Hybrid Modular Matrices

MX SERIES

visual engineering
LIGHTWARE

visual engineering
LIGHTWARE

HYBRID
video switching

The MX series matrix routers are high performance modular expandable DVI and HDMI compliant switchers available with five different frame sizes. The built-in sophisticated software and hardware features make these routers the most flexible and integrated solution for AV professionals and high-end home theatre applications.

The future-proofed matrix backplanes are able to switch data rates up to 12.8 Gigabit per second data rates allowing transportation of the HDMI 1.4, 4K x 2K, 3D and Displayport 1.1 video signals. All input boards e.g. DVII, 3G-SDI, etc. convert their respective input signals to the widest and broadest standard for all existing video signals – uncompressed HDMI (including embedded audio). Output boards convert the router's switched HDMI format to their respective output e.g. fiber and twisted pair amongst others.

Highlight features

- MX-CPU2 processor board
- Frame Detector and Input signal analysis on any input port
- Genlock switching (bi-level, tri-level, TTL and any input)
- Multiple TCP/IP connection
- Advanced error handling and logging with time stamps
- Combine non-HDCP and HDCP capable I/O boards in the same frame
- USB control
- EtherCON ruggedized LAN connector

Cross platform signal routing

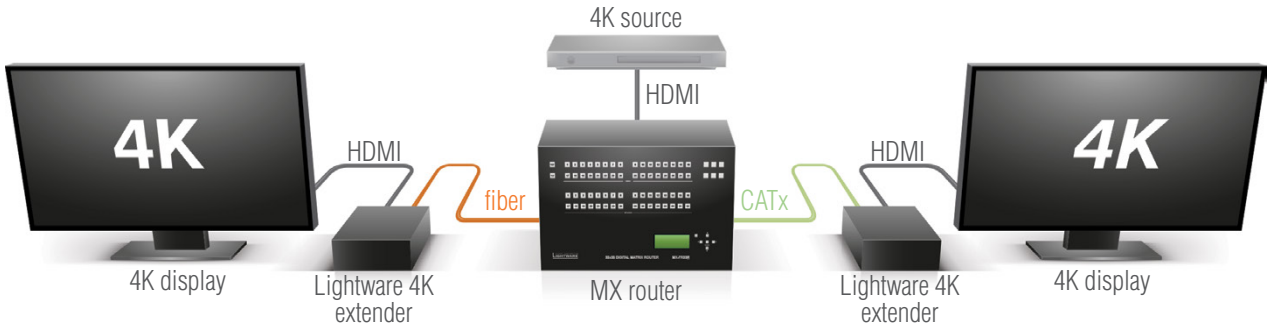
Fiber, TPS, TP, DVI, HDMI, analog VGA, SDI, HD-SDI, 3G-SDI, S/PDIF and analog stereo audio signals are handled in the same frame without routing limitations.

without routing limitations

Any input can be tied to any one or more outputs without limitations. One source can be viewed on multiple destinations at the same time. Crosspoint switching is done instantly without any frame delay or frame latency. Different frame sizes are available from 9x9 up to 80x80 allowing the building of custom I/O sized matrices.

4K UHD support

Lightware's MX series Hybrid Modular and also the 25G HYBRID matrices support the highest 4096x2160@30Hz 4K, 3840x2160@30Hz UHD, 2560x1600 and 1920x1080@120Hz FullHD resolutions. Lightware also provides 4K extenders which can be used in point-to-point 4K transmission and also connected to MX series or 25G HYBRID matrices as far end points.



Advanced EDID Management

This proprietary Lightware technology has been further upgraded. It stores more than 100 user EDID files and offers various factory preloaded versions including all standard DVI resolutions. HDMI EDID with various audio channels and codecs are also supported, plus analog VESA, non-standard VGA EDID formats and Dual-Link DVI resolutions including the latest 4K projector's requirements.
With the supplied Lightware Matrix Control Software, which includes our Advanced EDID Editor option, users can create their own EDID file, send by Email, upload to any Lightware product or modify existing EDID data read from any projector or monitor. It supports .bin, .dat and .edid file formats allowing system engineers to generate EDID files for 3rd party manufacturer's AV products.

Single fiber technology

Single Fiber Technology is one of the main features of our OPT, OPTS and OPTM fiber optical extenders. This technology makes possible to send several signals over one optical fiber core. All the bi-directional communication - necessary for HDCP handshaking or the control commands - is performed on the same fiber core that transmits the video signal making installation of these extenders easy and cost effective.

HDCP compatibility

All Lightware matrix router frames, relevant I/O boards and suitable devices are compatible with HDCP encrypted sources and displays. Installing a complex AV system with both HDCP and non-HDCP components becomes easy and with our non-blocking architecture, HDCP and non-HDCP boards are now compatible within the same chassis.

A **red screen alert** is shown when protected content is switched to a non-compliant display. Lightware Visual Engineering is a legal HDCP adopter, and has developed several functions that helps to solve HDCP related problems.

HDCP key caching is the technique introduced in early 2009 that validates all the display keys in an AV system during system boot up and keeps them constantly available for sources. This method eliminates an HDCP handshake at every switch and keeps all sources sending uninterrupted signals. Similar to fixing an EDID on input ports, the whole video and audio system will be free from black displays, 5..8 second blinking screens and dropped signals that are all too common in many switching and distribution products.

HDCP enabling/disabling function turns off HDCP capability on individual input ports while keeping other inputs HDCP compliant. Some computers choose to encrypt their output even when unprotected content is displayed, such as desktop images or presentations. This function forces the source to send an unencrypted signal if the content itself is also unencrypted.

No signal latency – Instantaneous switching

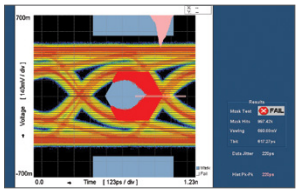
All Lightware matrix routers and standalone extenders – even the analog VGA or the 3G-SDI input boards – add no frame or line period delay to the signal. When a key press or a switch command has been sent over any control port the switching is instantaneous. Lightware routers and switchers do not add delay to the switch function and multiple switches can be executed at the same time instantaneously. Switching genlocked sources gives a glitch-free image change similar to seamless switchers. Even non-locked sources' signals are switched instantaneously allowing displays to resynchronize as fast as their internal circuitry allows. This resynchronization time may take between 50 milliseconds and 2 seconds depending on the display or projector type.

3D formats support

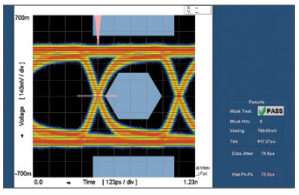
Lightware provides complete, integrated solutions for the digital age delivering 3D HDMI. Lightware products enable customers to use 3D technology in every environment used nowadays from professional to home AV including: Blu-ray players, game consoles, cable, and satellite or broadcast installations.

Pixel Accurate Reclocking

This Lightware proprietary technology was introduced by the world's first DVI matrix switcher (MX8x8DVI-Pro) in 2006 and provides exceptional signal regeneration capability. The circuitry cleans the signal from noise, skew and jitter caused by long cable runs, EMC incompatible devices and poor quality twisted pair cables/equipment. Automatic skew compensation eliminates intra-pair and inter-pair skew caused by imperfect wire twists and lengths in DVI, HDMI and CAT cables. Pixel Accurate Reclocking decodes the pixel information from the video content and drives them over the dual PLL circuitry. The regenerated pixel information is re-encoded as a DVI or HDMI signal ensuring the output is stable with sharp digital transitions and accurate timings.



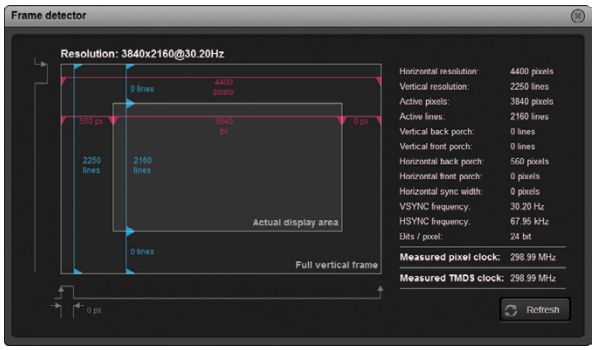
HDMI signal before Pixel Accurate Reclocking



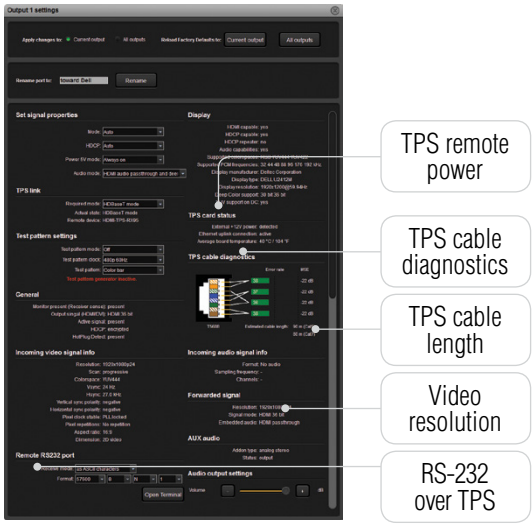
HDMI signal after Pixel Accurate Reclocking

Frame Detector and Input Signal Analysis

Uniquely available on Lightware matrices, this function determines the exact video format sent by the source and therefore helps to identify many potential issues. The signal analyzer displays detailed information regarding an incoming video and audio signal such as timing, frequencies, scan mode, HDCP encryption, color range, color space and audio sample rate. In the Frame Detector window the parameters are displayed on an intuitive graphical interface. Through the CPU2, this function is now available on all input boards.



Frame detector



Input Signal Analysis

Built-in cable compensation

Each DVI, HDMI or SDI input port contains an individual built-in cable extender in the Modular Matrices. The cable equalizer can be used in manual or automatic adaptive mode and extends the cable length on inputs respective to the signal format. Using a 22AWG high quality DVI or HDMI cable, the inputs are automatically compensated for up to 60 meter cable length at 1080p, WUXGA and 2K computer resolutions at 24bpp. This feature eliminates the need for additional cable extender boxes in the system rack. Other switchers, interfaces and extenders' cable compensation may differ, for exact parameters see the product's feature list.

Cross compatibility

Cross compatibility is ensured between every device in Lightware's product families. Extender pairs work together in point to point standalone applications as well as connected to a matrix router thanks to Lightware's Hybrid Modular design. This integrated solution simplifies installation and helps reducing system costs as well.

Advanced control options

Various control options have been introduced to ease system control, setup, maintenance and troubleshooting. In the matrix frames a ruggedized Ethercon connector proves a reliable connection to the LAN allowing multiple TCP/IP and WEB controls simultaneously. An RS-232 connector is provided for 3rd party control systems. These touch-panel controls allow customization of your system, offer simplicity in system control and operation. The front panel contains a mini USB connector for easy access in rack applications. Lightware also has a company developped Matrix Control Software which supports quick matrix configuration and easy EDID setup with the built-in Advanced EDID Editor.

Lightware Device Controller

The new Lightware Device Controller application is now available with further upgraded features and a completely new, redesigned look. The LDC is more intuitive, user friendly, smarter and has a more modern interface.

With its Tile view LDC shows a new way of matrix handling, the Dynamic crosspoint layout makes it possible to use it on different screen sizes and an Auto update function has been integrated as well. The new Lightware Device Controller is available for both Windows and OS X operating systems, for more information please check Lightware's software site: software.lightware.eu

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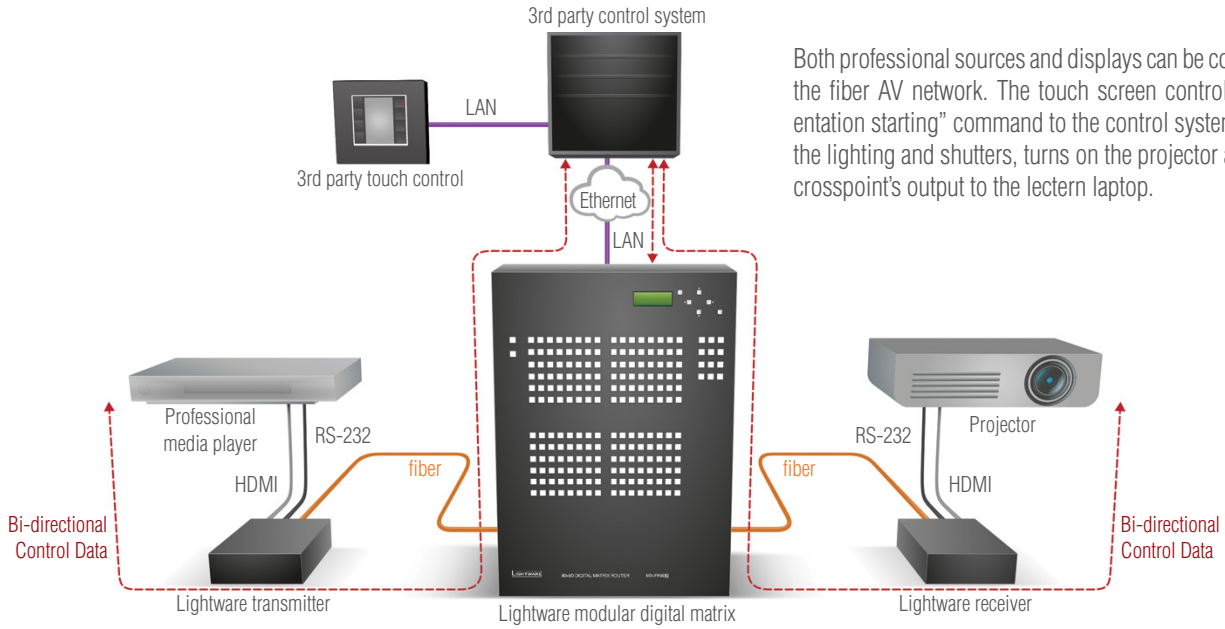
RS-232 over fiber and TPS

This control option allows the endpoint devices (eg. sources and displays) to be remotely controlled through a single fiber or twisted pair cable. The central control system can send and receive commands directly to and from the far endpoint devices with RS-232 control capability. The control commands are delivered on the same fiber or CATx cable which carries the video and audio signal therefore no extra cabling is required for RS-232 control. The matrix functions as a communication hub. The control system needs only one physical LAN or RS-232 connection to the matrix and will be able to communicate with all the endpoint devices directly connected to far end optical or TPS transmitters and receivers.

