visual engineering

LIGHTWARE

Product Line 2016

TWICE THE RESOLUTION – HALF THE SIZE

8X8 HDMI™ 2.0 MATRIX

Full 4K/UHD at 60Hz 4:4:4

18 Gbps Speed per Port

7" Deep Compact Size

Silent Operation

Rack-Conform Front-to-Rear Cooling Airflow

Jog Dial and Graphic LCD

Audio Embedding and De-embedding

AVAILABLE IN Q4 2016

visual engineering
LIGHTWARE

lightware.eu

Company

Lightware Visual Engineering is a leading manufacturer of DVI, HDMI and DisplayPort matrix switchers, signal extenders and accessories for the professional AV market. Our goal is to recognize industry needs and develop performance-rich products of the highest quality by continuously consulting with integrators, rental technicians and design engineers.

Pro-series Matrix Routers. The technology built into our Pro-series DVI matrix routers breaks many standard limitations; allowing 60 meters DVI cable on input, Advanced EDID Management, Pixel Accurate Reclocking, LAN, RS-232, RS-422 control, fiber cable powering and more. All signals from Single-Link to the highest resolution Dual-Link DVI can be managed by Lightware Pro-series routers which deliver the ultimate performance in signal conditioning, retransmission and easy system integration.

Hybrid Modular Design. Lightware's MX series router frames and I/O board family incorporate broad signal compatibility, precise switching, control, troubleshooting and signal measurement. AV professionals can choose various I/O sizes, video signal types and transport media options thanks to our Hybrid Modular Design. The MX series matrix backplanes are capable of switching 12.8 Gigabit per second data rates allowing transportation of HDMI 1.4, 4K UHD, 3D and DisplayPort 1.1 video signals.

25G Hybrid Technology. 25G Hybrid Signal Management introduces a completely new concept to the AV industry. Innovative engineering and design created a uniquely new Multilayer Management technology, which allows managing, switching and extending digital and analog video, audio, Ethernet, and control. Designed to deliver exceptionally high resolution image quality and 24/7 reliability, the 25G Hybrid technology establishes a new standard in the professional AV industry.

High Fidelity Signal Management. All Lightware products utilize pixel by pixel signal transmission between endpoints. The lack of latency and compression ensures that the signal keep its original quality. This is achieved by employing such proprietary Lightware technologies as Pixel Accurate Reclocking and Single Fiber Technology.

Research and Development. Lightware technology incorporates numerous professional features developed by our R+D centre in Budapest. These features are Lightware's own intellectual property and some have now become industry standards. Lightware products are solely designed, developed and manufactured in Hungary in the European Union.

Trainings and Education. Lightware Visual Engineering organizes educational seminars designed to provide an insight into the specifics, pitfalls and best practices when integrating the major digital video formats. At these events Lightware trainers and engineers respond to questions, and present a deep insight of the digital standards and their application.

Lightware Worldwide. Our products are available in more than 40 countries in Europe, Asia, Australia and in the United States through our offices and distributors. We also find it important to show our latest technologies and products at the finest events of the audiovisual industry worldwide. We are always present at the ISE Forums in the Amsterdam RAI, at the InfoComm shows and at several other events.

Customer Satisfaction Above All. At Lightware we believe in strong direct support service: our engineers spend long service hours at installation premises, if that seems necessary, and never leave any possible problem untreated or unresolved. Nevertheless, owing to the quality assurance and the professional design of our products we have a rather low number of post-sale support calls.

- Offices
- Distributors
- Managed by the Head office
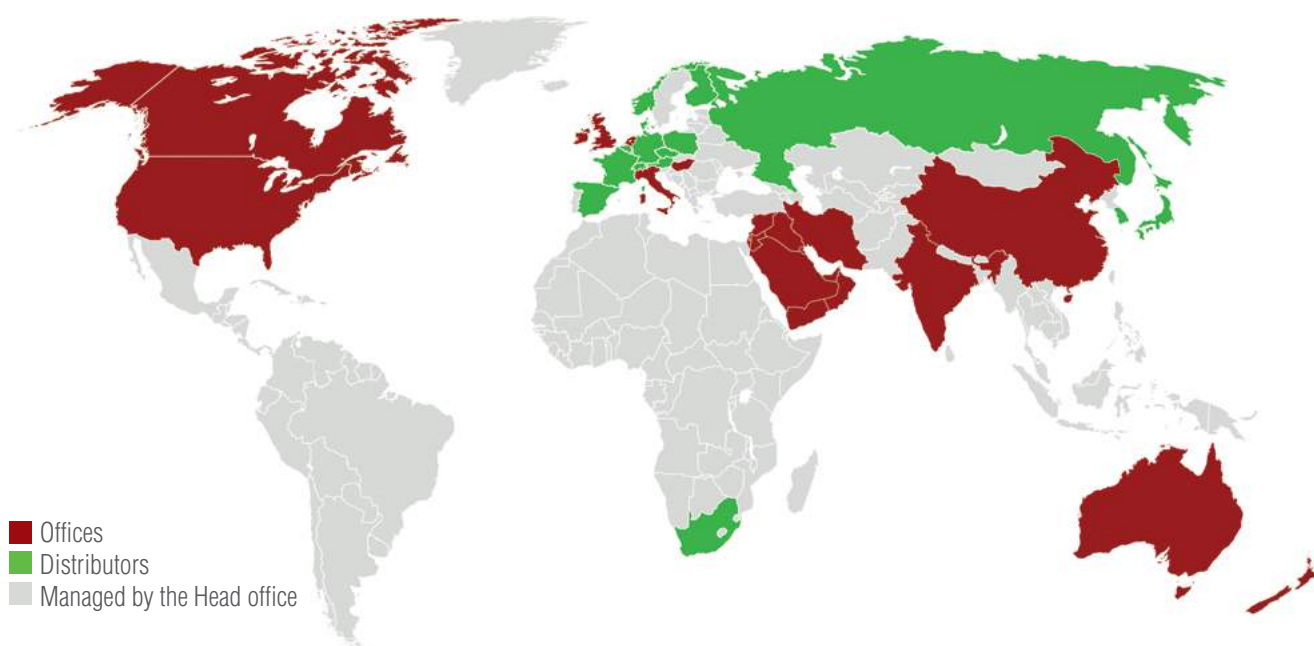
TECHNOLOGIES
Lightware Research & Development

24/7

RS-232

3D

10KM
@1080p
60Hz

HDCP
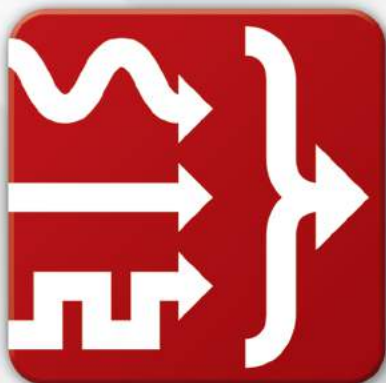
Instantaneous Switching without Signal Latency

All Lightware matrix routers and standalone extenders – even the analog VGA or 3G-SDI Input Boards – add no frame or line period delay to the signal. When a key press or a switch command is sent over any control port the switching is instantaneous. Lightware routers and switchers do not add delay to the switching process and multiple switches can be executed at the same time. Even signals of non-locked sources are switched instantaneously, allowing displays to resynchronize as fast as their internal circuitry allows. The resynchronization time may take between 2 and 50 milliseconds depending on the display or projector type.
depending on the display or projector type.

Advanced EDID Management

This proprietary Lightware technology stores more than 100 user EDID files and offers numerous factory presets including all standard DVI resolutions. HDMI EDID with various audio channels and codecs are also supported, also analog VESA, non-standard VGA EDID formats and Dual-Link DVI resolutions including requirements of the latest 4K projectors.
With the supplied Lightware Device Controller software application including the Advanced EDID Editor tool users can create their own EDID preset and upload it to any Lightware product or they can modify existing EDID data read from any projector or monitor and send the preset setting file via Email. It supports .bin, .dat and .edid file formats allowing system engineers to generate EDID files for 3rd party manufacturer's AV products.

HDCP Compatibility

The Lightware matrix router frames, the majority of I/O boards and other devices are compatible with HDCP encrypted sources and displays. Installing a complex AV system with both HDCP and non-HDCP components is possible, 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 maintains all HDCP regulations and has developed several functions which help solve HDCP related problems.

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

Single Fiber Technology

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

Pixel-Accurate Reclocking

Lightware developed Pixel-Accurate Reclocking and introduced it in the world's first DVI matrix switcher (MX8x8DVI-Pro) in 2006. This technology 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 and 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 it 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.
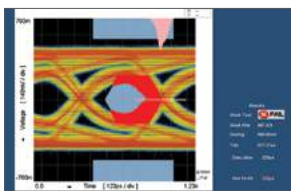
HDMI signal before
Pixel Accurate Reclocking
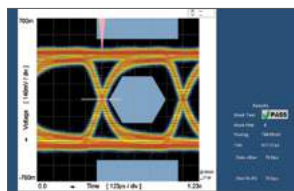
HDMI signal after
Pixel Accurate Reclocking

Cross Compatibility

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

3D Format Support

Lightware provides complex, integrated solutions for the digital age, delivering 3D HDMI. Lightware products enable customers to use 3D technology in every typical professional or household application including Blu-ray players, game consoles, cable, and satellite or broadcast installations.

Built-in Cable Compensation

DVI, HDMI or SDI input ports have built-in cable extenders in the Modular Matrices. The cable equalizer can be used in manual or automatic adaptive mode and extends the cable length on inputs as the actual signal format requires. 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.

Advanced Control Options

Various control options assure that system control, setup, maintenance and troubleshooting tasks are performed easily. A rugged Ethercon connector serves as reliable connection to the LAN, allowing multiple TCP/IP and WEB controls simultaneously in the matrix frames. An RS-232 connector is provided for third-party control systems. Touch-panel controls allow the customization of the system maintaining simplicity in system control and operation. The front panel mini USB connector serves for easy access in rack applications. Lightware Device Controller software enables quick matrix configuration and it includes a built-in Advanced EDID Editor.

4K UHD Support

The MX series Hybrid Modular and the 25G HYBRID matrices support the highest 4K / UHD (30Hz RGB 4:4:4, 60Hz YCbCr 4:2:0) and 1920x1080@120Hz FullHD resolutions. Lightware 4K extenders can be used in point-to-point 4K transmission and can also be connected to MX series or 25G HYBRID matrices as far end points.
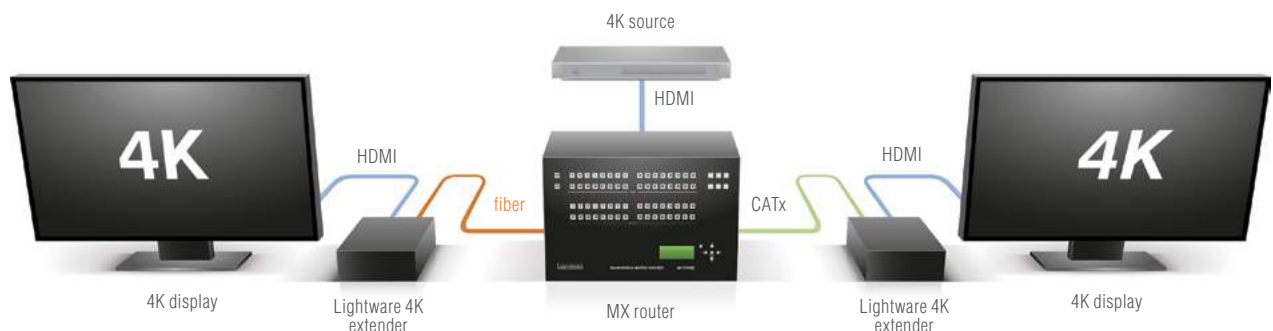
Frame Detector and Input Signal Analysis

Available only in Lightware matrices, this function determines the exact video format sent by the source and helps 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 sampling rate. In the Frame Detector window the parameters are displayed on an intuitive graphical interface. Through the CPU2 board this function is now available on all Input Boards.

Frame Detector

Lightware Device Controller

The Lightware Device Controller (LDC) application keeps receiving upgrades adding new features and tools. The latest edition of LDC is more intuitive, user friendly, smarter and has a modern interface.

Tile view in LDC presents a new way of matrix handling, the Dynamic Crosspoint Layout allows using it on different screen resolutions and an auto update function is now also integrated. The Lightware Device Controller is available for both Windows and OS X operating systems.
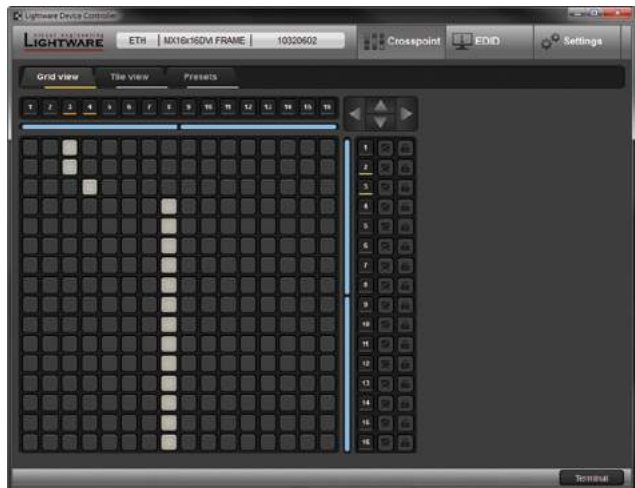
Lightware Device Controller

Configuration Cloning

Configuration Cloning is available as a feature in the Lightware Device Controller software and it eliminates the need to repeatedly configure certain devices in a configuration to have identical (non-factory) settings. If the devices have to be installed in the same type of system multiple times, then it is enough to set up only one device to fit the requirements and then copy those settings to the others, saving time and resources. The cloning process can be performed in two steps: saving the configuration of one device into a backup file and then restoring settings from the backup file in another device.

Fail-safe Operation

Lightware products are famous for their reliability. The MX-FR33R, MX-FR65R and MX-FR80R frames include hot-swappable N+1 redundant Power Supply Units (PSU). 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 PSUs continue to function keeping the AV system continue to operate seamlessly. Our power supplies are all rated to 1,000,000 hours MTBF, their load is set to a maximum of 60% and accept all international AC line voltages from 100 to 240 Volts, with 50 to 60 Hz frequency. PSUs connect to mains cable with a standard IEC connector.

Event Manager   new!

The Event Manager is a smart, built-in feature in the Lightware HDBaseT™ compatible TPS extender family, the MODEX line and in select matrix switchers like the MMX6x2-HT series units. The feature is available through the freely downloadable Lightware Device Controller software and can be configured to detect changes in the device status and perform actions according to the predefined settings.

The Event Manager was developed to handle tasks from the most simple to expert ones, like controlling the rolling shutter, the air conditioning system or the lights based on any condition changes on the media ports, such as a new source being connected or removed. The Event Manager ensures that no additional control solution is required in less complex systems.

The latest upgrade of the Event Manager application added substantial available options to the list of configurable conditions and performable actions.

Now a delay (three types) can be added between the condition and the action and more actions can be triggered by a single condition change. With the help of the 'condition count' and 'action test' features the predefined settings can be tested before going live. The system can recognize infrared commands which can also be set as conditions, and commands can also be sent via Ethernet.

Event Manager Wizard

Assigning an action to a condition is quick and easy with the Wizard function of Event Manager.

The most typical examples of the currently selectable conditions and actions within the Event Manager Wizard are the following:

The Events menu contains separately configurable Events
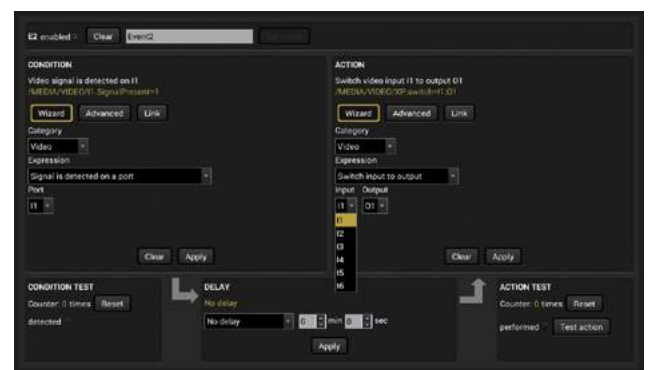
The Event Wizard makes the setup easy with simple dropdown options

Conditions	
Video	Signal is detected on a port
Video	Signal is not detected on a port
Audio	Signal is detected on a port
Audio	Signal is not detected on a port
Audio	Signal type changes to PCM
Audio	Signal type changes to Compressed
Audio	Signal type changes to HBR
Audio	Signal type changes to Undefined (no signal)
IR	Infra code recognized
General	OPT / TPS link state changes to Connected
General	OPT / TPS link state changes to Disconnected

Actions	
Video	Switch input to output
Video	Enable autoselect output
Video	Disable autoselect on output
Ethernet	Send TCP command
Ethernet	Send UDP command
R232	Send RS232 message
EDID	Switch EDID
Audio	Set audio volume
Audio	Mute output
Audio	Unmute output
Audio	Increase/decrease volume

Condition	Action	
	A	Input select on the TPS transmitter
	B	Switch on the projector using RS232
	C	Roll down the projection screen using the transmitter's GPIO port

The projector and the rolling screen (via relay box) are connected to the UMX-TPS-TX140. When the user connects a laptop to the HDMI port of the transmitter, then the connected input is selected automatically, the screen goes down and the projector turns on to display the source.

RS-232 Over Fiber and TPS

This control option allows that endpoint devices can be remotely controlled through a single fiber or a twisted pair cable. The central control system can send and receive commands directly to and from the far endpoint devices which have RS-232 control capability. The control commands are delivered on the same fiber or CATx cable which carries the video and audio signal, so extra cabling is not 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.

Using RS-232 command capabilities 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
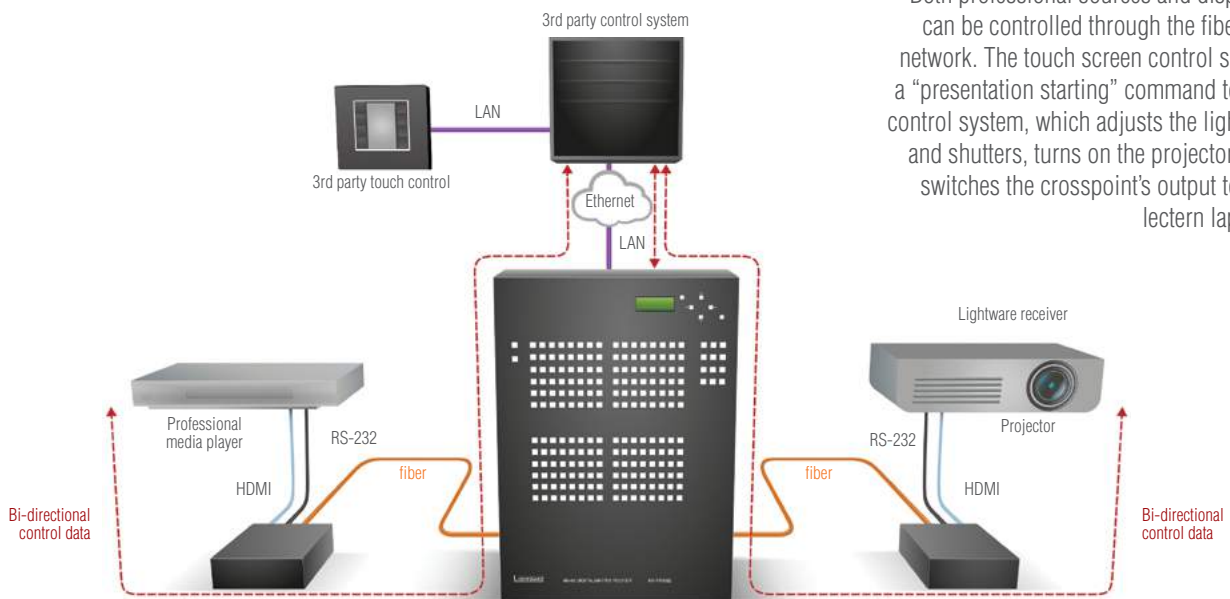
Both professional sources and displays can be controlled through the fiber AV network. The touch screen control sends a "presentation starting" command to the control system, which adjusts the lighting and shutters, turns on the projector and switches the crosspoint's output to the lectern laptop.

Advanced Audio Options

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 the sound can be directly adjustable.

RICOD (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.

TPS Cable Diagnostics Tool

The TPS Cable Diagnostics Tool within the LDC software will help you identify potential twisted pair cable issues in your TPS-capable system. It provides a real-time overview of the estimated cable lengths and the quality of the link.

For more information visit Lightware's dedicated software site at http://software.lightware.eu
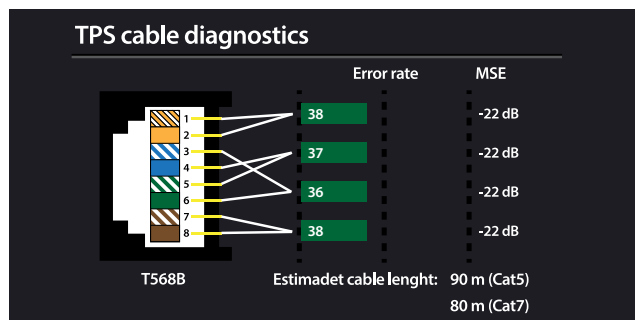
TPS Cable Diagnostics Tool

UMX Technology

Lightware developed UMX (Universal MatriX) technology to support various analog and digital video and audio signal formats with several input and output connection possibilities.

Breakaway Audio/Video Switching

The UMX technology provides separate switching of audio and video including de-embedding and embedding of HDMI signals. For instance, de-embedding audio from the incoming HDMI stream, re- embedding at outputs from a different audio source or even routing the audio separately are easily handled. An example of breakaway switching is shown below. Two sources are connected to the UMX Matrix: a laptop with VGA video and analog stereo audio and a Blu-ray player with HDMI video and embedded audio. The AV receiver takes an HDMI signal with video and audio.

Analog to Digital Conversion

The analog video is digitized at the input ports which ensures signal integrity within the whole system. The conversion does not cause any latency as zero frame delay is crucial in certain applications. The UMX technology allows the combination of analog and digital signals in the same system. A VGA video and an analog stereo audio signal can be combined to generate an HDMI signal with embedded audio or the same analog audio can also be embedded into other incoming HDMI signals.

Combining Video and Audio from Different Ports

The laptop's VGA video signal is digitized and the Blu-ray player's digital audio is de-embedded from the original HDMI stream. The output is an HDMI stream with the laptop's video and the Blu-ray player's re-embedded audio.

Replacing Audio Content in an HDMI Stream

Blu-ray player's audio signal is de-embedded and the laptop's analog audio is digitized. The output is an HDMI stream with the Blu-ray player's HDMI video and the laptop's digitized embedded audio.

25G HYBRID
signal management

25G Technologies

The unprecedented solutions and methods of the 25G Hybrid family together with other Lightware technologies make this family significantly outstanding and future-proof.

Multilayer Switching

Lightware re-invented the term 'matrix switch'. We do not only handle inputs and outputs, we have added the third dimension of the Media Layers providing the flexibility and freedom of independent signal switching. Inside a 25G Hybrid router there are as many Media Layers as signal types - there are as many individual routers as signal formats being incorporated. The advanced audio functions make this technology even more unique. The 25G Hybrid routers have 3 different audio layers: Embedded Audio, Forward Audio and Return Audio.

Video + embedded audio
Forward audio
Return audio
Ethernet
USB KVM
IR
CEC
RS-232

Media layers

Inputs   Outputs

Tel: +36 1 255 3800
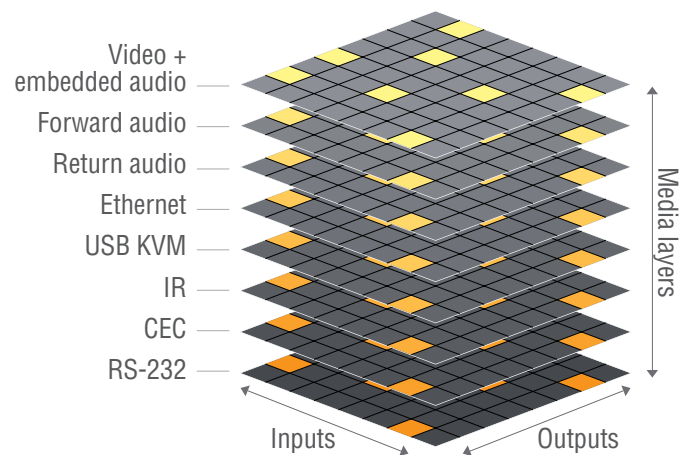
Graphical User Interface

25G Hybrid matrices have a built-in JAVA-based graphical user interface which eases system control, setup, maintenance and troubleshooting. It is accessible via LAN, RS-232 and the front panel touch screen.

The screenshot above presents the GUI for the 25G routers. The 25G Controller is available for both Apple Macintosh and PC computers as a standalone desktop application.

Room Management

As the maximal 160x160 is a large switching plane, Lightware has introduced Room Management. These smaller virtual matrices called 'rooms' can be programmed with their own sources and destinations, but can also share some resources if required.

User Access

For security, a user password can be set to access system control.
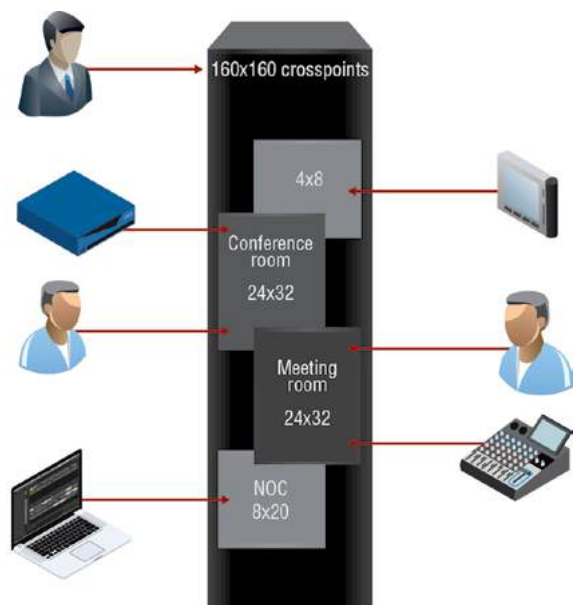
HYBRID MODULAR MATRICES
The Standard for Variable Matrix Routers
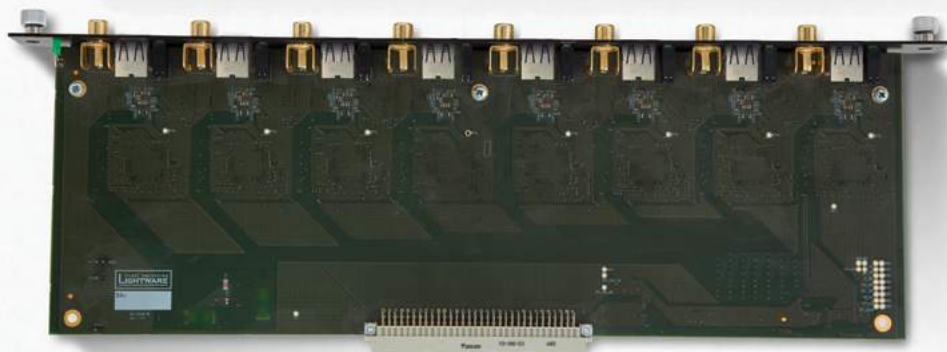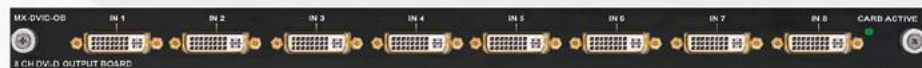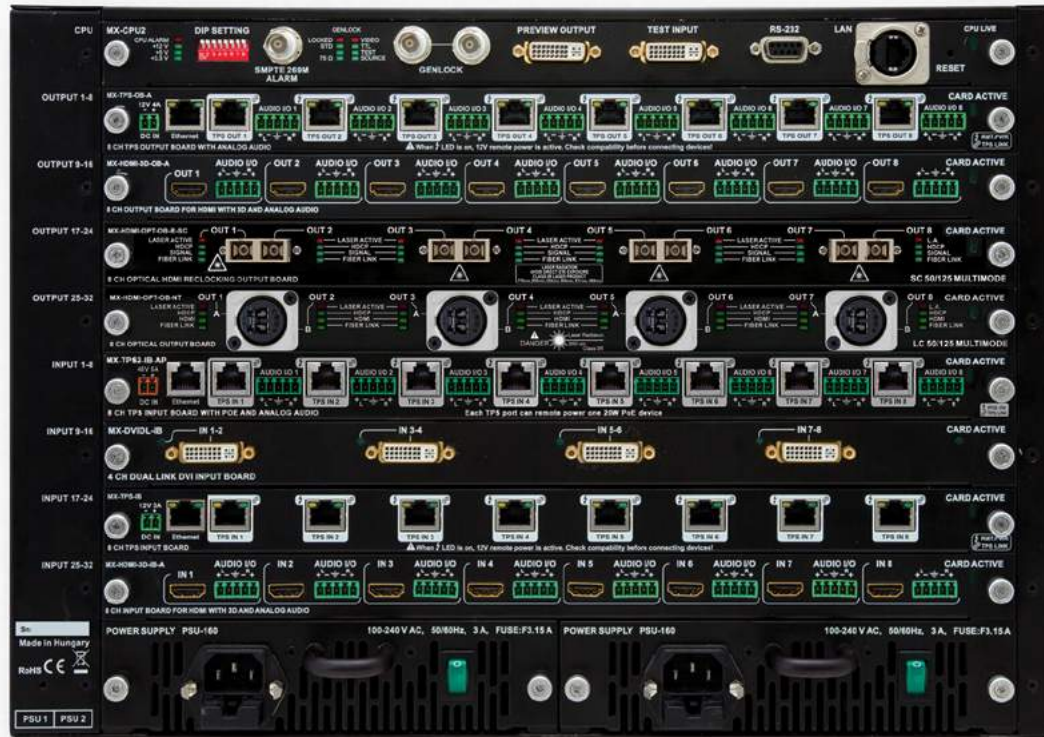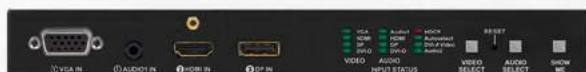
Matrix Switcher Frames

The MX series matrix routers are the highest performance, modular expandable DVI and HDMI compliant switchers, available in five different frame sizes.

