or fire.



The exclamation point, within an equilateral triangle, is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.



The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electrical shock to persons.



ESD Warning: The icon to the left indicates text regarding potential danger associated with the discharge of static electricity from an outside source (such as human hands) into an integrated circuit, often resulting in damage to the circuit.

- WARNING:** To reduce the risk of fire or electrical shock, do not expose this apparatus to rain or moisture.
- WARNING:** No naked flame sources - such as lighted candles - should be placed on the product.
- WARNING:** Equipment shall be connected to a MAINS socket outlet with a protective earthing connection.
- WARNING:** To reduce the risk of electric shock, grounding of the center pin of this plug must be maintained.

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MXA-MPL Modero X Series® Multi Preview Live

Overview

The MXA-MPL (**FG5968-10**) is a touch panel accessory that displays a HD digital video stream on Modero X Series Touch Panels when used in conjunction with an Enova DVX All-In-One Presentation Switcher or Enova DGX Digital Media Switcher (FIG. 1). The MXA-MPL accepts digital video inputs over HDMI and converts them to a video stream. The MXA-MPL also supports all of the features of the MXA-MP, displaying up to 10 JPEG preview images on a Modero X Series touch panel. The MXA-MPL makes it easy for users to make quick identification of what is currently being displayed by up to 10 source devices.

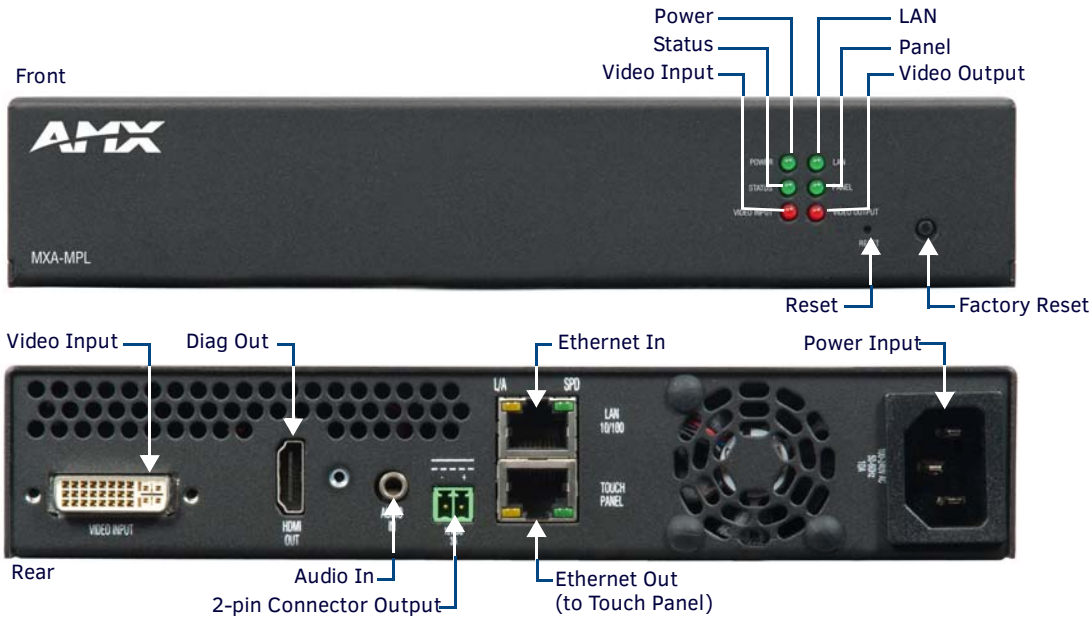


FIG. 1 MXA-MPL

Common Applications

Use the MXA-MPL to preview a live video stream or snapshot of the content from a source device before switching to that source.

Features

- Supports one HD digital video stream or up to 10 preview images.
- Updates all 10 preview images sequentially or one image continuously.
- Streams digital video sources to a Modero X Series Touch Panel.
- Multi-format video input accepts HDMI and DVI.
- Seamlessly interconnects between a Modero X Series Touch Panel and an Enova DGX or Enova DVX.

NOTE: The MXA-MPL supports the delivery of HDMI 1.4a (w/HDCP) content to a Modero X Series touch panel. The MXA-MPL has a HDMI input and delivers that video content to the Modero X Series panel over a dedicated link using a proprietary interface.

Product Specifications

MXA-MPL Specifications	
DIMENSIONS (HWD)	1 9/16" x 8 1/4" 7 3/16" (4 cm x 21 cm x 18.2 cm)
WEIGHT	2.80 lbs (1.27 kg)
POWER	• IEC power cord connector • 100-240 VAC • 47-63 Hz • Power Consumption without Panel: 120VAC at 170ma, 20W • Power Consumption with Panel: 120VAC at 410ma, 50W • Start-Up Inrush Current: 17.2 A at 116.8 VAC for 80 µsec
EXTERNAL POWER SUPPLY INCLUDED	MIC AC Universal Power Cord (CA1090-131) <i>Note: If using the MXA-MPL in conjunction with a touch panel that requires a PoE power supply please see the requirements of the touch panel and include an AMX supported PoE solution. The MXA-MPL does not provide PoE power to the touch panel.</i>

MXA-MPL Specifications (Cont.)	
VIDEO	• Max Number of Active Video Streams: 1 • Video Preview Image Format: JPEG (accessed over HTTP) • Max Number of Video Preview Images: 10 • Min Refresh Time of Preview Images: 2 sec per preview image • Video Input: HDMI, DVI, RGBHV, S-Video, Composite or Component video • Video Input Resolutions supported by Firmware v2.1.28 or higher: HDMI: 640x480p@60Hz, 800x600p@60Hz, 1024x768p@60Hz, 1280x720p@60Hz DVI: 640x480p@60Hz, 800x600p@60Hz, 1024x768p@60Hz, 1280x720p@60Hz RGB/GRAPHICS: 640x480p@60Hz, 800x600p@60Hz, 1024x768p@60Hz, 1280x768p@60Hz COMPONENT: 720x480i@60Hz, 720x480p@60Hz, 720x576i@50Hz, 720x576p@50Hz SVIDEO: ntsc, pal-bghid, pal-m COMPOSITE: ntsc, pal-bghid, pal-m • Note: When using the MXA-MPL for displaying live motion streams, make sure to use the supported resolutions with the video input type. While the MXA-MPL is capable of supporting up to 60 Hz, the Modero X display panels that use MXA-MPL only support 30 Hz. • Video Input Resolutions supported by Firmware versions previous to v2.1.28: HDMI/DVI: 640 x 480p @ 60 Hz, 800 x 600p @ 60 Hz, 1024 x 768p @ 60 Hz, 1280 x 720p @ 60 Hz PAL: 576i, 576p@50 Hz NTSC: 480i, 480p@60 Hz • Video Input Resolutions not supported: 1280 x 768p @ 60 Hz, 1920 x 1080p @ 60 Hz: • Supported Video Codecs: MPEG-2-TS: H.264 High Profile@Layer 4, AAC-LC up to 720p at 25 fps (decode) • Video Output: Up to 720p@25 fps over IP (Matches input resolution)
COMMUNICATIONS	Ethernet: 10/100 port, RJ-45 connector with Ethernet/IP pass-through
AUDIO	Audio Input: Unbalanced 1/8th-inch mini-jack connector (for use with non-HDMI audio only)
FRONT PANEL COMPONENTS	• Power: (1) LED (green) lights when device is receiving power • Status: (1) LED toggles on/off green every 5 seconds if communicating to the panel (i.e. the panel is configured to use the MXA-MPL) • Video Input: (1) LED (red) lights when receiving video signals • LAN: (1) LED (green) lights when the LAN connection is enabled • Panel: (1) LED (green) lights when device is connected to the panel • Video Output: (1) LED (red) lights when sending a video stream to a touch panel • Reset Button: Reboots the unit when pressed • Factory Reset Button: Resets the unit to factory defaults when pressed for at least 5 seconds
REAR PANEL COMPONENTS	• DVI-I: DVI-I multi-format video input • Diagnostics Output: HDMI diagnostics output (720p only) • Analog Audio Jack: 1/8th-inch mini-jack input (for use with non-HDMI audio only) • Power Output: 2-pin 3.5 mm Phoenix-style connector output, 12 Volts, 3 Amps • Ethernet In: (1) 10/100 port, RJ-45 connector for connection to network • Ethernet Out: (1) 10/100 port, RJ-45 connector for connection to touch panel • Power: IEC power cord connector (100-240V AC, 47-63Hz)
ENVIRONMENTAL	• Temperature (Operating): 32° F to 104° F (0° C to 40° C) • Temperature (Storage): 4° F to 140° F (-20° C to 60° C) • Humidity (Operating): 20% to 85% RH • Humidity (Storage): 5% to 85% RH • Power ("Heat") Dissipation without Panel: 68 BTU/hr • Power ("Heat") Dissipation with Panel: 170 BTU/hr
REGULATORY COMPLIANCE	• FCC Part 15 Class A • CE EN 55022 • CE EN 55024 • CE EN 60065 • IEC 60065 • IC • UL 60065 • RoHS • WEEE
INCLUDED ACCESSORIES	• MXA-MP Installation Guide (93-5968-20) • MIC AC Universal Power Cord (CA1090-131)