For example the central control system can turn on and off a TV which is connected to a TPS or fiber receiver, can select inputs directly on a multi-input TPS or optical transmitter and also be able to communicate with a touch panel connected to a transmitter in a room.

Conference room application



Both professional sources and displays can be controlled through the fiber AV network. The touch screen control sends a “presentation starting” command to the control system, which adjusts the lighting and shutters, turns on the projector and switches the crosspoint’s output to the lectern laptop.

Advanced audio options

Nowadays AV applications are still rife with analog stereo audio signals. Lightware extenders and matrix boards support direct analog audio connections to ease system integration. Analog audio ports feature volume, gain, bass and treble controls. These controls help to interface with an audio subsystem or if the ports are connected directly to audio sources or speakers it gives an easy way to adjust the sound.

Reliability & Redundancy

Reliability is one of the most important and main features of Lightware's products. The MX-FR33**R**, MX-FR65**R** and MX-FR80**R** frames contain hot swappable N+1 redundant power supplies. These frames were designed for mission critical operations where redundancy is key and high reliability is required. If one of the supplies fail unexpectedly the remaining PSU units continue to function keeping the AV system seamlessly in operation. Our power supplies are all rated to 1,000,000 hours MTBF, are loaded to a maximum of 60%, and accept all international AC line voltages from 100 to 240 Volts with 50 to 60 Hz frequency on a standard IEC connector.

PSU-160 power supply for MX-FR33**R**

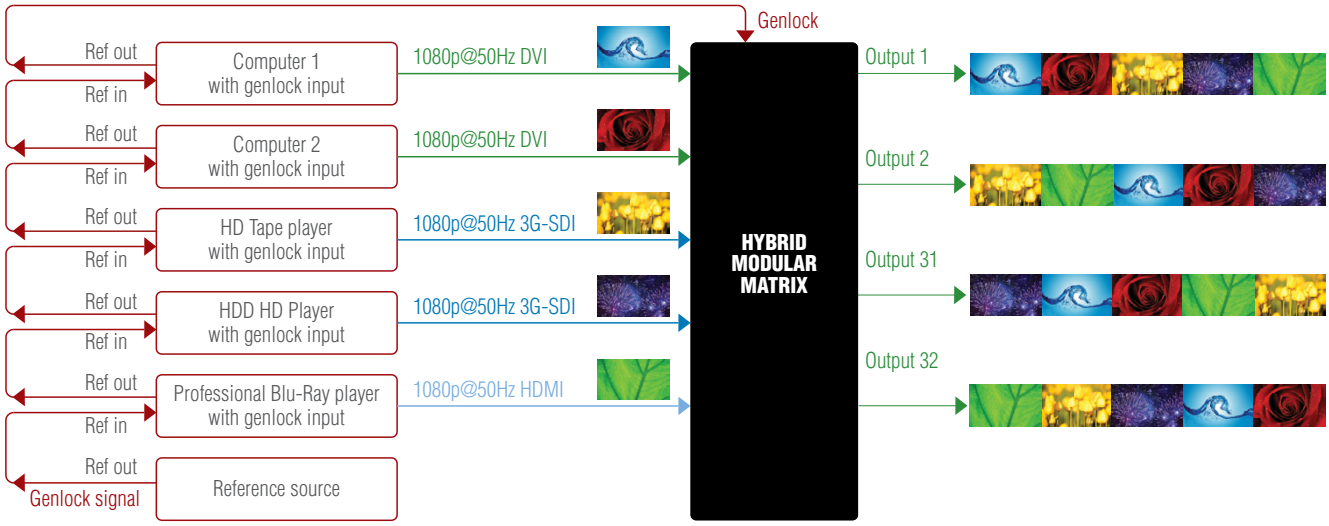

850 W power supply for MX-FR65**R**, MX-FR80**R**

Genlock switch function

Genlock function has been introduced in our new router frames. This feature was designed to integrate Lightware matrix switches in rental and staging and broadcast systems where professional grade equipment is used. The routers' switch can be manually set up to take place during the blanking interval or simply according to the SMPTE recommendation - RP-168. Many types of external sync signals can be fed through the BNC connectors. For example, Bi level sync, Tri level sync and TTL sync. In addition to the external BNC connector, the routers can lock to any incoming video signal applied to any input port. Lightware has also extended the range of possible sync frequencies and allows synchronized vertical interval switching for all SMPTE and non-SMPTE standard signals. For example, VESA, 3D and other non-standardized computer resolutions are supported.

Remote Input Control over DDC

Remote input control over DDC is designed to switch inputs remotely on Lightware signal extenders without any additional control cabling. The RICOD master device can control the RICOD slave device which is connected to its input port. This allows the user to switch between the multiple input ports on the remote transmitter directly from a matrix switcher.




Without genlock


With genlock

Genlock switching is the cost effective way to achieve seamless switching. No black picture, signal drop or glitch will occur when switching between sources.

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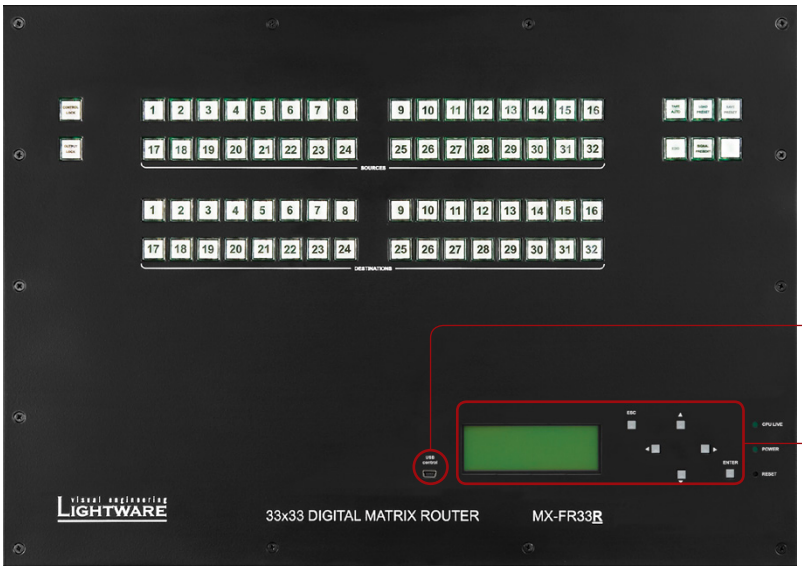
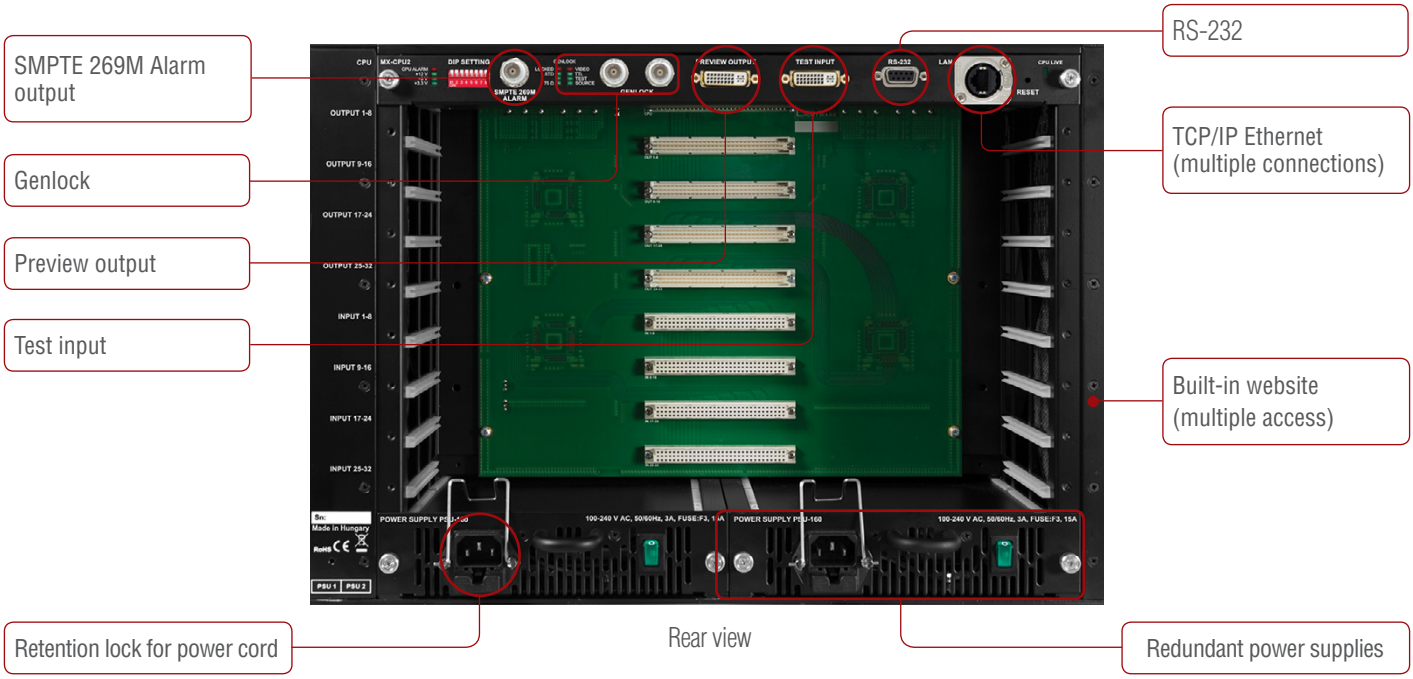
Matrix switcher frames

MX series matrix frames are available in five different frame sizes from 9x9, 17x17, 33x33, 65x65 to 80x80 allowing the building of custom I/O sized matrices. Lightware's brand new Lightware Device Controller software is now available, which simplifies system setup with new functions and a new user friendly graphical interface. There are many sophisticated software and hardware features which make these frames the most flexible and integrated solution for AV professionals and high-end home theatre applications.



Front view



Rear view

Features:

- MX-CPU2 processor board
- Frame Detector for Input signal analysis on any port
- Genlock switching (bi-level, tri-level, TTL and any input)
- Multiple TCP/IP connection
- Advanced error handling and logging with time stamps
- Combine non-HDCP and HDCP capable I/O boards in the same frame
- Front panel USB control
- Front panel buttons and 4 line LCD menu
- TCP/IP Ethernet (multiple connections)
- Built-in website (multiple access)
- Compatible with all MX-.. and MXD-.. I/O boards
- Advanced EDID Management
- Intuitive control software
- HDCP compliant and HDCP key counter
- Optional redundant power supplies
- Hybrid Modular and Cross Platform technology
- RS-232/RS-422
- Vista Spyder and Barco Encore compatible

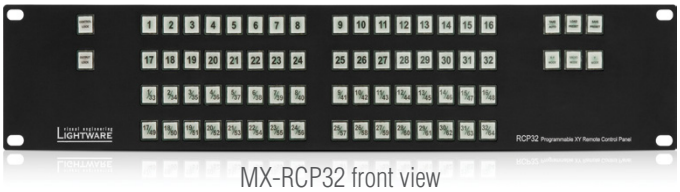
MX-CPU2

Processor board for modular matrix frames

MX-CPU2

Part No: 9111 0008

MX-CPU2 contains an additional input and output port that fully support DVI and 3D HDMI signals with or without HDCP encryption. The test input and preview output ports turn an existing 16x16 matrix to a 17x17, an existing 32x32 to a 33x33.



MX-RCP32 front view

MX-RCP32 rear view

Remote control panels for Lightware matrix switchers

MX-RCP16 and MX-RCP32

Part No: 9111 0009 (RCP16), 9111 0010 (RCP32)

Features:

- Remote access to matrix switchers
- Setup and programming through Ethernet connection
- 10/100 Ethernet connection
- Programmable Preset and Salvo functions
- 16+16 and 32+32 button versions
- XY control possibility

Lightware MX-RCP16 and MX-RCP32 are remote control panels for controlling Lightware matrix routers remotely through LAN connection. The RCPs can be used just like the front panel buttons on matrix routers to make crosspoint changes, or they can be programmed for special functions like salvo mode or universal device control.


MX-FR80**R**, MX-FR65**R**


MX-FR33**R**


MX-FR33L


MX-FR17


MX-FR9

Hybrid modular redundant matrix switcher frame with up to 80 inputs and 80 outputs

MX-FR80**R**

Part no: 9111 0006

Features:

- I/O board slots: 10 input board slots, 10 output board slots
- Custom I/O sizes: from 9x9 to 80x80 (Single-Link DVI or HDMI)
- Rack height: 15U
- Redundant high reliability power supplies

Hybrid modular redundant matrix switcher frame with up to 65 inputs and 65 outputs

MX-FR65**R**

Part no: 9111 0005

Features:

- I/O board slots: 8 input board slots, 8 output board slots
- Custom I/O sizes: from 9x9 to 65x65 (Single-Link DVI or HDMI)
- Rack height: 15U
- MX-FR65R can be upgraded any time to a real MX-FR80R frame
- Redundant high reliability power supplies

Hybrid modular redundant matrix switcher frame with up to 33 inputs and 33 outputs

MX-FR33**R**

Part no: 9111 0004

Features:

- I/O board slots: 4 input board slots, 4 output board slots
- Custom I/O sizes: from 9x9 to 33x33 (Single-Link DVI or HDMI)
- Rack height: 7U
- Redundant high reliability power supplies

Hybrid modular matrix switcher frame with up to 33 inputs and 33 outputs

MX-FR33L

Part no: 9111 0003

Features:

- I/O board slots: 4 input board slots, 4 output board slots
- Custom I/O sizes: from 9x9 to 33x33 (Single-Link DVI or HDMI)
- Rack height: 6U
- Single high reliability power supply

Hybrid modular matrix switcher frame with up to 17 inputs and 17 outputs

MX-FR17

Part no: 9111 0002

Features:

- I/O board slots: 2 input board slots, 2 output board slots
- Custom I/O sizes: from 9x9 to 17x17 (Single-Link DVI or HDMI)
- Rack height: 4U
- Single high reliability power supply

Hybrid modular matrix switcher frame with up to 9 inputs and 9 outputs

MX-FR9

Part no: 9111 0001

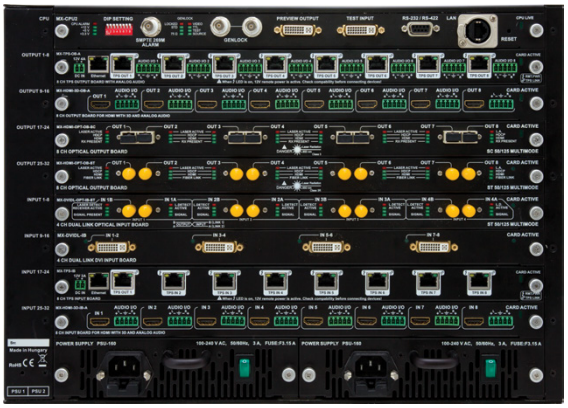
Features:

- I/O board slots: 1 input board slots, 1 output board slots
- Custom I/O sizes: 9x9 (Single-Link DVI or HDMI)
- Rack height: 4U
- Single high reliability power supply

Hybrid Modular design

The MX series matrices are truly Hybrid and Modular. Hybrid as different signal types can be managed in the same matrix and modular as any input and output boards can be used in one frame without limitations. These examples represent how to build a full optical or twisted pair matrix system and show the possibility to combine different I/O boards. Any input or output board can be replaced by another DVI, HDMI, SDI, fiber or TPS boards thanks to our Hybrid Modular architecture.