The built-in sophisticated software and hardware features make these routers the most flexible integrated solution for AV professionals and high-end home theatre applications.

Non-Blocking Topology:

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 frame delay or frame latency. Different frame sizes are available from 9x9 up to 80x80 allowing the building of custom I/O sized matrices.

Hybrid Modular Architecture:

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

Cross-Platform Signal Routing:

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.

MX Series Frame Features:
- Equipped with MX-CPU2 processor board
- Additional I/O ports accessible on MX-CPU2 processor board
- Dual-Link DVI compatible
  (one Dual-Link port uses two Single-Link ports)
- Compatible with all MX- and MXD- I/O boards
- Provide Ethernet and RS-232 extension to the endpoints
- Frame Detector for input signal analysis on any port
- Multiple TCP/IP connection
- Non-blocking topology
- Advanced error handling and logging with time code
- Combine non-HDCP and HDCP capable I/O boards
  in the same frame
- Advanced EDID Management
- Intuitive control software
- HDCP compliant
- Simultaneous control over several interfaces
- Optional redundant power supplies
- Hybrid Modular and Cross Platform technology
- Full crosspoint configuration save and reload as preset
  (32 presets)

Control Options:
- Front panel buttons and 4 line LCD menu
- RS-232
- TCP/IP Ethernet (multiple connections)
- Built-in website (multiple access)
- Front panel USB
- Christie (ex-Vista) Spyder and Barco Encore compatible

Processor Board
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-CPU2

Remote Control Panels (RCP)
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.
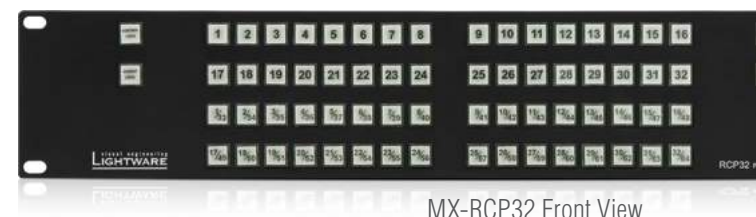
MX-RCP32 Front View
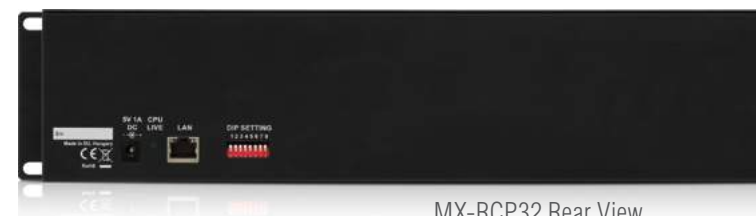
MX-RCP32 Rear View

Hybrid Modular Redundant Matrix Switcher Frame 80x80
MX-FR80R
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 65x65
MX-FR65R
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 33x33
MX-FR33R
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 Redundant Matrix Switcher Frame 33x33
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 Redundant Matrix Switcher Frame 17x17
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 Redundant Matrix Switcher Frame 9x9
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

The 'MX series frame features' on page 19 refer to all the Lightware MX series frames. The features above highlight the differences between the models.

Available Models, Rear Views:

| MX-FR80R, MX-FR65R | MX-FR33R | MX-FR33L | MX-FR17 | MX-FR9 |

Limitless Variations:

switcher
local monitor
LCD display with speakers
ceiling speakers
HDMI-TPS-RX95
projector
access point
laptop
power amplifier
4K UHD
4K UHD
HDMI-3D-OPT-RX150RA
monitor
MX-FR33R
5.1 speakers
AV receiver
HDBaseT smart TV
stereo speakers
power amplifier
mp3 player
laptop
DVI-OPT-RX110
projector
4K UHD PC
projector
HDMI-TPS-TX95
access point
4K UHD Media player
DVI-OPT-TX110
blu-ray player
PC
laptop
UMX-TPS-TX140
WP-UMX-TPS-TX130-US
MacBook
PC
laptop
laptop
UMX-OPT-TX150R
touch panel

▬ CATx cable	▬ LAN		
▬ DVI cable	▬ VGA cable		
▬ HDMI cable	▬ Optical cable		
▬ Audio cable			

Available Models, Front Views:

MX-FR9	MX-FR17	MX-FR33L	MX-FR33R	MX-FR80R, MX-FR65R

Frame-Dependent Specifications:

	MX-FR80R	MX-FR65R	MX-FR33R	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)[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

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

Single-Link DVI Input Board
MX-DVID-IB
Part no: 9112 0001

MX-DVID-IB

Lightware manufactures a wide range of Single-Link products. The MX-DVID-IB Input Board is one of them with eight input channels accepting digital-only DVI signals. It supports resolutions from 640 x 480 to 1920 x 1200 or 2048 x 1080 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 up to 60 meters of copper cable.

Features:
- 8 DVI-D input ports
- Adaptive and manual equalization for up to 60 m DVI cable
- Advanced EDID Management

Dual-Link DVI Input Board
MX-DVIDL-IB
Part no: 9112 0005

MX-DVIDL-IB

Lightware provides the world's biggest Dual-Link matrix switcher, the MX-FR80R frame, fully populated with MX-DVIDL-IB and MX-DVIDL-OB boards. MX-DVIDL-IB is a four-channel Dual-Link DVI Input Board which was designed for high 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.

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

DVI, HDCP and HDMI Compliant Input Board
MX-DVI-HDCP-IB
Part no: 9112 0002

MX-DVI-HDCP-IB

MX-DVI-HDCP-IB is an eight channel Input Board with DVI connectors which can receive 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 pass HDMI with Embedded Audio signals from blu-ray and set top boxes and ensure a reliable connection with its lockable screws.

Features:
- 8 DVI input ports
- 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

Analog and Digital DVI-I Input Board
MX-DVII-HDCP-IB
Part no: 9112 0003

MX-DVII-HDCP-IB

MX-DVII-HDCP-IB is an all-around Input Board which was designed to handle analog VGA, YUV, digital DVI and HDMI 1.3 video signals with HDCP compliancy. Each input port incorporates an individual EDID Manager, a video A/D converter and a Analog/Digital video switch. No frame delay occurs while the analog signal is digitized.

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

3G-SDI Input Board
MX-3GSDI-IB
Part no: 9112 0010

MX-3GSDI-IB

The MX-3GSDI-IB input board allows 3G-SDI sources to be connected, routed and extended, brings your 3G-SDI sources to an HDMI, DVI routing system. It 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.

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

Port Diagram:

Tel: +36 1 255 3800
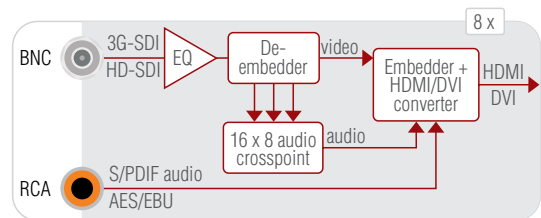
4K, 3D and Deep Color HDMI Input Board
MX-HDMI-3D-IB, -A, -S
Part no: 9112 0007, 9112 0008 (A), 9112 0009 (S)

MX-HDMI-3D-IB provides eight channel HDMI 1.4 extension with 4K resolution, 3D formats and local audio support. DVI and HDCP compliance are important features as are the different audio connector options: 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. Advanced functions such as HDCP enable/disable mode, Pixel Accurate Reclocking, Advanced EDID Management and Frame Detector are integrated providing the professional setup and operation.

Features:
- 8 HDMI input ports
- HDMI 1.4a; DVI and HDCP compliant
- For advanced audio optional 8 S/PDIF (S)
  or 8 stereo audio (A) connectors
- 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 (MX-HDMI-3D-IB)
- 4K / UHD (30Hz RGB 4:4:4, 60Hz YCbCr 4:2:0),
  1080p @ 120 Hz, 2560 x 1600, 2048 x 2048,
  HD video resolutions and all 3D formats are supported
- Advanced EDID Management and Frame Detector
- Pixel Accurate Reclocking
- Dolby TrueHD and DTS-HD Master Audio
- 36-bit deep color support

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
- S/PDIF can be sent over ARC back to the source device

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
- Volume, gain, balance, bass and treble control
- Phase invert, DC filter and de-emphasis option

MX-HDMI-3D-IB
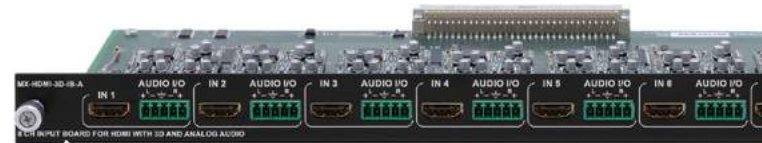
MX-HDMI-3D-IB-A

MX-HDMI-3D-IB-S

Port Diagrams:

MX-HDMI-3D-IB-A
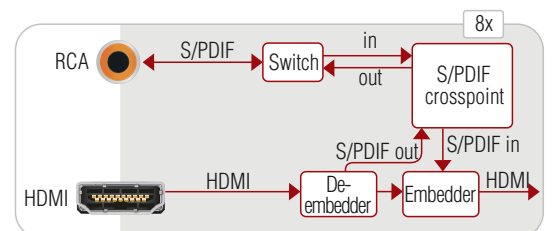
MX-HDMI-3D-IB

MX-HDMI-3D-IB-S

Available Video Patterns:

Solid red | Solid green | Solid blue | Solid black
Solid white | Ramp | Chessboard | Color bars
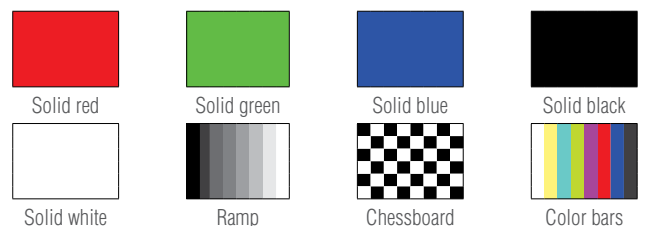
Test Pattern Generator Video Formats:
480p, 576p, 720p, 1080p, 1080p deep color

TPS and HDMI Input Board for Ethernet, Audio and Control new!
MX-4TPS2-4HDMI-IB, -A, -S, -P, -AP, -SP
Part no: 9112 0041, 9112 0042 (A), 9112 0043 (S), 9112 0038 (AP), 9112 0039 (SP), 9112 0040 (P)

MX-4TPS2-4HDMI-IB

MX-4TPS2-4HDMI-IB-A

MX-4TPS2-4HDMI-IB-S

MX-4TPS2-4HDMI-IB-P

MX-4TPS2-4HDMI-IB-AP

MX-4TPS2-4HDMI-IB-SP

MX-4TPS2-4HDMI-IB is a mixed input board with four HDMI and four HDBaseT™ single CAT inputs providing HDMI 1.4, audio, Ethernet and RS-232 extension on a single CAT5/6/7 cable up to 120m in HDBaseT™ and 170m distance in Long reach mode (maximal resolution is Full HD 1080p in Long reach mode). Resolutions up to 4K / UHD (30Hz RGB 4:4:4 , 60Hz YCbCr 4:2:0) 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). 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).

MX-4TPS2-4HDMI-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 ensuring professional setup and operation. The board is compatible with deep color, Dolby TrueHD and DTS-HD audio.

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 (30Hz RGB 4:4:4, 60Hz YCbCr 4:2:0),
  1080p @ 120 Hz, 2560 x 1600, 2048 x 2048,
- 10/100 Ethernet transmission
- Supports all HDMI audio formats
- Digital or analog audio add-on option
- PoE add-on option
- Adjustable analog audio settings

Product Name	Audio Add-on	PoE Add-on
MX-4TPS2-4HDMI-IB	none	none
MX-4TPS2-4HDMI-IB-A	analog	none
MX-4TPS2-4HDMI-IB-S	spdif	none
MX-4TPS2-4HDMI-IB-P	none	yes
MX-4TPS2-4HDMI-IB-AP	analog	yes
MX-4TPS2-4HDMI-IB-SP	spdif	yes

HDBaseT™ and the HDBaseT Alliance logo are trademarks of the HDBaseT Alliance

MX-4TPS2-4HDMI-IB-P
- PoE compatible
- 48V remote powering
- Remote powering on/off switching
- Status feedback

MX-4TPS2-4HDMI-IB-AP
- Bi-directional configurable analog stereo ports 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) into the HDMI signal
- PoE compatible
- 48V remote powering
- Remote powering on/off switching
- Volume, gain, balance, bass and treble control
- Phase invert, DC filter and de-emphasis option

MX-4TPS2-4HDMI-IB-SP
- 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) into the HDMI signal
- PoE compatible
- 48V remote powering
- Remote powering on/off switching
- Status feedback
- S/PDIF can be sent over ARC back to the source device

MX-4TPS2-4HDMI-IB-A
- Bi-directional configurable analog stereo ports 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) into the HDMI signal
- Volume, gain, balance, bass and treble control
- Phase invert, DC filter and de-emphasis option

MX-4TPS2-4HDMI-IB-S
- 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) into the HDMI signal
- S/PDIF can be sent over ARC back to the source device

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 Input Board is a long distance single CAT HDBaseT™ solution with localized audio embedding and de-embedding points. The board provides HDMI 1.4, audio, Ethernet and RS-232 extension on a single CAT5/6/7 cable up to a 100 m distance in HDBaseT™ and a 170 m distance in Long Reach Mode (maximum resolution is Full HD 1080p in Long Reach Mode) on eight channels. 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 optional audio 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 functions such as HDCP enable/ disable mode, Pixel Accurate Reclocking, Advanced EDID Management and Frame Detector are integrated providing professional setup and operation. The board is compatible with deep color, Dolby TrueHD and DTS-HD audio and features PCM audio sample rate conversion.

Features:
- 8 channel twisted pair input board
- 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 (30Hz RGB 4:4:4, 60Hz YCbCr 4:2:0), UHD, 2560 x 1600, HD video resolutions and all 3D formats are supported
- 10/100 Ethernet transmission
- Supports all HDMI audio formats
- Options for cards with digital or analog audio connections

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
- Volume, gain, balance, bass and treble control
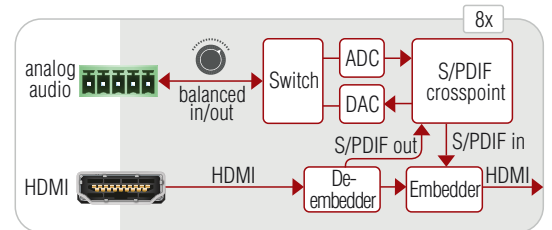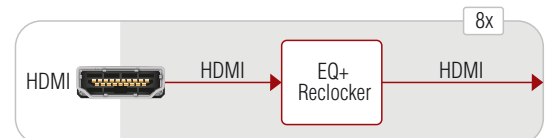- Phase invert, DC filter and de-emphasis option

HDBaseT™ and the HDBaseT Alliance logo are trademarks of the HDBaseT Alliance

MX-TPS-IB

MX-TPS-IB-A

MX-TPS-IB-S

Port Diagrams:
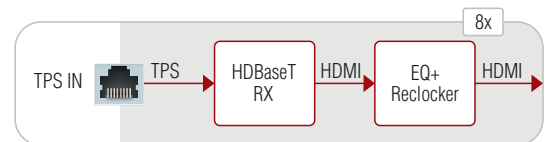
MX-TPS-IB
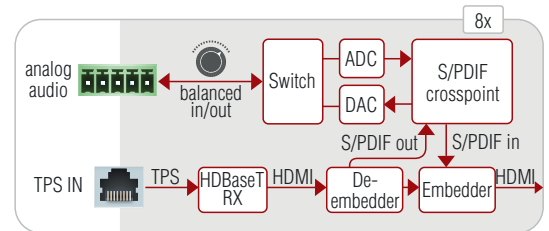
MX-TPS-IB-A
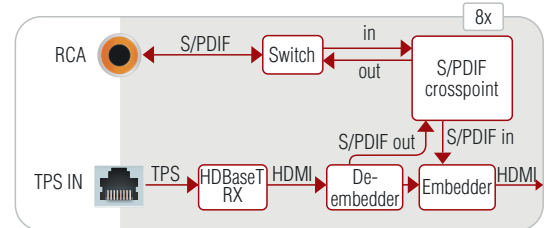
MX-TPS-IB-S

Available Video Patterns:

Solid red | Solid green | Solid blue | Solid black

Solid white | Ramp | Chessboard | Color bars
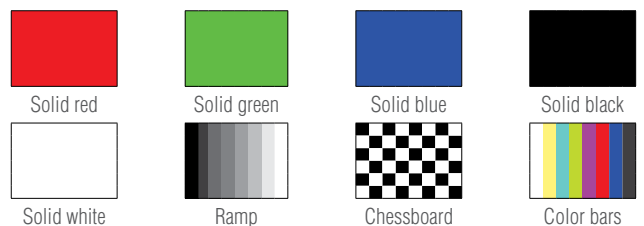
Test Pattern Generator Video Formats:
480p, 576p, 720p, 1080p, 1080p deep color

TPS Input Board with PoE new!

MX-TPS2-IB-P, -AP, -SP

Part no: Part No: 9112 0035 (P), 9112 0036 (AP), 9112 0037 (SP)

MX-TPS2-IB-P

MX-TPS2-IB-AP

MX-TPS2-IB-SP

MX-TPS2-IB is an eight channel HDMI and single CAT HDBaseT™ Input Board providing HDMI 1.4, audio, Ethernet and RS-232 extension on a single CAT5/6/7 cable up to a 100m in HDBaseT™ and a 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 functions such as HDCP enable/disable mode, Pixel Accurate Reclocking, Advanced EDID Management and Frame Detector are integrated providing professional setup and operation. The board is compatible with deep color, Dolby TrueHD and DTS-HD audio, and features PCM audio sample rate conversion.

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 (30Hz RGB 4:4:4, 60Hz YCbCr 4:2:0), 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-TX95 and DVI-HDCP-TPS-TX95 remote powering is supported by these boards: MX-TPS-IB, MX-TPS-IB-A, MX-TPS-IB-S

Product Name	Audio Add-on	PoE Add-on
MX-TPS2-IB-P	none	yes
MX-TPS2-IB-AP	analog	yes
MX-TPS2-IB-SP	spdif	yes

HDBaseT™ and the HDBaseT Alliance logo are trademarks of the HDBaseT Alliance

MX-TPS2-IB-P

- PoE compatible
- 48V remote powering
- Remote powering on/off switching
- Status feedback

MX-TPS2-IB-AP

- 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
- Volume, gain control
- PoE compatible
- 48V remote powering
- Remote powering on/off switching
- Status feedback

MX-TPS2-IB-SP

- 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
- PoE compatible
- 48V remote powering
- Remote powering on/off switching
- Status feedback

Port Diagrams:
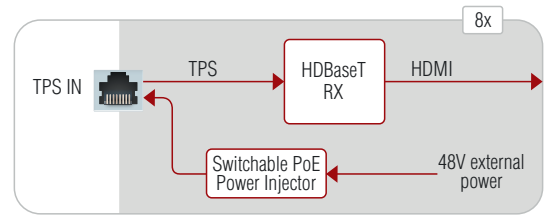
MX-TPS2-IB-P
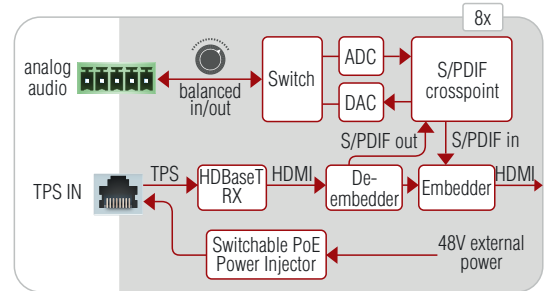
MX-TPS2-IB-AP
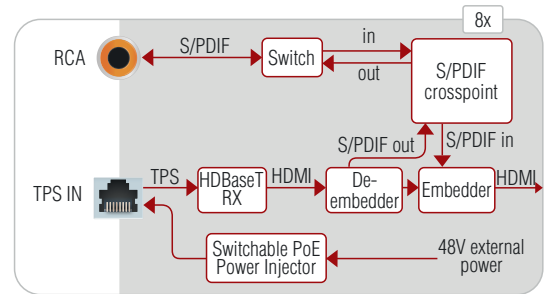
MX-TPS2-IB-SP

Twisted Pair Single-Link DVI Input Board
MX-DVI-TP-IB

Part no: 9112 0011

MX-DVI-TP-IB

MX-DVI-TP-IB is a cost-effective solution for the top level HDBaseTTM matrix boards with several useful features. The eight 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.

Features:
- 8 channel twisted pair input board
- Accepts DVI signals over CAT5, CAT6 or CAT7 cables
- Input cable equalization: adaptive or manual

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

Twisted Pair Single-Link DVI Input Board
MX-DVI-TP-IB+

Part no: 9112 0012

MX-DVI-TP-IB+

MX-DVI-TP-IB+ is a cost-effective solution to the top level HDBaseT™ matrix boards with several useful features. This input board has eight 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 active.

Optional Accessory:

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

Features:
- 8 channel dual twisted pair Input Board
- Accepts DVI signals over CAT5, CAT6 or CAT7 cables
- Optional extender remote powering over second CATx cable
- Advanced EDID Management over second CATx cable
- Input cable equalization: adaptive or manual

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

Twisted Pair HDMI Input Board
MX-HDMI-TP-IB

Part no: 9112 0013

MX-HDMI-TP-IB

MX-HDMI-TP-IB is a cost-effective solution of extending HDMI, DVI, VGA signals over shorter distances. This eight 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.

Optional Accessory:

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

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

Compatible Products:
- Transmitters:

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

Twisted Pair HDMI Input Board
MXD-HDMI-TP-IB
Part no: 9112 0014

MXD-HDMI-TP-IB

The MXD-HDMI-TP-IB 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 de-embeds digital audio from the HDMI stream and generates output via an S/PDIF connector locally while maintaining the audio content to the router's main crosspoint board.

Features:
- 8 channel twisted pair Input Board
- 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
- Double slot output board - needs two cards' slot in the frame
- S/PDIF audio output per channel
- RS-232 control over twisted pair for each input port
- HDCP compliant
- Advanced EDID Management
- Pixel Accurate Reclocking
- Adaptive or manual CATx cable equalization
- Automatic or adjustable color range conversion
- 3D signal compatibility with frame packing, side-by-side and top-bottom formats
- Compatible with MX-FR80R, MX-FR65R, MX-FR33R, MX-FR33L, MX-FR17 and MX-FR9 frames

Compatible Products:
- Transmitters:
  WP-HDMI-TP-TX50R
  WP-DVI-HDCP-TP-TX50RW
  DVI-TP-TX200
  DVI-TP-TX300
  DVI-HDCP-TP-TX50
  DVI-HDCP-TP-TX100R
  HDMI-TP-TX50
  HDMI-TP-TX100R
  HDMI-TP-TX200R

Port Diagram:
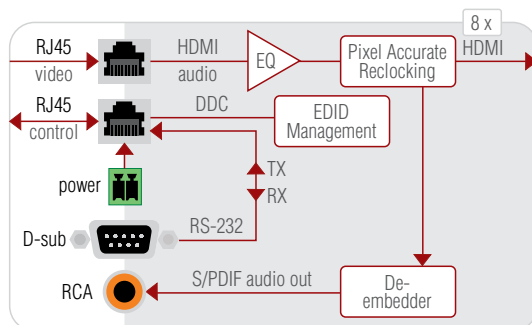
Optional Accessory:

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

Fiber Optical Single-Link DVI Input Board

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

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

MX-DVI-OPT-IB-LC

MX-DVI-OPT-IB-ST   MX-DVI-OPT-IB-NT   MX-DVI-OPT-IB-SC
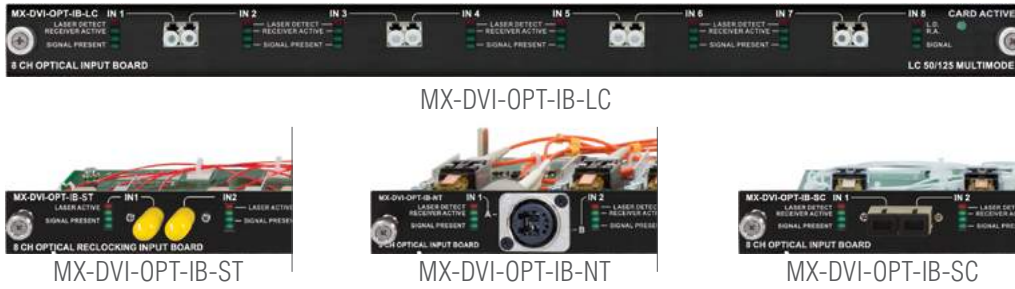
MX-DVI-OPT-IB offers an extremely long, 2500m distance extension over a single Multimode fiber for Single-Link DVI signals on eight channels. The board is available with Neutrik OpticalCON, -LC, -SC or -ST connectors. Each port converts an incoming fiber signal to DVI-D format. Single Fiber Technology ensures transmission of DVI-D signals over one multimode fiber core using multiple wavelengths.

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)

Compatible Products:
- Transmitters:
  DVI-OPT-TX110
  DVI-OPT-TX220-Pro

Fiber Optical Dual-Link DVI Input Board

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

Part no: 9112 0019 (LC), 9112 0022 (NT)

MX-DVIDL-OPT-IB-LC

MX-DVIDL-OPT-IB-NT

MX-DVIDL-OPT-IB offers an extremely long, 2500m distance extension over a duplex Multimode fiber for Dual-Link DVI signals on four channels. 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 without video compression. The board is available with Neutrik OpticalCON, -LC, -SC or -ST connectors.

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

Compatible Products:
- Transmitters:
  DVIDL-OPT-TX200

4K, 3D and Deep Color HDMI Optical Input Board
MX-HDMI-OPT-IB-LC, -NT, -SC
Part no: 9112 0023 (LC), 9112 0025 (SC), 9112 0026 (NT)

MX-HDMI-OPT-IB-NT

MX-HDMI-OPT-IB-SC

MX-HDMI-OPT-IB-LC

MX-HDMI-OPT-IB offers an extremely long, 2500m distance extension over a single Multimode fiber for HDMI, DVI, VGA signals on 8 channels with 4K resolution and 3D formats support. An internal fiber to HDMI conversion adds no latency or frame delay and uses no video compression.

Features:
- Built-in HDMI to fiber converter
- Selectable connectors: Neutrik OpticalCON, -LC, -SC
- 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)

Compatible Products:
- Transmitters:
  DVI-OPT-TX110
  DVI-OPT-TX220-Pro
  HDMI-OPT-TX100
  HDMI-OPT-TX100R
  HDMI-OPT-TX200R
  MX-HDMI-OPT-LC, NT
  MX-HDMI-OPT-LC, NT
  25G-MX-HDMI-OPT-OB

Analog Audio Output Board   new!
MX-AUDIO-OB-A
Part no: 9113 0045

MX-AUDIO-OB-A

MX-AUDIO-OB-A is an eight-channel analog audio output board to switch audio de-embedded from a video signal to an output port. The board has adjustable audio setting options. This output board features eight durable Phoenix type audio connectors. Volume, balance, bass and treble settings help enhancing the stereo PCM audio signal ranging up to 96kHz. Further options to set phase inverting and pre-emphasis are also included.

Features:
- Eight Phoenix (Euroblock) connectors
- Stereo PCM audio up to 96 kHz de-embedded from the HDMI signals
- Volume, balance, bass and treble control
- Phase invert option
- Pre-emphasis option

Single-Link DVI Output Board
MX-DVID-OB
Part no: 9113 0001

MX-DVID-OB

MX-DVID-OB is a cost effective solution for routing DVI signals. It accepts digital DVI signals and incorporates a Pixel Accurate Reclocking engine, recognizes attached Monitor EDIDs and each output can power the DVI-OPT-TX110 fiber optic transmitter via +5 V pin with up to 500 mA current.

Features:
- 8 DVI-D connectors
- Advanced EDID Management
- Pixel Accurate Reclocking
- +5 V fiber extender powering

Dual-Link DVI Output Board
MX-DVIDL-OB
Part no: 9113 0003
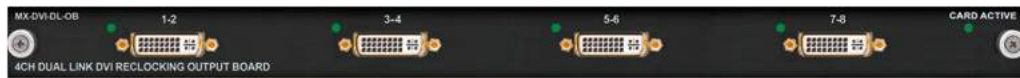
MX-DVIDL-OB

Lightware's MX-FR80R frame is the world's largest Dual-Link matrix switcher, which is fully populated with MX-DVIDL-IB and MX-DVIDL-OB boards. MX-DVIDL-OB is a Dual-Link DVI Output Board supporting four Dual-Link DVI-D connectors. All signals are reclocked on output with the TMDS Reclocking technology. High-definition computer signals and 120Hz 3D video content are supported.

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

DVI, HDCP and HDMI Compliant Output Board
MX-DVI-HDCP-OB
Part no: 9113 0002

MX-DVI-HDCP-OB

MX-DVI-HDCP-OB is an eight channel Output Board with DVI connectors able to receive digital DVI and HDMI 1.3 signals with or without HDCP encryption. This board fully supports HDMI signals with embedded multichannel audio using reliable screw-lockable DVI connectors. Numerous professional features are built-in such as 3D compatibility, Pixel Accurate Reclocking, HDMI to DVI conversion and color space conversion.

Features:
- 8 channel Output Board
- 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

4K, 3D and Deep Color HDMI Output Board
MX-HDMI-3D-OB, -A, -S
Part no: 9113 0005, 9113 0006 (A), 9113 0007 (S)

MX-HDMI-3D-OB

MX-HDMI-3D-OB-A

MX-HDMI-3D-OB-S

MX-HDMI-3D-OB provides eight channel HDMI 1.4 extension with 4K resolution, 3D formats and local audio support. DVI and HDCP compliance are important features as are the different audio connector options: 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 and HDMI (24 bit RGB) to DVI conversion are incorporated. The board is compatible with deep color, Dolby TrueHD and DTS-HD audio.