MXA-MPL Specifications (Cont.)**OPTIONAL ACCESSORIES**

- MPA-VRK, Rack Shelf 1RU 7.3" Depth (FG5968-30)
- AC-SMB, Surface Mount Bracket Accessory (FG525)
- CC-DVI-5BNCM, DVI to 5 BNC Male Cable 6' (FG10-2170-08)
- CC-DVI-RCA3M, DVI to 3 RCA Male Cable 6' (FG10-2170-09)
- CC-DVIM-VGAF, DVI to HD-15 Female Adapter (FG10-2170-13)
- CC-DVI-SVID, DVI to S-Video Cable (FG10-2170-10)
- CC-3.5ST5-RCA2F, 5-pin 3.5mm Phoenix-style to 2 RCA Female Cable (FG10-003-20)

MXA-MP Modero X Series Multi Preview

Overview

The MXA-MP (**FG5968-20**) is a touch panel accessory that displays up to 10 preview images on Modero X Series Touch Panels when used in conjunction with an Enova DVX All-In-One Presentation Switcher (FIG. 2). The MXA-MP accepts digital video input signals over HDMI and converts them to JPEG preview images for display on Modero X Series touch panels. The MXA-MP makes it easy for users to make quick identification of what is currently being displayed by up to 10 source devices.

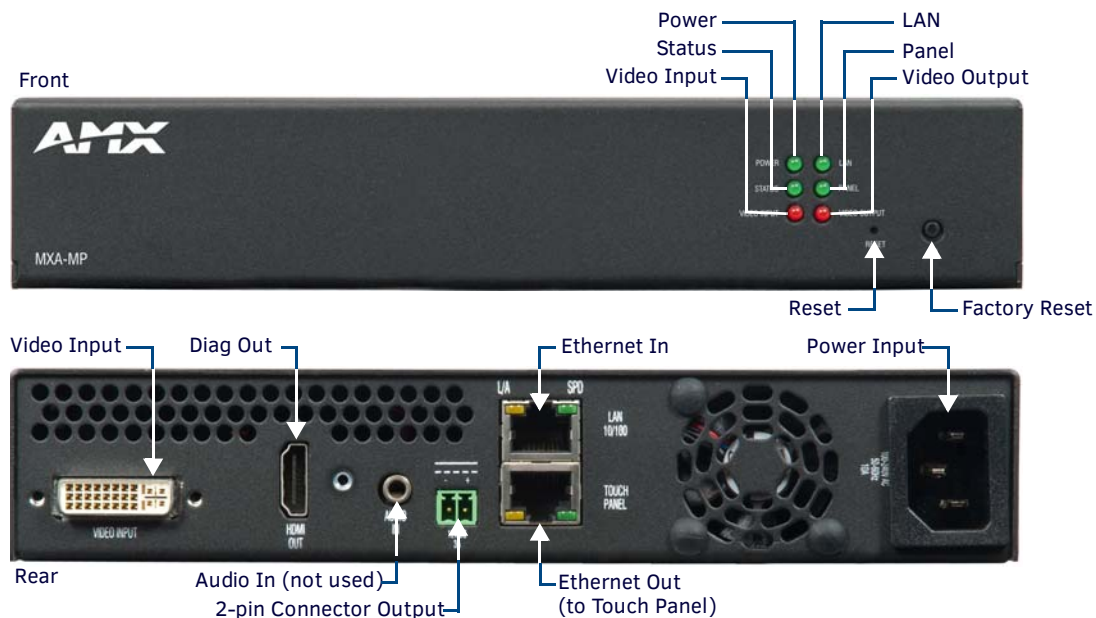


FIG. 2 MXA-MP

Common Applications

Use the MXA-MP to preview a snapshot of the content from a source device before switching to that source.

Features

- Updates all 10 preview images sequentially or one image continuously.
- Converts HDMI sources into video snapshots.
- Easily add to existing implementations that use an Enova DGX or Enova DVX with a Modero X Series Touch Panel.

Product Specifications

MXA-MP Specifications	
DIMENSIONS (HWD)	1 9/16" x 8 1/4" 7 3/16" (4 cm x 21 cm x 18.2 cm)
WEIGHT	2.80 lbs (1.27 kg)
POWER	• IEC power cord connector • 100-240 VAC • 47-63 Hz • Power Consumption without Panel: 120VAC at 170ma, 20W • Power Consumption with Panel: 120VAC at 410ma, 50W • Start-Up Inrush Current: 17.2 A at 116.8 VAC for 80 µsec
EXTERNAL POWER SUPPLY INCLUDED	MIC AC Universal Power Cord (CA1090-131) <i>Note: If using the MXA-MPL in conjunction with a touch panel that requires a PoE power supply please see the requirements of the touch panel and include an AMX supported PoE solution. The MXA-MPL does not provide PoE power to the touch panel.</i>