MX-FR9 with MXD I/O boards



MX-FR33**R** with combined I/O boards

MX-FR80**R** with TPS I/O boards

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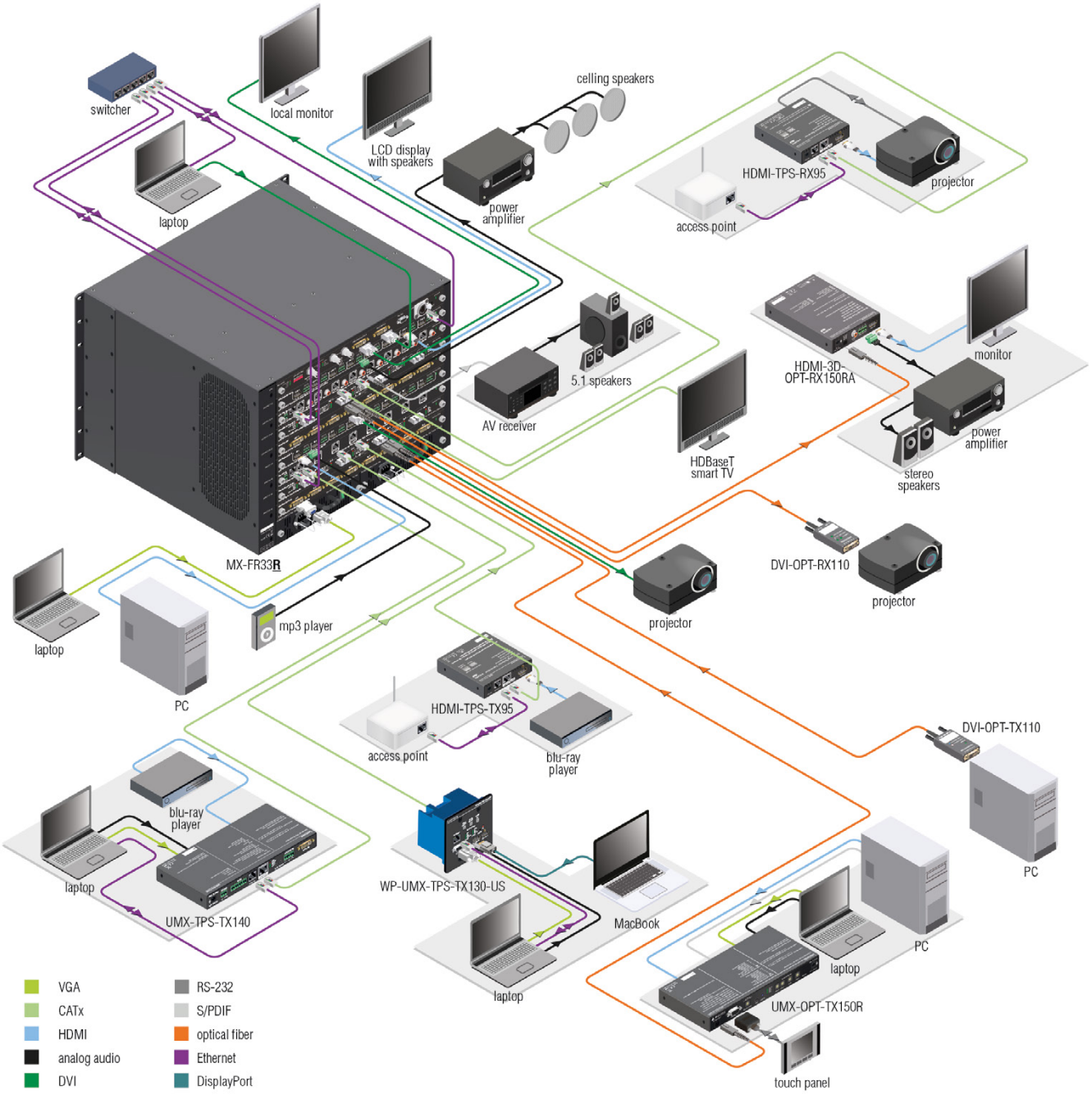
Specifications for all frames:

Video data rate:	12.8 Gbps
EDID memory:	100 factory preset and 50 user programmable
EDID emulation:	256-Byte Extended EDID v1.3
Front panel buttons:	Yes
Front panel LCD:	Yes, 4 x 20 characters
RS-232:	Selectable (9600, 38400, 57600, 115200) Baud RX, TX (default: 57600)
LAN:	Ethernet 10Base-T or 100Base-TX (Auto-sensing)
WEB:	Built-in website
Temperature:	0°C to +50°C operational -40°C to +70°C storage
Humidity::	10 to 90% non-condensing
Altitude:	2000 m operational
EMI/EMC compliance:	Yes, EN 55022 Class B
RoHS compliance:	Yes
Warranty:	3 years

Frame-dependent specifications:

	MX-FR80**R**	MX-FR65**R**	MX-FR33**R**	MX-FR33L	MX-FR17	MX-FR9
Equipped with MX-CPU2 processor board	✓	✓	✓	✓	✓	✓
I/O board slots	10 in, 10 out	8 in, 8 out	4 in, 4 out	4 in, 4 out	2 in, 2 out	1 in, 1 out
Additional I/O ports accessible on MX-CPU2	✓	✓	✓	✓	✓	✓
Custom I/O sizes (Crosspoint size)	from 9x9 to 80x80	from 9x9 to 65x65	from 9x9 to 33x33	from 9x9 to 33x33	from 9x9 to 17x17	9x9
Dual-Link DVI compatible (Dual-Link crosspoint size)	from 4x4 to 40x40	from 4x4 to 32x32	from 4x4 to 16x16	from 4x4 to 16x16	from 4x4 to 8x8	4x4
Rack height	15U	15U	7U	6U	4U	4U
Redundant high reliability power supplies	✓	✓	✓	x	x	x
Number of power supplies	3	2	2	1	1	1
Power supply hot swappable	✓	✓	✓	x	x	x
Power consumption[1]	114 W	114 W	27 W	26 W	19 W	19 W
Heat dissipation (BTU/h)[1]	389	389	92	89	65	65
Cooling (forced convection) 120 mm fans	10	10	4	2	2	2
Dimensions with rack mounting ears:	482 W x 665 H x 392 D mm	482 W x 665 H x 392 D mm	482 W x 309,5 H x 400 D mm	482 W x 265,5 H x 300 D mm	482 W x 176,5 H x 300 D mm	482 W x 176,5 H x 300 D mm
Dimensions without rack mounting ears:	440 W x 665 H x 392 D mm	440 W x 665 H x 392 D mm	440 W x 309,5 H x 400 D mm	440 W x 265,5 H x 300 D mm	440 W x 176,5 H x 300 D mm	440 W x 176,5 H x 300 D mm
Net weight[2]	25 kg	25 kg	12 kg	12 kg	9,8 kg	9,8 kg

[1] with CPU2 board and without I/O boards
[2] with CPU2 board, power supplies and without I/O boards



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Input and output boards

Lightware's Hybrid Modular matrix switchers can be used with various input and output boards, which can be mixed in the same frame without limitation. The hybrid architecture makes possible to route signals between the boards even if they have different type of interfaces (like DVI, HDMI, fiber optical, or CATx twisted pair). A wide range of compatible extender devices is available for all input and output boards.

DVI-D Single-Link input board

MX-DVID-IB

Part No: 9112 0001

MX-DVID-IB

Features:

- Adaptive and manual equalization for up to 60 m DVI cable
- Advanced EDID Management

MX-DVID-IB is an 8 channel input board accepting digital only DVI signals. It supports resolutions from 640 x 480 to 1920 x 1200 or 2048 x 1080 resolutions with interlaced or progressive scan. Weak input signals are independently equalized and buffered for further signal processing. Each input port incorporates a built-in Cable Extender and an individual EDID Manager fixing EDID information and keeping sources continuously active. Users can set up any EDID resolution when using the Advanced EDID Management function of the routers. Non-HDCP encrypted DVI sources like computers can be connected to MX-DVID-IB with an up to 60 meter copper cable.

Specifications

HDCP compliancy:	No
Max Resolution:	1920x1200 or 2048x1080
Input cable equalization:	40 dB
Power consumption (3.3 V):	1.7 A (typical), 2.3 A (max.)
Power consumption (5 V):	0 A (typical), 0 A (max.)
Calculated AC Power (W):	8 (typical), 10.8 (max.)
Heat dissipation (BTU/h):	30 (typical), 39 (max.)
Weight:	450 g
Input connectors:	DVI-D

Dual-Link DVI input board

MX-DVIDL-IB

Part No: 9112 0005

MX-DVIDL-IB

Features:

- Pro series Dual-Link DVI input board
- 60 m copper cable equalization - adaptive or manual mode
- Advanced EDID Management
- Gold plated DVI connectors

MX-DVIDL-IB, the 4 channel Dual-Link DVI input board was designed for higher video resolutions such as 2560 x 1600 or 4096 x 2400 as well as 100 or 120 Hz 3D signals. It incorporates Advanced EDID Management and 60 m Dual-Link DVI copper cable equalization.

Specifications

HDCP compliancy:	No
Max Resolution:	4096x2400 or 1920x1200 Stereo
Power consumption (3.3 V):	1.7 A (typical), 2.3 A (max.)
Power consumption (5 V):	0 A (typical), 0 A (max.)
Calculated AC Power (W):	8 (typical), 10.8 (max.)
Heat dissipation (BTU/h):	30 (typical), 39 (max.)
Weight:	850g
Input connectors:	DVI-D Dual-Link

DVI, HDCP and HDMI compliant input board

MX-DVI-HDCP-IB

Part No: 9112 0002

MX-DVI-HDCP-IB

Features:

- HDMI 1.3; DVI and HDCP compliant
- 60 m copper cable compensation on all input - adaptive or manual
- Advanced EDID Management
- Supports all HDMI audio formats: Dolby TrueHD and DTS-HD Master Audio
- Pixel Accurate Reclocking
- 36-bit deep color support
- 3D signal compatibility with frame packing, side-by-side and top-bottom formats

MX-DVI-HDCP-IB, the 8 channel input board receives digital DVI and HDMI 1.3 signals with or without HDCP encryption. Each input has 60 m cable equalization and an individual EDID Manager incorporated. The DVI connectors passes HDMI with embedded audio signals from Blu-ray and Set-top boxes, and ensures a reliable connection with its lockable screws. Advanced professional functions such as an HDCP enable/disable mode, Pixel Accurate Reclocking and built-in Frame Detector are integrated providing the highest level of setup and usage. 3D HDMI signal compatibility is provided with the following formats: 1920x1080p, 1280x720p and 640x480p.

Specifications

HDCP compliancy:	Yes
Max Resolution:	1920x1200 or 2048x1080
3D signal compatibility:	Frame packing, side-by-side, top-bottom
Input cable equalization:	40 dB
Power consumption (3.3 V):	2.8 A (typical), 4.7 A (max.)
Power consumption (5 V):	2.1 A (typical), 2.4 A (max.)
Calculated AC Power (W):	28.2 (typical), 39.3 (max.)
Heat dissipation (BTU/h):	103 (typical), 145 (max.)
Weight:	850 g
Input connectors:	DVI-I

Analog and digital DVI-I input board

MX-DVII-HDCP-IB

Part No: 9112 0003

MX-DVII-HDCP-IB

Features:

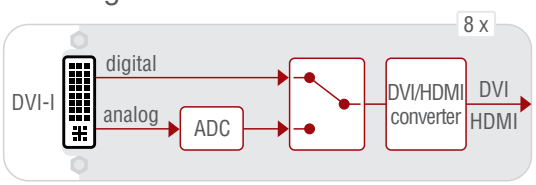
- DVI-I (analog+digital) input board
- Digitizes VGA, YUV analog input formats and converts to HDMI or DVI
- 10-bit HD and SD; interlaced and progressive A/D conversion
- Accepts DVI and HDMI 1.3 digital signals with embedded audio
- HDCP compliant
- Autodetects input signal
- Deep color support
- Picture adjustments per input port, contrast, black level, color etc.
- Pixel Accurate Reclocking
- Advanced digital and analog EDID Management
- Adaptive DVI and HDMI cable equalization for up to 20 meters

MX-DVII-HDCP-IB the all-round input board was designed to handle analog VGA or YUV and digital DVI or HDMI 1.3 with HDCP video signals. Each input port incorporates an individual EDID Manager, a video A/D converter and a digital/analog video switch. No frame delay occurs if an analog signal is digitized. Each port contains an autosync function, however the picture parameters (Hpos, Vpos, Phase, etc.) can be fine-tuned manually. The built-in Frame Detector and graphical signal analyzer helps precise adjustments and the Pixel Accurate Reclocking technology provides exceptional signal regeneration capability.