Port Diagrams:

MX-HDMI-3D-IB-A
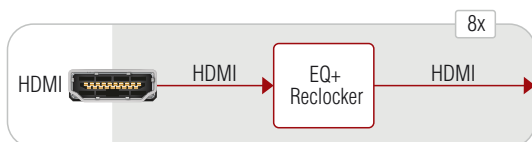
MX-HDMI-3D-IB

MX-HDMI-3D-IB-S

Features:
- 8 HDMI output ports
- HDMI 1.4a; DVI and HDCP compliant
- For advanced audio optional 8 S/PDIF (S) or 8 stereo audio (A) connectors
- 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 (MX-HDMI-3D-OB)
- 4K / UHD (30Hz RGB 4:4:4, 60Hz YCbCr 4:2:0), 1080p @ 120 Hz, 2560 x 1600, 2048 x 2048 , HD video resolutions and all 3D formats are supported
- Advanced EDID Management and Frame Detector
- Pixel Accurate Reclocking
- Dolby TrueHD and DTS-HD Master Audio
- 36-bit deep color support

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

Available Video Patterns:
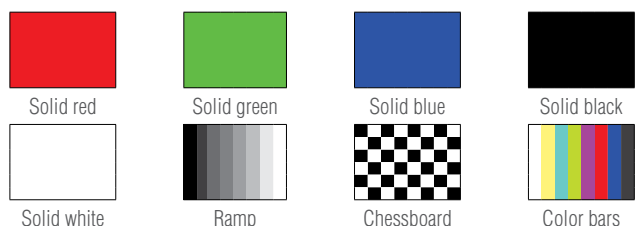
| Solid red | Solid green | Solid blue | Solid black |

| Solid white | Ramp | Chessboard | Color bars |

Test Pattern Generator Video Formats:
480p, 576p, 720p, 1080p, 1080p deep color

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 Output Board is a long-distance single CAT HDBaseT™ solution with localized audio embedding and de-embedding points. This board provides HDMI 1.4, audio, Ethernet and RS-232 extension on a single CAT5/6/7 cable up to a 100m in HDBaseT™ and up to a 170m distance in Long Reach Mode (maximum resolution is Full HD 1080p in Long Reach Mode) on eight channels. 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 optional audio 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 functions such as HDCP enable/disable mode, Pixel Accurate Reclocking, Advanced EDID Management and Frame Detector are integrated providing professional setup and operation.

Features:
- 8 channel twisted pair Output Board
- 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 (30Hz RGB 4:4:4, 60Hz YCbCr 4:2:0), UHD, 2560 x 1600, HD video resolutions and all 3D formats are supported
- 10/100 Ethernet transmission
- Supports all HDMI audio formats
- Options for cards with digital or analog audio connectors

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
- Volume, gain, balance, bass and treble control
- Phase invert, DC filter and de-emphasis option

HDBaseT™ and the HDBaseT Alliance logo are trademarks of the HDBaseT Alliance

MX-TPS-OB

MX-TPS-OB-A

MX-TPS-OB-S

Port Diagrams:
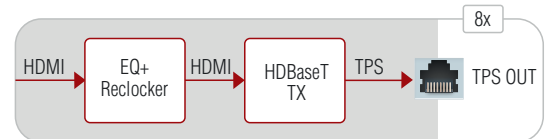
MX-TPS-OB
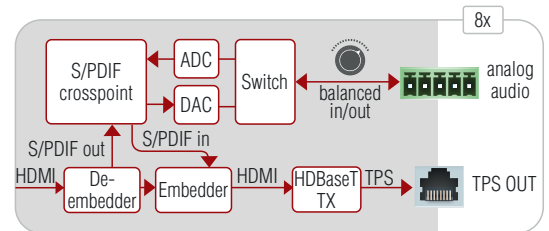
MX-TPS-OB-A
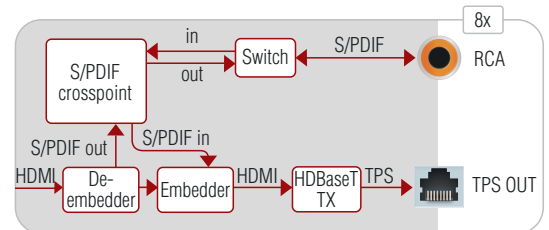
MX-TPS-OB-S

Available Video Patterns:
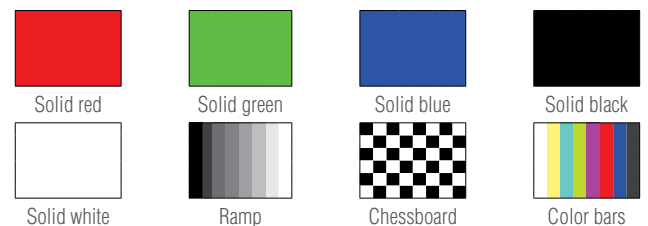
Solid red | Solid green | Solid blue | Solid black

Solid white | Ramp | Chessboard | Color bars

Test Pattern Generator Video Formats:
480p, 576p, 720p, 1080p, 1080p deep color

TPS Output Board with PoE Option `new!`

MX-TPS2-OB-P, -AP, -SP

Part no: 9113 0042 (P), 9113 0043 (AP), 9112 0044 (SP)

MX-TPS2-OB-P

MX-TPS2-OB-AP

MX-TPS2-OB-SP

MX-TPS2-OB-P 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-P 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.

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 (30Hz RGB 4:4:4, 60Hz YCbCr 4:2:0), 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

HDBaseT™ and the HDBaseT Alliance logo are trademarks of the HDBaseT Alliance

MX-TPS2-OB-AP

- 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
- Digitized audio (PCM 48 kHz) can be embedded (or replaced) to the HDMI signal
- Volume, gain control
- PoE compatible
- 48V remote powering
- Remote powering on/off switching
- Status feedback

MX-TPS2-OB-SP

- 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
- PoE compatible
- 48V remote powering
- Remote powering on/off switching
- Status feedback

Twisted Pair Single-Link DVI Output Board
MX-DVI-TP-OB
Part no: 9113 0008

MX-DVI-TP-OB

MX-DVI-TP-OB is a cost-effective solution for the top level matrix boards with several useful features. This Output Board 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.

Features:
- 8 channel twisted pair Output Board
- Converts and transmits Single-Link digital DVI-D signals over one CATx cable
- Pixel Accurate Reclocking

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

Twisted Pair Single-Link DVI Output Board
MX-DVI-TP-OB+
Part no: 9113 0009

MX-DVI-TP-OB+

MX-DVI-TP-OB+ is a cost-effective solution for the top level matrix boards with several useful features. This eight channel Output Board transmits 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.

Features:
- 8 channel twisted pair Output Board
- 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

Compatible Products:
- Receivers:
  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.

Twisted Pair HDMI Output Board
MX-HDMI-TP-OB
Part no: 9113 0010

MX-HDMI-TP-OB

MX-HDMI-TP-OB is a cost-effective solution of extending HDMI, DVI, VGA signals over shorter distances. This eight channel twisted pair Output Board was designed for dual CAT5, CAT6 or CAT7 cables, extending HDMI and DVI signals with HDCP compliance. HDCP encryption, remote powering of compatible receivers (with external 12 Volt DC power supply), and EDID handling are performed over the second CATx cable.

Optional Accessory:

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

Features:
- Built-in CAT7 to HDMI converters
- 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

Compatible Products:
- Receivers:

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

Twisted Pair HDMI Output Board
MXD-HDMI-TP-OB
Part no: 9113 0011
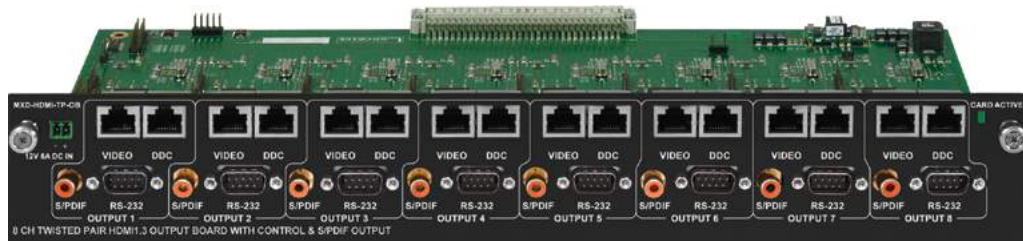
MXD-HDMI-TP-OB

MXD-HDMI-TP-OB provides eight channel HDMI to CATx conversion in addition to 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.

Features:
- 8 channel twisted pair Output Board
- Transmits HDMI 1.3 and DVI signals over CAT5, CAT6 or CAT7 cables
- Supports all audio formats over HDMI: Dolby TrueHD and DTS-HD Master Audio
- Double slot Output Board - needs two cards' slot in the frame
- RS-232 or S/PDIF over twisted pair on each output
- HDCP compliant
- Advanced EDID Management
- Pixel Accurate Reclocking
- Automatic or adjustable color space and color range conversion
- PCM subsampling by 2 x or 4 x
- 3D signal compatibility with frame packing, side-by-side and top-bottom formats
- Compatible with MX-FR80R, MX-FR65R, MX-FR33R, MX-FR33L, MX-FR17 and MX-FR9 frames

Compatible Products:
- Receivers:

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

Port Diagram:
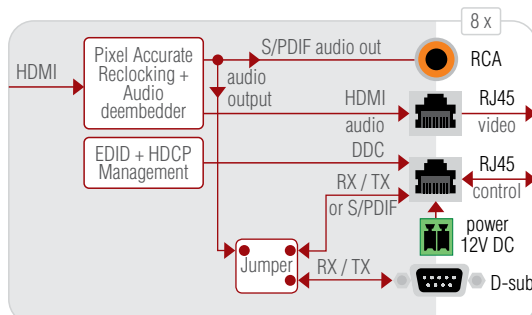
Optional Accessory:

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

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

MX-DVI-OPT-OB provides extremely long, 2500m distance extension over a single Multimode fiber for Single-Link DVI signals on eight channels. It incorporates eight DVI to fiber converters, and it is available with -LC, -SC or -ST connectors. Digital video signals up to 1920 x 1200 or 2048 x 1080 pixel resolution can be extended from the router frame to compatible Lightware fiber receivers 2500m away.

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)

Compatible Products:
- Receivers:
  DVI-OPT-RX110
  DVI-OPT-RX220-Pro

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-SC

MX-DVI-OPT-OB-R-NT

MX-DVI-OPT-OB-R-ST

MX-DVI-OPT-OB-R Output Board provides extremely long, 2500m extension and reclocking for DVI-D signals over Multimode fiber on eight channels. It incorporates our Pixel Accurate Reclocking technology and Single Fiber Technology. Fiber connectors are available with Neutrik OpticalCON, -LC, -SC or –ST connectors.

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)

Compatible Products:
- Receivers:
  DVI-OPT-RX110
  DVI-OPT-RX220-Pro

Fiber Optical Dual-Link DVI Output Board
MX-DVIDL-OPT-OB-LC, -NT
Part no: 9113 0019 (LC), 9113 0022 (NT)

MX-DVIDL-OPT-OB-NT

MX-DVIDL-OPT-OB-LC

MX-DVIDL-OPT-OB provides extremely long, 2500m extension over a duplex Multimode fiber for Dual-Link DVI signals on 4 channels. 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.

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

Compatible Products:
- Receivers:
  DVIDL-OPT-RX100

Fiber Optical HDMI Output Board
MX-HDMI-OPT-OB-LC, -SC, -NT
Part no: 9113 0023 (LC), 9113 0025 (SC), 9113 0026 (NT)

MX-HDMI-OPT-OB-NT

MX-HDMI-OPT-OB-SC

MX-HDMI-OPT-OB-LC

MX-HDMI-OPT-OB provides extremely long 2500m distance extension over a single Multimode fiber for HDMI, DVI, VGA signals on 8 channels with 4K resolution and 3D formats support. EDID handshaking is performed over the one Multimode fiber as well utilizing our Single Fiber Technology. The board is available with Neutrik OpticalCON, -LC, -SC or -ST connectors.

Features:
- 8 channel fiber optical Output Board
- Built-in HDMI to fiber converter
- Selectable connectors: Neutrik OpticalCON, -LC, -SC
- 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)

Compatible Products:
- Receivers:
  DVI-OPT-RX110   HDMI-OPT-RX200R
  DVI-OPT-RX220-Pro   MX-HDMI-OPT-LC, NT
  HDMI-OPT-RX100   25G-MX-HDMI-OPT-IB
  HDMI-OPT-RX100R

4K, 3D and Deep Color HDMI Optical Output Board with Reclocking
MX-HDMI-OPT-OB-R-LC, -NT
Part no: 9113 0030 (LC), 9113 0032 (SC), 9113 0033 (NT)

MX-HDMI-OPT-OB-R-ST

MX-HDMI-OPT-OB-R-NT

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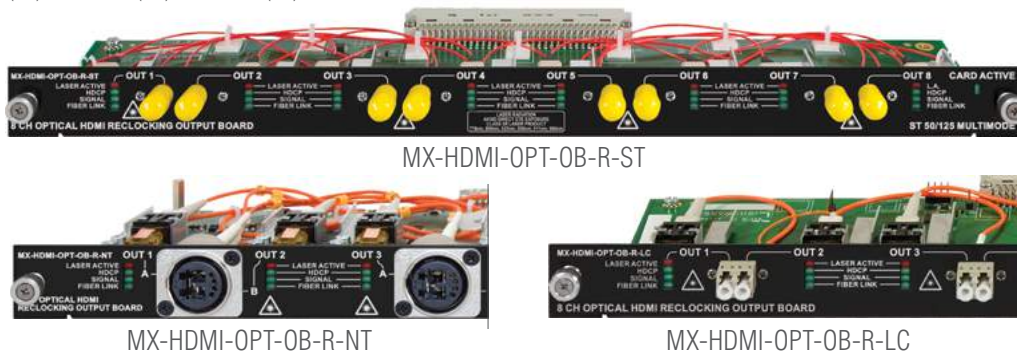
MX-HDMI-3D-OB-R is an eight channel Multimode optical Output Board providing HDMI 1.4, audio and RS-232 extension over a single Multimode fiber up to 2500m distance. Pixel Accurate Reclocking, HDCP compliance and HDMI to DVI conversion are incorporated. Resolutions up to 4K and 36-bit color depth are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

Together with 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 transmitted 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 professional setup and operation. The board is available with Neutrik OpticalCON, -LC, or -ST connectors.

Features:
- HDMI 1.4a; DVI and HDCP compliant 8 output matrix board
- Selectable connectors: Neutrik OpticalCON, -LC
- Resolution up to 4096x2048@30Hz and all 3D formats are supported
- Extension distance: 2500 m (up to 1920 x 1200 @ 60Hz), 1100m (4096 x 2048 @ 30Hz)
- Dolby TrueHD and DTS-HD Master Audio
- Advanced EDID Management
- Frame Detector
- Pixel Accurate Reclocking
- One bi-directional RS-232 channel per port

Compatible Products:
- Receivers:
  DVI-OPT-RX110
  DVI-OPT-RX220-Pro
  HDMI-OPT-RX100
  HDMI-OPT-RX100R
  HDMI-OPT-RX200R
  HDMI-3D-OPT-RX150RA
  MX-HDMI-OPT-IB
  25G-MX-HDMI-OPT-IB

MX- 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-FR33R.............................33x33 digital crosspoint router frame with redundant power supplies, built-in control panel and CPU2
- MX-FR65R.............................65x65 digital crosspoint router frame with redundant power supplies, built-in control panel and CPU2
- MX-FR80R.............................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-DVIDL-IB ....Dual-Link DVI digital only input board with DVI-I 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
- MX-HDMI-3D-IB ....HDMI input board including 4K, 3D and Deep Color
- 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-4TPS2-4HDMI-IB .... TPS-HDMI input board
- MX-4TPS2-4HDMI-IB-A .... TPS-HDMI input board with analog audio
- MX-4TPS2-4HDMI-IB-S .... TPS-HDMI input board with digital audio
- MX-4TPS2-4HDMI-IB-P .... TPS-HDMI input board with PoE
- MX-4TPS2-4HDMI-IB-AP ...... TPS-HDMI input board with PoE and analog audio
- MX-4TPS2-4HDMI-IB-SP ...... TPS-HDMI input board with PoE and digital audio
- MX-3GSDI-IB .... 3G-SDI input board supporting SDI embedded, S/PDIF and AES/EBU audio
- MX-TPS-IB .... TPS input board
- MX-TPS-IB-A .... TPS input board with analog audio
- MX-TPS-IB-S .... TPS input board with digital audio
- MX-TPS2-IB-P .... TPS input board for HDMI, Ethernet, audio and control, with optional PoE
- MX-TPS2-IB-AP .... TPS input board for HDMI, Ethernet, audio and control, with optional PoE and analog audio
- MX-TPS2-IB-SP .... TPS input board for HDMI, Ethernet, audio and control, with optional PoE and digital audio
- 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-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-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-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-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

Output Boards

- MX-AUDIO-OB .... Analog audio output board
- MX-DVID-OB......................... DVI-D Single-Link output board with DVI-I connectors
- MX-DVIDL-OB....................... Dual-Link DVI digital only output board with DVI-I connectors
- MX-DVI-HDCP-OB .... DVI, HDCP and HDMI compliant output board
- MX-HDMI-3D-OB................... HDMI output board including 4K, 3D and Deep Color
- MX-HDMI-3D-OB-A............... HDMI output board including 4K, 3D and Deep Color, with Phoenix connectors
- MX-HDMI-3D-OB-S............... HDMI output board including 4K, 3D and Deep Color, with S/PDIF connectors
- MX-TPS-OB .... TPS output board for HDMI, Ethernet, audio and control
- MX-TPS-OB-A....................... TPS output board for HDMI, Ethernet, audio and control with analog audio
- MX-TPS-OB-S....................... TPS output board for HDMI, Ethernet, audio and control with digital audio
- MX-TPS2-OB-P, -AP, -SP .... TPS output board with PoE option
- MX-DVI-TP-OB .... Twisted pair output board for DVI over CAT5-CAT7 cables
- MX-DVI-TP-OB+ .... Twisted pair output board for DVI over CAT5-CAT7 cables
- MX-HDMI-TP-OB................... Twisted pair HDMI output board for CAT5-CAT7 cables
- MXD-HDMI-TP-OB .... Double slot twisted pair HDMI output board with control and audio
- MX-DVI-OPT-OB-LC .... Fiber optical output board for extending DVI-D signals, with LC connectors
- MX-DVI-OPT-OB-SC .... Fiber optical output board for extending DVI-D signals, with SC connectors
- MX-DVI-OPT-OB-ST .... Fiber optical output board for extending DVI-D signals, with ST connectors
- MX-DVI-OPT-OB-R-LC .... Fiber optical output board with Pixel Accurate Reclocking, with LC connectors
- MX-DVI-OPT-OB-R-NT .... Fiber optical output board with Pixel Accurate Reclocking, with Neutrik OpticalCON connectors
- MX-DVI-OPT-OB-R-SC .... Fiber optical output board with Pixel Accurate Reclocking, with SC connectors
- MX-DVI-OPT-OB-R-ST........... Fiber optical output board with Pixel Accurate Reclocking, with ST connectors
- MX-DVIDL-OPT-OB-LC.......... Dual-Link DVI fiber optical output board, with LC connectors
- MX-DVIDL-OPT-OB-NT.......... Dual-Link DVI fiber optical output board, with Neutrik OpticalCON connectors
- MX-HDMI-OPT-OB-LC........... HDMI and HDCP compliant fiber optical output board, with LC connectors
- MX-HDMI-OPT-OB-NT........... HDMI and HDCP compliant fiber optical output board, with Neutrik OpticalCON connectors
- MX-HDMI-OPT-OB-SC .... HDMI and HDCP compliant fiber optical output board, with SC connectors
- MX-HDMI-OPT-OB-R-LC .... HDMI optical output board with Pixel Accurate Reclocking including 4K, 3D and Deep Color with LC connectors
- MX-HDMI-OPT-OB-R-NT .... HDMI optical output board with Pixel Accurate Reclocking including 4K, 3D and Deep Color with NT connectors

STANDALONE MATRICES

One-Box Solutions for Dynamically Changing Environments

LIGHTWARE

MMX6x2-HT220

MMX6x2-HT220
Multiport HDMI and TPS Matrix Switcher

ESC

ENTER

LIVE

5V

48V

RESET

4 | L + ⏚ + R

OUTPUT 1 | L + ⏚ + R | AUDIO

OUTPUT 2 | L + ⏚ + R | AUDIO

6 | HDMI

TPS+PoE | HDMI

TPS+PoE | HDMI

Made in EU, Hungary

Standalone Matrices

A standalone matrix is a self-containing device, which does not require any other devices to function. Input sources are connected directly to the matrix, just like the displays to the outputs. These 4x4 to 16x16 I/O sized routers are perfect for dynamically changing environments, such as small board rooms, classrooms or meeting rooms. Lightware provides standalone matrices for VGA, YUV, Digital DVI, HDMI with HDCP, stereo analog and S/PDIF digital audio signals. Crosspoint switching is done instantly without frame delay or frame latency and can be controlled either by RS-232 / RS-422 port, TCP/IP LAN, through USB connection or by the built-in website.

4 x 4 DVI Matrix Switcher
MX4x4DVI
Part No: 9131 0001

MX4x4DVI is a 4 input / 4 output DVI crosspoint matrix switcher supporting all DVI-D resolutions coming from PC video boards or other DVI-D sources. It supports PC resolutions from 640 x 480 @ 60 Hz to 1920 x 1200 or 2048 x 1080 including all HDTV resolutions: 720p, 1080i, 1080p and 2K. The DVI matrix router can route four DVI signals to any four displays; for example LCD monitors, plasma displays or projectors. All outputs support 500 mA power on DVI +5V pin to power fiber optical DVI cables.

The DVI Matrix switcher has an Advanced EDID Management feature which can learn and store 100 EDIDs, and emulate any monitor on its separate inputs. The unit can be controlled either via the RS-232/RS-422 port , TCP/IP LAN connection or by built-in website.

Features
- Supports all VESA and HDTV resolutions: 720p, 1080i and 1080p and 2K, 1920 x 1200 without HDCP encoding
- Front panel buttons control
- Fiber cable power support
- Advanced EDID routing and management - learnes, stores and emulates up to 100 EDIDs
- RS-232 or RS-422 control
- TCP/IP LAN control port with built in WEB access

Pro Series DVI Switcher
MX8x8DVI-Pro and MX8x4DVI-Pro
Part No: 9131 0003 (8x8), 9131 0002 (8x4)

MX8x4DVI-Pro and MX8x8DVI-Pro are cost effective solutions for routing DVI signals on 8 input / 4 output or 8 input / 8 output. These standalone matrices can switch all DVI-D resolutions from 640x480 @ 60Hz to 1920 x 1200 including all HDTV resolutions: 720p, 1080i, 1080p, 2048 x1080. All inputs have a unique cable equalization circuit which allows using cables up to 50 meters. All outputs drive 500 mA power on DVI +5V pin to power fiber optical DVI cables. Each output has PLL reclocking which ensures a clean, jitter free signal, eliminating signal distortion caused by long cables or connector reflections.

MX8x4DVI-Pro and MX8x8DVI-Pro include the Advanced EDID Management system. The user can emulate any EDID on the switcher's inputs independently, read out and store EDIDs of the attached monitors in 100 internal memory locations, upload and download EDID files using Remote Control Software.

The front panel buttons control the eight inputs and the eight (or four) outputs and the Take, Load preset, Save preset, Panel Lock, Output Lock functions. The DVI crosspoint switcher can be controlled through 9 pole D-sub connector via the RS-232 or RS-422 protocol, or via the IP based Ethernet connection, also including web access.

Features:
- 8 input 8 output or 8 input 4 output DVI matrix router
- 50 meter 24 AWG cable support due to input cable equalization
- Single-Link, 1.65 Gb/s DVI-D transmission (1920x1200 or 2048x1080 max resolution)
- Supports HDTV resolutions: 720p, 1080i and 1080p and 2K
- without HDCP encoding
- Signal Detect LEDs at each input connector
- Output PLL reclocking
- RS-232 or RS-422 control for switching, preset calling, status request, etc.
- Advanced EDID management
- Ethernet control - TCP/IP based control

MX8x8DVI-Pro Rear View

HDCP Compliant Pro Series 8 x 8 DVI Matrix with HDMI
MX8x8DVI-HDCP-Pro
Part No: 9131 0004

This HDMI matrix switcher offers all the features you expect from an HDMI product including the benefits of rugged, lockable DVI connectors. MX8x8DVI-HDCP-Pro digital video router is the most advanced DVI router that supports DVI 1.0, HDCP 1.2 and even HDMI 1.3 deep color standards. This high performance routing switcher offers eight inputs and eight outputs with 29 pole screw lockable DVI-I connectors (only digital pins are connected). The built-in sophisticated software and hardware features make the router the most flexible integrated solution for AV professionals and high-end home theatre applications. Any input can be switched to any one or more outputs without switching delay or frame latency. Supporting HDMI1.3 36 bit deep color standard, it can be connected to Blu-Ray players, set top boxes, AV receivers or Apple TV.

Advanced HD audio transmission and sample rate conversion assures compatibility with previous generation products while also handling the finest Dolby TrueHD and DTS-HD formats. DVI, HDMI and HDCP signals can be seamlessly integrated in any AV system using Lightware MX8x8DVI-HDCP-Pro.

All inputs are equalized and reclocked for up to 60 meters of DVI copper cable, and all outputs of the matrix router are reclocked for stable, jitter free signal transmission. The unit can be controlled either via the RS-232/RS-422 port, via the TCP/IP LAN connection or through the built-in website.

Features:
- No signal or switching latency
- HDMI 1.3; HDCP 1.1 and DVI 1.0 compliant
- 1920 x 1200 or 2048 x 1080 maximal resolutions
- Frame Detector: Input signal analysis / monitoring
- Signal presence display
- Color space conversion: RGB and YUV per output
- Color range scaling per output, 24/30/36-bit RGB/YCbCr 4:4:4 (deep color)
- Gold plated high grade PCB boards and DVI connectors
- 60 m copper cable compensation on all inputs
- Pixel Accurate Reclocking for both input and output
- Advanced EDID Management
- PCM audio sample rate conversion ½ and ¼ per output - 32-192 kHz Fs sample rate
- Dolby TrueHD and DTS-HD Master Audio
- Full crosspoint configuration saving and reloading as preset (32 presets)

MX8x8DVI-HDCP-Pro Rear View

HDCP Compliant Pro Series 8 x 8 HDMI Matrix
MX8x8HDMI-Pro
Part No: 9131 0014

MX8x8HDMI-Pro is full of features and it is a reliable choice for HDMI signal routing. It supports DVI 1.0, HDCP 1.2 and even HDMI 1.3 deep color standards. This high performance routing switcher offers eight inputs and eight outputs with HDMI connectors. The built-in sophisticated software and hardware features turn this router into the most flexible integrated solution for AV professionals and high end home theatre applications. Any input can be switched to any one or more outputs without switching delay or frame latency. Supporting HDMI1.3 36 bit deep color standard, it can be connected to Blu-Ray players, set top boxes, AV receivers or Apple TV.

Advanced HD audio transmission and sample rate conversion assures compatibility with previous generation products while also handling the finest Dolby TrueHD and DTS-HD formats. DVI, HDMI and HDCP signals can be seamlessly integrated in any AV system using the MX8x8HDMI-Pro.

All inputs are equalized and reclocked for up to 60 meters of DVI copper cable, and all outputs of the matrix router are reclocked for stable, jitter free signal transmission. The unit can be controlled either via the RS-232 / RS-422 port, TCP/IP LAN connection or through the built-in website.

Features:
- No signal or switching latency
- HDMI 1.3; HDCP 1.1 and DVI 1.0 compliant
- 1920 x 1200 or 2048 x 1080 maximal resolutions
- Frame Detector: Input signal analysis / monitoring
- Signal presence display, S/PDIF Digital Audio breakout for every output
- Color space conversion: RGB and YUV per output
- Color range scaling per output, 24/30/36-bit RGB/YCbCr 4:4:4 (deep color)
- Gold plated high grade PCB boards and HDMI connectors
- 60 m copper cable compensation on all inputs
- Pixel Accurate Reclocking for both input and output
- Advanced EDID Management
- PCM audio sample rate conversion 1/2 and 1/4 per output - 32-192 kHz Fs sample rate
- Dolby TrueHD and DTS-HD Master Audio
- Full crosspoint configuration saving and reloading as preset (32 presets)

MX8x8HDMI-Pro Rear View

Dual-Link DVI Switchers
MX4x4DVI-DL, MX6x6DVI-DL, MX8x8DVI-DL
Part No: 9131 0011 (4x4), 9131 0012 (6x6), 9131 0013 (8x8)

MX4x4DVI-DL, MX6x6DVI-DL and MX8x8DVI-DL are Dual-Link DVI crosspoint matrix switchers providing most of the features of the Pro-series modular matrices in a single standalone 4x4, 6x6 or 8x8 design. Single-Link and Dual-Link DVI-D resolutions coming from PC GPU cards or other DVI-D sources are supported just like the highest resolutions from 640 x 480 @ 60Hz to 3840 x 2400 including all HDTV resolutions: 720p, 1080i, 1080p and 2K.

These DVI matrix routers have non-blocking architecture, which routes DVI signals to any display. All outputs support 500 mA power on DVI +5V pin to power fiber optical DVI cables.

The units have an Advanced EDID Management feature that learns and stores 100 EDIDs and emulates any monitor on its separate inputs. External control can be done either via the RS-232 / RS-422 port, a TCP/IP LAN connection or by built-in website.