MXA-MP Specifications (Cont.)	
VIDEO	• Video Preview Image Format: JPEG (accessed over HTTP) • Max Number of Video Preview Images: 10 • Min Refresh Time of Preview Images: 2 sec per preview image • Video Input: HDMI, DVI, RGBHV, S-Video, composite or component video • Video Input Resolutions: HDMI: 640x480p@60Hz, 800x600p@60Hz, 1024x768p@60Hz, 1280x720p@60Hz DVI: 640x480p@60Hz, 800x600p@60Hz, 1024x768p@60Hz, 1280x720p@60Hz RGB/GRAPHICS: 640x480p@60Hz, 800x600p@60Hz, 1024x768p@60Hz, 1280x768p@60Hz COMPONENT: 720x480i@60Hz, 720x480p@60Hz, 720x576i@50Hz, 720x576p@50Hz SVIDEO: ntsc, pal-bghid, pal-m COMPOSITE: ntsc, pal-bghid, pal-m <i>NOTE: Although the frame rate to the panel does not apply on the MP, it still needs to be present in the send command or the command setting the 'videomode' will not parse correctly. The send commands use the @30 and @25 to specify the effective streaming frame rate instead of the @60 and @50 which refer to the input source's frame rate.</i>
COMMUNICATIONS	Ethernet: 10/100 port, RJ-45 connector with Ethernet/IP pass-through
FRONT PANEL COMPONENTS	• Power: (1) LED (green) lights when device is receiving power • Status: (1) LED toggles on/off green every 5 seconds if communicating to the panel (i.e. the panel is configured to use the MXA-MP) • Video Input: (1) LED (red) lights when receiving video signals • LAN: (1) LED (green) lights when the LAN connection is enabled • Panel: (1) LED (green) lights when device is connected to the panel • Reset Button: Reboots the unit when pressed • Factory Reset Button: Resets the unit to factory defaults when pressed for at least 5 seconds
REAR PANEL COMPONENTS	• DVI-I: DVI-I multi-format video input • HDMI: HDMI preview video output • Analog Audio Jack: 1/8th-inch mini-jack input (not used) • Power Output: 2-pin 3.5 mm Phoenix-style connector output, 12 Volts, 3 Amps • Ethernet In: (1) 10/100 port, RJ-45 connector for connection to network • Ethernet Out: (1) 10/100 port, RJ-45 connector for connection to touch panel • Power: IEC power cord connector
ENVIRONMENTAL	• Temperature (Operating): 32° F to 104° F (0° C to 40° C) • Temperature (Storage): 4° F to 140° F (-20° C to 60° C) • Humidity (Operating): 20% to 85% RH • Humidity (Storage): 5% to 85% RH • Power ("Heat") Dissipation without Panel: 68 BTU/hr • Power ("Heat") Dissipation with Panel: 170 BTU/hr
REGULATORY COMPLIANCE	• FCC Part 15 Class A • CE EN 55022 • CE EN 55024 • CE EN 60065 • IEC 60065 • IC • UL 60065 • RoHS • WEEE
INCLUDED ACCESSORIES	• MXA-MP Installation Guide (93-5968-20) • MIC AC Universal Power Cord (CA1090-131)
OPTIONAL ACCESSORIES	• MPA-VRK, Rack Shelf 1RU 7.3" Depth (FG5968-30) • AC-SMB, Surface Mount Bracket Accessory (FG525) • CC-3.5ST5-RCA2F, 5-pin 3.5mm Phoenix-style to 2 RCA Female Cable (FG10-003-20)

Installation

Overview

Both the MXA-MP and MXA-MPL may be installed in a freestanding location, such as on a desktop or table, but both devices may also be installed in a standard AV rack. This should be done to ensure accessibility to the Modero X Series touch panel receiving the device's video or image output.

NOTE: For full functionality, the MXA-MP and MXA-MPL should be used with the Enova series media switchers and Modero X Series touch panels. Neither device may be used with previously released AMX touch panels or media switchers.

Installing the MXA-MP/MPL

In a network, the MXA-MPL or MXA-MPL must be connected between the Enova DVX or DGX and the Modero X Series touch panel (FIG. 3). Multiple devices may be used for touch panels on a network, but each individual device cannot be used by multiple Modero X Series touch panels.

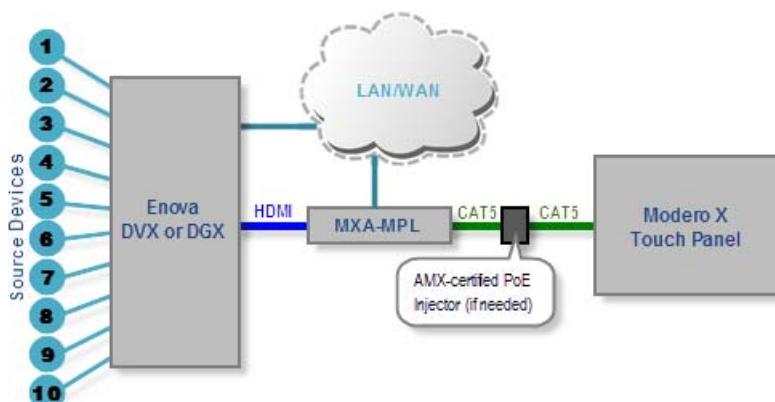


FIG. 3 MXA-MP/MPL Installation Diagram

NOTE: When connecting an Enova DVX to an MXA-MP or MXA-MPL, an HDMI cable adapter may be necessary to make the connection from the DVX's HDMI cable to the MXA-MP/L's Video Input port.

When using the MXA-MP or MXA-MPL with a Modero X Series touch panel, the device may be used to supply power to the touch panel in certain circumstances. (For more information, please refer to the *Maximum Power Cable Gauges and Distances* section on page 11.)

Instead of using a separate external power source, touch panels using an external power source may also connect to the device via the 2-pin connector output on the device's back (FIG. 4).

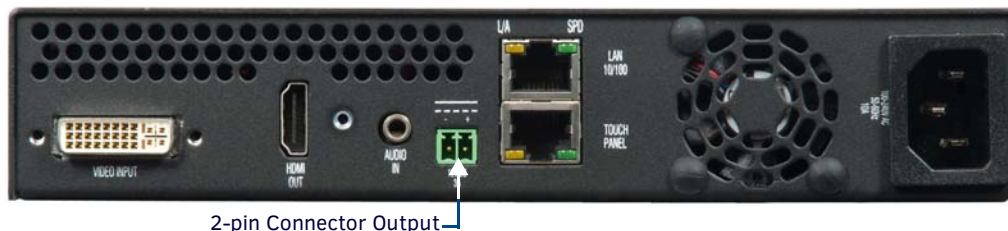


FIG. 4 Rear of the MXA-MP/MPL

In the case of Power Over Ethernet (PoE) Modero X Series touch panels, these panels require the use of an AMX-certified PoE injector. The PoE injector must be connected between the device and the touch panel for proper operation (see FIG. 3 above).

NOTE: For PoE-powered Modero X Series touch panels, the AMX-certified PoE injector must be connected between the device and the touch panel. Use of a PoE switch in place of an AMX-certified PoE injector is NOT recommended.

To connect the Modero X Series touch panel to the device:

1. Insert the incoming cable from the network LAN to the upper *Ethernet In* RJ45 connector (FIG. 4).
2. If the touch panel is a Power Over Ethernet (PoE) device, connect an outgoing Ethernet cable from the device's *Ethernet Out* RJ45 connector to an AMX-certified PoE injector. Connect the output of the injector to the touch panel's RJ45 connector, but do not apply power until the installation is complete.
3. If the touch panel is an MXD/T-1900L-PAN or MXD/T-2000XL-PAN (panoramic) device, outgoing power to the touch panel may be supplied via the device's 2-pin connector output (FIG. 4) or through another source. Do not apply power until the installation is complete.

NOTE: If using the device's 2-pin connector for power for a touch panel, please refer to the *Maximum Power Cable Gauges and Distances* section on page 11 for maximum cable lengths between the device and the touch panel, based on cable gauge. Using a separate power source for panoramic panel installations that require long cable runs is highly recommended.

4. When the installation is complete, apply power to the device and to the touch panel. Verify via the LEDs on the front of the device (FIG. 1) that it is receiving power and is connected to the network.
5. If the touch panel has not been configured to receive video signals from the device, do so now.

NOTE: For more information on configuring the Modero X Series touch panel to receive video signals, please refer to the *Configuration* section on page 14. For further information, please refer to the Modero X Series Programming Guide, available at www.amx.com.

Connecting the MXA-MP/MPL to a Network

Since the MXA-MP and MXA-MPL work to transmit HD images from an Enova DVX or DGX switcher to a Modero X Series touch panel, the device needs to be connected between the switcher and the touch panel. To connect the touch panel to the device:

NOTE: For PoE-powered Modero X Series touch panels, the AMX-certified PoE injector must be connected between the device and the touch panel. Use of a PoE switch in place of an AMX-certified PoE injector is NOT recommended.

1. Insert the incoming cable from the network LAN to the upper *Ethernet In* RJ45 connector (FIG. 4).
2. If the touch panel is a Power Over Ethernet (PoE) device (not panoramic), such as the MXD/T-1000, MXD/T-700, or MXD-430, connect an outgoing Ethernet cable from the device's *Ethernet Out* RJ45 connector to an AMX-certified PoE injector.
 - Connect the output of the PoE injector to the touch panel's RJ45 connector, but do not apply power until the installation is complete.
3. If the touch panel accepts external power, power to the touch panel may be supplied via the device's 2-pin connector output (FIG. 1) or through another source.
 - Do not apply power until the installation is complete.