Specifications

HDCP compliancy:	Yes
Max Resolution:	1920x1200 or 2048x1080
Power consumption (3.3 V):	3.6 A (typical), 5.6 A (max.)
Power consumption (5 V):	2 A (typical), 3.2 A (max.)
Calculated AC Power (W):	31.3 (typical), 49.3 (max.)
Heat dissipation (BTU/h):	109 (typical), 151 (max.)
Weight:	450 g
Input connectors:	DVI-I

Port diagram



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UMX series input board

MXD-UMX-IB

Part No: 9112 0004

MXD-UMX-IB

Features:

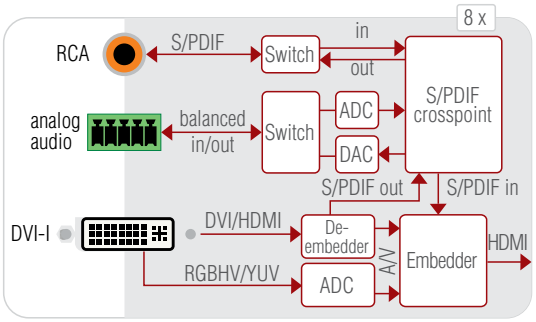
- Double slot input board - needs two cards' slot in the frame
- UMX technology
- Accepts DVI-I and HDMI digital signals with embedded audio
- Digitizes VGA, YUV analog input formats and converts to HDMI or DVI
- 10-bit HD and SD; interlaced and progressive A/D conversion
- HDCP compliant, autodetects input signal
- Deep color support, picture adjustments per input port, contrast, black level, color etc.
- Pixel Accurate Reclocking, digital and analog audio embedding and de-embedding
- Simultaneous audio embedding and de-embedding per port
- S/PDIF digital audio connector can be configured either as both input and output
- Balanced stereo audio connector can be individually configured as both input or output
- S/PDIF connector supports PCM Stereo and 5.1 AC3 digital audio formats
- Only compatible with MX-FR80**R**, MX-FR65**R**, MX-FR33**R**, MX-FR33L and MX-FR17 frames

UMX (Universal MatriX) technology has been developed by Lightware to support various analog and digital video and audio signal formats. MXD-UMX-IB is an input board designed for our matrix routers accepting DVI, HDMI, VGA and YUV video signals and digital or analog audio. Each channel also has balanced analog bi-directional line level input/output connector, a bi-directional S/PDIF input/output connector, an HDMI audio de-embedder and re-embedder plus a small 3x3 digital audio crosspoint switch per each input port. Various combinations of sources can be connected, such as analog laptops with stereo audio output, Set-top boxes with HDMI and S/PDIF outputs, computers with HDMI output and embedded audio and many, many more. HDMI de-embedded PCM audio can be converted to stereo analog formats locally, and a new audio stream can be embedded into the video stream (5.1 S/PDIF for example) from another source. Computer VGA signals with 5.1 S/PDIF audio can be converted to HDMI for further switching in the matrix. Our well-known professional features like Pixel Accurate Reclocking, Advanced EDID Management, built-in Frame Detector and Input signal analysis, 10 bit video A to D conversion, deep color support and an HDCP enable/ disable function are all built in this versatile tool.

Specifications

HDCP compliancy:	Yes
Max Resolution:	1920x1200 or 2048x1080
PCM Stereo audio support:	Balanced analog, S/PDIF and DVI-I connectors
5.1 audio support:	S/PDIF and DVI-I connectors only
Dolby TrueHD and DTS-HD audio:	DVI-I connector only
Power consumption (3.3 V):	4.7 A (typical), 6.8 A (max.)
Power consumption (5 V):	4.2 A (typical), 5.4 A (max.)
Calculated AC Power (W):	52.2 (typical), 70.6 (max.)
Heat dissipation (BTU/h):	115 (typical), 181 (max.)
Weight:	1200 g
Input connectors:	DVI-I, Phoenix, S/PDIF

Port diagram



HDMI input board including 4K, 3D and Deep Color

MX-HDMI-3D-IB, -A, -S

Part No: 9112 0007, 9112 0008 (A), 9112 0009 (S)

Features:

- HDMI 1.4a; DVI and HDCP compliant
- 4K x 2K @ 30 Hz, 1080p @ 120 Hz, 2560 x 1600, 2048 x 2048, HD video resolutions and all 3D formats are supported
- Available models: analog stereo audio option (MX-HDMI-3D-IB-A) or digital S/PDIF audio option (MX-HDMI-3D-IB-S) or without audio option (MX-HDMI-3D-IB)
- Advanced EDID Management and Frame Detector
- Pixel Accurate Reclocking
- Dolby TrueHD and DTS-HD Master Audio
- 36-bit deep color support

MX-HDMI-3D-IB provides 8 channel HDMI 1.4a inputs with DVI and HDCP compliance supporting all 3D formats as well. The input board is available with audio option connectors: digital S/PDIF or analog stereo connectors are available for advanced audio functions (HDMI embedded audio signals are managed by the board as well). The MX-HDMI-3D-IB without the digital or analog audio option can handle HDMI embedded audio as well. Advanced professional functions such as HDCP enable/disable mode, Pixel Accurate Reclocking, Advanced EDID Management and Frame Detector are integrated providing the highest level of setup and usage.

Digital S/PDIF audio option:

- S/PDIF breakout for every port
- Bi-directional configurable S/PDIF connectors:
  audio can be de-embedded from the HDMI signals or
  audio can be embedded (or replaced) to the HDMI signal

Analog stereo audio option:

- Bi-directional configurable analog stereo port with 5 pole phoenix connector
- Stereo PCM audio up to 96 kHz can be de-embedded from the HDMI signals
- Digitalized audio (PCM 48 kHz) can be embedded (or replaced) to the HDMI signal

Specifications

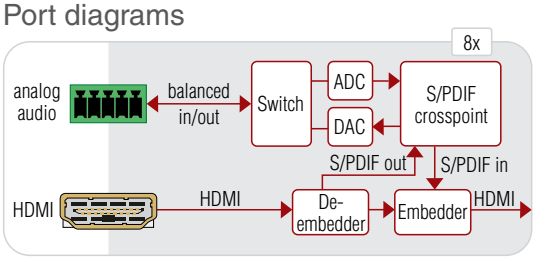
HDCP compliancy:	Yes
Max Resolution:	Up to 4096 x 2160
3D signal compatibility:	Frame packing, side-by-side, top-bottom
Input cable equalization:	20 dB
Power consumption (3.3 V) MX-HDMI-3D-IB & -IB-S:	0.79 A (typ.), 1.32 A (max.)
Power consumption (3.3 V) MX-HDMI-3D-IB-A:	1.03 A (typ.), 1.72 A (max.)
Power consumption (5 V) MX-HDMI-3D-IB & -IB-S:	0.56 A (typ.), 0.93 A (max.)
Power consumption (5 V) MX-HDMI-3D-IB-A:	0.56 A (typ.), 0.93 A (max.)
Calculated AC Power (W) MX-HDMI-3D-IB & -IB-S:	7.7 (typ.), 12.9 (max.)
Calculated AC Power (W) MX-HDMI-3D-IB-A:	8.9 (typ.), 14.8 (max.)
Heat dissipation (BTU/h) MX-HDMI-3D-IB & -IB-S:	28 (typ.), 47 (max.)
Heat dissipation (BTU/h) MX-HDMI-3D-IB-A:	33 (typ.), 54 (max.)
Weight MX-HDMI-3D-IB & -IB-S:	809 g
Weight MX-HDMI-3D-IB-A:	865 g
Input connectors:	HDMI, S/PDIF, Phoenix

MX-HDMI-3D-IB-A

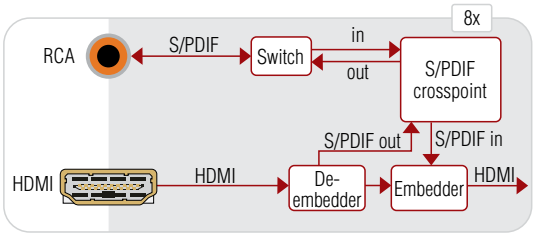
MX-HDMI-3D-IB-S

MX-HDMI-3D-IB

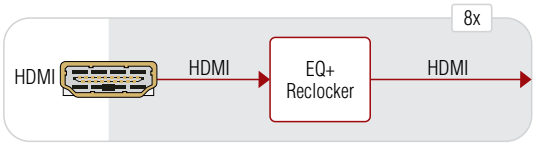
Port diagrams



MX-HDMI-3D-IB-A

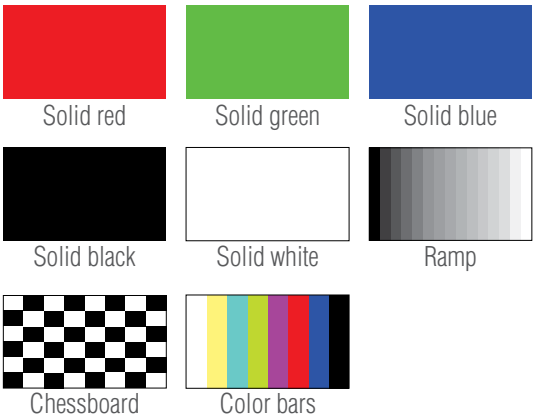


MX-HDMI-3D-IB-S



MX-HDMI-3D-IB

Available video patterns:



Test pattern generator video formats:
480p, 576p, 720p, 1080p, 1080p deep color

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3G-SDI input board

MX-3GSDI-IB

Part No: 9112 0010

MX-3GSDI-IB

Features:

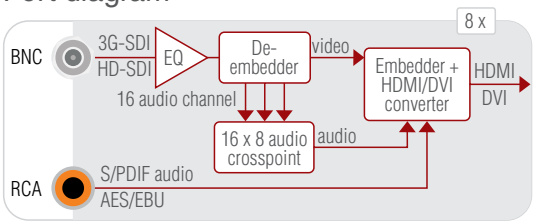
- Built-in 8 x SDI to HDMI converter
- SDI multichannel audio de-embedding
- Embeds multichannel SDI or external S/PDIF digital audio onto the HDMI signal
- Converts SDI, HD-SDI and 3G-SDI to DVI or HDMI
- Input cable equalization
- PLL Reclocking
- Auto detects input formats

MX-3GSDI-IB accepts SD-SDI, HD-SDI and 3G-SDI video signals with embedded audio on BNC connectors. Each channel also incorporates an SDI/HD-SDI/3G-SDI to HDMI/DVI conversion for further switching and processing in the router frame. SDI input signals are automatically equalized and reclocked. The card also boasts an additional RCA Phono digital audio input connector accepting AES/EBU or S/PDIF digital audio per channel. Both Stereo PCM and 5.1 AC3 encoded formats are supported and are embedded into the video stream. Each input port contains a mini 16x8 channel audio crosspoint that allows de-embedding of up to 16 PCM audio channels from the SDI signal, switching them and re-embedding up to 8 audio channels onto the HDMI stream. Either SDI audio or S/PDIF audio can be embedded, however converting or mixing them is not possible. The SDI video pixel resolution and scan mode are maintained in the HDMI signal, whilst YUV ro RGB and color range settings are also supported.

Specifications

HDCP compliancy:	No
Max Resolution:	1920x1080p 60 Hz YCbCr 4:2:2
Power consumption (3.3 V):	1.5 A (typical), 2.4 A (max.)
Power consumption (5 V):	2.3 A (typical), 5.4 A (max.)
Calculated AC Power (W):	23.5 (typical), 49.9 (max.)
Heat dissipation (BTU/h):	192 (typical), 260 (max.)
Weight:	530g
Input connectors:	3G-SDI, S/PDIF

Port diagram



TPS input board for HDMI, Ethernet, audio and control

MX-TPS-IB, -A, -S

Part No: 9112 0027, 9112 0028 (A), 9112 0029 (S)

MX-TPS-IB-A

MX-TPS-IB-S

MX-TPS-IB

Features:

- HDMI extension supporting 3D and 4K
- Accepts HDMI + Ethernet + RS-232 over one CAT5/6/7 cable up to 170m distance
- HDMI 1.4; DVI and HDCP compliant
- 4K x 2K, UHD, 2560 x 1600, HD video resolutions and all 3D formats are supported
- 10/100 Ethernet transmission
- Supports all HDMI audio formats
- Digital or analog audio option card

MX-TPS-IB is an 8 channel twisted pair input board providing HDMI 1.4, audio, Ethernet and RS-232 extension on a single CAT5/6/7 cable up to 100m in HDBaseT™ and 170m distance in Long reach mode (maximal resolution is Full HD 1080p in Long reach mode). Resolutions up to 4K and 48-bit color depth are handled with all standard audio formats as well as 120Hz 3D signals. The board offers bi-directional RS-232 and Ethernet transmission (each board has a 10/100 uplink connector for the Ethernet network connection) and remote powering option for the TPS 95 series extenders. The input board is available with audio option connectors: digital S/PDIF or analog stereo connectors are available for advanced audio functions (HDMI embedded audio signals are managed by the board). The MX-TPS-IB without the digital or analog audio option also handles HDMI embedded audio. Advanced professional functions such as HDCP enable/disable mode, Pixel Accurate Reclocking, Advanced EDID Management and Frame Detector are integrated providing the highest level of setup and usage. The board is compatible with deep color, Dolby TrueHD and DTS-HD audio and features PCM audio sample rate conversion.