Features:
- Dual-Link DVI crosspoint matrix switchers
- No signal or switching latency
- 3840 x 2400 pixel maximum resolution (1920 x 1200 in Single-Link mode)
- Front panel buttons control, RS-232 or RS-422 control
- Advanced EDID Management
- TCP/IP LAN control port with built-in WEB access
- Supports 120 Hz - 3D signals
- Full crosspoint configuration saving and reloading as preset (32 presets)
- Available I/O sizes: 8x8, 6x6, 4x4

MX8x8DVI-DL   Rear View

Slim DVI Matrix Switchers up to 16 x 16
MX9x9DVI-Slim, MX12x12DVI-Slim and MX16x16DVI-Slim
Part No: 9131 0008 (9x9), 9131 0009 (12x12), 9131 00010 (16x16)

MX16x16DVI-Slim

The MX9x9DVI-Slim, MX12x12DVI-Slim and MX16x16DVI-Slim with their 1.2 inch depth are today's smallest and lightest 9x9, 12x12 or 16x16 DVI matrix switchers which provide routing in the most rugged environments. The ultra slim, aluminum alloy body and the fan-less design makes it ideal for many space-, and noise-sensitive applications. In space-constrained systems these standalone slim matrices can even be mounted behind other rack-mounted equipment.

The frames are equipped with gold plated, screw-locking DVI connectors, which are dust-proof and also lockable Neutrik Ethercon and high current Speakon power connectors ensure a robust connection at all times. All outputs supply 500 mA continuous current on DVI +5V pin to power long distance fiber optical transmitters (e.g. Lightware's DVI-OPT-TX110).

These slim matrices incorporate +12 dB input cable equalization that allows using up to 20 meter DVI cables even in the highest resolutions. Thanks to the switchers' non-blocking architecture, any input can be switched to any one or more outputs without switching delay or frame latency.

Features:
- Industry's smallest and lightest frame
- No signal or switching latency
- Routing up to 16x16 DVI 1.0 signals
- Routing HDMI 1.3 signals (with embedded audio) without HDCP
- 1920 x 1200 or 2048 x 1080 maximal resolution
- Gold plated PCB boards and connectors
- Web page hosting capabilities
- Front panel buttons control
- Advanced EDID Management
- RS-232 or RS-422 and Ethernet control
- Vista Spyder and Barco Encore compatibility
- Full crosspoint configuration saving and reloading as preset (32 presets)
- Available I/O sizes: 9x9, 12x12, 16x16

Connection Diagram:

Single CAT x cable up to 60m
DVI cable
Single fiber multimode optical cable up to 2500m
Power cable
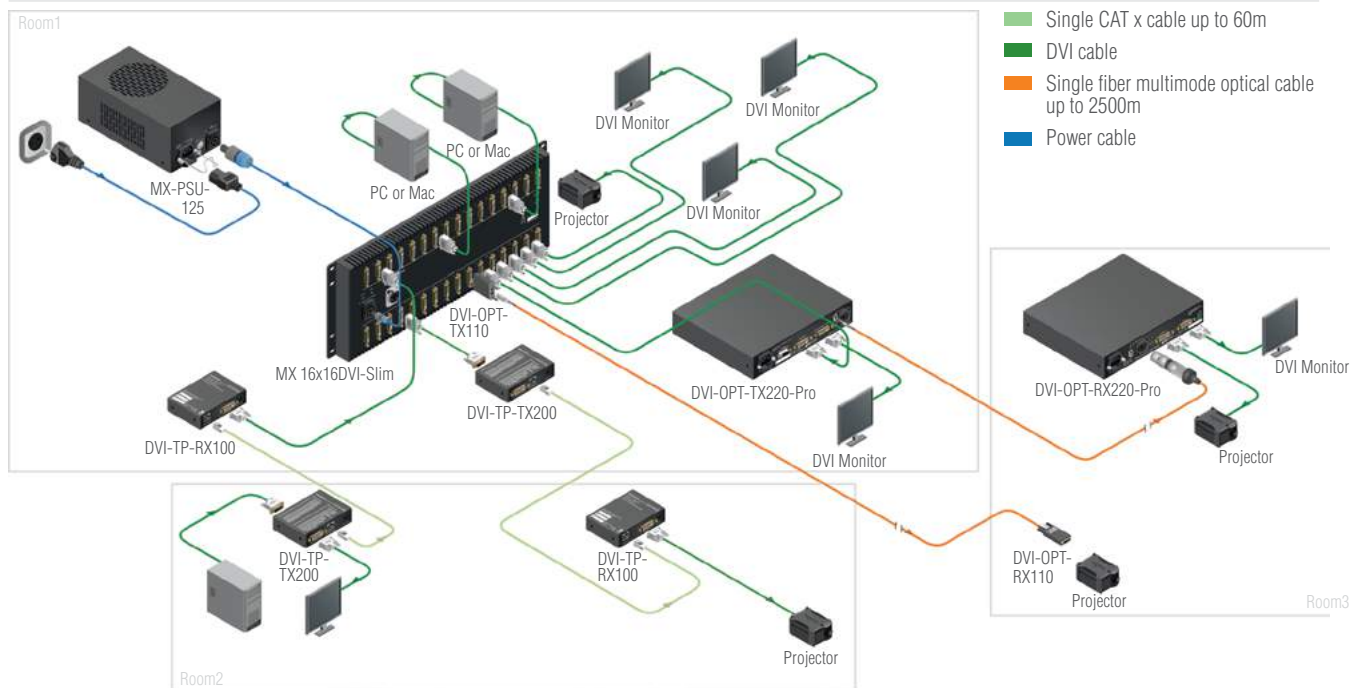
Plus Series DVI Matrix Switchers up to 16 x 16
MX9x9DVI-Plus, MX12x12DVI-Plus and MX16x16DVI-Plus
Part No: 9131 0005 (9x9), 9131 0006 (12x12), 9131 0007 (16x16)
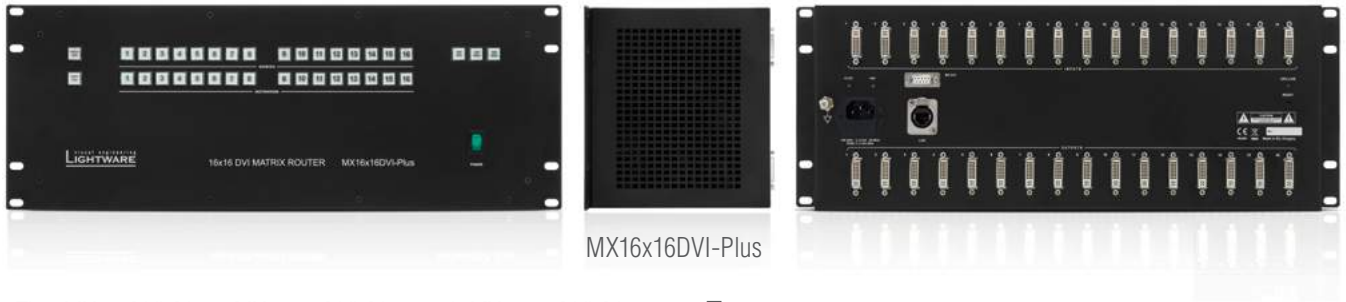
MX16x16DVI-Plus

The MX9x9DVI-Plus, MX12x12DVI-Plus and MX16x16DVI-Plus cost-effective matrix switchers range from 9 input 9 output, 12 input 12 output to 16 input 16 output. The Plus series switchers are based on the Slim matrices with the added benefits of the integrated power supply insuring reliable performance in the most harshest environments. The 7 inch depth, 4 RU high body and low noise fan design makes it ideal for many space and noise sensitive applications.

The frames incorporate Lightware's Advanced EDID Management function. The user can emulate any EDID on the switcher's inputs independently, read out and store any attached monitor's EDID in 100 internal memory locations, upload and download EDID files using Remote Control software.

The crosspoint switcher can be controlled through a 9-pole D-sub connector via RS-232 or RS-422 protocol, and IP based Ethernet connection including web access through a Neutrik EtherCON connector which ensures a robust connection at all times.

Features:
- No signal or switching latency
- Routing up to 16x16 DVI 1.0 signals
- Routing HDMI 1.3 signals (with embedded audio) without HDCP
- 1920 x 1200 or 2048 x 1080 maximal resolution
- Gold plated PCB boards and connectors
- Built-in website
- Front panel buttons control
- Advanced EDID Management
- RS-232 or RS-422 and Ethernet control
- Vista Spyder and Barco Encore compatibility
- Full crosspoint configuration saving and reloading as preset (32 presets)
- Built-in power supply
- Available I/O sizes: 9x9, 12x12, 16x16

Connection Diagram:
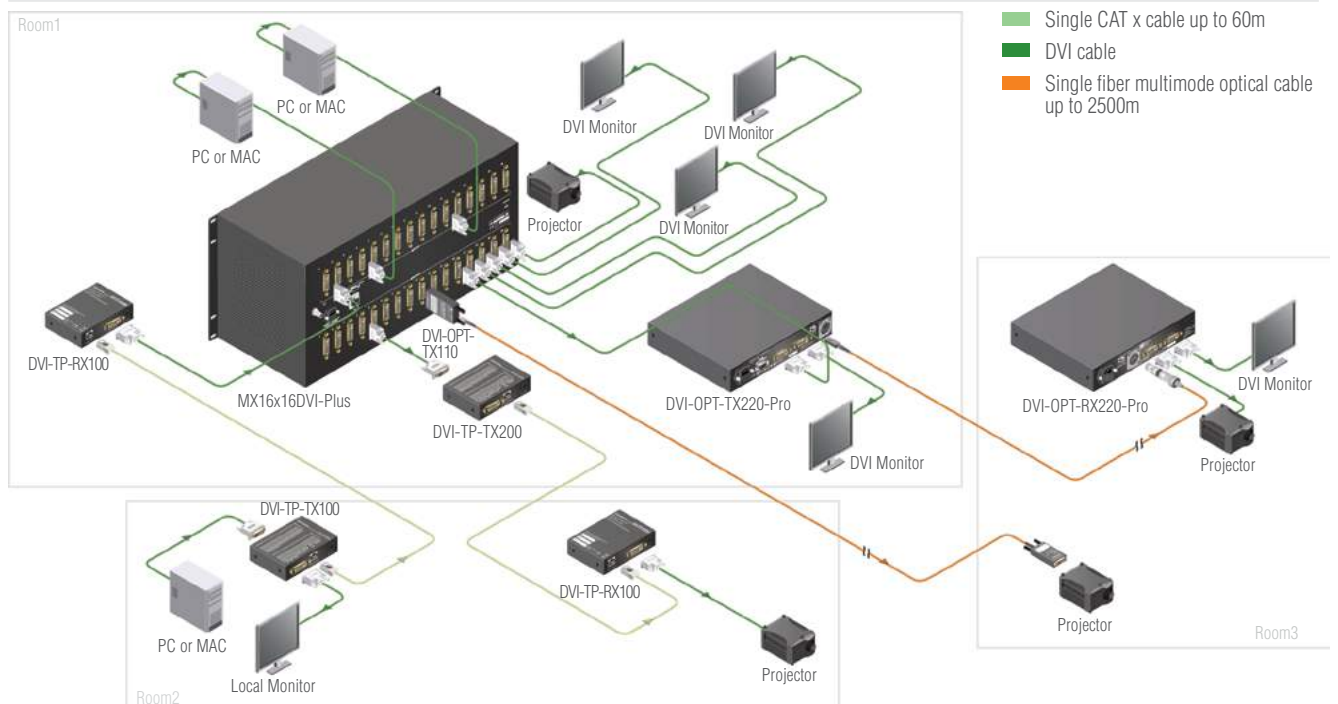
4K UHD 4x2 HDMI Matrix Switcher with Audio Embedding/De-embedding
MMX4x2-HDMI
Available in Q4 2016

A uniquely mini size, HDMI only matrix switcher is being developed in the Lightware labs. It has four HDMI inputs and two HDMI outputs. Audio can be de-embedded from the HDMI signal to a balanced 5-pole Phoenix (Euroblock) port and external audio signal can be embedded into the HDMI stream from another 5-pole Phoenix input port. The volume and gain properties of the audio signal can be modified at both input and output. The device has an external power source.

The unit is fully 4K/UHD/3D capable and HDCP compliant. The device has a built-in Event Manager configurable via the Lightware Device Controller software. Further control options are served by the USB, RS-232, IR (in and out) and Ethernet ports.

Features:
- 4x2 HDMI matrix switcher
- 4K/UHD (30Hz RGB 4:4:4, 60Hz YCbCr 4:2:0) and 3D capabilities
- Fully HDCP compliant
- Balanced analog audio input and output for embedding and de-embedding audio
- Audio volume and gain control on analog input and output
- Event Manager
- RS-232, IR, Ethernet control capabilities
- Compact size

4K UHD 4x2 Matrix Switcher with HDBaseT™ and HDMI Inputs and Audio Embedding/De-embedding
MMX4x2-HT200
Available in Q4 2016

Available in Q4 2016

A uniquely mini size matrix switcher is being developed by the Lightware engineers. It has three HDMI inputs and one HSBaseT™ compatible TPS input port with PoE capability, adding an all new advantage to the world of Lightware matrices. The unit is also very small and can also be fed by an external power source. It has two independent HDMI outputs. Audio can be de-embedded from the HDMI signal to a balanced 5-pole Phoenix (Euroblock) port and external audio signal can be embedded into the HDMI stream from another 5-pole Phoenix input port. The volume and gain properties of the audio signal can be modified at both input and output.

The unit is fully 4K/UHD/3D capable and HDCP compliant. The device has a built-in Event Manager configurable via the Lightware Device Controller software. Further control options are served by the USB, RS-232, IR (in and out) and Ethernet ports.

Features:
- 4x2 HDMI matrix switcher, with HDMI and TPS ports
- Up to 170m transmission distance over TPS*
- 4K/UHD (30Hz RGB 4:4:4, 60Hz YCbCr 4:2:0) and 3D capabilities
- Fully HDCP compliant
- Balanced analog audio input and output for embedding and de-embedding audio
- Audio volume and gain control on analog inputs and outputs
- Event Manager
- PoE remote power capable
- RS-232, IR, Ethernet control capabilities
- Compact size
    * Depends on cable category and quality

MMX Series 6x2 HDMI TPS Matrix Switcher new!

MMX6x2-HT220
Part No: 9131 0032

The MMX6x2-HT220 is our solution for a practical standalone matrix switcher specifically designed for meeting room and classroom environments. The compact MMX6x2-HT220 has six video inputs and two video outputs - four HDMI 1.4, two TPS inputs and two independent HDMI outputs, both outputs have mirrored TPS outputs. 4K@30Hz, 3D capabilities and HDCP are fully supported. The device also has four audio connectors for audio insertion and two audio outputs for de-embedding purposes. These features makes this standalone matrix unique on the market. PoE 48V remote powering is available on every TPS ports (both inputs and outputs) for cost effective installations.

Features:
- 6x2 multiport matrix switcher with HDMI and TPS ports
- 4K / UHD (30Hz RGB 4:4:4, 60Hz YCbCr 4:2:0) and 3D capabilities
- 4x HDMI 1.4 input + 2x TPS input
- 2x independent AV output
- Two ports per output: mirrored HDMI + TPS
- Up to 170m* transmission distance over TPS
- Balanced analog audio inputs and outputs
- Event Manager

*Depends on cable category and quality

Application Diagram:

I/O Connectors Comparison Chart

	HDMI in	TPS in	HDMI out	TPS out
MMX6x2-HT220	4	2	2	2
MMX6x2-HT210	4	2	2	1
MMX6x2-HT200	4	2	2	0
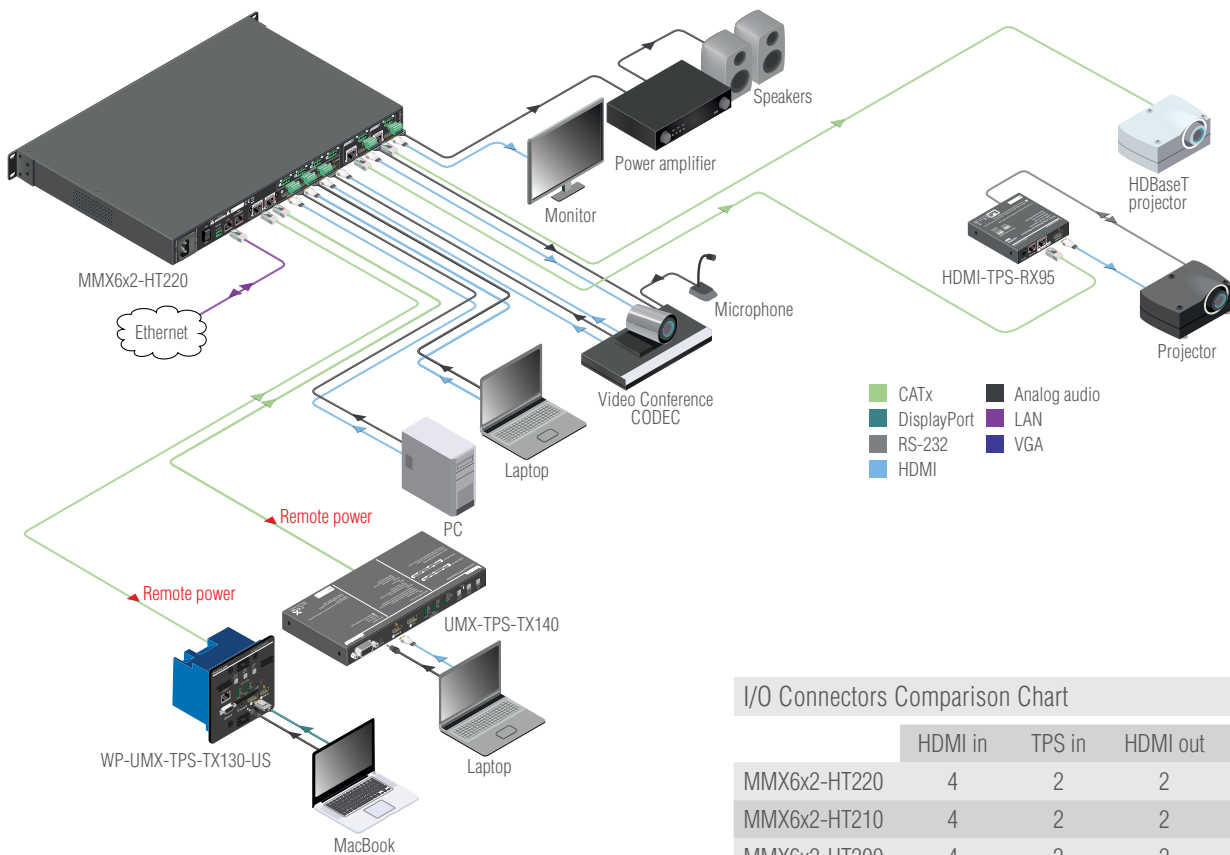
HDBaseT™ and the HDBaseT Alliance logo are trademarks of the HDBaseT Alliance
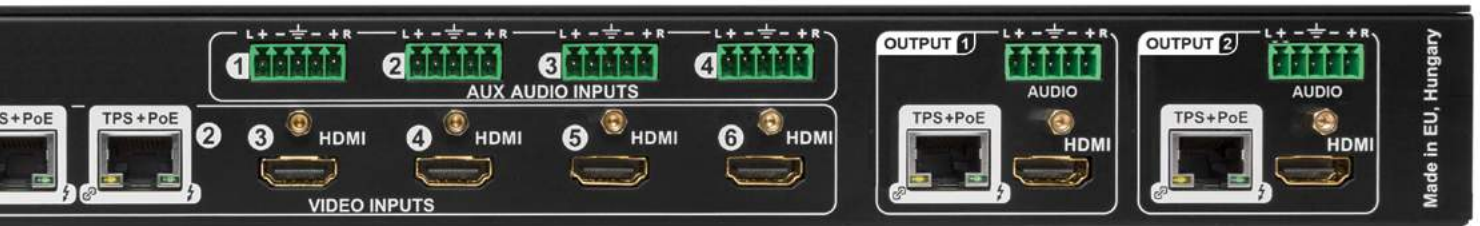
MMX6x2-HT220 Rear View

MMX Series 6x2 HDMI TPS Matrix Switcher
MMX6x2-HT210 new!
Part No: 9131 0031

MMX6x2-HT210 is almost fully identical with the MMX6x2-HT220 model and offers all of its functions, but it only has one of its HDMI outputs mirrored as TPS port.

HDBT™

Features:
- 4K / UHD (30Hz RGB 4:4:4, 60Hz YCbCr 4:2:0) and 3D capabilities
- 6 input 2 output video matrix
- 4 HDMI 1.4 and 2 TPS inputs
- 2 independent AV output streams
- Two separate HDMI and one mirrored TPS output ports (the two ports can transmit the same AV content simultaneously)
- Audio insertion and de-embedding options
- Fully HDCP compliant
- PoE (48V) transmitter on every TPS port (both TPS inputs and outputs)
- RS-232, Ethernet, IR control options
- Event Manager support
- Compact one RU chassis

MMX Series 6x2 HDMI TPS Matrix Switcher
MMX6x2-HT200 new!
Part No: 9131 0030

MMX6x2-HT200 is almost fully identical with the MMX6x2-HT220 and MMX6x2-HT210 models and offers all of their functions, but it does not have TPS ports at the output end.

HDBT™

Features:
- 4K / UHD (30Hz RGB 4:4:4, 60Hz YCbCr 4:2:0) and 3D capabilities
- 6 input 2 output video matrix
- 4 HDMI 1.4 and 2 TPS inputs
- 2 independent AV output streams
- Two HDMI outputs
- Audio insertion and de-embedding options
- Fully HDCP compliant
- PoE (48V) transmitter on every TPS port
- RS-232, Ethernet, IR control options
- Event Manager support
- Compact one RU chassis

MMX6x2-HT210 Rear View

MMX6x2-HT200 Rear View

HDBaseT™ and the HDBaseT Alliance logo are trademarks of the HDBaseT Alliance

Universal Video and Audio Matrix Switcher
UMX4x4-Pro2
Part No: 9131 0029

UMX4x4-Pro2 is an all-round Universal Matrix and a breakaway audio/video switcher. It is a perfect solution for dynamically changing environments such as small board rooms and classrooms.

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 auto sync function, but the picture parameters can also be fine-tuned manually. The built in Frame Detector and graphical signal analyzer helps make precise adjustments and our Pixel Accurate Reclocking technology provides exceptional signal regeneration capability. UMX4x4-Pro2 has the ability to input HDMI with embedded audio and DVI with HDCP encryption, VGA, component video and analog or digital audio. De-embedding audio from the incoming HDMI stream, re-embedding at output from a different audio source and even routing audio separately from video is easily handled with the UMX switcher.

With the additional features of RS-232 and IP control and a comprehensive software suite, the UMX4x4-Pro2 is one of our most powerful and adaptive matrices yet.

Analog Audio

Gain:	0 - 24 dB for inputs
Volume:	-78 - 0 dBV for outputs

Features:
- Accepts VGA, YUV, DVI and HDMI 1.3 signals on each input
- Accepts analog stereo; 5.1 S/PDIF and 7.1 HDMI embedded audio signals on input ports
- Breakaway audio/video switching
- Volume and gain audio control options
- Zero frame delay – on analog inputs as well
- Audio de-embedding from uncompressed HDMI signals
- Audio embedding on outputs
- All analog signals are converted to digital formats
- HDCP compliant
- RS-232 and IP control
- Advanced EDID Management

Applications
- Small classrooms
- Conference rooms, collaborative telepresence
- Control room
- Multiroom video
- Home cinema

Supplied Accesory:

UMX VGA Cable Adapter
CAB-DVIA-VGA-02 (Part No: 1375 0084)
This DVI-I male to VGA female adapter is designed to break out the analog signals from the DVI-I connector and adapt them to a VGA connector.

UMX4x4-Pro2 Front View
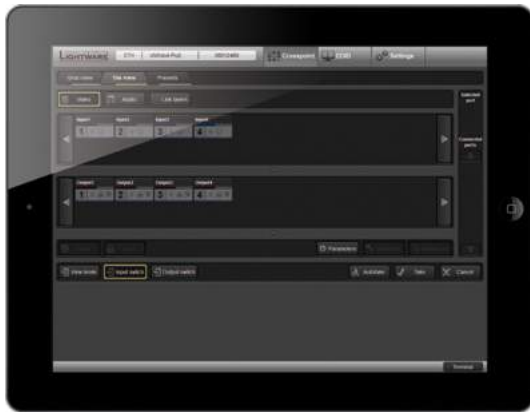
Web control provides user control of the system, including management, monitoring and controlling such as source and destination video and audio selection and advanced options of the video/audio signals. Commands are configured with a simple and intuitive graphical user interface even through your mobile device.

Connection Diagram:
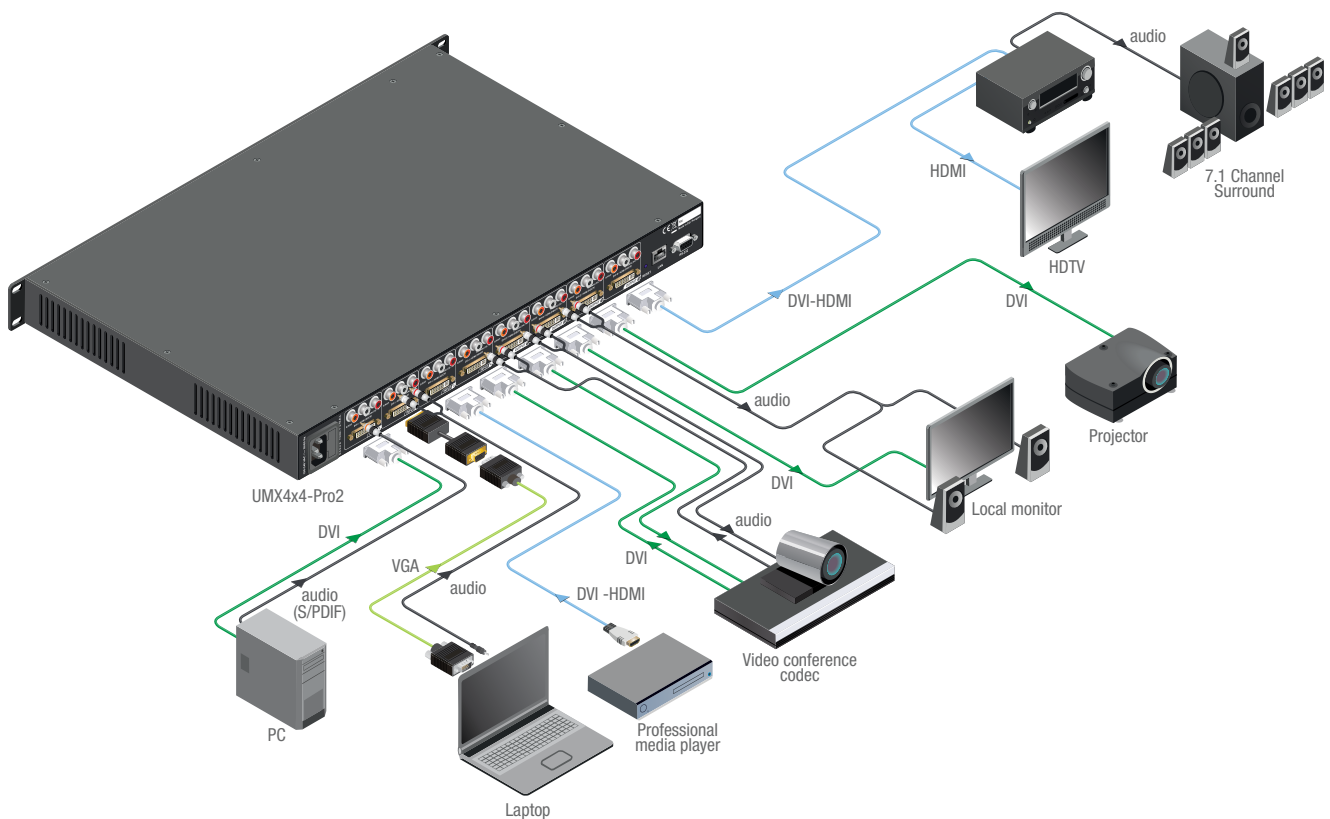
Interfaces

One of Lightware's main aims is to offer an all-round product line. For this reason we find it important not to provide the customers only with routers and extenders but to offer interfaces, distribution amplifiers, as well as mounting and other accessories. This is how we make sure you find everything for your desired application at the highest quality under one roof.

HDCP Compliant HDMI and DVI EDID Emulator
EDID Manager V4
Part No: 9133 0001

Create, edit and emulate EDID with ease with this HDCP compatible EDID tool. The Lightware EDID Manager V4 is an HDMI/DVI EDID emulator and repeater which can store 79 EDIDs (29 of them user programmable), emulates and keeps a fixed EDID for the source. Thanks to our Advanced EDID Management, the device can 'trick' the DVI source (PC computer, laptop, etc.) by emulating any DVI display (LCD monitor, projector) for continuous video output - even if the AV system is disconnected or powered down. In emulating an EDID, the user can set up any DVI or HDMI output resolution, regardless of the used projector or monitor. This ensures that the overall system resolution can be controlled.

The EDID Manager automatically compensates for up to 60 meters of DVI copper cable at 22AWG. HDCP enable/disable function turns off the unit's HDCP capability, which helps integrate certain laptops into a non-HDCP AV environment.

With the Easy EDID Creator (PC software) the users can create their own EDID by completing four simple steps. More experienced users can use the Advanced EDID Editor software to manage every possible setting in the EDID, which they can store in the memory of the EDID Manager.

Features:
- 79 EDID memories 29 of them user programmable
- Up to 60 meters cable loss compensation at input
- Keeps source's HDMI or DVI output continuously active
- HDCP compliancy
- HDCP enable/disable function
- Signal detection, source detection and monitor detection LEDs
- USB control

Applications:
- Rental and staging
- Post production studios
- Control room
- Digital signage
- Multiroom video
- Conference rooms, collaborative telepresence

4K UHD HDMI Reclocker and EDID Manager new!
HDMI-4K Manager
Part No: 9133 0009
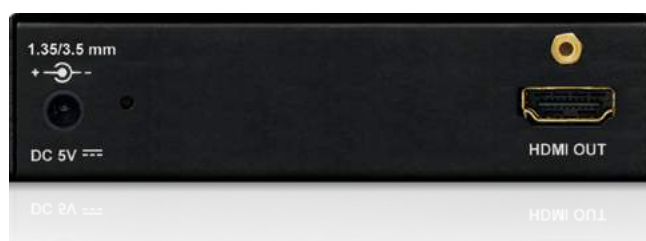
HDMI-4K-Manager is a multifunctional interface with built-in EDID Management and Pixel Accurate Reclocking, supporting DVI and HDMI 1.4 signals with or without HDCP encryption. The output signal is reclocked and stabilized using Lightware Pixel Accurate Reclocking technology to remove jitter caused by long cables or poor quality sources.