NOTE: If using the device's 2-pin connector for power for a touch panel, please refer to the *Maximum Power Cable Gauges and Distances* section on page 11 for maximum cable lengths between the device and the touch panel, based on cable gauge. Using a separate power source for panoramic panel installations that require long cable runs is highly recommended.

4. When the installation is complete, apply power to the device and to the touch panel. Verify via the LEDs on the front of the device that it is receiving power and is connected to the network.
5. If the touch panel has not been configured to receive video signals from the device, do so now.

Maximum Power Cable Gauges and Distances

While most Modero X Series touch panels use Power Over Ethernet (PoE) for their power needs, the panoramic Modero X Series touch panels (MXD/T-2000XL-PAN and MXD/T-1900L-PAN) use external power from an AMX-certified power source. Both the MXA-MP and MXA-MPL may be used as a power source for the panoramic touch panels, but only to certain lengths determined by the cable gauge and the maximum distance between the device and the touch panel.

Maximum Power Cable Gauges and Distances	
Cable Gauge (AWG)	Maximum Distance (feet/meters)
<16	Not recommended
16	24 feet (7.32 meters)
17	20 feet (6.10 meters)
18	15 feet (4.57 meters)
19	12 feet (3.66 meters)
20	10 feet (3.05 meters)
21	8 feet (2.44 meters)
22	6 feet (1.83 meters)
23	5 feet (1.52 meters)
24	4 feet (1.22 meters)
>24	Not recommended
<i>Note: All power cable gauges are in AWG (American Wire Gauge).</i>	

When installing panoramic Modero X Series touch panels that exceed these cable lengths between the MXA-MP/MPL and the touch panel, a separate AMX-certified power source should be used instead.

Using the Diagnostic Out Port

The *Diagnostic Out* port (FIG. 4) mirrors the video signal being sent to the MXA-MPL for diagnostic purposes, such as assessing video sources. The *Diagnostic Out* port output displays on an available screen or touch panel as a 1280 x 720p HDMI signal. This output cannot be modified or expanded. While the *Diagnostic Out* port may be used in certain circumstances as an HDMI output port, the inability to modify the output should relegate it to diagnostic purposes only.

Rebooting the MXA-MP/MPL

To reboot the MXA-MPL, press and hold the **Reset** button on the front of the device for one second.

Resetting the MXA-MP/MPL to Factory Defaults

To reset the MXA-MPL to its factory defaults, press and hold the **Factory Reset** button on the front of the device for five seconds.

A Note About Wall and Rack Installation

Some products are installed in areas of differing temperature and cooling methodologies. These include products installed in walls, racks, cabinets, etc. Those areas may have different temperatures and/or cooling approaches that must be taken into consideration to maintain the product within the specified operating temperature.

FIG. 5 shows an AMX device installed in a wall with a filled volume (such as with insulation or concrete), as well as with a closed volume (such as between studs in an otherwise finished wall). The diagram shows how heat generated by the device or other devices may have no way to escape, and may build up to levels that may affect device operation.

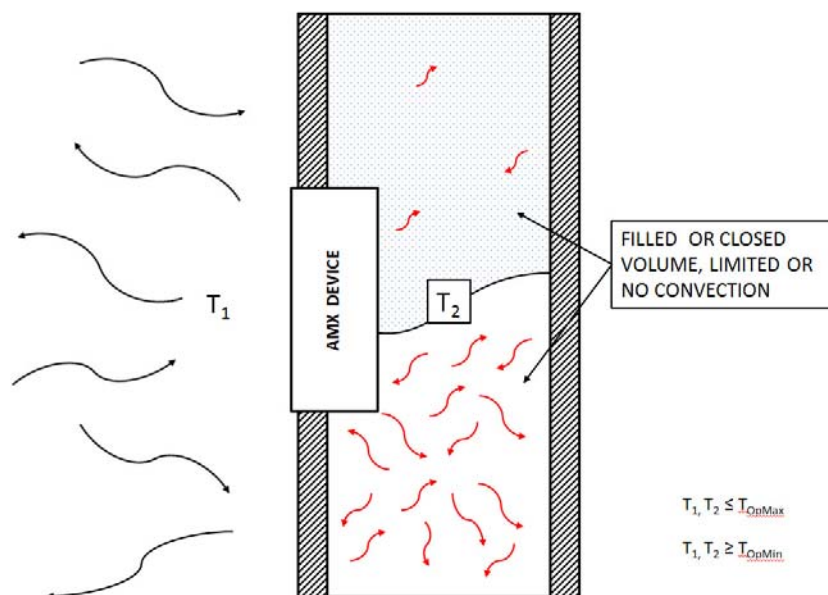


FIG. 5 Heat convection in filled or closed volume, limited or no convection

In FIG. 6, the diagram displays an AMX device in a typical rack mounting, with full air circulation around the front and back of the device. In this case, the main concern is with heat building up between components, possibly to levels that may affect device operation.

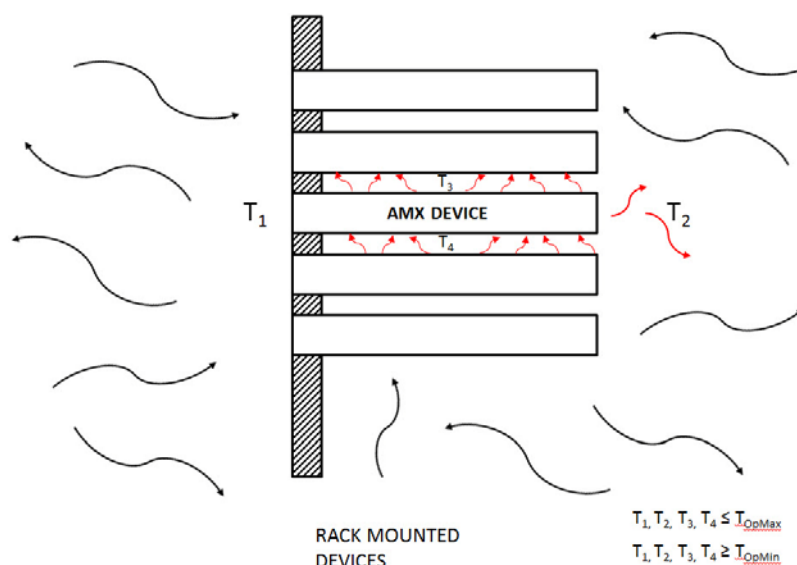


FIG. 6 Heat convection in rack-mounted devices

Installation Recommendations

During any installation, a lack of ventilation may produce conditions that may adversely affect the device's operation. In these circumstances, special care must be made to make sure that temperatures within enclosed areas do not exceed the device's maximum rated temperature.

NOTE: While the outside temperature of the device may be at or below its maximum operating temperature, special care must be taken before and during installation to ensure that the maximum operating temperature is not exceeded within wall or rack installation spaces.

Rack Mounting the MXA-MP/MPL

The MXA-MP or MXA-MPL may be put in a freestanding location on a desktop or table, but the device may also be installed in a standard AV rack. Installation in a rack requires the use of an MPA-VRK Rack Mounting Tray (**FG5968-30**), available from www.amx.com.

MXA-VRK (FG5968-30) Specifications	
Dimensions (HWD):	1 3/4" x 17 9/16 x 7 5/8" (4.44 cm x 44.61 cm x 19.37 cm)
Weight:	2.70 lbs (1.22 kg)
Included Accessories:	• Installation Screws, #10-32 x .625, Ph. Truss, Black (4) (80-0186) • Washer, #10, Black Nylon (4) (80-0342) • Installation Screws, #4-40 x .187, PFH, Undercut, Black (8) (80-1231-01)

To install an MXA-MP or MXA-MPL in a MPA-VRK Rack Mounting Tray:

1. Select a position on the Rack Mounting Tray for the installation. The Rack Mounting Tray contains screw holes to allow single or double device installations (FIG. 7).
2. Using the installation screws included with the MPA-VRK, install the screws to the bottom of the device through the Rack Mounting Tray. Use four screws for each device, with one at each corner.