Digital S/PDIF audio option:

- S/PDIF breakout for every port
- Bi-directional configurable S/PDIF connectors:
  audio can be de-embedded from the HDMI signals or
  audio can be embedded (or replaced) to the HDMI signal

Analog stereo audio option:

- Bi-directional configurable analog stereo port with 5 pole Phoenix connector
- Stereo PCM audio up to 96 kHz can be de-embedded from the HDMI signals
- Digitalized audio (PCM 48 kHz) can be embedded (or replaced) to the HDMI signal

Specifications

HDCP compliancy:	Yes
Max resolution:	Up to 4096x2160
3D signal compatibility:	Frame packing, side-by-side, top-bottom
Input connectors:	RJ45, S/PDIF, PHOENIX
Power consumption (3.3 V)-IB & -IB-S:	2,9A typ., 6,7A max.
Power consumption (3.3 V) -IB-A:	3,3A typ., 7,1A max.
Power consumption (5 V) -IB & -IB-S:	5A typ., 6,9A max.
Power consumption (5 V) -IB-A:	5A typ., 6,9A max.
Calculated AC Power (W) -IB & -IB-S:	35W typ., 51,6W max.
Calculated AC Power (W) -IB-A:	36W typ., 53W max.
Heat dissipation (BTU/h) -IB & -IB-S:	119,42 typ., 176 max.
Heat dissipation (BTU/h) -IB-A:	122,83 typ., 180,84 max.
Weight MX-TPS-IB:	875 g
Weight MX-TPS-IB-S:	980 g
Weight MX-TPS-IB-A:	945 g

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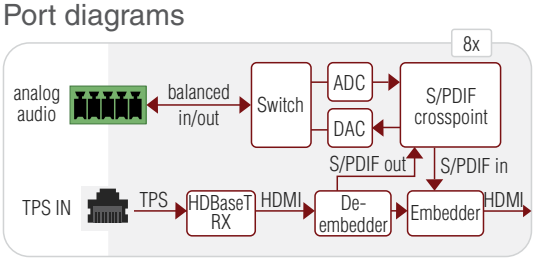
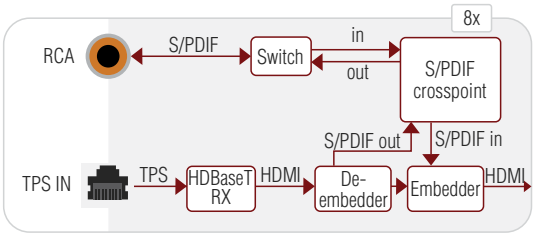
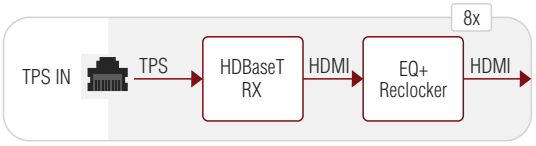
Port diagrams



MX-TPS-IB-A



MX-TPS-IB-S



MX-TPS-IB

Available video patterns:

Solid red | Solid green | Solid blue

Solid black | Solid white | Ramp

Chessboard | Color bars

Test pattern generator video formats:
480p, 576p, 720p, 1080p, 1080p deep color

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TPS input board with PoE option HDBT™

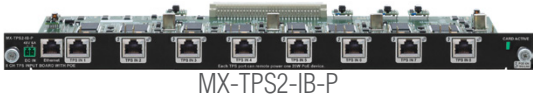
MX-TPS2-IB, -A, -S, -P, -AP, -SP new!

Under development

MX-TPS2-IB

MX-TPS2-IB-A

MX-TPS2-IB-S



MX-TPS2-IB-P

MX-TPS2-IB-AP

MX-TPS2-IB-SP

Features:

- HDMI extension supporting 3D and 4K
- Accepts HDMI + Ethernet + RS-232 over one CAT5/6/7 cable up to 170m distance
- HDMI 1.4; DVI and HDCP compliant
- 4K, UHD, 2560 x 1600, HD video resolutions and all 3D formats are supported
- 10/100 Ethernet transmission
- Supports all HDMI audio formats
- Digital or analog audio add-on option
- Adjustable analog audio settings
- Integrated PoE power injection option for TPS extenders*

*HDMI-TPS-TX/RX95 and DVI-HDCP-TPS-TX/RX95 remote powering isn't supported by this board.

MX-TPS2-IB is an 8 channel twisted pair input board providing HDMI 1.4, audio, Ethernet and RS-232 extension on a single CAT5/6/7 cable up to 100m in HDBaseT™ and 170m distance in Long reach mode (maximal resolution is Full HD 1080p in Long reach mode). Resolutions up to 4K and 48-bit color depth are handled with all standard audio formats as well as 120Hz 3D signals. The board offers bi-directional RS-232 and Ethernet transmission (each board has a 10/100 uplink connector for the Ethernet network connection) and remote powering option for the TPS extenders available with the PoE add-on.* The input board is available with audio add-ons: digital S/PDIF or analog stereo connectors are available for advanced audio functions (HDMI embedded audio signals are managed by the board).

The MX-TPS2-IB without the digital or analog audio option also handles HDMI embedded audio. Advanced professional functions such as HDCP enable/disable mode, Pixel Accurate Reclocking, Advanced EDID Management and Frame Detector are integrated providing the highest level of setup and usage. The board is compatible with deep color, Dolby TrueHD and DTS-HD audio and features PCM audio sample rate conversion.

Product name	audio addon	PoE addon
MX-TPS2-IB	none	none
MX-TPS2-IB-A	analog	none
MX-TPS2-IB-S	spdif	none
MX-TPS2-IB-P	none	yes
MX-TPS2-IB-AP	analog	yes
MX-TPS2-IB-SP	spdif	yes

Twisted pair Single-Link DVI input board

MX-DVI-TP-IB

Part No: 9112 0011

MX-DVI-TP-IB

Features:

- Accepts DVI signals over CAT5, CAT6 or CAT7 cables
- Input cable equalization: adaptive or manual

MX-DVI-TP-IB the 8 channel twisted pair input board takes DVI signals over a single CATx cable. Each input has a manual or adaptive CAT5, CAT6 or CAT7 twisted pair cable equalization for up to 40 dB signal loss.

Compatible products:

- Transmitters:
  DVI-TP-TX200
  DVI-TP-TX300
  DVI-HDCP-TP-TX100R

Specifications

HDCP compliancy:	No
Max Resolution:	1920x1200 or 2048x1080
Power consumption (3.3 V):	1.7 A (typical), 2.3 A (max.)
Power consumption (5 V):	0 A (typical), 0 A (max.)
Calculated AC Power (W):	8 (typical), 10.8 (max.)
Heat dissipation (BTU/h):	30 (typical), 39 (max.)
Weight:	440 g
Input connectors:	RJ45

Twisted pair Single-Link DVI input board

MX-DVI-TP-IB+

Part No: 9112 0012

MX-DVI-TP-IB+

Features:

- Optional extender remote powering over second CATx cable
- Advanced EDID Management over second CATx cable
- Accepts DVI signals over CAT5, CAT6 or CAT7 cables
- Input cable equalization: adaptive or manual

MX-DVI-TP-IB+ input board has 8 dual twisted pair input channels accepting DVI-D signals. Each input port incorporates two RJ45 connectors that have built-in Cable Extender and an individual EDID Manager for setting EDID information and keeping sources continuously active. Using an external 12 Volt DC power supply, this board is able to remotely power the connected compatible TP transmitters such as the DVI-HDCP-TP-TX50.

Compatible products:

- Transmitters:
  DVI-TP-TX200
  DVI-TP-TX300
  DVI-HDCP-TP-TX50
  DVI-HDCP-TP-TX100R

Optional accessory:

Power adaptor with IEC plug.
Universal input: 100-240 V AC, 50-60 Hz.
Output: 12 V DC, 6.67 A.

Specifications

HDCP compliancy:	No
Max Resolution:	1920x1200 or 2048x1080
Power consumption (3.3 V):	1.7 A (typical), 2.3 A (max.)
Power consumption (5 V):	0 A (typical), 0 A (max.)
Calculated AC Power (W):	8 (typical), 10.8 (max.)
Heat dissipation (BTU/h):	86 (typical), 183 (max.)
Weight:	830 g
Input connectors:	RJ45

Twisted pair HDMI input board

MX-HDMI-TP-IB

Part No: 9112 0013

MX-HDMI-TP-IB

Features:

- Built-in CAT7 to HDMI converters
- Accepts HDMI 1.3 and DVI signals over CAT5, CAT6 or CAT7 cables
- HDCP compliant
- Supports all HDMI audio formats such as Dolby TrueHD and DTS-HD Master Audio
- Advanced EDID Management
- Adaptive and manual cable equalization
- Pixel Accurate Reclocking
- 3D signal compatibility with frame packing, side-by-side and top-bottom formats

MX-HDMI-TP-IB the 8 channel input board accepts HDMI 1.3 and DVI signals over CAT5, CAT6 or CAT7 cables with HDCP compliance. Each input has two RJ45 connectors that feature manual or automatic twisted pair cable equalization, Pixel Accurate Reclocking, Frame Detector and an individual EDID Manager. Using the optional 12 Volt DC power supply this board is able to remotely power the connected compatible TP transmitters.

Specifications

HDCP compliancy:	Yes
Max Resolution:	1920x1200 or 2048x1080
3D signal compatibility:	Frame packing, side-by-side, top-bottom
Power consumption (3.3 V):	3.1 A (typical), 5.1 A (max.)
Power consumption (5 V):	2.1 A (typical), 2.4 A (max.)
Calculated AC Power (W):	29.6 (typical), 41.2 (max.)
Heat dissipation (BTU/h):	108 (typical), 150 (max.)
Weight:	830 g
Input connectors:	RJ45

Compatible products:

- Transmitters:

WP-HDMI-TP-TX50R
WP-DVI-HDCP-TP-TX50R
DVI-TP-TX200
DVI-TP-TX300
DVI-HDCP-TP-TX50
DVI-HDCP-TP-TX100R
HDMI-TP-TX50
HDMI-TP-TX100R
HDMI-TP-TX200R

Twisted pair HDMI input board

MXD-HDMI-TP-IB

Part No: 9112 0014

MXD-HDMI-TP-IB

Features:

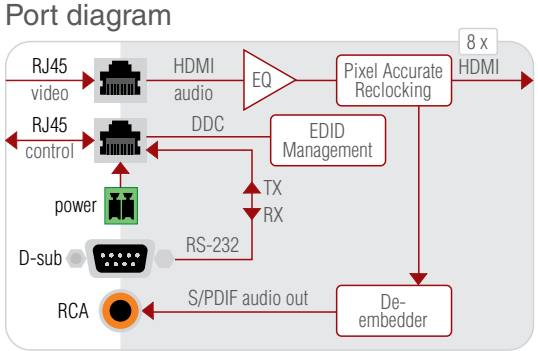
- Double slot input board - needs two cards' slot in the frame
- HDCP compliance
- RS-232 control over twisted pair for each input port
- Accepts HDMI 1.3 and DVI signals over CAT5, CAT6 or CAT7 cables
- Supports all HDMI audio formats such as Dolby TrueHD and DTS-HD Master Audio
- Advanced EDID Management, Pixel Accurate Reclocking
- Adaptive or manual CATx cable equalization
- Automatic or adjustable color range conversion
- S/PDIF audio output per channel
- 3D signal compatibility with frame packing, side-by-side and top-bottom formats
- Only compatible with MX-FR80**R**, MX-FR65**R**, MX-FR33**R**, MX-FR33L and MX-FR17 frames

MXD-HDMI-TP-IB is an upgraded version of MX-HDMI-TP-IB. This double slot board accepts HDMI 1.3 and 3D signals over two CATx cables, and provides a bi-directional RS-232 link to each remote source device when using compatible CATx transmitters. Each input port deembeds digital audio from the HDMI stream, and outputs via an S/PDIF connector locally while maintaining the audio content to the router's main crosspoint board.

Specifications

HDCP compliancy:	Yes
Max Resolution:	1920x1200 or 2048x1080
3D signal compatibility:	Frame packing, side-by-side, top-bottom
Power consumption (3.3 V):	3.1 A (typical), 5.1 A (max.)
Power consumption (5 V):	2.1 A (typical), 2.4 A (max.)
Calculated AC Power (W):	29.6 (typical), 41.2 (max.)
Heat dissipation (BTU/h):	23 (typical), 26 (max.)
Weight:	1000g
Input connectors:	RJ45, RS-232

Port diagram



Compatible products:

- Transmitters:

WP-HDMI-TP-TX50R
WP-DVI-HDCP-TP-TX50R
DVI-TP-TX200
DVI-TP-TX300
DVI-HDCP-TP-TX50
DVI-HDCP-TP-TX100R
HDMI-TP-TX50
HDMI-TP-TX100R
HDMI-TP-TX200R

Fiber optical Single-Link DVI input board

MX-DVI-OPT-IB-LC, -ST, -SC, -NT

Part No: 9112 0015 (LC), 9112 0016 (ST), 9112 0017 (SC), 9112 0018 (NT)

Features:

- 8 x Multimode fiber input
- Selectable connectors: Neutrik OpticalCON, -LC, -SC, -ST
- Laser detect LED for each input
- No video compression
- Zero frame delay
- Extension distance: 2500 m (1600 x 1200 @ 60Hz)

MX-DVI-OPT-IB is a multimode fiber based input board with 8 inputs for Single-Link DVI signals. The board is available with Neutrik OpticalCON, -LC, -SC or -ST connectors. Each port converts an incoming fiber signal to DVI-D format. Single Fiber Technology ensures transmission of DVI-D signals over one multimode fiber core using multiple wavelengths.

Compatible products:

- Transmitters:
  DVI-OPT-TX110
  DVI-OPT-TX220-PRO

MX-DVI-OPT-IB-LC

MX-DVI-OPT-IB-NT

MX-DVI-OPT-IB-SC

MX-DVI-OPT-IB-ST

Specifications

HDCP compliancy:	No
Max Resolution:	1920x1200 or 2048x1080
Laser wavelengths (4 ch. CWDM):	778 nm; 800 nm; 825 nm; 850 nm
Power consumption (3.3 V):	1.3 A (typical), 1.5 A (max.)
Power consumption (5 V):	0 A (typical), 0 A (max.)
Calculated AC Power (W):	6.1 (typical), 7.1 (max.)
Heat dissipation (BTU/h):	23 (typical), 26 (max.)
Weight:	1350 g (LC, SC, NT) 1500g (NT)
Input connectors:	LC, NT, SC, ST

Fiber optical Dual-Link DVI input board

MX-DVIDL-OPT-IB-LC, -ST, -SC, -NT

Part No: 9112 0019 (LC), 9112 0020 (ST), 9112 0021 (SC), 9112 0022 (NT)

Features:

- 4 Dual-Link DVI Multimode fiber input
- Selectable connectors: Neutrik OpticalCON, -LC, -SC, -ST
- Laser detect LED for each input
- No video compression
- Zero frame delay
- Extension distance: up to 2500 m
- Supports 120 Hz 3D signals

MX-DVIDL-OPT-IB board has 4 Multimode duplex fiber inputs accepting Dual-Link DVI signals. It supports Dual-Link DVI video resolutions as well as 120 Hz 3D signals. Fiber to Dual-Link DVI conversion maintains the signal integrity with zero frame delay and no video compression. The board is available with Neutrik OpticalCON, -LC, -SC or -ST connectors.