HDMI-4K-Manager features Advanced EDID Management and can emulate any HDMI display for continuous video output, even if the attached display is disconnected or powered down. HDCP enable/disable function turns off the unit's HDCP capability, which helps integrate certain laptops into a non-HDCP AV environment. The EDID memories from 1 to 55 are factory preset, the memories from 62 to 98 are user programmable. EDID memories from 56 to 61 are for universal EDID presets. Memory 00 is transparent for output so using this setting the EDID of the last attached display device (monitor or projector) will be reported to the source. With the Easy EDID Creator (PC software wizard) the users can create their own EDID by completing four simple steps. Experienced users can use the Advanced EDID Editor software to manage every possible setting in the EDID, which can be uploaded to the user programable memory of the HDMI-4K-Manager.

HDMI-4K-Manager can be rack-mounted or used standalone. The unit is equipped with the highest grade gold plated connectors to ensure reliable connection.

Applications:
- Rental and staging
- Medical
- Digital Signage
- Multiroom video
- Conference rooms, collaborative telepresence

Features:
- 4K / UHD (30Hz RGB 4:4:4, 60Hz YCbCr 4:2:0) and 3D capabilities
- Keeps source's HDMI or DVI output continuously active
- HDCP enable/disable function
- Signal detection, source detection and monitor detection LEDs
- USB control
- Cable loss compensation at Input
- Built-in Advanced EDID Management
- Pixel Accurate Reclocking
- HDCP compliant
- Built-in Video Testpattern Generator
- Deep color support
- Daisy chain support

4K UHD HDMI Audio De-embedder new!
HDMI-4K De-embedder
Part No: 9133 0008

Available in
Q3 2016

HDMI-4K De-embedder is a multifunctional interface which is capable of audio de- embedding the PCM audio stream. Audio out is a 5-pole Phoenix socket. The unit also features a 3.5 jack output for headphone monitoring.

HDMI-4K De-embedder has built-in EDID Management and Pixel Accurate Reclocking, supporting DVI and HDMI 1.4 signals with or without HDCP encryption. The output signal is reclocked and stabilized using Lightware Pixel Accurate Reclocking technology to remove jitter caused by long cables or poor quality sources.

HDMI-4K De-embedder features Advanced EDID Management and can emulate any HDMI display for continuous video output, even if the attached display is disconnected or powered down. HDCP enable/disable function turns off the unit's HDCP capability, which helps integrate certain laptops into a non-HDCP AV environment. The EDID memories from 1 to 55 are factory preset, the memories from 62 to 98 are user programmable. EDID memories from 56 to 61 are for universal EDID presets. Memory 0 is transparent for output, so using this setting the EDID of the last attached display device (monitor or projector) will be reported to the source. With the Easy EDID Creator (PC software wizard) the users can create their own EDID by completing four simple steps. Experienced users can use the Advanced EDID Editor software to manage every possible setting in the EDID, which can be uploaded to the user programable memory of the HDMI-4K-De-embedder.

HDMI-4K-De-embedder can be rack-mounted or used standalone. The unit is equipped with the highest grade gold plated connectors to ensure reliable connection.

Applications:
- Rental and staging
- Medical
- Digital Signage
- Multiroom video
- Conference rooms, collaborative telepresence

Features:
- 4K / UHD (30Hz RGB 4:4:4, 60Hz YCbCr 4:2:0) and 3D capabilities
- Local audio De-Embedding
- Keeps source's HDMI or DVI output continuously active
- HDCP enable/disable function
- Signal detection, source detection and monitor detection LEDs
- USB control
- Cable loss compensation at Input
- Built-in Advanced EDID Management
- Pixel Accurate Reclocking
- HDCP compliant
- 5-pole Phoenix Balanced Output
- 3.5mm Headphone Output
- Built-in Video Testpattern Generator
- Deep color support
- Daisy chain support

Matchbox Size DDC Cable Breakout for RS-232
BR-TP-COM
Part No: 9133 0005

BR-TP-COM is a matchbox size DDC cable breakout, which has two RJ-45 connectors: a serial RS-232 control port and a locking DC connector. The device doesn't need to be supplied with power unless it is intended to work as a remote power source. In this case it can transfer +12V through the CATx cable for connected devices.

Features:
- System setup tool
- Control options available through RS-232
- Works as a remote +12V power source for Lightware TP series wallplates and all other TP series extenders

Compatible products:
- WP-UMX-TP-TX100-EU
- WP-UMX-TP-TX100-EUROMOD
- WP-UMX-TP-TX100-UK
- WP-UMX-TP-TX100-US
- FP-UMX-TP-TX100-LEGRAND
- FP-UMX-TP-TX100-GB3
- WP-HDMI-TP-TX50R
- WP-HDMI-TP-RX50R
- WP-HDMI-TP-RX50A
- WP-DVI-HDCP-TP-TX50R
- WP-DVI-HDCP-TP-RX50R
- WP-DVI-HDCP-TP-RX50A
- MX-HDMI-TP-IB
- MX-HDMI-TP-OB
- HDMI-TP-RX100R
- HDMI-TP-RX100RA
- HDMI-TP-RX200R
- HDMI-TP-TX100R
- HDMI-TP-TX200R
- DVI-HDCP-TP-TX100R
- DVI-HDCP-TP-RX100R
- UMX-TP-TX100R

Reclocking DVI and HDMI Distribution Amplifier
DA2DVI-HDCP-Pro
Part No: 9132 0002

DA2DVI-HDCP-Pro provides a perfect cost-effective out-of-box solution for professional installations. This device is a multifunctional distribution amplifier with built-in EDID Management and Pixel Accurate Reclocking, supporting DVI and HDMI 1.3a signals with or without HDCP encryption. It automatically compensates for up to 60 meters of DVI copper cable, without further adjustment required by the user. The output signal is reclocked and stabilized using Pixel Accurate Reclocking technology which can remove jitter caused by long cables or poor quality DVI sources.
Employing Advanced EDID Management, DA2DVI-HDCP-Pro can emulate any DVI display for continuous video output, even if the attached display is disconnected or powered down. The EDID memories from 01 to 50 are factory preset, the memories from 51 to 98 are user programmable. Memory 00 for output 1 and Memory 99 for output 2 are transparent, which means that the EDID of the attached display devices (monitor or projector) will be reported to the source. With the Easy EDID Creator (PC software) the users can create their own EDID by completing four simple steps. Advanced users can use the Advanced EDID Editor software to manage every possible setting in the EDID, which they can upload to the memory of the DA2DVI-HDCP-Pro.

Features:
- Up to 60 meters cable loss compensation at input
- Built-in Advanced EDID Management
- Pixel Accurate Reclocking
- Two identical outputs
- HDCP compliant
- HDCP enable/disable function
- HDCP key-count
- Source, Signal, HDCP and Monitor detection LEDs
- USB control

Single-Link, Dual-Link and HDMI Cable Extenders
DVISL-, DVIDL-, HDMI-, Extender
Part No: 9159 0001 (DVISL), 9159 0002 (HDMI), 9159 0003 (DVIDL)

DVISL-Extender, DVIDL-Extender and HDMI-Extender are matchbox size inline equalizers designed to extend the usable range of high performance DVI, DVI-DL and HDMI signals up to a maximum of 50 m cable length. These extenders are state-of-the- art dynamic equalizers, which perform high speed cable compensation on long DVI and HDMI cables. The amount of equalization is automatically adjusted regardless of the cable length connected. These units provide up to 40 dB of insertion loss correction at 825 Mhz.

Features:
- 50 meter DVI and HDMI cable compensation
- Cable compensation for DDC communication
- Compact sized metal enclosure

4K UHD HDMI Distribution Amplifier with Audio Embedder, De-Embedder and HDCP
DA2HDMI-4K-Plus-A new!

Part No: 9132 0006

Available in Q3 2016

DA2HDMI-4K-Plus-A is a multifunctional distribution amplifier with built-in EDID Management and Pixel Accurate Reclocking, supporting DVI and HDMI 1.4 signals with or without HDCP encryption. The output signal is reclocked and stabilized using Lightware Pixel Accurate Reclocking technology to remove jitter caused by long cables or poor quality sources.

DA2HDMI-4K-Plus-A features Advanced EDID Management and can emulate any HDMI display for continuous video output, even if the attached display is disconnected or powered down. HDCP enable/disable function turns off the unit's HDCP capability, which helps integrate certain laptops into a non-HDCP AV environment. The EDID memories from 1 to 55 are factory preset, the memories from 62 to 98 are user programmable. EDID memories from 56 to 61 are for universal EDID presets. Memory 0 is transparent for output 1, memory 99 is transparent for output 2, so using these settings the EDID of the last attached display devices (monitor or projector) will be reported to the source. With the Easy EDID Creator (PC software wizard) the users can create their own EDID by completing four simple steps. Experienced users can use the Advanced EDID Editor software to manage every possible setting in the EDID, which can be uploaded to the user programable memory of the DA2HDMI-4K-Plus-A.

DA2HDMI-4K-Plus-A can be rack-mounted or used standalone. The unit is equipped with the highest grade gold plated connectors to ensure reliable connection.

DA2HDMI-4K-Plus-A is capable of audio embedding and de- embedding the PCM audio stream. Audio in port is a 3.5 jack socket, audio out is a 5-pole Phoenix socket. The unit also features a 3.5 jack output for headphone monitoring.

Applications:
- Rental and staging
- Medical
- Digital Signage
- Multiroom video
- Conference rooms, collaborative telepresence

Features:
- 4K / UHD (30Hz RGB 4:4:4, 60Hz YCbCr 4:2:0) and 3D capabilities
- Local audio Embedding and De-Embedding
- Keeps source's HDMI or DVI output continuously active
- HDCP enable/disable function
- Signal detection, source detection and monitor detection LEDs
- USB control
- Cable loss compensation at Input
- Built-in Advanced EDID Management
- Pixel Accurate Reclocking
- HDCP compliant
- 3.5mm Jack input
- 5-pole Phoenix Balanced Output
- 3.5mm Headphone Output
- Built-in Video Testpattern Generator
- Deep color support
- Daisy chain support

4K UHD HDMI Distribution Amplifier with HDCP
DA2HDMI-4K-Plus **new!**

Part No: 9132 0007
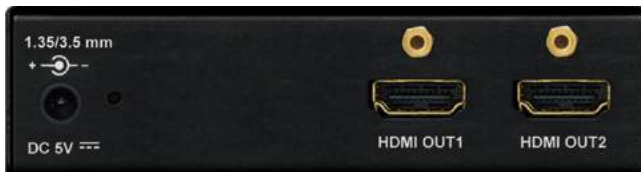
DA2HDMI-4K-Plus is a multifunctional distribution amplifier with built-in EDID Management and Pixel Accurate Reclocking, supporting DVI and HDMI 1.4 signals with or without HDCP encryption. The output signal is reclocked and stabilized using Lightware Pixel Accurate Reclocking technology to remove jitter caused by long cables or poor quality sources.

DA2HDMI-4K-Plus features Advanced EDID Management and can emulate any HDMI display for continuous video output, even if the attached display is disconnected or powered down. HDCP enable/disable function turns off the unit's HDCP capability, which helps integrate certain laptops into a non-HDCP AV environment. The EDID memories from 1 to 55 are factory preset, the memories from 62 to 98 are user programmable. EDID memories from 56 to 61 are for universal EDID presets. Memory 0 is transparent for output 1, memory 99 is transparent for output 2, so using these settings the EDID of the last attached display devices (monitor or projector) will be reported to the source. With the Easy EDID Creator (PC software wizard) the users can create their own EDID by completing four simple steps. Experienced users can use the Advanced EDID Editor software to manage every possible setting in the EDID, which can be uploaded to the user programable memory of the DA2HDMI-4K-Plus.

DA2HDMI-4K-Plus can be rack-mounted or used standalone. The unit is equipped with the highest grade gold plated connectors to ensure reliable connection.

Applications:
- Rental and staging
- Medical
- Digital Signage
- Multiroom video
- Conference rooms, collaborative telepresence

Features:
- 4K / UHD (30Hz RGB 4:4:4, 60Hz YCbCr 4:2:0) and 3D capabilities
- Keeps source's HDMI or DVI output continuously active
- HDCP enable/disable function
- Signal detection, source detection and monitor detection LEDs
- USB control
- Cable loss compensation at Input
- Built-in Advanced EDID Management
- Pixel Accurate Reclocking
- HDCP compliant
- Built-in Video Testpattern Generator
- Deep color support
- Daisy chain support

Dual-Link DVI Distribution Amplifier
DA2DVI-DL
Part No: 9132 0003

DA2DVI-DL is a single input / 2 output multifunctional Dual- Link DVI distribution amplifier with built-in EDID Management, allowing to create, edit and emulate EDIDs. It distributes signals at the highest resolutions required for military, medical, automotive design and active 3D (60 + 60 Hz) applications.

Employing Advanced EDID Management, DA2DVI-DL can emulate any DVI display for continuous video output even if the attached display is disconnected or powered down. The EDID memories from 01 to 50 are factory preset and the memories from 51 to 79 are user programmable. Memory 00 is transparent which means that the attached display device's EDID (monitor or projector connected to OUTPUT1) will be copied to the input connector. With the Easy EDID Creator (free PC software) the users can create their own EDID by completing four simple steps. Advanced users can use the Advanced EDID Editor software to manage every possible setting in the EDID. This can be uploaded to the memory of the DA2DVI-DL via the mini-USB port.

DA2DVI-DL can be rack mounted or used standalone. The unit is equipped with the highest grade gold plated connectors and gold plated printed circuit boards to ensure reliable connections and long-term operation.

Features:
- Supports 120 Hz - 3D signals
- Advanced EDID Management
- Quick and easy EDID editing and creation with Advanced EDID Editor software
- Two identical outputs
- Source detection and Monitor detection LED (for DVI-DL OUTPUT1)
- USB connectivity
- Robust metal housing for usage in hard environment
- Locking DC connector
- Rack mountable

SD, HD-SDI and 3G-SDI Distribution Amplifier
DA4-3GSDI
Part No: 9132 0001

DA4-3GSDI is a multirate one input four output serial distribution amplifier. Input equalization provides compensation of 140 m (3G-SDI) cable loss, while outputs are reclocked and independently buffered. Front panel LEDs gives quick information about the DA status: power, data rate and PLL lock status. The unit has a built-in power supply and housed in a metal enclosure for long term reliability and tough environment operation.

Features:
- 3G, HD, SD data rates
- Cable lengths:
  SD-SDI – 400 m
  HD-SDI – 200 m
  3G-SDI – 140 m
- Internal, built-in power supply
- Metal enclosure
- Rack mountable

You Know It Is Better When It's **Plus**

DA2HDMI-4K-**Plus**-A

Pixel Accurate Reclocking

Audio Embedding & De-embedding

Advanced EDID Manager

HDMI distribution amplifier with 4K/UHD, HDCP enable/disable, Advanced EDID Management, Pixel Accurate Reclocking, local audio embedding & de-embedding, gold plated PCB, Phoenix audio-out, 3.5 jack audio-in port and a local headphone jack port for monitoring.

DEFINITELY MORE THAN WHAT YOU'D EXPECT.

visual engineering
LIGHTWARE

lightware.eu

SIGNAL EXTENDERS
Lossless Transmission Solutions

TPS Extenders

Lightware continuously designs and releases
DVI, HDMI and universal video signal
transmitters and receivers to broaden the TPS
Extender family's coverage. These products
include HDBaseT™ integration with additional
Lightware technology enhancements adding
further features and functions.
Our standalone twisted pair extender
interfaces are fully compatible with our
TPS Matrix Boards and other TPS products.

UMX Series TPS Transmitter for VGA, DVI-I, HDMI and DisplayPort
UMX-TPS-TX140
Part No: 9154 0008

UMX-TPS-TX140 transmits universal 4K video, audio and control up to a 170 m distance* over a single CAT cable. This transmitter was designed for digital and analog video and audio signals: VGA, YPrPb, HDMI1.4 and DP 1.1 with analog stereo audio from local inputs or embedded 7.1 HBR audio. The unit can also handle HDCP encryption. Analog signals (both audio and video) are converted into digital format and can be transmitted separately from each other. Using the factory, custom or transparent EDID emulation the user can fix and lock EDID data on each input connector. Advanced EDID Management forces the required resolution from any video source and fixes the output format conforming the system requirements. The unit offers bi-directional and transparent IR, RS-232 and Ethernet transmission. Both the IR and RS-232 connections support command injection, allowing it to send any IR or RS-232 control command directly from the LAN connection.

Remote powering is available through the single CAT cable, but local power supply can also be used. The device can be mounted on a rack shelf or used standalone.

UMX-TPS-TX140 is compatible with both HDBaseT™ extenders and matrix switchers.

Features:
- 4K / UHD (30Hz RGB 4:4:4, 60Hz YCbCr 4:2:0) and 3D capabilities
- Extends DVI, HDMI, VGA or DisplayPort + Ethernet + RS-232 + IR over a single CAT5e-CAT7e cable up to 170 m distance*
- Event Manager
- Audio and video connectors: DVI-I, HDMI, VGA, DisplayPort, Stereo jack, PHOENIX 1x5-pole
- 10/100 Ethernet transmission
- Bi-directional RS-232 and IR
- GPIO control port
- HDCP compliant, CEC, EDID transparent
- Local audio embedding
  *Depends on cable category and quality

Port Diagram
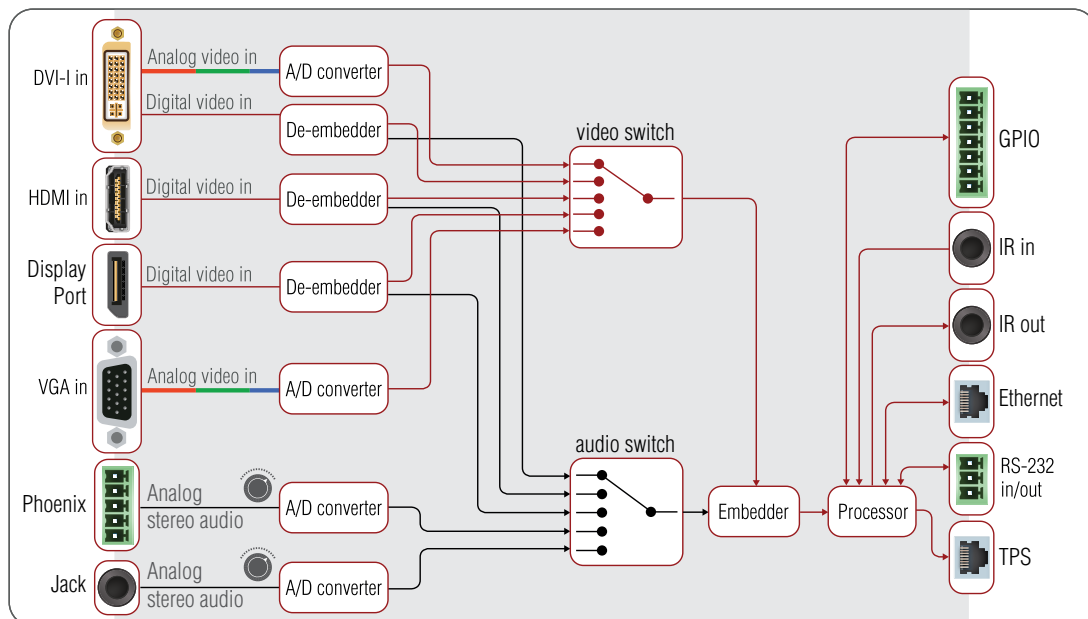
HDBaseT™ and the HDBaseT Alliance logo are trademarks of the HDBaseT Alliance

UMX Series TPS Transmitter for VGA, DVI-I, and HDMI
UMX-TPS-TX130
Part No: 9154 0013

Features:
- 4K / UHD (30Hz RGB 4:4:4, 60Hz YCbCr 4:2:0) and 3D capabilities
- Extends DVI, HDMI or VGA + Ethernet + RS-232 + IR over a single CAT5e-CAT7e cable up to 170 m distance*
- Event Manager
- Audio and video connectors: DVI-I, HDMI, VGA, Stereo jack
- 10/100 Ethernet transmission
- Bi-directional RS-232 and IR
- GPIO control port
- HDCP compliant, CEC, EDID transparent
- Local audio embedding
  *Depends on cable category and quality

UMX-TPS-TX130 transmits universal 4K video, audio and control up to a 170 m distance over a single CAT cable. This transmitter was designed for digital and analog video and audio signals: DVI, VGA, YPrPb and HDMI1.4 with analog stereo audio from local input or embedded 7.1 HBR audio. It also handles HDCP encryption. Analog signals (both audio and video) are converted into a digital format and can be transmitted separately from each other. The unit offers bi-directional and transparent IR, RS-232 and Ethernet transmission. Both the IR and RS-232 connections support command injection, allowing it to send any IR or RS-232 control command directly from the LAN connection. Remote powering is available through a single CAT cable, but local power supply can also be used. UMX-TPS-TX130 is compatible with both HDBaseT™ extenders and matrix boards.

UMX Series TPS Transmitter for VGA and HDMI
UMX-TPS-TX120
Part No: 9154 0012

Features:
- 4K / UHD (30Hz RGB 4:4:4, 60Hz YCbCr 4:2:0) and 3D capabilities
- Extends HDMI or VGA + Ethernet + RS-232 + IR over a single CAT5e-CAT7e cable up to 170 m distance*
- Event Manager
- Audio and video connectors: HDMI, VGA, Stereo jack
- 10/100 Ethernet transmission
- Bi-directional RS-232 and IR
- HDCP compliant, CEC, EDID transparent
- Local audio embedding
  *Depends on cable category and quality

UMX-TPS-TX120 transmits universal 4K video, audio and control up to a 170 m distance over a single CAT cable. This transmitter was designed for digital and analog video and audio signals: VGA, YPrPb and HDMI1.4 with analog stereo audio from local input or embedded 7.1 HBR audio. I can also handle HDCP encryption. Analog signals (both audio and video) are converted into a digital format and can be transmitted separately from each other. The unit offers bi-directional and transparent IR, RS-232 and Ethernet transmission. Furthermore the IR and RS-232 connection supports command injection, allowing it to send any IR or RS-232 control command directly from the LAN connection. Remote powering is available through a single CAT cable, but local power supply can also be used. UMX-TPS-TX120 is compatible with both HDBaseT™ extenders and matrix boards.

HDBaseT™ and the HDBaseT Alliance logo are trademarks of the HDBaseT Alliance

UMX Series TPS Wallplate for VGA, HDMI and DisplayPort
WP-UMX-TPS-TX130-US
Part No: 9154 0009

UMX Series TPS Wallplate for VGA and HDMI
WP-UMX-TPS-TX120-US
Part No: 9154 0014

The WP-UMX-TPS-TX130-US is a flagship model in the Lightware TPS (HDBaseT™ Transmitter) product family. The device can transmit universal video, audio and control up to a 170 meter distance   over a single CAT cable in dynamically changing environments such as small board rooms and classrooms. The extender was designed to handle digital and analog video and audio signals: VGA, YPrPb, HDMI1.4 and DP 1.1 with analog stereo audio from local inputs or embedded 7.1 HBR audio. Analog signals (both audio and video) are converted into digital formats. The audio and the video signal can be transmitted separately from each other. The unit offers bi-directional and transparent RS232 and Ethernet transmission and unidirectional and transparent IR transmission. The RS232 connection supports command injection. Remote powering is available through a single CAT 5e - CAT 7 cable, but local power supply can also be used. WP-UMX-TPS-TX130-US is compatible with both the HDBaseT™ extenders and matrix switchers.

The WP-UMX-TPS-TX120-US can transmit universal video, audio and control up to a 170 meter distance over a single CAT cable in dynamically changing environments such as small board rooms and classrooms The extender was designed to handle digital and analog video and audio signals: VGA, YPrPb, HDMI1.4 with analog stereo audio from local inputs or embedded 7.1 HBR audio. Analog signals (both audio and video) are converted into digital formats. The audio and the video signal can be transmitted separately from each other. The unit offers bi-directional and transparent Ethernet transmission and unidirectional and transparent IR transmission. Remote powering is available through a single CAT 5e - CAT 7 cable, but local power supply can also be used. WP-UMX-TPS-TX120-US is compatible with both the HDBase™ extenders and matrix switchers.

Features:
- 4K / UHD (30Hz RGB 4:4:4, 60Hz YCbCr 4:2:0) and 3D capabilities
- Extends HDMI, DisplayPort or VGA + Ethernet + RS-232 + IR over a single CAT5e-CAT7e cable up to 170 m distance*
- Event Manager
- Audio and video connectors: HDMI, VGA, DisplayPort, Stereo jack
- 10/100 Ethernet transmission
- Bi-directional RS232 and IR
- HDCP compliant, CEC, EDID transparent
- Local audio embedding
- Also available in white colour
  *Depends on cable category and quality

Features:
- 4K / UHD (30Hz RGB 4:4:4, 60Hz YCbCr 4:2:0) and 3D capabilities
- Extends HDMI or VGA + Ethernet + IR over a single CAT5e-CAT7e cable up to 170 m distance*
- Event Manager
- Audio and video connectors: HDMI, VGA, Stereo jack
- 10/100 Ethernet transmission
- Bi-directional IR
- HDCP compliant, CEC, EDID transparent
- Local audio embedding
- Also available in white colour
  *Depends on cable category and quality

HDBaseT™ and the HDBaseT Alliance logo are trademarks of the HDBaseT Alliance

TPS Switcher and Transmitter for DisplayPort, HDMI and DVI with Local Monitor Out
SW4-TPS-TX240
Part No: 9154 0007

SW4-TPS-TX240 is a flagship model in the Lightware TPS (HDBaseT™ Transmitter) product family. The device can transmit universal video, audio and control up to a 170 meter distance over a single CAT cable in dynamically changing environments such as small board rooms and classrooms. The extender was designed to handle HDMI1.4 and DP1.1 digital video signals and analog stereo audio from local inputs or HDMI or DP Embedded Audio up to eight Channel PCM or HBR audio. Analog audio is converted into digital format. The device has a local HDMI video output. The video and the Embedded Audio of the local output is the same as the one transmitted via TPS link. The SW4-TPS-TX240 handles HDCP encryption. Using the factory, custom or transparent EDID emulation the user can fix and lock EDID data on each input connector. Advanced EDID Management forces the required resolution from any video source and fixes the output format conforming to the system requirements. The unit offers bi-directional and transparent IR, RS232 and Ethernet transmission. Furthermore the RS232 and IR connection supports command injection. Remote powering is available through the single CAT 5e - CAT 7 cable, but local power supply can also be used. All devices can be mounted on a rack shelf or used standalone formats. SW4-TPS-TX240 is compatible with both the HDBaseT extenders and matrix switchers.

Features:
- 4K / UHD (30Hz RGB 4:4:4, 60Hz YCbCr 4:2:0) and 3D capabilities
- Extends DVI, HDMI or DisplayPort + Ethernet + RS-232 + IR over a single CAT5e-CAT7e cable up to 170 m distance*
- Event Manager
- Audio and video connectors: DVI-D, HDMI (input and output), DisplayPort, Stereo jack
- 10/100 Ethernet transmission
- Bi-directional RS-232 and IR
- GPIO control port
- HDCP compliant, CEC, EDID transparent
- Local audio embedding
  *Depends on cable category and quality

Standalone Application
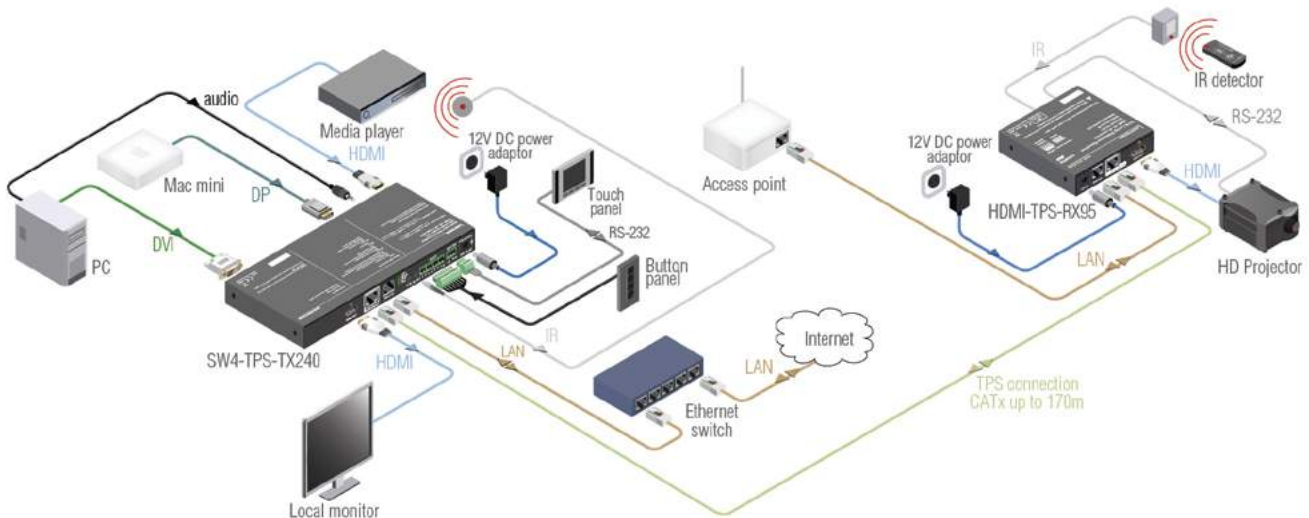
HDBaseT™ and the HDBaseT Alliance logo are trademarks of the HDBaseT Alliance

TPS Receiver with Relay Modules and Balanced Audio Out
HDMI-TPS-RX110AY
Available in Q3 2016

HDBaseT™

Available in Q3 2016

A small size HDBaseT™ TPS receiver unit is being developed in the Lightware works with one PoE capable TPS input and a single HDMI output. The unit is full 4K/UHD and 3D capable and HDCP compliant. The HDMI audio is de-embedded to the balanced audio output via a Phoenix (Euroblock) connector, the audio port has volume and gain control. The built-in Event Manager feature and the dual Relay module of the device are both configurable via the Lightware Device Controller software. Further control options are served by the USB, RS-232, IR (in and out) and Ethernet ports.