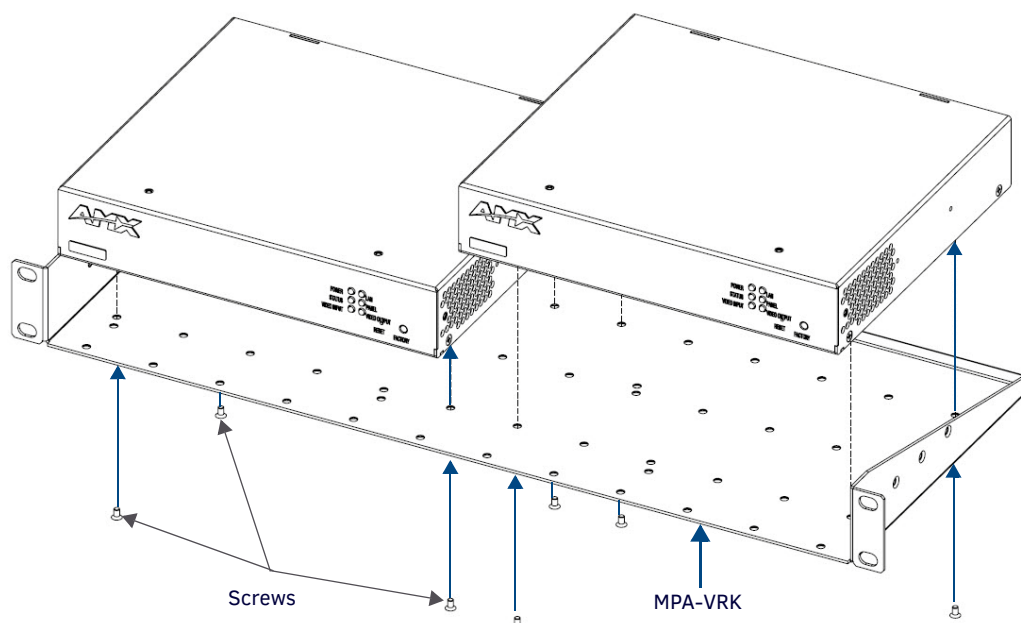


FIG. 7 Installing two MXA-MP devices in a Rack Mounting Tray

3. Connect the Rack Mounting Tray to the rack with the provided installation screws.
4. Connect the device to the network and apply power.

Configuration

Overview

To use the MXA-MP or MXA-MPL, the Modero X Series touch panel to which it is connected needs to be configured to receive its signals. This is done through the touch panel's *Settings* pages.

NOTE: For more information on accessing a Modero X Series touch panel's *Settings* Pages, please refer to the Modero X Series Programming Guide, available at www.amx.com.

To configure the touch panel:

1. From the *Settings* page, select *Connections & Networks*.
2. From the *Connections & Networks* page, select *Breakout Box* to open the *Breakout Box* page (FIG. 8).

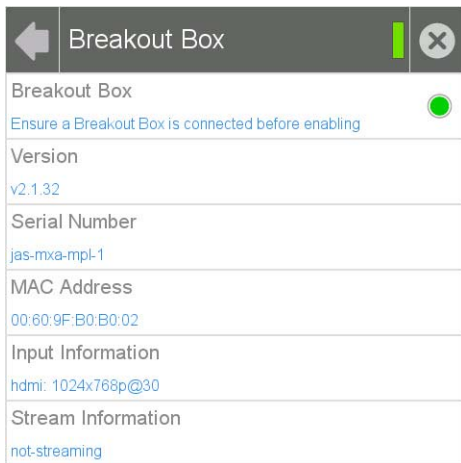


FIG. 8 Breakout Box Settings page

3. Press the **Breakout Box** button to enable the panel to receive information from the device.
4. If the device is connected, the remaining information on the *Breakout Box* page will self-populate as the touch panel receives that information from the device.

NOTE: If the device is not connected to the touch panel at this time, any attempts at enabling the panel will fail, and the Breakout Box page will be blank other than the Breakout Box button.

5. The touch panel will now display images or video from the device.

Uploading MXA-MP and MXA-MPL Firmware

Firmware updates and upgrades for the MXA-MP and MXA-MPL must be done through NetLinx Studio.

NOTE: Verify you are using the latest NetLinx Master and Modero firmware, as well as the latest version of NetLinx Studio and TPDesign 4. Configuring the MXA-MP or MXA-MPL in NetLinx Studio requires at least version 3.3, available at www.amx.com.

To upload new firmware to the MXA-MP and MXA-MPL:

1. Connect the MXA-MP or MXA-MPL to the intended Modero X Series touch panel and network. For more information on the connection, please refer to the *Installation* section on page 10.
2. Once the Modero X Series panel is booted and connected to the device, select the appropriate method for Master connection.
3. Ensure that the device is visible to the Modero X Series panel. The *Status* LED on the device (FIG. 1) should toggle on and off every 5 seconds.
4. Ensure the **Reboot Device** button is checked in NetLinx Studio.
5. Locate and download the latest firmware update at www.amx.com.
6. Begin the upgrade by downloading the file.
7. After the transfer, the panel and the device will reboot and perform the firmware upgrade. After the upgrade, the device contains the latest firmware release.

NOTE: The device will not be ready for use and will not show up on the online tree in NetLinx Studio until AFTER its Status LED begins to blink again.

Programming the MXA-MP and MXA-MPL Output

NOTE: Programming the MXA-MP and MXA-MPL require the use of the latest versions of NetLinX Studio and TPDesign 4, both available at www.amx.com.

After uploading the firmware, the device's corresponding NetLinX program file will need to be edited in NetLinX Studio and transferred to the device's Master controller.

NOTE: Obtaining the device's output will require modification of the device's corresponding NetLinX module files in NetLinX Studio.

The MXA-MP and MXA-MPL use Send Commands in order to optimize communication between the device and its connected touch panel. These Send Commands are accessed by the device through the Modero X Series touch panel.

The Send Commands, as well as information on *Settings* pages, panel configuration, and touch panel programming, may be found in the *Modero X Series Programming Guide*, available at www.amx.com.

Best Practices

In order to optimize the functionality and presentation of TPDesign 4 pages containing input from the MXA-MP and MXA-MPL, please consider the following to improve the user experience: Although the MXA-MP and MXA-MPL allow input from up to ten video sources, concentrating on a few essential video sources within a touch panel page will allow faster updating of images (MXA-MP) or images and video (MXA-MPL). More video input sources on a page means that the touch panel processor has more to process as video input is passed to it from the device.

Resetting the MXA-MP/MPL's Configuration to Factory Defaults

In certain circumstances, you may need to return the device's configuration settings to its factory defaults. To do so:

1. Press and hold the **Factory Reset** button (FIG. 1, FIG. 2) for about 5 seconds.
2. The *Power* LED will blink three times. At this time, release the **Factory Reset** button.
3. The device's configuration settings are now set to their factory defaults.

NOTE: Returning the device's configuration settings to their factory defaults will not affect the device's firmware version.

Resetting the MXA-MP/MPL's Firmware to Factory Defaults

To reset the device's firmware from its current version to the factory default version:

1. Press and hold the **Factory Reset** button (FIG. 1, FIG. 2) for about 10 seconds.
2. At about the 5-second mark, the *Power* LED will blink 3 times. Keep holding the **Factory Reset** button.
3. At the 10-second mark, the *Power* LED will blink 7 times at a faster rate. At this time, release the *Factory Reset* button.
4. The device's firmware is now reset to its factory default.