Compatible products:

- Transmitters:
  DVIDL-OPT-TX200

MX-DVIDL-OPT-IB-LC

MX-DVIDL-OPT-IB-NT

MX-DVIDL-OPT-IB-SC

MX-DVIDL-OPT-IB-ST

Specifications

HDCP compliancy:	No
Max Resolution:	4096x2400 or 1920x1200 Stereo
Power consumption (3.3 V):	1.3 A (typical), 1.5 A (max.)
Power consumption (5 V):	0 A (typical), 0 A (max.)
Calculated AC Power (W):	6.1 (typical), 7.1 (max.)
Heat dissipation (BTU/h):	29 (typical), 40 (max.)
Weight:	1350 g (LC, SC, ST), 1500 g (NT)
Input connectors:	LC, NT, SC, ST

Fiber optical HDMI input board including 4K, 3D

MX-HDMI-OPT-IB-LC, -ST, -SC, -NT

Part No: 9112 0023 (LC), 9112 0024 (ST), 9112 0025 (SC), 9112 0026 (NT)

Features:

- Built-in HDMI to fiber converter
- Selectable connectors: Neutrik OpticalCON, -LC, -SC, -ST
- 4K x 2K @ 30 Hz, 1080p @ 120 Hz, 2560 x 1600, 2048 x 2048 , HD video resolutions and all 3D formats are supported
- Laser detect LED
- No video compression
- Zero frame delay
- Extension distance: 2500 m (1600 x 1200 @ 60Hz)

MX-HDMI-OPT-IB is an 8 channel fiber optical extension board for HDMI and DVI signals, extends up to 2500 m over a single fiber when using a compatible transmitter. An internal fiber to HDMI conversion adds no latency or frame delay and uses no video compression.

Compatible products:

- Transmitters:
  DVI-OPT-TX110
  DVI-OPT-TX220-Pro
  HDMI-OPT-TX100
  HDMI-OPT-TX100R
  HDMI-OPT-TX200R
  MX-HDMI-OPT-OB-R

MX-HDMI-OPT-IB-LC

MX-HDMI-OPT-IB-NT

MX-HDMI-OPT-IB-SC

MX-HDMI-OPT-IB-ST

Specifications

HDCP compliancy:	Yes
Max Resolution:	Up to 4096 x 2160
Power consumption (3.3 V):	1.2 A (typical), 1.5 A (max.)
Power consumption (5 V):	0.3 A (typical), 0.3 A (max.)
Calculated AC Power (W):	7.8 (typical), 9.2 (max.)
Heat dissipation (BTU/h):	26 (typical), 31 (max.)
Weight:	1350 g (LC, SC, ST), 1500 g (NT)
Input connectors:	LC, NT, SC, ST

Single-Link DVI output board

MX-DVID-OB

Part No: 9113 0001

MX-DVID-OB

Features:

- Advanced EDID Management
- Pixel Accurate Reclocking
- +5 V fiber extender powering

MX-DVID-OB sends 8 channels of digital only DVI signals. It incorporates our Pixel Accurate Reclocking engine, recognizes Monitor EDID, and each output can power Lightware DVI-OPT-TX110 fiber optic transmitter via +5 V pin up to 500 mA current.

Specifications

HDCP compliancy:	No
Max Resolution:	1920x1200 or 2048x1080
Power consumption (3.3 V):	3.3 A (typical), 4.2 A (max.)
Power consumption (5 V):	0 A (typical), 0 A (max.)
Calculated AC Power (W):	15.6 (typical), 19.8 (max.)
Heat dissipation (BTU/h):	58 (typical), 72 (max.)
Weight:	430 g
Output connectors:	DVI-D

Dual-Link DVI output board

MX-DVIDL-OB

Part No: 9113 0003

MX-DVIDL-OB

Features:

- Pro series Dual-Link I/O board
- Advanced EDID Management
- TMDS Reclocking
- Fiber adapter powering on output
- Gold plated DVI connectors

MX-DVIDL-OB is a Dual-Link DVI output board supporting 4 Dual-Link DVI-D connectors. All signals are reclocked on output with the TMDS Reclocking technology. High definition computer signals and 120 Hz 3D video content are all supported.

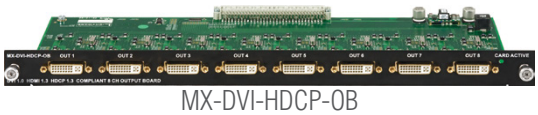
Specifications

HDCP compliancy:	No
Max Resolution:	4096x2400 or 1920x1200 Stereo
Power consumption (3.3 V):	3.3 A (typical), 4.2 A (max.)
Power consumption (5 V):	0 A (typical), 0 A (max.)
Calculated AC Power (W):	15.6 (typical), 19.8 (max.)
Heat dissipation (BTU/h):	58 (typical), 72 (max.)
Weight:	850 g
Output connectors:	DVI-D Dual-Link

DVI, HDCP and HDMI compliant output board

MX-DVI-HDCP-OB

Part No: 9113 0002



MX-DVI-HDCP-OB

Features:

- HDMI 1.3; DVI and HDCP compliant
- Advanced EDID Management
- Supports all HDMI audio formats such as Dolby TrueHD and DTS-HD Master Audio
- Pixel Accurate Reclocking
- 36-bit deep color support
- Color space conversion: RGB and YUV
- Color range scaling (16:235 to 0:255)
- 3D signal compatibility with frame packing, side-by-side and top-bottom formats

MX-DVI-HDCP-OB is Lightware's 8 channel output board for digital DVI and HDMI 1.3 signals with or without HDCP encryption. This board fully supports HDMI signals with embedded multichannel audio using more reliable screw lockable DVI connectors for more reliable connection. Many of our professional features are built in such as 3D compatibility, Pixel Accurate Reclocking, HDMI to DVI conversion, color space conversion (RGB and YUV per output), Signal analysis, Color range scaling, 12 bit deep color, Dolby TrueHD and DTSHD audio compatibility and PCM audio sample rate conversion.

Specifications

HDCP compliancy:	Yes
Max Resolution:	1920x1200 or 2048x1080
3D signal compatibility:	Frame packing, side-by-side, top-bottom
Power consumption (3.3 V):	1.2 A (typical), 2.6 A (max.)
Power consumption (5 V):	2.1 A (typical), 2.4 A (max.)
Calculated AC Power (W):	20.7 (typical), 29.4 (max.)
Heat dissipation (BTU/h):	74 (typical), 107 (max.)
Weight:	850 g
Output connectors:	DVI-I

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HDMI output board including 4K, 3D and Deep Color

MX-HDMI-3D-OB, -A, -S

Part No: 9113 0005, 9113 0006 (A), 9113 0007 (S)

Features:

- HDMI 1.4a; DVI and HDCP compliant
- 4K x 2K @ 30 Hz, 1080p @ 120 Hz, 2560 x 1600, 2048 x 2048, HD video resolutions and all 3D formats are supported
- Available models: analog stereo audio option (MX-HDMI-3D-OB-A) or digital S/PDIF audio option (MX-HDMI-3D-OB-S) or without audio option (MX-HDMI-3D-OB)
- Advanced EDID Management and Frame Detector
- Pixel Accurate Reclocking
- Dolby TrueHD and DTS-HD Master Audio
- 36-bit deep color support

MX-HDMI-3D-OB is an 8 channel HDMI 1.4a output board, with DVI and HDCP compliance supporting all 3D formats. The output board is available with audio add-on connectors: digital S/PDIF or analog stereo connectors are available for advanced audio functions (HDMI embedded audio signals are managed by the board as well). The MX-HDMI-3D-OB without the digital or analog audio option can handle HDMI embedded audio as well. Pixel Accurate Reclocking, HDMI to DVI conversion are all incorporated. The board is compatible with deep color, Dolby TrueHD and DTS-HD audio.

Digital S/PDIF audio option:

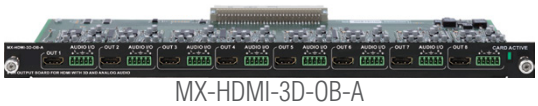
- S/PDIF breakout for every port
- Bi-directional configurable S/PDIF connectors:
  audio can be de-embedded from the HDMI signals or
  audio can be embedded (or replaced) to the HDMI signal

Analog stereo audio option:

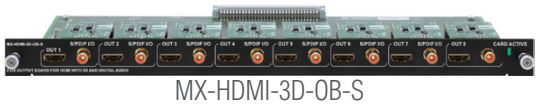
- Bi-directional configurable analog stereo port with 5 pole phoenix connector
- Stereo PCM audio up to 96 kHz can be de-embedded from the HDMI signals
- Digitalized audio (PCM 48 kHz) can be embedded (or replaced) to the HDMI signal

Specifications

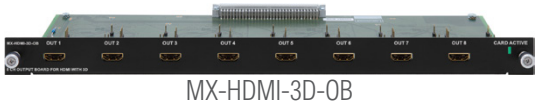
HDCP compliancy:	Yes
Max Resolution:	Up to 4096 x 2160
3D signal compatibility:	Frame packing, side-by-side, top-bottom
Power consumption (3.3 V) MX-HDMI-3D-OB & -OB-S:	0.79 A (typ.), 1.32 A (max.)
Power consumption (3.3 V) MX-HDMI-3D-OB-A:	1.03 A (typ.), 1.72 A (max.)
Power consumption (5 V) MX-HDMI-3D-OB & -OB-S:	0.56 A (typ.), 0.93 A (max.)
Power consumption (5 V) MX-HDMI-3D-OB-A:	0.56 A (typ.), 0.93 A (max.)
Calculated AC Power (W) MX-HDMI-3D-OB & -OB-S:	7.7 (typ.), 12.9 (max.)
Calculated AC Power (W) MX-HDMI-3D-OB-A:	8.9 (typ.), 14.8 (max.)
Heat dissipation (BTU/h) MX-HDMI-3D-OB & -OB-S:	28 (typ.), 47 (max.)
Heat dissipation (BTU/h) MX-HDMI-3D-OB-A:	33 (typ.), 54 (max.)
Weight MX-HDMI-3D-OB & -OB-S:	809 g
Weight MX-HDMI-3D-OB-A:	865 g
Output connectors:	HDMI, S/PDIF, Phoenix



MX-HDMI-3D-OB-A

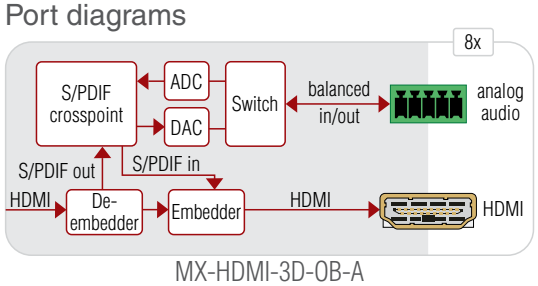


MX-HDMI-3D-OB-S

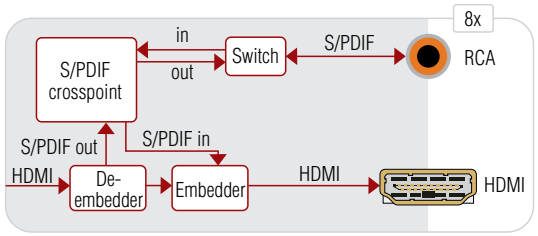


MX-HDMI-3D-OB

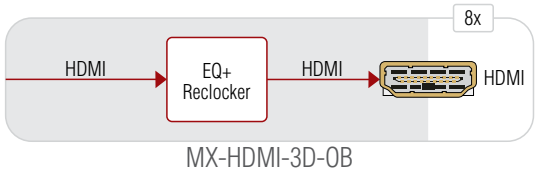
Port diagrams



MX-HDMI-3D-OB-A

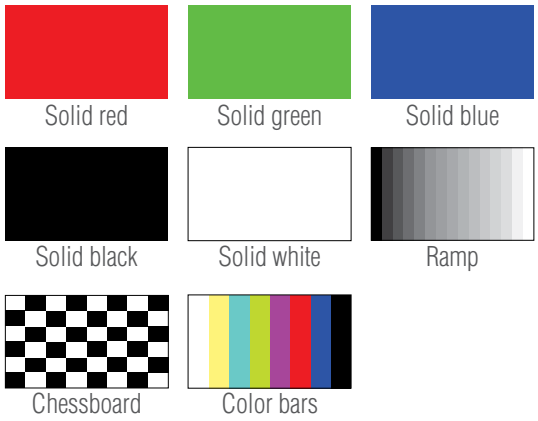


MX-HDMI-3D-OB-S



MX-HDMI-3D-OB

Available video patterns:



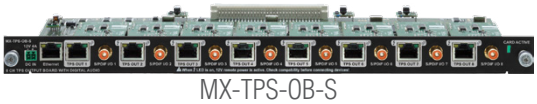
Test pattern generator video formats:
480p, 576p, 720p, 1080p, 1080p deep color

TPS output board for HDMI, Ethernet, audio and control

MX-TPS-OB, -A, -S

Part No: 9113 0027, 9113 0028 (A), 9113 0029 (S)


MX-TPS-OB-A


MX-TPS-OB-S


MX-TPS-OB

Features:

- HDMI extension supporting 3D and 4K
- Accepts HDMI + Ethernet + RS-232 over one CAT5/6/7 cable up to 170m distance
- HDMI 1.4; DVI and HDCP compliant
- 4K x 2K, UHD, 2560 x 1600, HD video resolutions and all 3D formats are supported
- 10/100 Ethernet transmission
- Supports all HDMI audio formats
- Digital or analog audio option card

MX-TPS-OB the 8 channel twisted pair output board provides HDMI 1.4, audio, Ethernet and RS-232 transmission on a single CAT5/6/7 cable up to 100m in HDBaseT™ and 170m distance in Long reach mode (maximal resolution is Full HD 1080p in Long reach mode). Resolutions up to 4K and 48-bit color depth are handled with all standard audio formats as well as 120Hz 3D signals. The board offers bi-directional RS-232 and Ethernet transmission (each board has a 10/100 uplink connector for the Ethernet network connection) and remote powering option for the TPS 95 series extenders. The output board is available with audio option connectors: digital S/PDIF or analog stereo connectors are available for advanced audio functions (HDMI embedded audio signals are managed by the board). The MX-TPS-OB without the digital or analog audio option also handles HDMI embedded audio. The board is compatible with deep color, Dolby TrueHD and DTS-HD audio and features PCM audio sample rate conversion. Advanced professional functions such as HDCP enable/disable mode, Pixel Accurate Reclocking, Advanced EDID Management and Frame Detector are integrated providing the highest level of setup and usage.