Features:
- HDMI1.4 TPS receiver with audio de-embedding capability
- Up to 170m transmission distance over TPS*
- 4K/UHD (30Hz RGB 4:4:4, 60Hz YCbCr 4:2:0) and 3D capabilities
- Fully HDCP compliant
- Balanced analog audio output for audio deembedding
- Audio volume and gain control
- 2x Relay modules
- Event Manager
- PoE remote power capable
- RS-232, IR, Ethernet extension
  *Depends on cable category and quality

TPS Extenders for Single CATx Cable with PoE
DVI-HDCP-TPS-TX97 and DVI-HDCP-TPS-RX97
Part No: 9154 0025, 9154 0026

HDBT™   **Available in Q3 2016**

TPS Extenders for Single CATx Cable with PoE
HDMI-TPS-TX97 and HDMI-TPS-RX97
Part No: 9154 0023, 9154 0024

HDBT™   **Available in Q3 2016**

DVI-HDCP-TPS-TX97 and DVI-HDCP-TPS-RX97 twisted pair HDBaseT™ extenders provide extension of uncompressed 4K/UHD video with embedded audio (up to eight channel PCM or HBR audio) for long distances over a single CATx cable. The unit offers bi-directional RS-232, IR, and Ethernet pass-through on the same CATx cable that carries the video signal. The TPS extenders support full HDCP and EDID compliance and work on all standard AV resolutions up to 4K and 48-bit color depth handling all standard audio formats and also 120 Hz 3D signals. PoE 48V remote powering is available through a single CATx cable, but a local power supply can also be used. All devices can be mounted on a rack shelf or used standalone.

The auto operation mode allows the device to detect the far end extender's mode and adopt it. If the far end device is in auto mode or if it is a third party HDBaseT™ device the link will be set to HDBT mode. If the far device is in forced Long Reach Mode then the auto operation will set the Link to Long Reach Mode. The IR OUT can operate in either Wired (unmodulated) or Emitter (modulated) mode.

DVI-HDCP-TPS-TX97 and DVI-HDCP-TPS-RX97 are compatible with HDBaseT extenders and matrix switchers.

HDMI-TPS-TX97 and HDMI-TPS-RX97 twisted pair HDBaseT™ extenders provide extension of uncompressed 4K/UHD video with embedded audio (up to eight channel PCM or HBR audio) for long distances over a single CATx cable. The unit offers bi-directional RS-232, IR, and Ethernet pass-through on the same CATx cable that carries the video signal. The TPS extenders support full HDCP and EDID compliance and work on all standard AV resolutions up to 4K and 48-bit color depth handling all standard audio formats and also 120 Hz 3D signals. PoE 48V remote powering is available through a single CATx cable, but a local power supply can also be used. All devices can be mounted on a rack shelf or used standalone.

The auto operation mode allows the device to detect the far end extender's mode and adopt it. If the far end device is in Auto mode or it is a third party HDBaseT™ device the link will be set to HDBT mode. If the far device is in forced Long Reach Mode then the auto operation will set the Link to Long Reach Mode. The IR OUT can operate in either Wired (unmodulated) or Emitter (modulated) mode.

HDMI-TPS-TX97 and HDMI-TPS-RX97 are compatible with HDBaseT extenders and matrix switchers.

Features:
- Single-Link DVI and HDMI extension supporting 4K/UHD (30Hz RGB 4:4:4, 60Hz YCbCr 4:2:0) and 3D capabilities
- Extends Single-Link DVI or HDMI + Ethernet + RS-232 + IR over one CATx cable to up to 170m* transmission distance
- 10/100 Ethernet transmission
- Bi-directional RS-232 and IR
- HDCP compliant, CEC, EDID transparent
- Operation mode switch (Auto or forced Long Reach Mode)
- IR out mode switch (Wired / Emitter)
  *Depends on cable category and quality

HDBaseT™ and the HDBaseT Alliance logo are trademarks of the HDBaseT Alliance

Features:
- Single-Link DVI and HDMI extension supporting 4K/UHD (30Hz RGB 4:4:4, 60Hz YCbCr 4:2:0) and 3D capabilities
- Extends Single-Link DVI or HDMI + Ethernet + RS-232 + IR over one CATx cable to up to 170m* transmission distance
- 10/100 Ethernet transmission
- Bi-directional RS-232 and IR
- HDCP compliant, CEC, EDID transparent
- Operation mode switch (Auto or forced Long Reach Mode)
- IR out mode switch (Wired / Emitter)
  *Depends on cable category and quality

Tel: +36 1 255 3800

TPS Extenders for Single CATx Cable
DVI-HDCP-TPS-TX95 and DVI-HDCP-TPS-RX95
Part No: 9154 0001, 9154 0002

TPS Extenders for Single CATx Cable
HDMI-TPS-TX95 and HDMI-TPS-RX95
Part No: 9154 0005, 9154 0006

DVI-HDCP-TPS-TX95 and DVI-HDCP-TPS-RX95 twisted pair HDBaseT™ extenders provide extension of uncompressed Full- HD video for long distances over a single CATx cable. The unit offers bi-directional RS-232, IR, and Ethernet pass-through on the same CATx cable that carries the video signal. The TPS extenders support full HDCP and EDID compliance and work at all standard AV resolutions up to 4K and 48-bit color depth handling all standard audio formats and also 120 Hz 3D signals. Remote powering is available through a single CATx cable, but a local power supply can also be used. All devices can be mounted on a rack shelf or used standalone.

The Auto operation mode allows the device to detect the far end extender's mode and adopt it. If the far end device is in Auto mode or if it is a third party HDBaseT™ device the link will be set to HDBT mode. If the far device is in forced Long Reach Mode then the auto operation will set the Link to Long Reach Mode.

HDMI-TPS-TX95 and HDMI-TPS-RX95 twisted pair HDBaseT™ extenders provide extension of uncompressed Full-HD video for long distances over a single CATx cable. The unit offers bi-directional RS-232, IR, and Ethernet pass-through on the same CATx cable that carries the video signal. The TPS extenders support full HDCP and EDID compliance and work at all standard AV resolutions up to 4K and 48-bit color depth handling all standard audio formats and also 120 Hz 3D signals. Remote powering is available through a single CATx cable, but a local power supply can also be used. All devices can be mounted on a rack shelf or used standalone.

The Auto operation mode allows the device to detect the far end extender's mode and adopt it. If the far end device is in Auto mode or it is a third party HDBaseT™ device the link will be set to HDBT mode. If the far device is in forced Long Reach Mode then the auto operation will set the Link to Long Reach Mode.

Features:
- Single-Link DVI and HDMI extension supporting 4K and 3D
- Extends Single-Link DVI or HDMI + Ethernet + RS-232 + IR over one CATx cable up to 170 m distance*
- 10/100 Ethernet transmission
- Bi-directional RS-232 and IR
- HDCP compliant, CEC, EDID transparent
- Operation mode switch (Auto or forced Long Reach Mode)
  *Depends on cable category and quality

Features:
- DVI and HDMI extension supporting 4K and 3D
- Extends DVI or HDMI + Ethernet + RS-232 + IR over one CATx cable up to 170 m distance*
- 10/100 Ethernet transmission
- Bi-directional RS-232 and IR
- HDCP compliant, CEC, EDID transparent
- Operation mode switch (Auto or forced Long Reach Mode)
  *Depends on cable category and quality

HDBaseT™ and the HDBaseT Alliance logo are trademarks of the HDBaseT Alliance

TPS Extenders for DVI with Local Monitor Out
DVI-HDCP-TPS-TX220, DVI-HDCP-TPS-TX210
Part No: 9154 0010 (220), 9154 0015 (210)

DVI-HDCP-TPS-TX220

The DVI-HDCP-TPS-TX220 is a flagship model in the Lightware TPS (HDBase-T Transmitter) product family. The device can transmit universal video, audio and control up to a 170 meter distance over a single CAT cable. The extender was designed to handle DVI, HDMI1.4 digital video signals and analog stereo audio from local inputs or HDMI Embedded Audio up to eight channel PCM or HBR audio. It also handles HDCP encryption. Using the factory, custom or transparent EDID emulation the user can fix and lock EDID data on each input connector. Advanced EDID Management forces the required resolution from any video source and fixes the output format conforming the system requirements. All devices can be mounted on a rack shelf or used standalone. DVI-HDCP-TPS-TX220 is compatible with both HDBaseT extenders and matrix switchers.

Features:
- 4K / UHD (30Hz RGB 4:4:4, 60Hz YCbCr 4:2:0) and 3D capabilities
- Extends DVI, HDMI1.4 + Ethernet + RS-232 + IR over a single CAT5e-CAT7e cable up to 170 m distance*
- Event Manager
- Audio and video connectors: DVI (input), DVI (local output), Stereo jack
- 10/100 Ethernet transmission
- Bi-directional RS-232 and IR
- GPIO control port
- HDCP compliant, CEC, EDID transparent
- Local audio embedding
  *Depends on cable category and quality

DVI-HDCP-TPS-TX210 has the same features and capabilities as DVI-HDCP-TPS-TX220, but without GPIO control port and local audio embedding.

DVI-HDCP-TPS-TX210

TPS Extenders for HDMI with Local Monitor Out
HDMI-TPS-TX220, HDMI-TPS-TX210
Part No: 9154 0011 (220), 9154 0017 (210)

HDMI-TPS-TX220

The HDMI-TPS-TX220 is a flagship model in the Lightware TPS (HDBase-T Transmitter) product family. The device can transmit universal video, audio and control up to a 170 meter distance over a single CAT. The extender was designed to handle HDMI1.4 digital video signals and analog stereo audio from local inputs or HDMI Embedded Audio up to 8 Channel PCM or HBR audio. It also handles HDCP encryption. Advanced EDID Management forces the required resolution from any video source and fixes the output format conforming the system requirements. Remote powering is available through the single CAT 5e - CAT 7 cable, but local power supply can also be used. All devices can be mounted on a rack shelf or used standalone. HDMI-TPS-TX220 is compatible with both HDBaseT extenders and matrix switchers.

Features:
- 4K / UHD (30Hz RGB 4:4:4, 60Hz YCbCr 4:2:0) and 3D capabilities
- Extends HDMI1.4 + Ethernet + RS-232 + IR over a single CAT5e-CAT7e cable up to 170 m distance*
- Event Manager
- Audio and video connectors: HDMI (input), HDMI (local output), Stereo jack
- 10/100 Ethernet transmission
- Bi-directional RS-232 and IR
- GPIO control port
- HDCP compliant, CEC, EDID transparent
- Local audio embedding
  *Depends on cable category and quality

HDMI-TPS-TX210 has the same features and capabilities as HDMI-TPS-TX220, but without GPIO control port and local audio embedding.

HDMI-TPS-TX210

HDBaseT™ and the HDBaseT Alliance logo are trademarks of the HDBaseT Alliance

TPS Extenders for DisplayPort with Local Monitor Out
DP-TPS-TX220, DP-TPS-TX210
Part No: 9154 0018(220), 9154 0019(210)

DP-TPS-TX220

DP-TPS-TX210

The DP-TPS-TX 220 is a flagship model in the Lightware TPS (HDBase-T Transmitter) product family. The device can transmit universal video, audio and control up to a 170 meter distance over a single CAT. The extender was designed to handle DP1.1 digital video signals and analog stereo audio from local inputs or DP Embedded Audio up to eight channel PCM or HBR audio. It also handles HDCP encryption. Advanced EDID Management forces the required resolution from any video source and fixes the output format conforming to the system requirements. Remote powering is available through the single CAT 5e - CAT 7 cable, but local power supply can also be used. All devices can be mounted on a rack shelf or used standalone. DP-TPS-TX 220 is compatible with both HDBaseT extenders and matrix switchers.

Features:
- 4K / UHD (30Hz RGB 4:4:4, 60Hz YCbCr 4:2:0) and 3D capabilities
- Extends DisplayPort1.1 + Ethernet + RS-232 + IR over a single CAT5e-CAT7e cable up to 170 m distance*
- Event Manager
- Audio and video connectors: DisplayPort (input), HDMI (local output), Stereo jack
- 10/100 Ethernet transmission
- Bi-directional RS-232 and IR
- GPIO control port
- HDCP compliant, CEC, EDID transparent
- Local audio embedding
  *Depends on cable category and quality

DP-TPS-TX210 has the same features and capabilities as DP-TPS-TX220, but without GPIO control port and local audio embedding.

Standalone Application
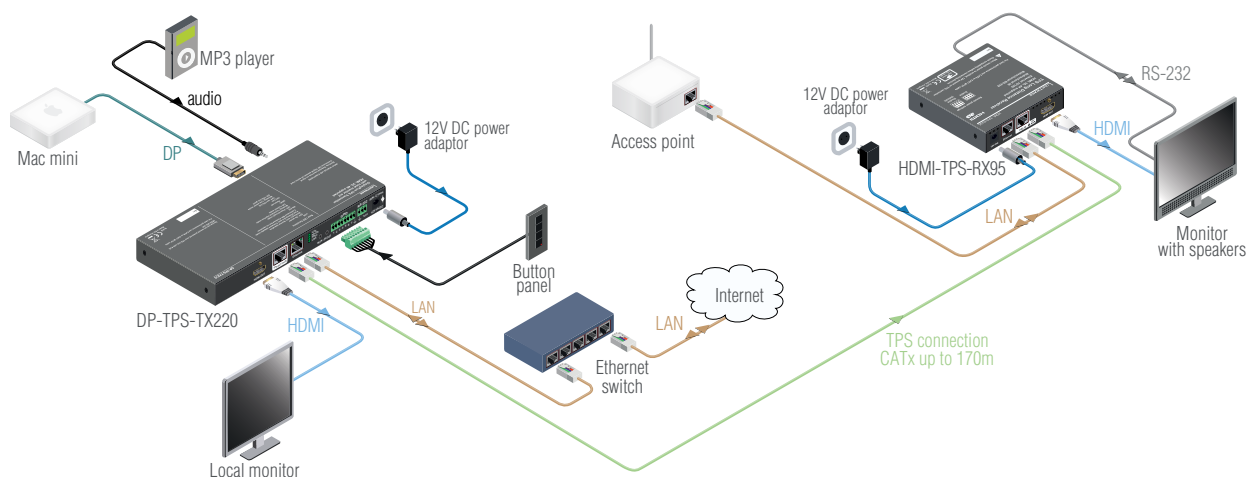
HDBaseT™ and the HDBaseT Alliance logo are trademarks of the HDBaseT Alliance

Single Port Standalone TPS Power Injector
TPS-PI-1P1
Part No: 9134 0010

TPS-PI-1P1 is an IEEE802.3at compatible high end remote power injector device providing power to a remote TPS transmitter or receiver.* The TPS-PI-1P1 can power a TPS extender placed in the TPS transmission chain, anywhere between the transmitter and the receiver unit. The incoming data stays untouched, the signal quality is unaffected but a 48V DC remote power is added to the signal by this device.

This unit provides a uni-directional remote power but due to the 12V local output option the other device can be powered with the TPS-PI-1P1 if they are placed close to each other. Powering of the injector itself is provided by its own power adapter, a supplied accessory.

TPS-PI-1P1 has four front panel LED indicators to monitor the operation and troubleshooting: power overload, 12V DC out active, remote power out active and 48V DC in present.

Based on the extension distance chart of the powered device, using the TPS-PI-1P1 may result in an approximately 20% distance decrease depending on the powering mode (local or remote) and cable quality.

*Remote powering of the 95 series HDMI-TPS and DVI-HDCP-TPS devices is not available by the TPS-PI-1P1 power injector.

Features:
- Single port 48V remote power feed to a TPS endpoint
- Optimized for HDBaseT transmission
- 12V DC local power output
- Feeding up to 30W power

Typical Application

UMX-TPS-TX140
Power send
48V DC Power adaptor
TPS-PI-1P1
CATx
12V DC Power adaptor
HDMI-TPS-RX95
CATx
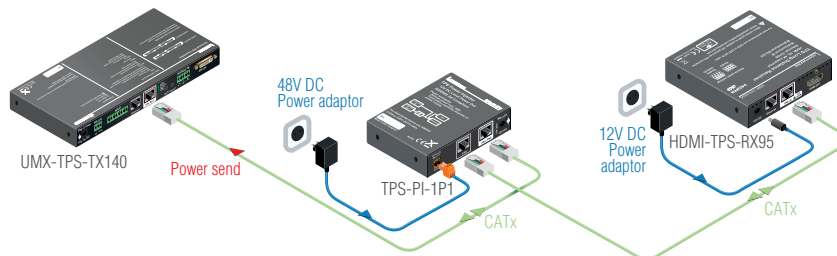
12V Local Powering Application Examples
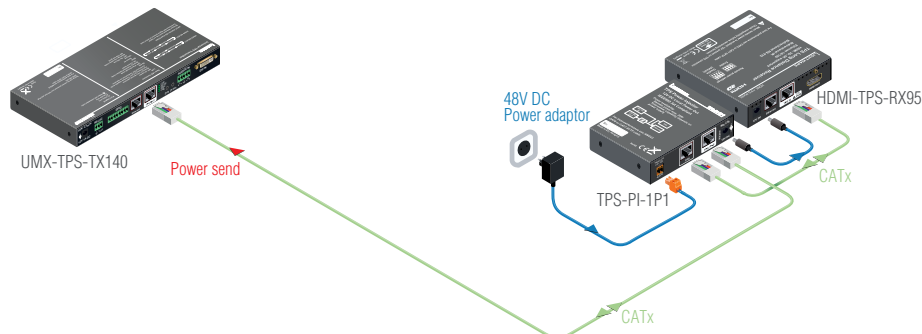
UMX-TPS-TX140
Power send
48V DC Power adaptor
TPS-PI-1P1
CATx
HDMI-TPS-RX95
CATx

HDBaseT™ and the HDBaseT Alliance logo are trademarks of the HDBaseT Alliance

Tel: +36 1 255 3800

Wallplate (WP) and Floorbox (FP) TPS Extenders for Single CATx Cable with PoE
WP-HDMI-TPS-RX97-EU, WP-HDMI-TPS-RX97-UK, WP-HDMI-TPS-RX97-US, WP-HDMI-TPS-RX97-EUROMOD, FP-HDMI-TPS-TX97-GB3 and FP-HDMI-TPS-TX97-LEGRAND
Part No: 9154 0027, 9154 0028, 9154 0029, 9154 0030, 9154 0037 and 9154 0038

Available in Q3 2016

WP/FP-HDMI-TPS-TX/RX97 series twisted pair HDBaseT™ extenders provide extension of uncompressed 4K/UHD video with embedded audio (up to eight channel PCM or HBR audio) for long distances over a single CATx cable. The unit offers bi-directional RS-232, IR, and Ethernet pass-through on the same CATx cable that carries the video signal. The WP/FP TPS extenders support full HDCP and EDID compliance and work on all standard AV resolutions up to 4K/UHD and 48-bit color depth, handling all standard audio formats, and also 120 Hz 3D signals. PoE 48V remote powering is available through a single CATx cable, but a local power supply can also be used.

The auto operation mode allows the device to detect the far-end extender's mode and adopt it. If the far end device is in auto mode or if it is a third party HDBaseT™ device the link will be set to HDBT mode. If the far device is in forced Long Reach Mode then the auto operation will set the link to Long Reach Mode.

WP/FP-HDMI-TPS-TX/RX97 extenders are compatible with both the HDBaseT extenders and matrix switchers.

Features:
- Single-Link DVI and HDMI extension supporting 4K/UHD (30Hz RGB 4:4:4, 60Hz YCbCr 4:2:0) and 3D capabilities
- Extends Single-Link DVI or HDMI + Ethernet + RS-232 + IR over one CATx cable up to 170m* transmission distance over TPS
- 10/100 Ethernet transmission
- Bi-directional RS-232 and IR
- HDCP compliant, CEC, EDID transparent
- Operation mode switch (Auto or forced Long Reach Mode)
- New design fits standard wall and floor panel boxes while providing easier cable connect and removal
- Fits in most common standard wall and floor panel boxes
- Right angle connection for optimized cable access
   *Depends on cable category and quality

The following table lists additional versions of the same wall and floor panel series. For availability and other information please inquire at your Lightware sales contact.

Available products: Part No:
- FP-HDMI-TPS-RX97-GB3 91540031
- FP-HDMI-TPS-RX97-LEGRAND 91540032
- WP-HDMI-TPS-TX97-EU..91540033
- WP-HDMI-TPS-TX97-UK 91540034
- WP-HDMI-TPS-TX97-US 91540035
- WP-HDMI-TPS-TX97-EUROMOD...............................91540036

WP-HDMI-TPS-RX97-EU

The thoroughly redesigned form factor of the wall and floor panels allows for easier connecting and removing cables in narrow spaces (behind TV sets, under floor panel lids) and reduces cable bending and breaking. The built-in cable tie-down points further ensure stable connection and reduce cable stress.
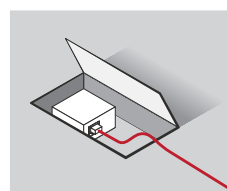
Cable access example with Floorbox extender
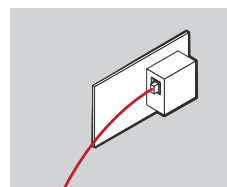
Cable access and orientation example with wall plate extenders.
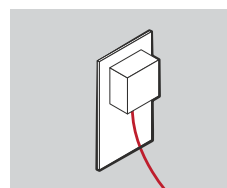
Cable access and orientation example with wall plate extenders.

TPS Transmitters Connector Comparison Chart

			DVI-HDCP-TPS-TX97	HDMI-TPS-TX97	WP-HDMI-TPS-TX97-(EU/US/UK/EUROMOD)	FP-HDMI-TPS-TX97-(GB3/LEGRAND)	DVI-HDCP-TPS-TX95	HDMI-TPS-TX95	UMX-TPS-TX120	UMX-TPS-TX130	UMX-TPS-TX140	WP-UMX-TPS-TX120-US	WP-UMX-TPS-TX130-US	DVI-HDCP-TPS-TX220	DVI-HDCP-TPS-TX210	HDMI-TPS-TX220	HDMI-TPS-TX210	DP-TPS-TX220	DP-TPS-TX210	SW4-TPS-TX240
Video Connectors	Input	VGA	x	x	x	x	x	x	✓	✓	✓	✓	✓	x	x	x	x	x	x	x
		HDMI	x	✓	✓	✓	x	✓	✓	✓	✓	✓	✓	x	x	✓	✓	x	x	✓
		DVI-D	✓	x	x	x	✓	x	x	x	x	x	x	✓	✓	x	x	x	x	✓
		DVI-I	x	x	x	x	x	x	✓	✓	x	x	x	x	x	x	x	x	x	x
		DisplayPort	x	x	x	x	x	x	x	x	✓	x	✓	x	x	x	x	✓	✓	✓
	Local output	DVI	x	x	x	x	x	x	x	x	x	x	x	✓	✓	x	x	x	x	x
		HDMI	x	x	x	x	x	x	x	x	x	x	x	x	x	✓	✓	✓	✓	✓
Audio Connectors		Stereo jack	x	x	x	x	x	x	✓	✓	✓	✓	✓	✓	x	✓	x	✓	x	✓
		Phoenix audio	x	x	x	x	x	x	x	x	✓	x	x	x	x	x	x	x	x	x
Control Connectors		Ethernet	✓(1)	✓(1)	✓(1)	✓(1)	✓(1)	✓(1)	✓(2)	✓(2)	✓(2)	✓(2)	✓(2)	✓(2)	✓(2)	✓(2)	✓(2)	✓(2)	✓(2)	✓(2)
		RS-232	✓(1)	✓(1)	✓(1)	✓(1)	✓(1)	✓(1)	✓(2)	✓(2)	✓(2)	✓(2)	✓(2)	✓(2)	✓(2)	✓(2)	✓(2)	✓(2)	✓(2)	✓(2)
		IR	✓(1)	✓(1)	✓(1)	✓(1)	✓(1)	✓(1)	✓(2)	✓(2)	✓(2)	✓(2)	✓(2)	✓(2)	✓(2)	✓(2)	✓(2)	✓(2)	✓(2)	✓(2)
		GPIO	x	x	x	x	x	x	x	✓(2)	✓(2)	x	x	✓(2)	x	✓(2)	x	✓(2)	x	✓(2)

All our TPS extenders compatible with each other and with the MX-TPS and MX-TPS2 input and output boards.

(1) Pass-through only

(2) Pass-through and / or control advanced

Twisted Pair (TP) Extenders

Lightware TP Extenders include a wide range of devices from entry level to high end. Out of these cost effective DVI, HDMI and universal video signal transmitters and receivers it is easy to find the best choice for the required application. RS-232 control signal transmission is also an available feature. Lightware also makes wall and floor plates specially designed for meeting room and other similar, dynamically changing environments.

UMX Series TP Transmitter
UMX-TP-TX100R
Part No: 9152 0017

UMX-TP-TX100R is a versitale transmitter which provides analog and digital audio and video connectivity from a remote point over Dual CAT cable. The extender was designed to handle VGA, YPbPr, DVI and HDMI 1.3 with analog stereo, 5.1 S/PDIF and even 7.1 HDMI Embedded Audio signals. Analog signals are converted into digital formats and digital or digitized analog audio is embedded in the video stream. UMX-TP-TX100R handles HDCP encryption and has HDCP enable/disable function.

Features:
- Extends VGA, YPbPr, DVI and HDMI 1.3 signals
- Accepts analog and digital audio signals
- Autoswitch and autosync function for video and audio inputs with priority
- HDCP compliant
- Cross compatibility with any Lightware twisted pair device (see in compatibility table)

Standalone Diagram
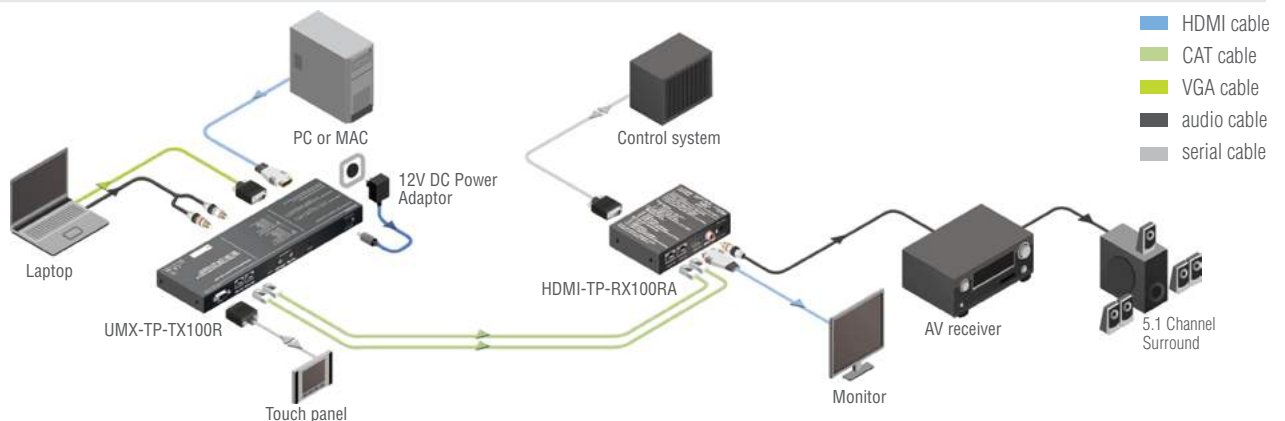
Port Diagram
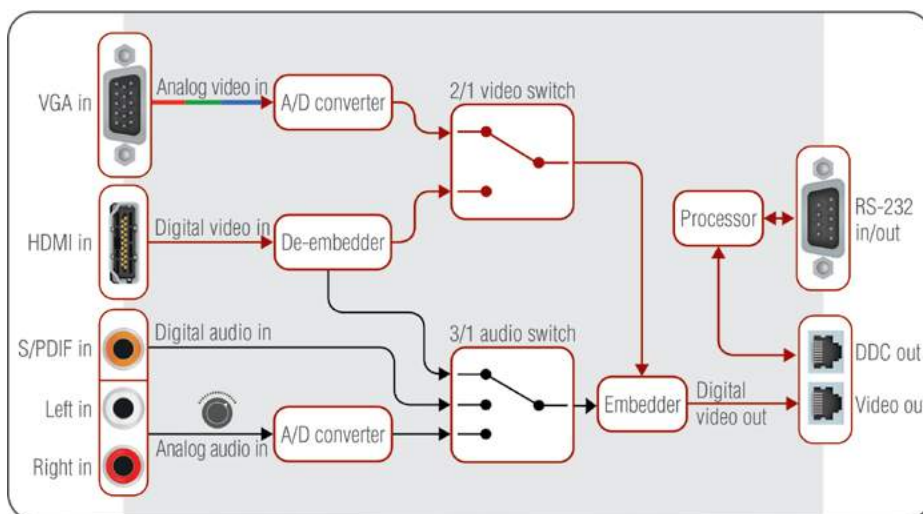
Analog Audio Input

Volume:	-63 - 0 dB
Gain:	0 - 24 dB
Balance:	0 - 100%
Phase invert:	On/Off

UMX Series Wallplate and Floorbox Transmitters
WP-UMX-TP-TX100 and FP-UMX-TP-TX100

WP-UMX-TP-TX100 and FP-UMX-TP-TX100 are universal video and audio extenders designed to handle digital and analog video and audio signals: VGA, YPbPr, RGB, DVI and HDMI 1.3 with analog stereo, and 7.1 HDMI embedded audio. Remote powering is available in both directions. Analog signals are converted into digital formats and digital or digitized analog audio is embedded in the video stream. Video, audio, RS-232 and remote power are carried by two twisted pair cables.