NOTE: Returning the device's firmware version to its factory default will not affect the device's configuration settings.

MXA-MPL Latency

In networks utilizing an MXA-MPL for video streaming to a Modero X Series touch panel, users may note a latency period between the video source and its presentation on the touch panel.

This latency period is approximately two seconds, although other factors, such as the size of the video image displayed on the touch panel and the cable distance between the video source and the MXA-MPL, may affect this. This may adversely affect latency-sensitive touch panel and keyboard/mouse applications that require a shorter period.

Network and video display design incorporating an MXA-MPL should take this into account.

NetLinx Programming

Streaming Video, MXA-MP, and MXA-MPL Commands

The following are NetLinx commands that control streaming video output, as well as coordinate video output to a Modero X/S Series G4 touch panel from an MXA-MP Multi Preview or MXA-MPL Multi Preview Live video breakout box.

NOTE: Streaming Video commands only apply to Modero X/S Series G4 panels equipped with a camera (excluding Portrait wall panels and all "No Comm" panels).

The command prefix for all MXA-MP/L commands is "**^SLT-1**" to match legacy Break Out Box video "slot" syntax. For Modero X/S Series G4 panels, Slot 1 (the only supported slot) always refers to the MXA-MP/L.

Streaming Video, MXA-MP/MPL Commands	
^DMM	Streaming audio/video mute. Syntax: <code>"^DMM-<audioMute>,<videoMute>,<url>"</code> Variables: audioMute = mutes the audio for <url> 0: Un-mute 1: Mute url = a valid ^SDM url that is already in the playing state. Examples: <code>^DMM-1,0,udp://224.1.1.1:1234</code> Mute audio. <code>^DMM-0,0,udp://224.1.1.1:1234</code> Unmute audio.
^SDM	Starts or stops a streaming session. Stream starts if a valid URL is specified and stops if server URL string is empty (or invalid). If the streaming session is with the MXA-MPL, this command also starts/stops the encoding on the MXA-MPL (i.e. a separate ^SLT command is not necessary). URL must adhere to the syntax: - <code>udp://<ip or hostname>:<portNumber></code> where IP could be 0.0.0.0 (unicast), or multicast address and port number. Port number must be an unused port from 1-65535 - <code>http://<ip or hostname>/url</code> for motion jpeg - <code>cam://local</code> for activating the camera Examples: <code>SEND_COMMAND 10001:2:0,"^SDM-10,2,udp://234.4.0.4:5500";#</code> Sets ON state to play video on multicast address <code>SEND_COMMAND 10001:2:0,"^SDM-10,1,cam://local";#</code> Sets OFF state to play camera <code>SEND_COMMAND 10001:2:0,"^SDM-10,1,stop";#</code> Stop playing the current video <code>SEND_COMMAND 10001:2:0,"^SDM-10,1,"";#</code> Stop playing the current video

Streaming Video, MXA-MP/MPL Commands (Cont.)

^SLT	MXA-MP and MXA-MPL Command Set. Syntax: <code>"^SLT-<device>, <subcommand>"</code> Examples: <code>^SLT-1, reboot=<current(default), previous, factory></code> Variables: - Device = 1 (Device is always 1 for the MXA-MP and MXA-MPL, the only device type currently supported by Modero X Series panels) Subcommands: ^SLT-1, reboot Reboot the MXA-MP/L. If "current" is used, or if no parameter is given, it is a simple reboot. Other parameters can tell the MP/L to change firmware loads as follows: current - simple reboot (default) previous - reboot and revert the MXA-MP/L the previously installed firmware factory - reboot and revert the MXA-MP/L to the factory installed version. <code>^SLT-1, reboot=<current(default), previous, factory></code> ^SLT-1, audiovideoenable MXA-MPL Audio/video enable command. Sets the option to enable video, or both audio and video on subsequent streams from the MXA-MPL. <code>^SLT-1, audiovideoenable=<video(default) both></code> <i>Note: this command will take effect on the next Stream start. It can still be overridden in the ^SLT-1, start command.</i> ^SLT-1, videomode Set format, resolution and rate for MXA-MPL video, where: format = <hdmi dvi> Resolution = <horizontal>x<vertical><i p>@<rate> <code>^SLT-1, videomode=<format>, <resolution></code> ^SLT-1, videoinput Turn on/off video input to the MXA-MPL. <code>^SLT-1, videoinput=<on off></code> ^SLT-1, start MXA-MPL Start stream. Tells the MXA-MPL to start streaming video or both audio and video (default=video, or the mode set by the "audiovideoenable" subcommand above). <code>^SLT-1, start=<video, both></code> ^SLT-1, stop MXA-MPL Stop stream. Tells the Breakout Box to stop streaming. <code>^SLT-1, stop</code> <i>Note: It is highly recommended that the ^SDM commands be used to start and stop video from the MXA-MPL rather than the commands below. The SDM command will issue the start/stop to the MXA-MPL, as well as starting/ stopping the decoding side on the panel. The "audiovideoenable" command above can be used to set the audio/ video option that will be invoked in the processing of the ^SDM command.</i> ?SLT-1, querystatus Query the value of any status field reported by the MXA-MP/L, such as version, serialNo, macAddress, inputInfo, streamInfo, type. <code>?SLT-1, querystatus=<statusField>, [id]</code> Response is a custom event as follows: CUSTOM.TYPE = EVENTID = 770 CUSTOM.ID = ADDRESS = 0 CUSTOM.FLAG = 0 CUSTOM.VALUE1 = Message ID (echoed 'id' value from query) CUSTOM.VALUE2 = 0 CUSTOM.VALUE3 = 0 CUSTOM.TEXT = Value of the status field specified by 'statusField' in the query
-------------	---

NOTE: While not necessary, creating video windows with width, height, and origin being multiples of 16 is a good practice. If the width and height are not multiples of 16, video could be cropped asymmetrically by the boundaries of the button.

NOTE: The MXA-MPL only supports 2-channel stereo audio over HDMI.

Notes on Using the ^SDM and ^SLT Commands

Based on the user's pages, the touch panel receiving video from an MXA-MPL will initiate that video feed as necessary, based on the button receiving the video. However, if you are changing video resolution or mode, using the ^SDM or ^SLT commands may be necessary to start and stop the video. To do so:

1. Use the ^SDM command first, with an empty URL value to stop the video.
2. If this does not work, use ^SDM with the URL value of "169.254.11.12:5700".
3. If neither of these options work, then and only then use ^SLT to start and stop the video.

In early firmware versions, ^SLT-1,start and ^SLT-1,stop were used to start and stop video coming from the MXA-MP. These commands are still available but using them is not recommended, as the stream is started and stopped automatically when a button that contains MXA-MPL video fill is displayed, and stopped when it is no longer in view. Showing/hiding the button state containing MXA-MPL video (e.g. via page flip, popup hide, or button state change) is the recommended way to start and stop MXA-MPL video. However, if it becomes necessary to stop video while the button is displayed on screen (for example, if resolution needs to be changed), then the ^SDM command should be used to start and stop the video.

If a button containing MXA-MPL video must be left on screen, try the following options:

```
SEND_COMMAND 10001:1:0, "" ^SDM-10, 1, ""
(stops MXA-MPL video)

SEND_COMMAND 10001:1:0, "" ^SLT-1, videomode=hdmi, 640x480p@30 ""
(changes MXA-MPL video resolution to 640x480 with a frame rate of 30fps)

SEND_COMMAND 10001:1:0, "" ^SDM-10, 1, udp://169.254.11.12:5700 ""
(restarts MXA-MPL streaming)
```

NOTE: When using the MXA-MPL for displaying live motion streams, make sure to use the supported resolutions with the video input type. While the MXA-MPL is capable of supporting up to 60 Hz, the Modero X panels that use MXA-MPL only support 25-30 Hz.