Digital S/PDIF audio option:

- S/PDIF breakout for every port
- Bi-directional configurable S/PDIF connectors:
  audio can be de-embedded from the HDMI signals or
  audio can be embedded (or replaced) to the HDMI signal

Analog stereo audio option:

- Bi-directional configurable analog stereo port with 5 pole phoenix connector
- Stereo PCM audio up to 96 kHz can be de-embedded from the HDMI signals
- Digitalized audio (PCM 48 kHz) can be embedded (or replaced) to the HDMI signal

Specifications

HDCP compliancy:	Yes
Max resolution	Up to 4096x2160
3D signal compatibility:	Frame packing, side-by-side, top-bottom
Input connectors:	RJ45, S/PDIF, PHOENIX
Power consumption (3.3 V) -OB & -OB-S:	3,4A typ., 7,8 max.
Power consumption (3.3 V) -OB-A:	3,8A typ., 8,2 max.
Power consumption (5 V) -OB & -OB-S:	2,2A typ., 3,1 max.
Power consumption (5 V) -OB-A:	2.2A typ., 3,1 max.
Calculated AC Power (W) -OB & -OB-S:	22W typ., 41W max.
Calculated AC Power (W) -OB-A:	23,5W typ., 42,5W max.
Heat dissipation (BTU/h) -OB & -OB-S:	75 typ., 139,89 max.
Heat dissipation (BTU) -OB-A:	80,18 typ., 145 max.
Weight MX-TPS-OB:	855 g
Weight MX-TPS-OB-S:	925 g
Weight MX-TPS-OB-A:	920 g

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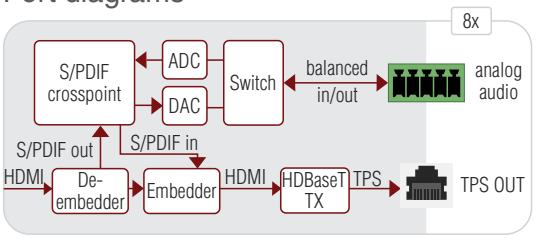
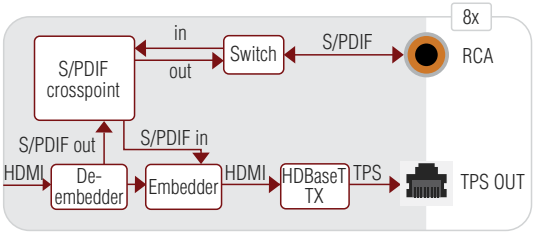
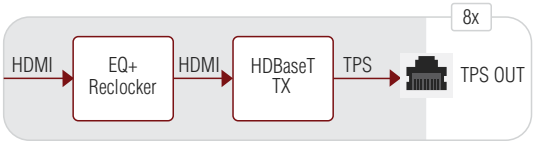
Port diagrams



MX-TPS-OB-A



MX-TPS-OB-S

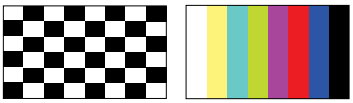


MX-TPS-OB

Available video patterns:


Solid red | Solid green | Solid blue


Solid black | Solid white | Ramp


Chessboard | Color bars

Test pattern generator video formats:
480p, 576p, 720p, 1080p, 1080p deep color

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TPS output board with PoE option

MX-TPS2-OB, -A, -S, -P, -AP, -SP **new!**

Under development

MX-TPS2-OB

MX-TPS2-OB-A

MX-TPS2-OB-S

MX-TPS2-OB-P

MX-TPS2-OB-AP

MX-TPS2-OB-SP

Features:

- HDMI extension supporting 3D and 4K
- Accepts HDMI + Ethernet + RS-232 over one CAT5/6/7 cable up to 170m distance
- HDMI 1.4; DVI and HDCP compliant
- 4K x 2K, UHD, 2560 x 1600, HD video resolutions and all 3D formats are supported
- 10/100 Ethernet transmission
- Supports all HDMI audio formats
- Digital or analog audio add-on option
- Adjustable analog audio settings
- Integrated PoE power injection option for TPS extenders*

*HDMI-TPS-TX/RX95 and DVI-HDCP-TPS-TX/RX95 remote powering isn't supported by this board.

MX-TPS2-OB the 8 channel twisted pair output board provides HDMI 1.4, audio, Ethernet and RS-232 transmission on a single CAT5/6/7 cable up to 100m in HDBaseT™ and 170m distance in Long reach mode (maximal resolution is Full HD 1080p in Long reach mode). Resolutions up to 4K and 48-bit color depth are handled with all standard audio formats as well as 120Hz 3D signals. The board offers bi-directional RS-232 and Ethernet transmission (each board has a 10/100 uplink connector for the Ethernet network connection) and remote powering option for the TPS extenders available with the PoE add-on.* The output board is available with audio add-ons: digital S/PDIF or analog stereo connectors are available for advanced audio functions (HDMI embedded audio signals are managed by the board).

The MX-TPS2-OB without the digital or analog audio option also handles HDMI embedded audio. The board is compatible with deep color, Dolby TrueHD and DTS-HD audio and features PCM audio sample rate conversion. Advanced professional functions such as HDCP enable/disable mode, Pixel Accurate Reclocking, Advanced EDID Management and Frame Detector are integrated providing the highest level of setup and usage.

Product name	audio addon	PoE addon
MX-TPS2-OB	none	none
MX-TPS2-OB-A	analog	none
MX-TPS2-OB-S	spdif	none
MX-TPS2-OB-P	none	yes
MX-TPS2-OB-AP	analog	yes
MX-TPS2-OB-SP	spdif	yes

Twisted pair Single-Link DVI output board

MX-DVI-TP-OB

Part No: 9113 0008

MX-DVI-TP-OB

Features:

- Converts and transmits Single-Link digital DVI-D signals over one CATx cable
- Pixel Accurate Reclocking

MX-DVI-TP-OB was designed to convert and transmit Single-Link digital DVI-D video signals over one CATx cable. Each port contains a Pixel Accurate Reclocking engine, a DVI-D to CATx converter and cable booster. The best performance will be achieved with CAT6a or CAT7 SFTP cables. Only the video content is extended and therefore no EDID, Hotplug or remote receiver powering is available with this board.

Compatible products:

- Receivers:
  DVI-TP-RX100
  DVI-HDCP-TP-RX50
  DVI-HDCP-TP-RX100R

Specifications

HDCP compliancy:	No
Max Resolution:	1920x1200 or 2048x1080
Power consumption (3.3 V):	4 A (typical), 5 A (max.)
Power consumption (5 V):	0.1 A (typical), 0.2 A (max.)
Calculated AC Power (W):	19.6 (typical), 25 (max.)
Heat dissipation (BTU/h):	72 (typical), 92 (max.)
Weight:	440 g
Output connectors:	RJ45

Twisted pair Single-Link DVI output board

MX-DVI-TP-OB+

Part No: 9113 0009

MX-DVI-TP-OB+

Features:

- Converts and transmits DVI signals over CAT5, CAT6 or CAT7 cables
- Advanced EDID Management
- Pixel Accurate Reclocking
- Optional extender remote powering over second CATx cable

MX-DVI-TP-OB+ is an 8 channel output board for transmitting DVI signals over CATx cables. Pixel Accurate Reclocking and the added Advanced EDID Management is incorporated. Using an external 12 Volt DC power supply, remote powering of external TP receivers can also be achieved over the second CATx cable.

Compatible products:

- Transmitters:
  DVI-TP-RX100
  DVI-HDCP-TP-RX50
  DVI-HDCP-TP-RX100R

Optional accessory:

Power adaptor with IEC plug.
Universal input: 100-240 V AC, 50-60 Hz.
Output: 12 V DC, 6.67 A.

Specifications

HDCP compliancy:	No
Max Resolution:	1920x1200 or 2048x1080
Power consumption (3.3 V):	4 A (typical), 5 A (max.)
Power consumption (5 V):	0.1 A (typical), 0.2 A (max.)
Calculated AC Power (W):	19.6 (typical), 25 (max.)
Heat dissipation (BTU/h):	86 (typical), 127 (max.)
Weight:	830 g
Output connectors:	RJ45

Twisted pair HDMI output board

MX-HDMI-TP-OB

Part No: 9113 0010

MX-HDMI-TP-OB

Features:

- Built-in HDMI to CAT7 converter
- Transmits HDMI 1.3 and DVI signals over CAT5, CAT6 or CAT7 cables
- HDCP compliant
- Supports all audio formats over HDMI: Dolby TrueHD and DTS-HD Master Audio
- Advanced EDID Management
- Pixel Accurate Reclocking
- 3D signal compatibility with frame packing, side-by-side and top-bottom formats

MX-HDMI-TP-OB is an 8 channel twisted pair output board for dual CAT5, CAT6 or CAT7 cables, extending HDMI and DVI signals with HDCP compliance. HDCP encryption, remote powering of compatible receivers (with external 12Volt DC power supply), and EDID handling are performed over the second CATx cable.

Specifications

HDCP compliancy:	Yes
Max Resolution:	1920x1200 or 2048x1080
3D signal compatibility:	Frame packing, side-by-side, top-bottom
Power consumption (3.3 V):	1.8 A (typical), 3.4 A (max.)
Power consumption (5 V):	2.1 A (typical), 2.6 A (max.)
Calculated AC Power (W):	23.5 (typical), 34.6 (max.)
Heat dissipation (BTU/h):	88 (typical), 126 (max.)
Weight:	830 g
Output connectors:	RJ45

Compatible products:

- Receivers:
  - WP-HDMI-TP-RX50A
  - WP-HDMI-TP-RX50R
  - WP-DVI-HDCP-TP-RX50A
  - WP-DVI-HDCP-TP-RX50R
  - DVI-TP-RX100
  - DVI-HDCP-TP-RX50
  - DVI-HDCP-TP-RX100R
  - HDMI-TP-RX50
  - HDMI-TP-RX100R
  - HDMI-TP-RX100RA
  - HDMI-TP-RX200R

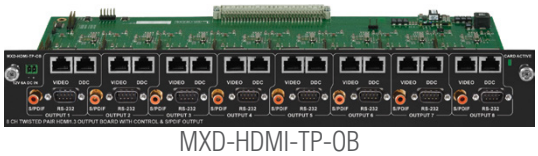
Optional accessory:

Power adaptor with IEC plug.
Universal input: 100-240 V AC, 50-60 Hz.
Output: 12 V DC, 6.67 A.

Twisted pair HDMI output board

MXD-HDMI-TP-OB

Part No: 9113 0011



MXD-HDMI-TP-OB

Features:

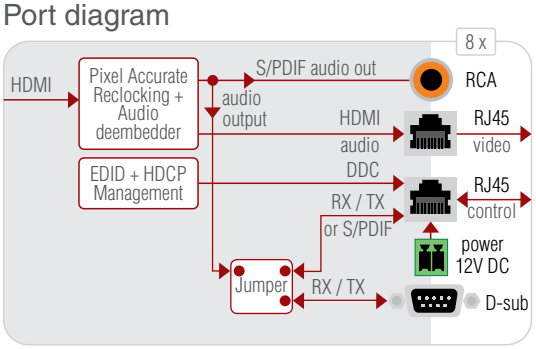
- Double slot output board - needs two cards' slot in the frame
- RS-232 or S/PDIF over twisted pair on each output
- Transmits HDMI 1.3 and DVI signals over CAT5, CAT6 or CAT7 cables
- HDCP compliant
- Supports all audio formats over HDMI: Dolby TrueHD and DTS-HD Master Audio
- Advanced EDID Management, Pixel Accurate Reclocking
- Automatic or adjustable color space and color range conversion
- Conversion between DVI, HDMI and deep color signals dependent upon the capabilities of the attached display
- PCM subsampling by 2 x or 4 x
- 3D signal compatibility with frame packing, side-by-side and top-bottom formats
- Only compatible with MX-FR80**R**, MX-FR65**R**, MX-FR33**R**, MX-FR33L and MX-FR17 frames

MXD-HDMI-TP-OB has, in addition to 8 channel HDMI to CATx conversion this output board offers S/PDIF audio de-embedding from the outgoing HDMI video stream and a bi-directional RS-232 link to each remote display device when using compatible twisted pair receiver. HDMI + embedded multichannel HD digital audio + RS-232 + remote DC power can be extended via two CATx cables from the AV rack to the projector or LCD display. The 12 Volt DC connector allows remote powering of the RX, eliminating the need for local DC adaptors.

Specifications

HDCP compliancy:	Yes
Max Resolution:	1920x1200 or 2048x1080
3D signal compatibility:	Frame packing, side-by-side, top-bottom
Power consumption (3.3 V):	1.8 A (typical), 3.4 A (max.)
Power consumption (5 V):	2.1 A (typical), 2.6 A (max.)
Calculated AC Power (W):	23.5 (typical), 34.6 (max.)
Heat dissipation (BTU/h):	21 (typical), 24 (max.)
Weight:	1000 g
Output connectors:	RJ45, S/PDIF, RS-232

Port diagram



Compatible products:

- Receivers:
  - WP-HDMI-TP-RX50A
  - WP-HDMI-TP-RX50R
  - WP-DVI-HDCP-TP-RX50A
  - WP-DVI-HDCP-TP-RX50R
  - DVI-TP-RX100
  - DVI-HDCP-TP-RX50
  - DVI-HDCP-TP-RX100R
  - HDMI-TP-RX50
  - HDMI-TP-RX100R
  - HDMI-TP-RX100RA
  - HDMI-TP-RX200R

Optional accessory:

Power adaptor with IEC plug.
Universal input: 100-240 V AC, 50-60 Hz.
Output: 12 V DC, 6.67 A.

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Fiber optical Single-Link DVI output board

MX-DVI-OPT-OB-LC, -ST, -SC

Part No: 9113 0012 (LC), 9113 0013 (ST), 9113 0014 (SC)

MX-DVI-OPT-OB-LC

MX-DVI-OPT-OB-SC

MX-DVI-OPT-OB-ST

Features:

- 8 Single-Link DVI Multimode fiber outputs
- Selectable connectors: -LC, -SC, -ST
- Laser active LED for each output
- No video compression
- Zero frame delay
- Extension distance: 2500 m (1600 x 1200 @ 60Hz)

MX-DVI-OPT-OB was designed to transmit Single-Link DVI signals over one Multimode fiber per channel. It incorporates eight DVI to fiber converters, and it is available with -LC, -SC or -ST connectors. Digital video signals up to 1920x1200 or 2048x1080 pixel resolution can be extended from the router frame to compatible Lightware fiber receivers 2500 m away.