Features:
- Connectors: DVI-I and VGA for video, 2 x RCA for analog audio
- Extends VGA, YPbPr, RGB, DVI and HDMI 1.3 signals
- Autoswitch and autosync function for video and audio inputs with priority
- HDCP compliant

Available products: Part No:
- WP-UMX-TP-TX100-EU 9152 0024
- WP-UMX-TP-TX100-UK 9152 0025
- WP-UMX-TP-TX100-US 9152 0026
- WP-UMX-TP-TX100-EUROMOD 9152 0027
- FP-UMX-TP-TX100-GB3 ....9152 0028
- FP-UMX-TP-TX100-LEGRAND 9152 0029

Compatible products:
- Receivers:
  DVI-HDCP-TP-RX50
  DVI-HDCP-TP-RX100R
  HDMI-TP-RX50
  HDMI-TP-RX100R
  HDMI-TP-RX100RA
  HDMI-TP-RX200R
  MX-HDMI-TP-IB
  MXD-HDMI-TP-IB

Single-Link DVI TP Extenders
DVI-TP-TX200, DVI-TP-TX300 and DVI-TP-RX100
Part No: 9152 0001 (TX200), 9152 0002 (TX300), 9152 0003 (RX100)

50 Series DVI and HDMI TP Extenders
DVI-HDCP-TP-TX/RX50, HDMI-TP-TX/RX50
Part No: 9152 0006 (HDCP TX50), 9152 0010 (HDMI TX50),
9152 0008 (HDCP RX50), 9152 0013 (HDMI RX50)

The TP series extenders offer cost-effective twisted pair extension transmitting Single Link DVI-D signals over a single CATx cable. Reachable distances depend on the used cable quality and the signal resolution. DVI-TP-TX200 and DVI-TP-TX300 transmitters include an EDID Manager and a built-in DVI distribution amplifier for local monitor output.

Features:
- Single cable technology
- DVI Reclocking
- TMDS Reclocking: Intra-pair skew compensation, jitter compensation
- 50 m long DVI signal transmission at 1920 x 1080p resolution
- 80 m DVI signal transmission at 1280 x 1024 resolution
- Advanced EDID Management
- 50 programmable EDID memory
- Local monitor output
- Source detection and Monitor detection LED

This entry level HDMI extension system transmit HDMI signal formats over dual CAT cable up to a 65 meter distance at 1920x1080p Full HD. HDMI 1.3a signals are fully supported with or without HDCP encryption. The DVI-HDCP-TP series extenders feature screw-locking DVI connectors to ensure secure operation in professional environments instead of the easily loosening HDMI connectors, while keeping the benefits of the HDMI 1.3a interface.

Features:
- Extends HDMI 1.3a, HDCP 1.1 and DVI 1.0 signals
- Supports Dolby TrueHD and DTS-HD Master Audio 7.1 formats
- 1920x1200 or 2048x1080 maximum resolutions
- Cross compatibility with any Lightware twisted pair device*
- Jumper selectable local or remote
  (remote-send / remote-receive) power source
- Automatic adaptive cable equalization adjustment
- Metal housing for professional use and rack mounting
  *See in compatibility table

100R Series DVI and HDMI TP Extenders
DVI-HDCP-TP-TX100R/RX100R and
HDMI-TP-TX100R/RX100R
Part No: 9152 0007 (HDCP TX100R), 9152 0011 (HDMI TX100R)
      9152 0009 (HDCP RX100R), 9152 0014 (HDMI RX100R)

TP HDMI Receiver with S/PDIF Digital Audio Output
HDMI-TP-RX100RA
Part No: 9152 0015

DVI-HDCP-TP and HDMI-TP are deep color extenders which can transmit HDMI or DVI-D signals over two CATx cables, fully supporting HDMI 1.3a signals with or without HDCP encryption. The DVI-HDCP-TP series extenders feature screw- locking DVI connectors instead of the the easily loosening HDMI connectors to ensure secure operation in professional environments while keeping the benefits of the HDMI 1.3a interface with audio.

Features:
- Extends HDMI 1.3a, HDCP1.1 and DVI 1.0 signals
- RS-232 pass-through
- Supports Dolby TrueHD and DTS-HD Master Audio 7.1 formats
- 1920x1200 or 2048x1080 maximal resolutions
- Cross compatibility with any Lightware twisted pair device*
- Jumper selectable local or remote power source
- Precise manual, or automatic adaptive cable equalization adjustment
- TMDS reclocking in receiver
- Advanced EDID Management in transmitter
- Metal housing for professional use and rack mounting
    *See in compatibility table

The HDMI-TP-RX100RA deep color receiver was designed to handle HDMI 1.3a or DVI signals over two CATx cables with or without HDCP encryption. HDMI-TP-RX100RA de-embeds digital audio from the HDMI stream and generates output on the S/PDIF connector.

Features:
- Extends HDMI 1.3a, HDCP1.1 and DVI 1.0 signals
- S/PDIF digital audio output
- RS-232 pass-through
- Supports Dolby TrueHD and DTS-HD Master Audio 7.1 formats
- 1920x1200 or 2048x1080 maximal resolutions
- Cross compatibility with any Lightware twisted pair device*
- Jumper selectable local or remote power source
- Precise manual, or automatic adaptive cable equalization adjustment
- Pixel Accurate Reclocking
- TMDS reclocking in receiver
- Advanced EDID Management in transmitter
- Metal housing for professional use and rack mounting
    *See in compatibility table

200 Series HDMI TP Extenders
HDMI-TP-TX200R and HDMI-TP-RX200R
Part No: 9152 0012 (TX200R), 9152 0016 (RX200R)

Dual-Link DVI TP Extenders
DVI-TP-TX200DL, DVI-TP-RX100DL
Part No: 9152 0004 (TX200DL), 9152 0005 (RX100DL)

HDMI-TP 200 series extenders can transmit HDMI or DVI-D signals over two CATx cables, fully supporting HDMI 1.3a signals with or without HDCP encryption. All the devices in the product series have cross compatibility: any transmitter can be paired with any receiver without restriction. Lightware's Hybrid Modular Matrix concept also assures that connecting an extender box directly to the matrix router using an MX-HDMI-TP series I/O board is arrangable.

Features:
- Two identical HDMI outputs at receiver
- Local monitor buffered loop output at transmitter
- Bi-directional RS-232 pass through
- Extends HDMI 1.3a, HDCP 1.1 and DVI 1.0 signals
- Supports Dolby TrueHD and DTS-HD Master Audio 7.1 formats
- 1920 x 1200 or 2048 x 1080 maximal resolutions
- Cross compatibility with any Lightware twisted pair device*
- Jumper selectable local or remote power source
- Precise manual, or automatic adaptive cable equalization adjustment
- Pixel Accurate Reclocking in both transmitter and receiver
- TMDS Reclocking in receiver
- Advanced EDID Management in both transmitter and receiver
- Several status LEDs
- Metal housing for professional use and rack mounting
- Available products:
  Transmitters: HDMI-TP-TX200R
  Receivers: HDMI-TP-RX200R
  *See in compatibility table

TP-DL series transceivers transmit Dual-Link DVI-D signals over two CATx cables. TP-DL series transceivers support the highest resolutions up to 3840x2400 including all HDTV resolutions: 720p, 1080p, 2K.

DVI-TP-TX200DL stores and emulates 100 EDID, 50 of which are factory preset and 50 are user programmable.

DVI-TP-RX100DL is a high performance Dual-Link twisted pair reclocking receiver with automatic, precise manual cable equalization (EQ) adjustment. It incorporates Lightware's TMDS Reclocking function, which eliminates pixel errors and noise from the video signal.

Features:
- TMDS Reclocking: Intra-pair skew compensation, jitter compensation
- 50 m long Dual-Link DVI signal transmission at 2560 x 1600 resolution (using two CAT7 cables)
- 50 m long Single-Link DVI signal transmission at 1920 x 1080p resolution (using one CAT7 cable)
- Advanced EDID Management
- 50 programmable EDID memory addresses

Wallplate TP Extenders
WP-DVI-HDCP-TP and WP-HDMI-TP

Lightware provides active wallplates with different connectors and finish. Part numbers range from 9152 0018 to 9152 0047, please visit lightware.eu for more information.

The wide range of HDMI/DVI wallplates provide extension of audio, video and RS-232, either point to point or from an end point to a matrix switcher. WP-DVI-HDCP-TP and WP-HDMI-TP 50 transmit HDMI or DVI-D signals over two CATx cables. They fully support HDMI 1.3a signals with or without HDCP encryption. The DVI HDCP-TP series extenders feature screw-locking DVI connectors for secure operation in professional environments, while keeping all the features of HDMI 1.3a, including embedded audio.

The extenders can work with any Lightware twisted pair transmitter or output board able to send power to the wallplate. The Active Wallplates can also be remotely powered from both directions: from receiver to transmitter or from transmitter to receiver.

Inputs are equalized on all receivers, allowing for up to 65 m long cable extension to be achieved with CAT7S/FTP cable in 1920 x 1080p @ 60 Hz resolution.

Features:

- Automatic CATx cable equalizing
- RS-232 pass-through or S/PDIF option
- S/PDIF outputs with Dolby TrueHD and DTS-HD Master Audio 7.1 formats only with MX-HDMI-TP-OB and MXD-HDMI-TP-OB board
- Aluminum case in two colors: matt silver and matt black
- Easy mounting with hidden screws

Compatible products:

- Transmitters:
  DVI-HDCP-TP-TX50
  DVI-HDCP-TP-TX100R
  HDMI-TP-TX50
  HDMI-TP-TX100R
  HDMI-TP-TX200R
  UMX-TP-TX100R
  MX-DVI-TP-OB+
  MX-HDMI-TP-OB
  MXD-HDMI-TP-OB

- Receivers:
  DVI-HDCP-TP-RX50
  DVI-HDCP-TP-RX100R
  HDMI-TP-RX50
  HDMI-TP-RX100R
  HDMI-TP-RX100RA
  HDMI-TP-RX200R
  MX-DVI-TP-IB+
  MX-HDMI-TP-IB
  MXD-HDMI-TP-IB

Standalone Application

Jumper setting: Remote-send

12V DC Power adaptor

HDMI-TP-TX100R

WP-HDMI-TP-RX50R

3D HDTV

3D Blu-Ray or DVD Player

HDMI-TP-RX100R

Jumper setting: Remote-send

12V DC Power adaptor

WP-HDMI-TP-TX50R

3D Blu-Ray or DVD Player

Projector
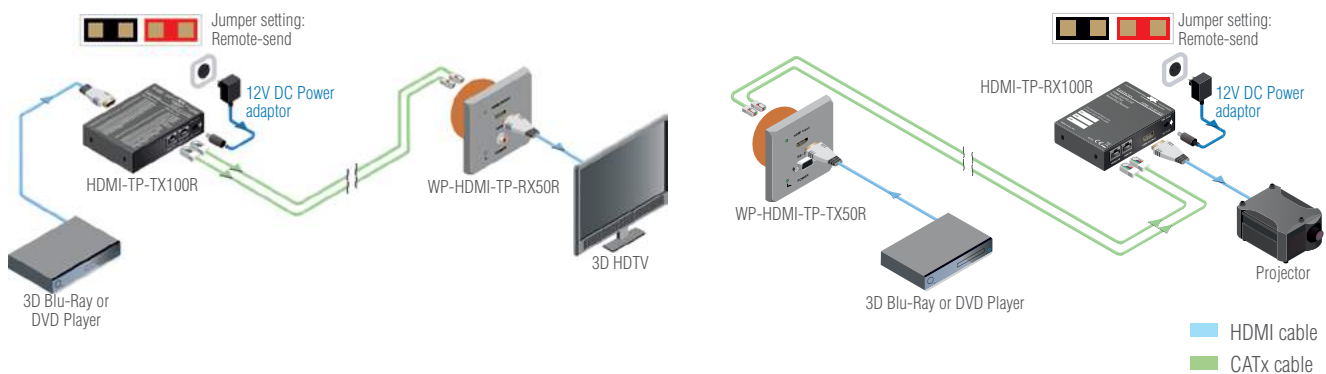
HDMI cable
CATx cable

Transmitters \ Receivers	Rack and desk mount units							MX boards				Wallplates			
	DVI-TP-RX100	DVI-TP-RX100DL	DVI-HDCP-TP-RX50	HDMI-TP-RX50	DVI-HDCP-TP-RX100R	HDMI-TP-RX100R	HDMI-TP-RX100RA	MX-DVI-TP-IB	MX-DVI-TP-IB+	MX-HDMI-TP-IB	MXD-HDMI-TP-IB	WP-HDMI-TP-RX50R	WP-HDMI-TP-RX50A	WP-DVI-HDCP-TP-RX50R	WP-DVI-HDCP-TP-RX50A
DVI-TP-TX200	1 -	1 -	1 -	1 -	1 -	1 -	1 -	1 -	1 -	1 -	1 -				
DVI-TP-TX300	1 -	1 -	1 -	1 -	1 -	1 -	1 -	1 -	1 -	1 -	1 -				
DVI-TP-TX200DL	1 -	2 D	1 -	1 -	1 -	1 -	1 -	1 -	1 -	1 -	1 -				
DVI-HDCP-TP-TX50			2 H	2 H	2 H	2 H	2 H		2 -	2 H	2 H	2 H	2 H	2 H	2 H
HDMI-TP-TX50			2 H	2 H	2 H	2 H	2 H		2 -	2 H	2 H	2 H	2 H	2 H	2 H
DVI-HDCP-TP-TX100R	1 -	1 -	2 H	2 H	2 HR	2 HR	2 HR	1 -	2 -	2 H	2 HR	2 HR	2 H	2 HR	2 H
HDMI-TP-TX100R	1 -	1 -	2 H	2 H	2 HR	2 HR	2 HR	1 -	2 -	2 H	2 HR	2 HR	2 H	2 HR	2 H
HDMI-TP-TX200R	1 -	1 -	2 H	2 H	2 HR	2 HR	2 HR	1 -	2 -	2 H	2 HR	2 HR	2 H	2 HR	2 H
UMX-TP-TX100R	1 -	1 -	2 H	2 H	2 HR	2 HR	2 HR	1 -	2 -	2 H	2 HR	2 HR	2 H	2 HR	2 H
MX-DVI-TP-OB	1 -	1 -	1 -	1 -	1 -	1 -	1 -	1 -	1 -	1 -	1 -				
MX-DVI-TP-OB+	1 -	1 -	2 -	2 -	2 -	2 -	2 -	1 -	2 -	1 -	2 -	2 -	2 -	2 -	2 -
MX-HDMI-TP OB	1 -	1 -	2 H	2 H	2 H	2 H	2 H	1 -	2 -	1 H	2 H	2 H	2 HA*	2 H	2 HA*
MXD-HDMI-TP-OB	1 -	1 -	2 H	2 H	2 HR	2 HR	2 HR	1 -	2 -	2 H	2 HR	2 HR	2 HA*	2 HR	2 HA*
WP-HDMI-TP-TX50R			2 H	2 H	2 HR	2 HR	2 HR		2 -	2 H	2 HR				
WP-DVI-HDCP-TP-TX50R			2 H	2 H	2 HR	2 HR	2 HR		2 -	2 H	2 HR				
WP-UMX-TP-TX100			2 H	2 H	2 H	2 H	2 H		2 -	2 H	2 H				
FP-UMX-TP-TX100			2 H	2 H	2 H	2 H	2 H		2 -	2 H	2 H				

Remote power
No remote power
Not compatible

1 one cable is necessary for FULL functionality
2 two cables are necessary for FULL functionality
(Some device pairings may operate with one cable.)

H HDCP compliant
D Dual-Link
R RS-232 pass-through
A S/PDIF audio output
- None of the above

A*: S/PDIF audio output can be used only if the transmitter is a MX-HDMI-TP-OB or MXD-HDMI-TP-OB

Transmitters Comparison

		Rack and desk mount units								Wallplates			
		DVI-TP-TX200 / 200DL	DVI-TP-TX300	DVI-HDCP-TP-TX50	HDMI-TP-TX50	DVI-HDCP-TP-TX100R	HDMI-TP-TX100R	HDMI-TP-TX200R	UMX-TP-TX100R	WP-UMX-TP-TX100	FP-UMX-TP-TX100	WP-HDMI-TP-TX50R	WP-DVI-HDCP-TP-TX50R
Main Features	HDCP and HDMI 1.3a compliant	x	x	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	3D pass through	✓	✓	✓	✓	✓	✓	x	x	x	x	✓	✓
	RS-232 pass through	x	x	x	x	✓	✓	✓	✓	x	x	✓	✓
	Pixel Accurate Reclocking	x	x	x	x	x	x	✓	✓	x	x	x	x
EDID Features	Transparent EDID	x	x	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Advanced EDID Management	✓	✓	x	x	✓	✓	✓	✓	✓	✓	x	x
Front Panel	EDID selector switch, validity LED	✓	✓	x	x	✓	✓	✓	✓	x	x	x	x
	Source and monitor detect LEDs	✓	✓	x	x	✓	✓	✓	✓	✓	✓	x	x
Input Connectors	HDMI input	x	x	x	✓	x	✓	✓	✓	x	x	✓	x
	DVI input	✓	✓	✓	x	✓	x	x	x	✓	✓	x	✓
	RS-232	x	x	x	x	✓	✓	✓	✓	x	x	✓	✓
Output Connectors	Extension: Dual RJ45	x	x	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Local: buffered output	✓	✓	x	x	x	x	✓	x	x	x	x	x
	Local: S/PDIF audio	x	x	x	x	x	x	x	x	x	x	x	x
Misc	USB control	x	x	x	x	x	x	✓	x	x	x	x	x
	Power consumption	4 W	4 W	2 W	2 W	2 W	2 W	4 W	4 W	4 W	4 W	1 W	1 W
Powering Options	Self powered	✓	✓	✓	✓	✓	✓	✓	✓	x	x	x	x
	Send power to distant device	x	x	✓	✓	✓	✓	✓	✓	x	x	x	x
	Remote powered through CATx	x	x	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Tel: +36 1 255 3800

Twisted Pair Extenders Comparison Chart

Receivers Comparison

		Rack and desk mount units							Wallplates			
		DVI-TP-RX100 / 100DL	DVI-HDCP-TP-RX50	HDMI-TP-RX50	DVI-HDCP-TP-RX100R	HDMI-TP-RX100R	HDMI-TP-RX100RA	HDMI-TP-RX200R	WP-HDMI-TP-RX50R	WP-HDMI-TP-RX50A	WP-DVI-HDCP-TP-RX50R	WP-DVI-HDCP-TP-RX50A
Main Features	HDCP and HDMI 1.3a compliant	x	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	3D pass through	✓	✓	✓	✓	✓	x	x	✓	✓	✓	✓
	Adaptive cable equalization	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Manual cable equalization	✓	x	x	✓	✓	✓	✓	x	x	x	x
	TMDS Reclocking	✓	x	x	✓	✓	x	x	x	x	x	x
	Pixel Accurate Reclocking	x	x	x	x	x	✓	✓	x	x	x	x
	RS-232 pass through	x	x	x	✓	✓	✓	✓	✓	x	✓	x
EDID Features	Transparent EDID	x	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Advanced EDID Management	x	x	x	x	x	✓(1)	✓(1)	x	x	x	x
Front Panel	EDID selector switch, validity LED	x	x	x	x	x	✓	✓	x	x	x	x
	EQ mode switch and LED, EQ trimmer	✓	x	x	✓	✓	✓	✓	x	x	x	x
	Monitor detect LED	✓	x	x	✓	✓	✓	✓	x	x	x	x
	Signal present LED	✓	x	x	✓	✓	✓	✓	✓	✓	✓	✓
	HDMI and HDCP detect LEDs	x	x	x	x	x	✓	✓	x	x	x	x
Input	Extension: Dual RJ45	x	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Output Connectors	HDMI output	x	x	✓	x	✓	✓	✓	✓	✓	x	x
	DVI-HDCP output	✓	✓	x	✓	x	x	x	x	x	✓	✓
	RS-232	x	x	x	✓	✓	✓	✓	✓	x	✓	x
	S/PDIF audio	x	x	x	x	x	✓	x	x	✓(2)	x	✓(2)
Misc	Power consumption	2 W	2 W	2 W	4 W	4 W	4 W	4 W	1,5 W	1,5 W	1,5 W	1,5 W
Powering Options	Self powered	✓	✓	✓	✓	✓	✓	✓	x	x	x	x
	Send power to distant device	✓	✓	✓	✓	✓	✓	✓	x	x	x	x
	Remote powered through CATx cable	x	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

(1) 10 options by rotary switch: 1 factory preset, 9 user learned preset, transparent

(2) S/PDIF audio output can be used only if the transmitter is a MX-HDMI-TP-OB or MXD-HDMI-TP-OB

Fiber Optic Extenders

Lightware Fiber Optic Extenders are designed to easily overcome distances. We provide DVI, HDMI, universal video, stereo analog and digital audio and control signal extension over extremely long distances of up to 10 kilometers. These extenders are available with VGA, DVI, HDMI and DisplayPort connectors in various design, size and finish.

UMX Series Fiber Optical Transmitter
UMX-OPT-TX150R
Part No: 9151 0020

UMX-OPT-TX150R is a versitale transmitter which provides long distance connectivity for analog and digital audio and video up to a distance of 2500 m. The extender was designed to handle VGA, DVI-I and HDMI 1.3 signals with analog stereo, 5.1 S/PDIF and 7.1 HDMI embedded audio. Analog video signals are converted into digital formats with digital or digitized analog audio becoming embedded in the video stream. The UMX-OPT-TX150R handles HDCP encryption and includes an HDCP enable/disable setting option.

Features:
- Extends VGA, DVI and HDMI 1.3 signals (YCbCr, RGB formats)
- Accepts analog stereo, 5.1 S/PDIF and even 7.1 HDMI embedded audio signals
- Volume, gain and balance control
- Phase invert and DC filter option
- HDCP compliant
- Connectors: DVI-I, HDMI and VGA for video, 2 x TRS for analog, 1x RCA for digital audio
- Autoswitch and autosync function for video and audio inputs with priority
- Auto select function for video and audio inputs
- Audio embedding
- Max fiber cable length of 2500 m (using OM3e type fiber)
- All analog signals are converted to digital formats
- Uncompressed video/audio up to 6.75 Gbps
- Input (video & audio) status LEDs
- Bidirectional RS-232 pass through
- Selectable RS-232 baud rates

Standalone Diagram
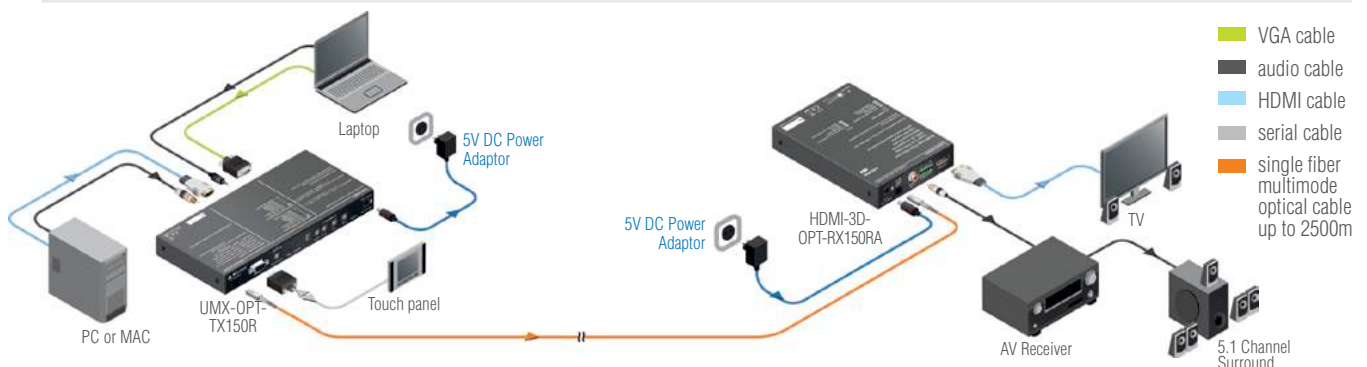
Port Diagram
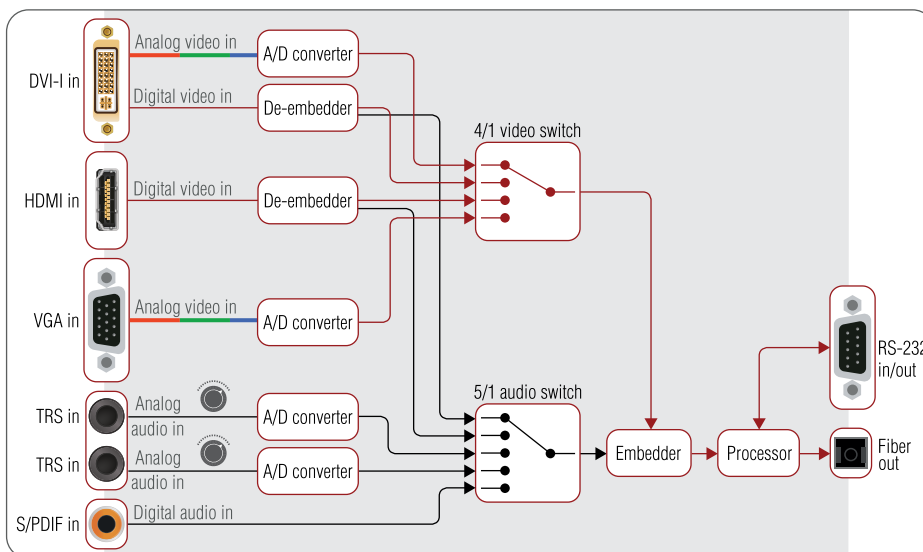
Analog Audio Input

Volume:	-63 - 0 dB
Gain:	0 - 24 dB
Balance:	0 - 100%
Phase invert:	On/Off

Connector-Sized DVI Multimode Fiber Extenders
DVI-OPT-TX110 and DVI-OPT-RX110
Part No: 9151 0001 (TX110), 9151 0002 (RX110)

The DVI-OPT-TX110 and DVI-OPT-RX110 pair is a DVI to fiber transmitter / receiver transmitting up to a 2500 m distance. Using Single Fiber Technology, the DVI-D signal is transmitted over a one multimode 50/125 fiber core. Sources and display devices are galvanically isolated against ground loops and hum effects. The video image is transported without frame latency and signal delay.

Features:
- Extends DVI-D signals with Single Fiber Technology
- 1920 x 1200 or 2048 x 1080 maximal resolutions
- Cross compatibility with Lightware fiber devices*
- Plug & Play
- Zero frame delay – no latency
- No compression
- EDID emulation + 1 factory EDID in TX110
- TX Status LEDs: Accurate power detection, EDID state
- RX Status LEDs: Power, laser detect, hotplug detect
- External universal power adaptor for receiver
- Power supplied through DVI connector for transmitter
- DVI connector sized form factor
- Solid Aluminum housing for professional use
- Recessed (slotted) thumbscrews
- Improved ESD protection
- Improved mechanical stability SC connectors
- Secure snap DC plug
- Restorable factory default EDID
  *See in compatibility table

Professional Multimode Fiber Extenders

DVI-OPT-TX220-Pro, DVI-OPT-RX220-Pro and DVI-OPT-TX220-ST-Pro, DVI-OPT-RX220-ST-Pro

Part No: 9151 0003 (TX220-Pro), 9151 0004 (RX220-Pro) 9151 0005 (TX220-ST-Pro), 9151 0006 (RX220-ST-Pro)

DVI-OPT-TX220-Pro

DVI-OPT-RX220-Pro
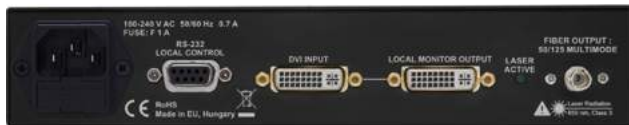
DVI-OPT-TX220-ST-Pro

DVI-OPT-RX220-ST-Pro

Designed for rental and professional use, the Lightware DVI-OPT 220-Pro series extenders can transmit DVI-D signals over multimode fiber cables up to a 2500 m distance. Using Single Fiber Technology the DVI-D signal is transmitted over one multimode 50/125 fiber core. Sources and display devices are galvanically isolated against ground loops and hum effects. The video image is transported without frame latency and delay in the signal. The Neutrik OpticalCON or ST fiber connectors ensure reliable operation in professional environments. The OpticalCON connectors are rugged, dust proof and reliable and are compatible with standard LC connectors.

Features:

- Extends DVI-D signals with Single Fiber Technology
- 1920 x 1200 or 2048 x 1080 maximal resolutions
- Cross compatibility with any Lightware fiber device*
- Zero frame latency - No delay
- No compression
- Neutrik OpticalCON or ST fiber connectors
- Breakout LC connector for Neutrik B channel (not available in -ST version)
- Advanced EDID Management through front panel LCD menu or serial port (-TX220-Pro)
- Improved DVI signal detection circuit
- Firmware upgrade through serial port
- Status LEDs: source, monitor and laser loss detection
- Local monitor buffered loop output at transmitter
- Pixel Accurate Reclocking (-RX220-Pro)
- Two identical DVI-D outputs at receiver
- Alarm output for fiber and DVI link loss (-RX220-Pro)
- Built-in universal power supply
- Remote power option for receiver (only when using Neutrik 2M-4S75 hybrid fiber cable with 2 fibers + 4 copper wires)
- Improved ESD protection
- Rack, truss or furniture mounting accessories
  *See in compatibility table

100 Series HDMI Fiber Optical Extenders

HDMI-OPT-TX/RX100, HDMI-OPT-TX/RX100R

Part No: 9151 0009 (TX100), 9151 0010 (RX100), 9151 0011 (TX100R), 9151 0012 (RX100R),

200 Series HDMI Fiber Optical Extenders

HDMI-OPT-TX200R, HDMI-OPT-RX200R

Part No:9151 0013 (TX200R), 9151 0014 (RX200R)

HDMI-OPT 100 series devices extend HDMI 1.3, DVI 1.0, HDCP and bi-directional RS-232 (optional add-on in „R" versions) signals over one multimode fiber and transmit the video signal with Embedded Audio up to a 2500 m distance. Transmitters feature Lightware Advanced EDID Management with a memory of 100 EDIDs, 50 of which are user programmable. Using the factory, custom or transparent EDID emulation, the user can fix and lock EDID data on the input connector of the transmitter. Pixel Accurate Reclocking is a standard feature in all transmitters and receivers - a Lightware technology to eliminate jitter and skew generated by low quality sources and multiple daisy-chained devices.