Stand-Alone Images and Video Feeds

Adding a Preview Image to a Touch Panel Page

As an example of how to add a simple JPEG preview image to a touch panel page in TPDesign4:

1. From the main TPDesign4 menu, select **Panel / Resource Manager** and select the **Dynamic Images** tab.
2. Select a JPEG image in the project. In this example, call it *MXA_MP*.
3. In the *Edit Dynamic Image* window (FIG. 9), add a new resource. In the example.
 - *Protocol:* HTTP
 - *Host:* mxamp
 - *Path:* snapit
 - *File:* slot1.jpg

In this example, make sure to use at least a 2-second Refresh Rate.

4. When finished, click **OK** and then **Close** to close the Resource Manager.

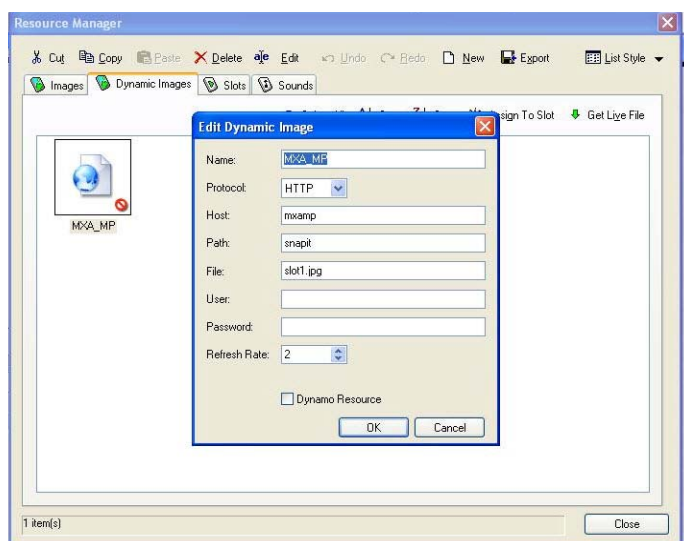


FIG. 9 Edit Dynamic Image window

5. After adding the Dynamic Image, assign the image as a Bitmap to a button on a touch panel page.

Adding a Live Motion Stream To A Touch Panel Page via an MXA-MPL

To add a live motion stream to a touch panel page via an MXA-MPL:

1. In the touch panel page, draw a button to be the video window.
2. In *Button Properties*, select *MXA-MPL* as the video fill (FIG. 10).

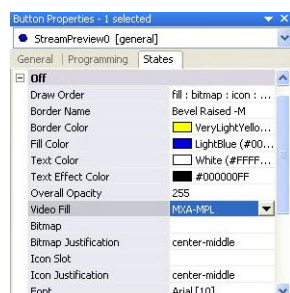


FIG. 10 Button Properties

NOTE: Any video button that has displayed video but is no longer active will display a snapshot of the last frame displayed.

Commands Through the Command Output Loopback Port (MXA-MPL Only)

If embedding them in TPDesign, send commands involving the MXA-MPL can be sent through the Command Output Loopback Port. In the *Button Properties* window, this may be found under the *Programming* tab.

The touchpanel file attachment example in FIG. 11 below has examples of preview and streaming windows, as well as a page to give examples of switching resolutions and signal types.

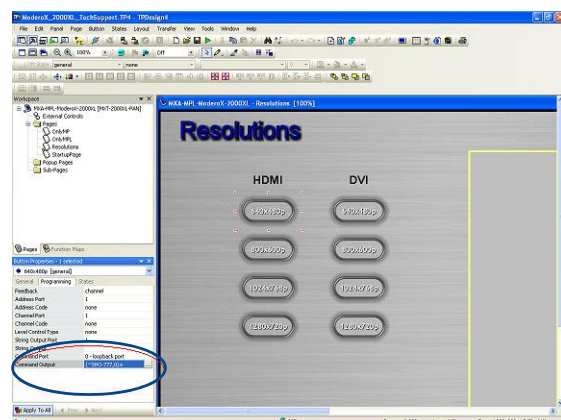


FIG. 11 Command Output Loopback Port

If you wish to embed commands in a button, these are done through the Command Output Loopback Port. This may be found in the *Button Properties* window, under the *Programming* tab. Click the "..." button to open the *Button Command Output* window (FIG. 12).

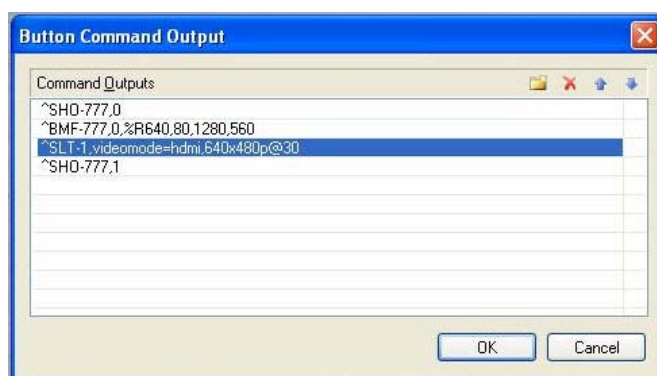


FIG. 12 Button Command Output popup window

In the above example, the commands added to the *Button Command Output* window hide the video window, resize the window, set the video mode to HDMI at 640x480@30 Hz, and show the video window.

NOTE: When using the MXA-MPL for displaying live motion streams, make sure to use the supported resolutions with the video input type. While the MXA-MPL is capable of supporting up to 60 Hz, the Modero X display panels that use MXA-MPL only support 25-30 Hz.

Supported Resolution/Signal Type Commands	
HDMI:	SEND_COMMAND 10001:1:0, "'^SLT-1,videomode=hdmi,640x480p@30'" SEND_COMMAND 10001:1:0, "'^SLT-1,videomode=hdmi,800x600p@30'" ** SEND_COMMAND 10001:1:0, "'^SLT-1,videomode=hdmi,1024x768p@30'" SEND_COMMAND 10001:1:0, "'^SLT-1,videomode=hdmi,1280x720p@30'"
DVI:	SEND_COMMAND 10001:1:0, "'^SLT-1,videomode=dvi,640x480p@30'" SEND_COMMAND 10001:1:0, "'^SLT-1,videomode=dvi,800x600p@30'" ** SEND_COMMAND 10001:1:0, "'^SLT-1,videomode=dvi,1024x768p@30'" SEND_COMMAND 10001:1:0, "'^SLT-1,videomode=dvi,1280x720p@30'"
RGB/Graphics:	** SEND_COMMAND 10001:1:0, "'^SLT-1,videomode=vga,640x480p@30'" ** SEND_COMMAND 10001:1:0, "'^SLT-1,videomode=svga,800x600p@30'" ** SEND_COMMAND 10001:1:0, "'^SLT-1,videomode=xga,1024x768p@30'" ** SEND_COMMAND 10001:1:0, "'^SLT-1,videomode=wxga,1280x768p@30'"
Component:	** SEND_COMMAND 10001:1:0, "'^SLT-1,videomode=component,720x480i@30'" ** SEND_COMMAND 10001:1:0, "'^SLT-1,videomode=component,720x480p@30'" ** SEND_COMMAND 10001:1:0, "'^SLT-1,videomode=component,720x576i@30'" ** SEND_COMMAND 10001:1:0, "'^SLT-1,videomode=component,720x576p@25'"
SVIDEO:	SEND_COMMAND 10001:1:0, "'^SLT-1,videomode=svideo,ntsc'" SEND_COMMAND 10001:1:0, "'^SLT-1,videomode=svideo,pal-bghid'" SEND_COMMAND 10001:1:0, "'^SLT-1,videomode=svideo,pal-m'"
Composite:	SEND_COMMAND 10001:1:0, "'^SLT-1,videomode=composite,ntsc'" SEND_COMMAND 10001:1:0, "'^SLT-1,videomode=composite,pal-bghid'" SEND_COMMAND 10001:1:0, "'^SLT-1,videomode=composite,pal-m'"
** available in firmware v2.1.100 and later.	