Compatible products:

- Receivers:
  DVI-OPT-RX110
  DVI-OPT-RX220-PRO

Specifications

HDCP compliancy:	No
Max Resolution:	1920x1200 or 2048x1080
Laser wavelengths (4 ch. CWDM):	778 nm; 800 nm; 825 nm; 850 nm
Power consumption (3.3 V):	1.3 A (typical), 1.4 A (max.)
Power consumption (5 V):	0 A (typical), 0 A (max.)
Calculated AC Power (W):	6.1 (typical), 6.6 (max.)
Heat dissipation (BTU/h):	20 (typical), 22 (max.)
Weight:	1350 g
Output connectors:	LC, SC, ST

Fiber optical Reclocking Single-Link DVI output board

MX-DVI-OPT-OB-R-LC, -ST, -SC, -NT

Part No: 9113 0015 (LC), 9113 0016 (ST), 9113 0017 (SC), 9113 0018 (NT)

MX-DVI-OPT-OB-R-LC

MX-DVI-OPT-OB-R-NT

MX-DVI-OPT-OB-R-SC

MX-DVI-OPT-OB-R-ST

Features:

- 8 Single-Link DVI Multimode fiber output
- DVI Pixel Accurate Reclocking
- Selectable connectors: Neutrik OpticalCON, -LC, -SC, -ST
- No video compression
- Zero frame delay
- Extension distance: 2500 m (1600 x 1200 @ 60Hz)

MX-DVI-OPT-OB-R output board reclocks DVI-D signals, and coverts them to fiber. It incorporates our Pixel Accurate Reclocking technology and Single Fiber Technology. Fiber connectors are available with Neutrik OpticalCON, -LC, -SC or –ST connectors.

Compatible products:

- Receivers:
  DVI-OPT-RX110
  DVI-OPT-RX220-PRO

Specifications

HDCP compliancy:	No
Max Resolution:	1920x1200 or 2048x1080
Laser wavelengths (4 ch. CWDM):	778 nm; 800 nm; 825 nm; 850 nm
Power consumption (3.3 V):	4.6 A (typical), 5.6 A (max.)
Power consumption (5 V):	0 A (typical), 0 A (max.)
Calculated AC Power (W):	21.7 (typical), 26.4 (max.)
Heat dissipation (BTU/h):	72 (typical), 87 (max.)
Weight:	1400 g (LC, SC, ST) 1550 g (NT)
Output connectors:	LC, NT, SC, ST

Fiber optical Dual-Link DVI output board

MX-DVIDL-OPT-OB-LC, -ST, -SC, -NT

Part No: 9113 0019 (LC), 9113 0020 (ST), 9113 0021 (SC), 9113 0022 (NT)


MX-DVIDL-OPT-OB-LC


MX-DVIDL-OPT-OB-NT


MX-DVIDL-OPT-OB-SC


MX-DVIDL-OPT-OB-ST

Features:

- 4 Dual-Link DVI Multimode fiber output
- Selectable connectors: Neutrik OpticalCON, -LC, -SC, -ST
- Laser active LED for each output
- No video compression
- Zero frame delay
- Extension distance: up to 2500 m
- Supports 120 Hz 3D signals

MX-DVIDL-OPT-OB board was designed to send high resolution Dual-Link DVI signals over 4 duplex fiber optical outputs. It supports 120 Hz 3D signals as well as high resolution computer signals such as 2560 x 1600 or 4096 x 2400 amongst others. The board is available with Neutrik OpticalCON, -LC, -SC or -ST connectors.

Compatible products:

- Receivers:
  DVIDL-OPT-RX100

Specifications

HDCP compliancy:	No
Max Resolution:	4096x2400 or 1920x1200 Stereo
Power consumption (3.3 V):	0 A (typical), 0 A (max.)
Power consumption (5 V):	0,8 A (typical), 0,9 A (max.)
Calculated AC Power (W):	5.7 (typical), 6.4 (max.)
Heat dissipation (BTU/h):	72 (typical), 92 (max.)
Weight:	1200 g (LC, SC, ST) 1350 g (NT)
Output connectors:	LC, NT, SC, ST

Fiber optical HDMI output board including 4K, 3D

MX-HDMI-OPT-OB-LC, -ST, -SC, -NT

Part No: 9113 0023 (LC), 9113 0024 (ST), 9113 0025 (SC), 9113 0026 (NT)


MX-HDMI-OPT-OB-LC


MX-HDMI-OPT-OB-NT


MX-HDMI-OPT-OB-SC


MX-HDMI-OPT-OB-ST

Features:

- Built-in HDMI to fiber converter
- Selectable connectors: Neutrik OpticalCON, -LC, -SC, -ST
- 4K x 2K @ 30 Hz, 1080p @ 120 Hz, 2560 x 1600, 2048 x 2048 , HD video resolutions and all 3D formats are supported
- Laser detect LED
- No video compression
- Zero frame delay
- Extension distance: 2500 m (1600 x 1200 @ 60Hz)

MX-HDMI-OPT-OB board transmits HDMI 1.3 signals on 8 optical outputs with HDCP compliance. HDMI, DVI signals and HDCP + EDID handshaking are performed over one Multimode fiber utilizing our Single Fiber Technology. The board is available with Neutrik OpticalCON, -LC, -SC or -ST connectors.

Compatible products:

- Receivers:
  DVI-OPT-RX110
  DVI-OPT-RX220-Pro
  HDMI-OPT-RX100
  HDMI-OPT-RX100R
  HDMI-OPT-RX200R

Specifications

HDCP compliancy:	Yes
Max Resolution:	Up to 4096 x 2160
Power consumption (3.3 V):	1.4 W (typical), 1.6 W (max.)
Power consumption (5 V):	0.2 W (typical), 0.3 W (max.)
Calculated AC Power (W):	8 (typical), 9.7 (max.)
Heat dissipation (BTU/h):	25 (typical), 30 (max.)
Weight:	1350 g (LC, SC, ST) 1500 g (NT)
Output connectors:	LC, NT, SC, ST

HDMI optical output board including 4K, 3D and Deep Color with reclocking function

MX-HDMI-OPT-OB-R-LC, -ST, -SC, -NT new!

Part No: 9113 0030 (LC), 9113 0031 (ST), 9113 0032 (SC), 9113 0033 (NT)

Features:

- Built-in HDMI to fiber converter
- Selectable connectors: Neutrik OpticalCON, -LC, -SC, -ST
- Four status LEDs per port: receiver detect, signal detect, HDCP enabled, Laser active
- No video compression
- Zero frame delay
- Extension distance: 2500 m (up to 1920 x 1200 @ 60Hz), 1100m (4096 x 2048 @ 30Hz)
- HDMI 1.4a; DVI and HDCP compliant
- 4K x 2K @ 30 Hz, 1080p @ 120 Hz, 2560 x 1600, 2048 x 2048, HD video resolutions and all 3D formats are supported
- 36-bit deep color support
- Dolby TrueHD and DTS-HD Master Audio
- Advanced EDID Management and Frame Detector
- Pixel Accurate Reclocking
- Built-in test pattern generator
- One bi-directional RS-232 channel per port

MX-HDMI-3D-OB-R is an 8 channel multimode optical output board providing HDMI 1.4, audio and RS-232 extension over a single multimode fiber up to 2500m distance. Pixel Accurate Reclocking, HDCP compliance and HDMI to DVI conversion are all incorporated. Resolutions up to 4K and 36-bit color depth are handled with all standard audio formats as well as 120Hz 3D signals.

Along the video and audio extension the unit provides a bi-directional RS-232 option for remote controlling external devices like projectors or professional media players.

The video signals with the HDCP, EDID handshaking data and the RS-232 channel traffic are performed over one Multimode fiber utilizing our Single Fiber Technology. The board is compatible with Dolby TrueHD and DTS-HD audio while Pixel Accurate Reclocking, Advanced EDID Management, Frame detector and built-in test pattern generator are integrated providing the highest level of setup and usage. The board is available with Neutrik OpticalCON, -LC, -SC or -ST connectors.

Compatible products:

- Receivers:
  DVI-OPT-RX110 (DVI only, without HDCP and RS-232)
  DVI-OPT-RX220-Pro (DVI only, without HDCP and RS-232)
  HDMI-OPT-RX100 (up to 1080p60 36bpp, without RS-232)
  HDMI-OPT-RX100R (up to 1080p60 36bpp)
  HDMI-OPT-RX200R (up to 1080p60 36bpp)
  HDMI-3D-OPT-RX150RA (up to 4K)
  MX-HDMI-OPT-IB (up to 4K)
  25G-MX-HDMI-OPT-IB (up to 4K)


MX-HDMI-OPT-OB-R-LC


MX-HDMI-OPT-OB-R-ST

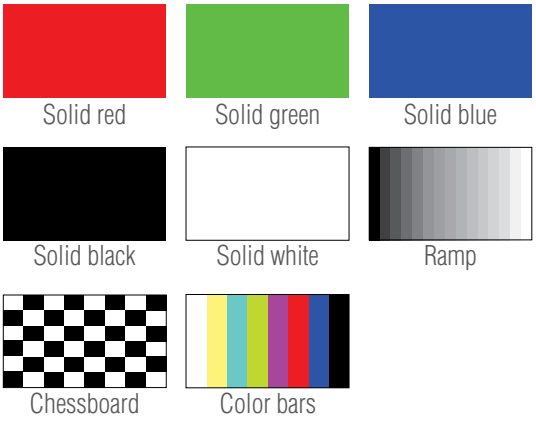

MX-HDMI-OPT-OB-R-SC


MX-HDMI-OPT-OB-R-NT

Specifications

HDCP compliancy:	Yes
RS232 passthrough:	9600-N-1, 19200-N-1, 38400-N-1, 57600-N-1, 115200-N-1 (max. 60 bytes/message)
3D signal compatibility:	Frame packing, side-by-side, top-bottom
Power consumption (3.3 V) (all connector type):	1.4 A (typ.), 1.5 A (max.)
Power consumption (5 V) (all connector type):	0.9 A (typ.), 1.5 A (max.)
Calculated AC Power (W) (all connector type):	9.2 (typ.), 12.5 (max.)
Heat dissipation (BTU/h) (all connector type):	32 (typ.), 43 (max.)
Weight MX-HDMI-OPT-OB-R:	1350 g (LC, SC, ST) 1500 g (NT)
Output connectors:	LC, NT, SC, ST
Optical wavelengths:	778 nm, 800nm, 825nm, 850nm, 911nm, 980nm

Available video patterns:


Solid red | Solid green | Solid blue
Solid black | Solid white | Ramp
Chessboard | Color bars

Test pattern generator video formats:
480p, 576p, 720p, 1080p, 1080p deep color

Frames

- MX-FR9 ..... 9x9 digital crosspoint router frame with built-in control panel and CPU2
- MX-FR17 ..... 17x17 digital crosspoint router frame with built-in control panel and CPU2
- MX-FR33L ..... 33x33 digital crosspoint router frame with built-in control panel and CPU2
- MX-FR33**R** ..... 33x33 digital crosspoint router frame with redundant power supplies, built-in control panel and CPU2
- MX-FR65**R** ..... 65x65 digital crosspoint router frame with redundant power supplies, built-in control panel and CPU2
- MX-FR80**R** ..... 80x80 digital crosspoint router frame with redundant power supplies, built-in control panel and CPU2
- MX-CPU2 ..... Processor board for modular matrix frames

Input boards

- MX-DVID-IB ..... DVI-D Single-Link input board with DVI-I connectors
- MX-DVI-TP-IB ..... Twisted pair input board for DVI over CAT5...CAT7 cables
- MX-DVI-TP-IB+ ..... Twisted pair input board for DVI over CAT5...CAT7 cables
- MX-DVI-OPT-IB-LC ..... Fiber optical input board for Single-Link DVI-D signal extension, with LC connectors
- MX-DVI-OPT-IB-NT ..... Fiber optical input board for Single-Link DVI-D signal extension, with Neutrik OpticalCON connectors
- MX-DVI-OPT-IB-SC ..... Fiber optical input board for Single-Link DVI-D signal extension, with SC connectors
- MX-DVI-OPT-IB-ST ..... Fiber optical input board for Single-Link DVI-D signal extension, with ST connectors
- MX-DVI-HDCP-IB ..... DVI, HDCP and HDMI compliant input board
- MX-DVII-HDCP-IB ..... DVI-I input board supporting VGA, YUV, DVI and HDMI with HDCP signals
- MXD-UMX-IB ..... Double slot universal input board for analog & digital video and audio
- MX-DVIDL-IB ..... Dual-Link DVI digital only input board with DVI-I connectors
- MX-DVIDL-OPT-IB-LC ..... Dual-Link DVI fiber optical input board, with LC connectors
- MX-DVIDL-OPT-IB-NT ..... Dual-Link DVI fiber optical input board, with Neutrik OpticalCON connectors
- MX-DVIDL-OPT-IB-SC ..... Dual-Link DVI fiber optical input board, with SC connectors
- MX-DVIDL-OPT-IB-ST ..... Dual-Link DVI fiber optical input board, with ST connectors
- MX-HDMI-3D-IB-A ..... HDMI input board including 4K, 3D and Deep Color, with Phoenix connectors
- MX-HDMI-3D-IB-S ..... HDMI input board including 4K, 3D and Deep Color, with S/PDIF connectors
- MX-HDMI-3D-IB ..... HDMI input board including 4K, 3D and Deep Color
- MX-HDMI-TP-IB ..... Twisted pair HDMI input board for CAT5...CAT7 cables
- MXD-HDMI-TP-IB ..... Double slot twisted pair HDMI input board with control
- MX-HDMI-OPT-IB-LC ..... HDMI and HDCP compliant fiber optical input board including 4K, 3D, with LC connectors
- MX-HDMI-OPT-IB-NT ..... HDMI and HDCP compliant fiber optical input board including 4K, 3D, with Neutrik OpticalCON connectors
- MX-HDMI-OPT-IB-SC ..... HDMI and HDCP compliant fiber optical input board including 4K, 3D, with SC connectors
- MX-HDMI-OPT-IB-ST ..... HDMI and HDCP compliant fiber optical input board including 4K, 3D, with ST connectors
- MX-TPS-IB, -A -S ..... TPS input board for HDMI, Ethernet, audio and control, with optional analog or digital audio add-on
- MX-TPS2-IB- A, -S, -P, -AP, -SP ..... TPS input board for HDMI, Ethernet, audio and control, with optional PoE, analog or digital audio add-on
- MX-3GSDI-IB ..... 3G-SDI input board supporting SDI embedded, S/PDIF and AES/EBU audio

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Output boards

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