Code-Driven Buttons and Video Feeds

Example code is available from AMX to assist with developing individual solutions for producing dynamic buttons and/or video feeds. From either the MXA-MP or MXA-MPL product pages on www.amx.com, select the AMX Device Modules link on the right side of the page. This example code is open source and may be modified to function with any source capable of providing the specified resolution and signal type.

Appendix: Video Streaming Troubleshooting

Optimizing Motion JPEG Video Presentation and Speed

In some cases, multiple Motion JPEG streams may slow presentation of individual screen popups, or prevent all of the streams from showing at the same time. This may happen even though the Panel Preview in TPDesign4 may show no issues. To minimize this and assure a smooth and non-sluggish stream, try these options:

- Limit the number of simultaneous Motion JPEG streams to eight or fewer streams at a time.
- Remove any unnecessary buttons associated with the Motion JPEG streams.
- Make sure that the Refresh rate on a Motion JPEG is set to 0.
- Make sure to define special preview resources in the Resource Manager, preferably at a lower resolution, and *without* the “Dynamo” checkbox checked. If only one resource can be accelerated, and if preview buttons are not defined, a different resource could be accessed each time the page is viewed.
- Make sure that the full images have the “Dynamo” checkbox checked, with a Refresh rate of 0.
- Make sure to hide the preview popup before displaying the full image.
- If possible, uncheck the “Scale to Fit” option, as scaling is very resource-intensive.
- Dial down the frame rate of the server. The frame rate of a Motion JPEG is determined by the server.
- When you go from a page with multiple previews to a page with a single full screen video, it is best to do a page flip rather than popup attach, or hide the preview windows first. Otherwise, the preview windows will continue to decode (taxing the system), even though they may be completely or partially obstructed by the popup.
- Verify that the full-screen image is set for acceleration by checking the “Dynamo” box in Resource Manager.

Motion JPEG Support for Modero X Series Panels	
Baseline mode:	ISO 10918-1
Encoding:	ISO-10918-5 (JFIF)
Maximum Resolution:	720p (hardware acceleration only; define as video fill, not Resource Manager)
Recommended resolution:	720x480-NTSC or 720x576-PAL (or less). If the video is defined in the Resource Manager as opposed to video fill, consideration must be made for the video being decoded by the Modero X Series panel, which cannot decode 720p.
Maximum Frame Rate:	Up to 30fps
Latency:	From 1-3 seconds, depending on multiple factors including button size, resolution and network performance.

Transcoding Guidelines

For certain H.264 video and audio streaming, you may observe a drift between audio and video the longer the content is streamed. This drift can be more pronounced when streaming from a non- MXA-MPL source such as a Vision 2 steaming server. If the panel detects excessive drift, it will attempt to restart the stream decode. During the restart, the audio will be temporarily interrupted and the video will be frozen on the last frame until the restart is complete (typically a couple of seconds).

To reduce the drift issue for Vision 2 H264 steaming, video transcoding tools (such as HandBrake or FFMPEG) are available to convert H.264 video into lower bitrates, reduced resolution and/or lower H.264 profiles. For example you can try the H.264, 2mbps bit rate, 480p resolution, Baseline profile. If this does not work, try transcoding the stream into MPEG2 video, which is less susceptible to A/V drift.

NOTE: *Third-party encoders and digital television devices have not been tested with Modero X Series touch panels, and are not supported by AMX.*

The table below lists the typical synchronization and latency times for each supported video and audio stream:

Video Performance					
Device	Typical A/V Sync (offset/hr)	Typical A/V Sync Restart Rate	Expected Latency - Typical	Expected Latency - Max	Notes:
MXA-MPL					
H.264	<100ms	~ every 3hrs	750ms (Video) 1s (Audio + Video)	2s or more, depending on network	Recommend maintaining aspect ratio of source and following usage guidelines regarding window/button placement. Network congestion can cause video glitches. AMX recommends the Multi-Preview Live and Modero X touch panel be installed behind a smart Ethernet switch to filter multicast packets reaching the panel and consuming panel resources. The MXA-UENET video accelerator cable (FG5968-74/75/76) may also improve performance in cases of network congestion.
MPEG2	N/A	N/A	N/A	N/A	N/A
H.264	<100ms	~ every 1-2hrs	1.5s	3s or more, depending on network	The MXA-UENET video accelerator cable (FG5968-74/75/76) is strongly recommended for this application. Network congestion can cause video glitches. AMX recommends the Modero X touch panel be installed behind a smart Ethernet switch to filter unintended multicast packets reaching the panel and consuming panel resources. Recommend maintaining aspect ratio of source and following usage guidelines regarding window/button placement. • AAC <= 192Kbps @ 48KHz • H.264 video 720p max (D1 for best results), < 30fps max and a 4Mbps bitrate • UDP Transport protocol only (RTP not supported) • Multicast and/or unicast addresses • SAP disabled May require transcoding to H.264 baseline profile and reducing resolution/ frame rate/bit rate per recommendations above. Recommend transcoding source material to MPEG2 if Audio/Video sync issues still occur after following above guidelines.
MPEG2	<100ms	~ every 1-2hrs	1.5s	3s or more, depending on network	The MXA-UENET video accelerator cable (FG5968-74/75/76) is recommended for this application, especially HD streams. Network congestion can cause video glitches. We recommend the panel be installed behind a smart Ethernet switch to filter unintended multicast packets reaching the panel and consuming panel resources. Recommend maintaining aspect ratio of source and following usage guidelines regarding window/button placement. Best results are obtained with standard definition (NTSC or PAL) sources. Minor audio/video irregularities may be noticed depending on network performance, video source content, and window size. Note: Video frame rate can be affected by network performance. MPEG-2 video streaming Settings: • MP2/MP3 audio <= 192Kbps @ 48KHz • MPEG2 video 720p max < 30fps max bitrate of 8Mbps • UDP Transport protocol only (RTP not supported) • Multicast and/or unicast addresses • SAP disabled

Video Performance					
MAX-CSE					
H.264	N/A	N/A	N/A	N/A	N/A
MPEG2	<100ms	~ every 1-2hrs	1.5s	3s or more, depending on network	Network congestion can cause video glitches. We recommend the panel be installed behind a smart Ethernet switch to filter unintended multicast packets reaching the panel and consuming panel resources. Recommend maintaining aspect ratio of source and following usage guidelines regarding window/button placement Minor audio/video irregularities may be noticed depending on network performance, video source content, and window size. Note: Video frame rate can be affected by network performance. MPEG-2 video streaming Settings: • High quality preset profile (6Mbps/ MPEG2 CBR D1 Resolution) • MP2/MP3 audio < 192Kbps @ 48KHz • UDP Transport protocol only (RTP not supported) • Multicast and/or unicast addresses • SAP disabled
3rd Party Solutions					
H.264	N/A	N/A	N/A	N/A	<i>Note: Third-party encoders and digital television devices have not been tested with Modero X Series touch panels, and are not supported by AMX.</i> The MXA-UENET video accelerator cable (FG5968-74/75/76) is recommended for this application, especially HD streams. Network congestion can cause video glitches. We recommend the panel be installed behind a smart Ethernet switch to filter unintended multicast packets reaching the panel and consuming panel resources. We recommend maintaining aspect ratio of source and following usage guidelines regarding window/button placement.
MPEG2	N/A	N/A	N/A	N/A	<i>Note: Third-party encoders and digital television devices have not been tested with Modero X Series touch panels, and are not supported by AMX.</i> The MXA-UENET video accelerator cable (FG5968-74/75/76) is recommended for this application, especially HD streams. Network congestion can cause video glitches. We recommend the panel be installed behind a smart Ethernet switch to filter unintended multicast packets reaching the panel and consuming panel resources. We recommend maintaining aspect ratio of source and following usage guidelines regarding window/button placement.



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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:
2/03/2016