Features:

- Single Fiber Technology, SC fiber optical connectors
- Extends DVI or HDMI signals over one multimode fiber core
- HDMI to DVI conversion (when using DVI monitor)
- 1920 x 1200 or 2048 x 1080 maximal resolutions
- HDCP 1.1 compliant
- Pixel Accurate Reclocking
- Zero frame delay – No signal latency
- No compression
- Cross compatibility with any Lightware fiber device*
- Advanced EDID Management in both transmitter and receiver
- Twist and lock DC power plug
- Several status LEDs: source, display, signal, HDCP and laser detection, EDID validity
- Robust metal housing, rack mountable
- Available products: HDMI-OPT-TX100, HDMI-OPT-TX100R, HDMI-OPT-RX100, HDMI-OPT-RX100R
  *See in compatibility table

HDMI-OPT 200 series have all the features of the 100 series but also include an additional local monitor HDMI output to enable easy monitoring of the outgoing signal on the transmitter, and two identical HDMI outputs through a built-in distribution amplifier on the receiver.

These devices also extend HDMI 1.3, DVI 1.0, HDCP and bi-directional RS-232 signals over one multimode fiber and transmit the video signal with Embedded Audio up to a 2500 meter distance. Transmitters feature Lightware Advanced EDID Management with a memory of 100 EDIDs, 50 of which are user programmable. Using the factory, custom or transparent EDID emulation the user can fix and lock EDID data on the transmitter's input connector. Pixel Accurate Reclocking included in all transmitters and receivers - a Lightware technology to eliminate jitter and skew generated by low quality sources and multiple daisy-chained devices.

Features:

- Single Fiber Technology
- SC fiber optical connectors
- Extends DVI or HDMI signals over one multimode fiber core
- HDMI to DVI conversion (when using DVI monitor)
- 1920 x 1200 or 2048 x 1080 maximal resolutions
- RS-232 pass through and remote control over fiber
- HDCP 1.1 compliant
- Pixel Accurate Reclocking
- Zero frame delay – No signal latency
- No compression
- Cross compatibility with any Lightware fiber device*
- Advanced EDID Management in both transmitter and receiver
- Twist and lock DC power plug
- Several status LEDs: source, display, signal, HDCP and laser detection, EDID validity
- Local monitor buffered loop output at transmitter
- Two identical HDMI outputs at receiver
- Robust metal housing, rack mountable
  *See in compatibility table

4K UHD HDMI Multimode Single Fiber Extender **new!**
HDMI-3D-OPT-TX210A, HDMI-3D-OPT-TX210RAK
Available in Q3 2016

Available in Q3 2016

HDMI-3D-OPT-TX210RAK

HDMI-3D-OPT-TX210 extends HDMI 1.4, DVI 1.0, HDCP and bi-directional RS-232* signals over one multimode fiber and transmit video signal with embedded audio to a distance of up to 2500 meters.

The extender was designed to handle HDMI1.4 digital video signal and analog stereo audio from local inputs or HDMI embedded audio up to eight channel PCM or HBR audio. Analog audio is converted into digital format. The device has a local HDMI video output for monitoring. The video and the embedded audio of the local output is the same as the one transmitted via the OPT link. The HDMI-3D-OPT-TX210 handles HDCP encryption.

Using the factory, custom or transparent EDID emulation the user can fix and lock EDID data on each input connector. Advanced EDID Management forces the required resolution from any video source and fixes the output format conforming to the system requirements. The unit offers bi-directional and transparent RS-232*.

All devices can be mounted on a rack shelf or used standalone. HDMI-3D-OPT-TX210 is compatible with most OPT series extenders and matrix switchers.

The device features Pixel Accurate Reclocking, a Lightware technology to eliminate jitter and skew generated by low quality sources and multiple daisy-chained devices.

Single fiber technology makes these units fully HDMI and HDCP compliant without need of a second fiber cable or copper connections. The bi-directional communication required for HDCP handshaking is performed via the same fiber core that transmits the video signal.

Galvanic isolation between source and display helps avoiding ground loops and hum effects. No delay occurs in the signal during optical conversion, the video image is transported without frame latency. This feature is crucial in 3D applications and systems where audio is processed separately.

All devices among the Lightware fiber optical product portfolio are designed to assure cross-compatibility. In a standalone application, HDMI-3D-OPT-TX210A/-RAK and HDMI-3D-OPT-RX150RA can work together flawlessly. To simplify installation and reduce costs, The Lightware hybrid modular matrix concept allows connecting these fiber extenders directly to an MX or a 25G Hybrid matrix router using MX-HDMI-OPT series input or output optical boards (with some limitations).

Applications:
- Rental and staging
- Long distance lossless HDMI or DVI signal transmission
- Ground loop isolation
- Professional AV systems, conference rooms
- High End home cinema
- Yacht installations

Features:
- 4K/UHD (30Hz RGB 4:4:4, 60Hz YCbCr 4:2:0) and 3D capabilities
- Multimode single fiber technology
- USB KVM (HID) extension* **
- Extends HDMI1.4 + Audio + RS-232 over a single multimode fiber
- Single fiber technology
- Local monitor output
- Analog audio embedding from 3.5mm jack or 5-pole balanced Phoenix ports
- RS-232 pass through*
- Control via Ethernet, RS-232 or USB
- Bi-directional RS-232 extension*
- Pixel Accurate Reclocking
- Zero frame latency, no delay
- No compression
- Cross compatibility with Lightware fiber devices
- Active status LEDs: signal, HDCP and link detection
- Twist-to-lock DC power plug
- Rack-mountable with optional accessories
- Advanced EDID Management
- HDCP compliant
- Built-in Event Manager control feature
- CEC

  * RS-232 and KVM extension are available only in RAK version
** KVM function will be added by firmware upgrade

4K UHD HDMI and DisplayPort Switcher and Multimode Fiber Transmitter   new!
SW4-OPT-TX240RAK
Available in Q3 2016

Available in Q3 2016

SW4-OPT-TX240RAK

SW4-OPT-TX240RAK extends HDMI 1.4, DVI 1.0, HDCP and bi-directional RS-232 signals over one multimode fiber and transmit video signal with embedded audio to a distance of up to 2500 meters.

The extender was designed to handle HDMI1.4 and DP1.1 digital video signals and analog stereo audio from local inputs or HDMI embedded audio up to eight channel PCM or HBR audio. Analog audio is converted into digital format. The device has a local HDMI video output for monitoring. The video and the embedded audio of the local output is the same as the one transmitted via the OPT link. SW4-OPT-TX240RAK handles HDCP encryption.

Using the factory, custom or transparent EDID emulation the user can fix and lock EDID data on each input connector. Advanced EDID Management forces the required resolution from any video source and fixes the output format conforming to the system requirements. The unit offers bi-directional and transparent RS-232.

The device can be mounted on a rack shelf or used standalone. SW4-OPT-TX240RAK is compatible with most OPT series extenders and matrix switchers.

The device features Pixel Accurate Reclocking, a Lightware technology to eliminate jitter and skew generated by low quality sources and multiple daisy-chained devices.

Single fiber technology makes these units fully HDMI and HDCP compliant without need of a second fiber cable or copper connections. The bi-directional communication required for HDCP handshaking is performed via the same fiber core that transmits the video signal.

Galvanic isolation between source and display helps avoiding ground loops and hum effects. No delay occurs in the signal during optical conversion, the video image is transported without frame latency. This feature is crucial in 3D applications and systems where audio is processed separately.

Most of the devices among the Lightware OPT series fiber optical product portfolio are designed to assure cross-compatibility. In a standalone application, SW4-OPT-TX240RAK and HDMI-3D-OPT-RX150RA can work together flawlessly. To simplify installation and reduce costs, The Lightware hybrid modular matrix concept allows connecting this fiber extender directly to an MX or a 25G Hybrid matrix router using MX-HDMI-OPT series input or output optical boards (with some limitations).

Applications:
- Long distance lossless HDMI or DVI signal transmission
- Ground loop isolation
- Professional AV systems, conference rooms
- High End home cinema
- Yacht installations

Features:
- 4K/UHD (30Hz RGB 4:4:4, 60Hz YCbCr 4:2:0) and 3D capabilities
- Extends DVI, HDMI or DisplayPort
- Single fiber technology
- USB KVM (HID) extension*
- Local monitor output
- Analog audio embedding from 3.5mm jack or 5-pole balanced Phoenix ports
- RS-232 pass through and remote control over fiber
- Control via Ethernet, RS-232 or USB
- Pixel Accurate Reclocking
- Zero frame latency, no delay
- No compression
- Cross compatibility with Lightware Fiber devices
- Active status LEDs: signal, HDCP and link detection
- Twist-to-lock DC power plug
- Rack-mountable with optional accessories
- Advanced EDID Management
- GPIO control port
- HDCP compliant
- Built-in Event Manager control feature
- CEC

    * KVM function will be added by firmware upgrade

4K UHD HDMI, Audio and Control Multimode Fiber Receiver
HDMI-3D-OPT-RX150RA
Part No: 9151 0015

The HDMI-3D-OPT-RX150RA optical receiver provides extension of uncompressed video and audio with optional HDCP encryption and USB HID over one multimode fiber up to a 2500 m distance. The unit offers a digital and an analog audio output, bi-directional RS-232 pass-through, HDCP compliance and works in all standard AV resolutions.

Features:
- HDMI 1.4 + Keyboard + Mouse fiber extender
- Up to 4K x 2K @30Hz or 1080p @60Hz
- HDCP 1.1 compliant extension over one multimode fiber
- 3D compliant
- 4K resolution can be achieved at lower frame rate (4096 x 2160 @30 Hz)
- Audio output: digital S/PDIF and symmetrical analog audio
- Volume, balance, bass and treble control
- Phase invert and de-emphasis option
- USB HID (Human Interface Device) only
- Bi-directional RS-232 pass-through
- Uncompressed video/audio up to 9 Gbps
- Single Fiber Technology
- Zero frame latency - No delay
- SC optical fiber connector
- Several status LEDs
- USB control
- Rack mounting options
- Locking DC connector

HDMI-3D-OPT-RX150RA Front View

HDMI-3D-OPT-RX150RA Rear View

Port Diagram
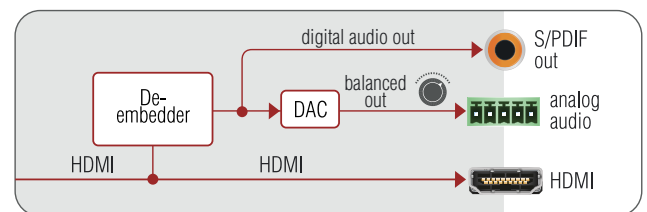
Dual-Link DVI Fiber Extender
DVIDL-OPT-TX200 and DVIDL-OPT-RX100
Part No: 9151 0007 (TX200), 9151 0008 (RX100)

Designed for rental and professional use, the DVIDL-OPT-TX200 and DVIDL-OPT-RX100 extender pair can transmit Dual-Link DVI signals over two multimode fiber cables for up to a 2500 meter distance. Neutrik OpticalCON DUO are compatible with industry standard LC Duplex fiber cables.

Features:
- Extends Dual-Link DVI-D signals over two fibers
- 4096 x 2400 maximal resolution
- Single-Link operation mode with one fiber
- Zero frame latency - No delay
- No compression
- Neutrik OpticalCON fiber connectors
- Advanced EDID Management in transmitter
- USB port for control and firmware upgrade
- Status LEDs: source, signal, monitor and laser loss detection
- Local monitor buffered loop output at transmitter
- TMDS Reclocking in receiver
- Improved ESD protection
- Rack mounting accessories

DVIDL-OTP-RX100

DVIDL-OPT-TX200

DisplayPort Fiber Optical Extender
DP-OPT-TX100 and DP-OPT-RX100
Part No: 9151 0016 (TX100), 9151 0017 (RX100)

Designed for use in both AV and IT applications, this DisplayPort extender pair provides extension up to 4K / UHD (30Hz RGB 4:4:4, 60Hz YCbCr 4:2:0) resolution on long 1100m distances. The world's first Single Fiber DisplayPort extender to extend Dual-mode DisplayPort 1.1a high resolution video and embedded audio, with optional HDCP encryption over one multimode fiber.

Features:
- DisplayPort 1.1a extension over one multimode fiber
- Dual-mode DP: supports DVI and HDMI adaptors
- 4K / UHD (30Hz RGB 4:4:4, 60Hz YCbCr 4:2:0)
- 10.8 Gbps datarate
- HDCP 1.1 compliant extension over one multimode fiber
- Full support of link training
- Compatible with Apple LED Cinema Display and 30" LCD displays
- Single Fiber Technology

Standalone Diagram

DisplayPort mode

DVI / HDMI mode

DP-OPT-TX100

DP-OPT-RX100

DP-OPT-RX100

Laptop with Dual-mode Output

30" DisplayPort monitor

HDMI Projector

- DP cable
- HDMI cable
- single fiber multimode optical cable up to 1100m
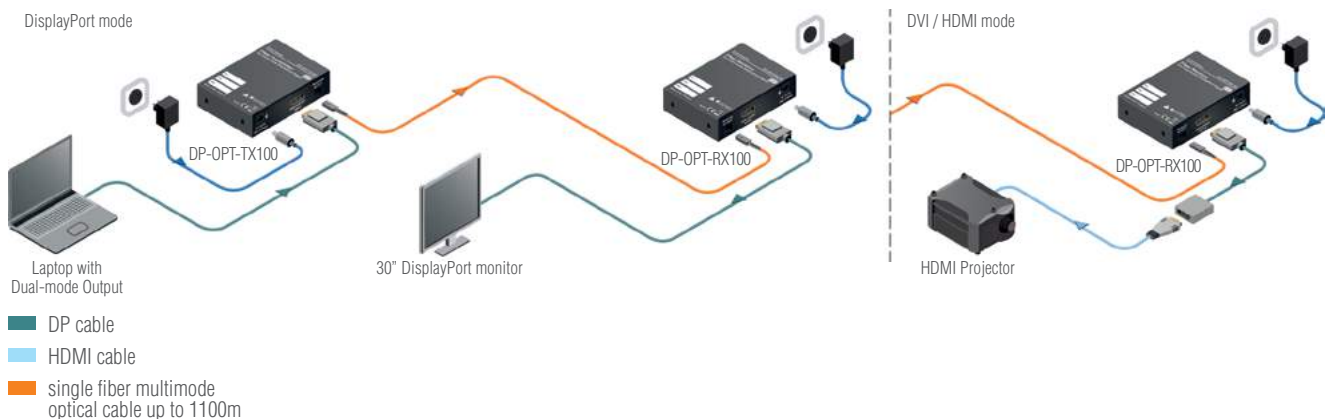
KVM DisplayPort Fiber Optical Extender
DP-OPT-TX150 and DP-OPT-RX150
Part No: 9151 0018 (TX150), 9151 0019 (RX150)
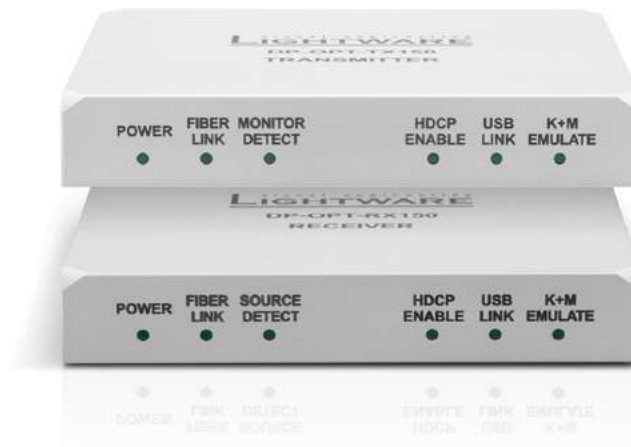
This DisplayPort extender pair available in brushed aluminium, which provides USB-KVM extension for DisplayPort workstation solutions. Lightware DP-OPT-TX150 and DP-OPT-RX150 devices extend Dual-mode DisplayPort 1.1a high resolution video and Embedded Audio with optional HDCP encryption plus USB HID over one multimode fiber up to 1100 m.

Features:
- DisplayPort 1.1a + Keyboard + Mouse fiber extender
- Plug and Play – no drivers required
- Up to UHD and 4096x2400@30Hz pixel resolution
- HDCP 1.1 compliant extension over one multimode fiber
- Compatible with Apple LED Cinema Display
- Support of the latest Mac laptop and desktop computers with Thunderbolt port

DP-OPT-TX150 rear view

DC connector

USB-A connectors for local devices

DisplayPort connector

USB connection towards the computers

DP-OPT-RX150 rear view

USB control

USB-A connectors for extended devices

SC fiber connector

Standalone Diagram

DP cable
HDMI cable
USB
single fiber multimode optical cable up to 1100m

DP-OPT-TX150

DP-OPT-RX150

DVI / HDMI adaptor

Local pendrive

HDMI Projector

Presenter

Wireless Mouse

Wireless keyboard

PC or Mac
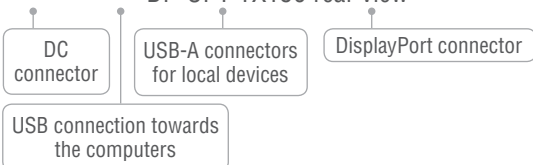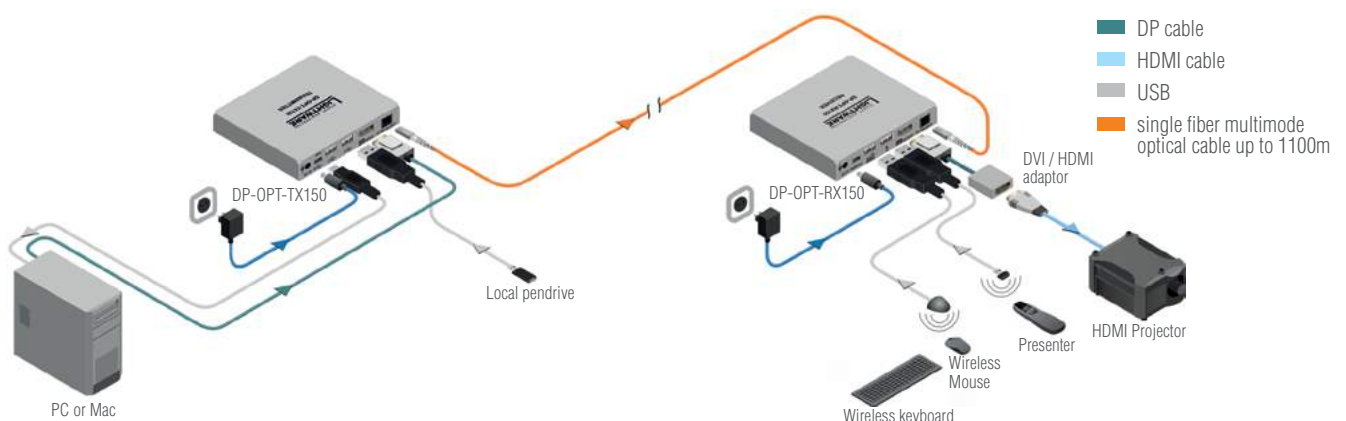
Connector-Sized DVI Extenders with HDCP for Singlemode Fiber
DVI-HDCP-OPTS-TX90 and DVI-HDCP-OPTS-RX90
Part No: 9153 0001 (TX90), 9153 0002 (RX90)

Small form factor Single-mode DVI and HDMI optical extenders provide HDCP compliancy transmitting up to a 10 km distance. Using Single Fiber Technology the DVI signal with HDCP encryption is transmitted over one Single Mode 9/125 fiber. Sources and display devices are galvanically isolated against ground loops and hum effects. The video signal is transported without dealy or frame latency.

Powered by the DVI source the DVI-HDCP-OPTS-TX90 transmitter does not need external power adaptor simplifying system installation. Support EDID pass-through for video source to read the capability of the video display devices.

Most useful in applications where space is a constraining factor, where the connectors are too close and can be reached only from the rear side. Massive solid metal casing provides excellent cooling and maximum reliability.

Features:
- Extends DVI or HDMI signals with Singlemode Fiber Technology
- 1920 x 1200 or 2048 x 1080 maximal resolutions
- Embedded audio
  Supported: uncompressed: PCM, Multichannel PCM
  compressed: DTS, Dolby Digital
  Not supported: Dolby true HD, DTS-HD, DTS-HD Master Audio
- Plug & Play
- Zero frame latency – No delay
- No compression
- EDID transparency
- Pixel Accurate Reclocking
- TX and RX both have Link status LEDs
- Power supply from Micro-B USB cable or DVI source in case
- Power supplied through DVI-D connector for transmitter
- Max fiber cable length of 10 km (using OS1 9/125 Singlemode fiber)
- DVI-D connector sized form factor
- Solid metal housing for professional use
- Recessed (slotted) thumbscrews
- Improved ESD protection
- LC connectors

Connector-Sized DVI Extenders with HDCP for Multimode Fiber
DVI-HDCP-OPTM-TX90 and DVI-HDCP-OPTM-RX90
Part No: 9151 0025 (TX90), 9151 0026 (RX90)

Small form factor Multi Mode DVI and HDMI optical extenders provide HDCP compliancy ttransmitting up to a 300 m distance. Using Multimode Fiber Technology the DVI and HDMI signals with HDCP encryption are transmitted over one Multimode 50/125 fiber core. Sources and display devices both have galvanic isolation to avoid ground loops as well as humming effects. No delays occur in the signal, as the video image is transported without any frame latency. The OPTM-RX90/TX90 extender pair supports EDID pass-through allowing the video source to read the capability of video display devices.

Lightware Pixel Accurate Reclocking provides exceptional signal regeneration capability. The circuitry cleans the signal from noise, skew and jitter which are caused by long cable runs and EMC incompatible devices.

In some applications our OPTM-TX90 transmitters can be optionally powered from DVI source besides being powered by a USB cable. The OPTM-RX90 receivers always need a USB power supply. Recessed thumbscrews allow easy mounting directly to DVI-D sockets by hand, or by using a flatbladed screwdriver. It is very useful in space-saving applications, where the connectors are at closed quarters and can only be reached from the rear side. The massive solid metal casing provides excellent cooling and maximum reliability.

Features:
- Extends DVI or HDMI signals with Single Fiber Technology
- 1920 x 1200 or 2048 x 1080 maximal resolutions
- Embedded audio
  Supported: uncompressed: PCM, Multichannel PCM
  compressed: DTS, Dolby Digital
  Not supported: Dolby true HD, DTS-HD, DTS-HD Master Audio
- Plug & Play
- Zero frame latency – No delay
- No compression
- EDID transparency
- Pixel Accurate Reclocking
- TX and RX both have Link status LEDs
- Power supply from Micro-B USB cable or DVI source in case
- Power supplied through DVI-D connector for transmitter
- Max fiber cable length of 300 m (using OM3e type fiber)
- DVI-D connector sized form factor
- Solid metal housing for professional use
- Recessed (slotted) thumbscrews
- Improved ESD protection
- LC connectors

Neutrik OpticalCON Breakout Box
BR-NT
Part No: 9159 0008

Features:

- Distributes one Neutrik connector's fiber A and fiber B channels to two Neutrik connectors
- Passive two way design, can be used for splitting or combining fibers
- 1/4 rack housing, rack shelf mountable

Passive Optical Splitters
SP2OPT-LC, SP2OPT-NT, SP2OPT-SC, SP2OPT-ST
Part No: 9159 0004 (LC), 9159 0005 (NT), 9159 0006 (SC), 9159 0007 (ST)

SP2OPT distributes one optical signal to two identical outputs. This splitter is available with various connectors: OpticalCON, -LC, -SC, -ST. The Neutrik OpticalCON version works with dual channel cable where both A and B fibers are split.

No power supply is required as the devices have no active electrical parts. This helps minimize system costs as compared to active distribution amplifiers.

Features:

- Splits fiber signal to 2 destinations
- Selectable connectors: Neutrik OpticalCON, -LC, -SC, -ST
- No power required
- ¼ rack width, metal enclosure
- Mounting options for rack, furniture or truss
- Two identical outputs

SP2OPT-LC

SP2OPT-NT

SP2OPT-SC

SP2OPT-ST

Transmitters \ Receivers	Rack and Desk Mount Unit											MX Boards	
	DP-OPT-RX100	DP-OPT-RX150	DVI-OPT-RX110	DVI-HDCP-OPTM-TX90	DVI-HDCP-OPTS-TX90	DVIDL-OPT-RX100	DVI-OPT-RX220-Pro	HDMI-OPT-RX100	HDMI-OPT-RX100R	HDMI-OPT-RX200R	HDMI-3D-OPT-RX150RA	MX-HDMI-OPT-IB	MX-DVI-OPT-IB
DP-OPT-TX100	DP												
DP-OPT-TX150		DP											
DVI-OPT-RX110			D			D	D	D	D	D	D	D	D
DVI-HDCP-OPTM-TX90				H [H]									
DVI-HDCP-OPTS-TX90					H [H]								
DVIDL-OPT-TX200			D			D [D]	D	D	D	D	D	D	D
DVI-OPT-TX220-Pro			D			D	D (Remote power)	D	D	D	D	D	D
HDMI-OPT-TX100			D			D D	D	H [H]	H [H]	H [H]	H [H]	H [H]	D
HDMI-OPT-TX100R			D			D	D	H [H]	H [H]	H [H]	H [H]	H [H]	D
HDMI-OPT-TX200R			D			D	D	H [H]	H [H] R	H [H] R	H [H] R	H [H]	D
UMX-OPT-TX150R			D			D	D	H [H]	H [H] R	H [H] R	H [H] R	H [H]	D
HDMI-3D-OPT-TX210A			D			D	D	H [H]	H [H]	H [H]	H [H]	H [H]	D
HDMI-3D-OPT-TX210RAK			D			D	D	H [H]	H [H] R	H [H] R	H [H] R	H [H]	D
SW4-OPT-TX240RAK			D			D	D	H [H]	H [H] R	H [H] R	H [H] R	H [H]	D
MX-HDMI-OPT-OB			D			D	D	H [H]	H [H]	H [H]	H [H]	H [H]	D
MX-DVI-OPT-OB			D			D	D	D	D	D	D	D	D
MX-DVI-OPT-OB-RCLK			D			D	D	D	D	D	D	D	D

Remote power
No remote power

H HDMI/DVI transmission
D DVI transmission
DP DisplayPort

[H] HDCP compliant
[D] Dual-Link operation

R RS-232 pass-through
– None of the above

Fiber Optic Extension System Comparison Chart

		Rack and Desk Mount Units												MX Boards		
		DVI-OPT-TX110	DVI-OPT-TX220-Pro	DVI-HDCP-OPTS-TX90	DVI-HDCP-OPTM-TX90	DVIDL-OPT-TX200	HDMI-OPT-TX100	HDMI-OPT-TX100R	HDMI-OPT-TX200R	UMX-OPT-TX150R	HDMI-3D-OPT-TX210A	HDMI-3D-OPT-TX210RAK	SW4-OPT-TX240RAK	MX-DVI-OPT-0B	MX-DVI-OPT-0B-RCLK	MX-HDMI-OPT-0B
Main Features	HDCP and HDMI 1.3a compliant	X	X	X	X	X	✓	✓	✓	✓	✓	✓	✓	X	X	✓
	Pixel Accurate Reclocking	X	X	X	X	X	✓	✓	✓	✓	✓	✓	✓	X	✓	X
EDID	Advanced EDID Management	X	✓	X	X	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	✓
Audio	Analog audio embedding	X	X	X	X	X	X	X	X	✓	✓	✓	✓	X	X	X
	S/PDIF audio embedding	X	X	X	X	X	X	X	X	✓	X	X	X	X	X	X
Input Connectors	HDMI input	X	X	X	X	X	✓	✓	✓	✓	✓	✓	✓	n/a	n/a	n/a
	DVI input	✓	✓	✓	✓	✓	X	X	X	✓	X	X	✓	n/a	n/a	n/a
	DP input	X	X	X	X	X	X	X	X	X	X	X	✓	X	X	X
	VGA input	X	X	X	X	X	X	X	X	✓	X	X	X	X	X	X
	Audio input	X	X	X	X	X	X	X	X	✓	✓	✓	✓	X	X	X
	RS-232	X	X	X	X	X	X	✓	✓	✓	X	✓	✓	n/a	n/a	n/a
Output Connectors	Optical connector	SC	NT,LC	LC	LC	NT,LC	SC	SC	SC	SC	SC	SC	SC	LC,SC,ST	Any	Any
	Local: buffered DVI/HDMI output	X	✓	X	X	✓	X	X	X	✓	✓	✓	✓	X	X	X
Misc	Software control	X	✓	X	X	X	X	✓	✓	✓	✓	✓	✓	✓	✓	✓
	USB KVM	X	X	X	X	X	X	X	X	✓	X	✓	✓	X	X	X

		Rack and Desk Mount Units									MX Boards	
		DVI-OPT-RX110	DVI-OPT-RX220-Pro	DVI-HDCP-OPTS-RX90	DVI-HDCP-OPTM-TX90	DVIDL-OPT-RX100	HDMI-OPT-RX100	HDMI-OPT-RX100R	HDMI-OPT-RX200R	HDMI-3D-OPT-RX150RA	MX-DVI-OPT-IB	MX-HDMI-OPT-IB
Main Features	HDCP and HDMI 1.3a compliant	X	X	X	X	X	✓	✓	✓	✓	X	✓
	TMDS Reclocking	X	✓	X	X	✓	✓	✓	✓	✓	X	X
	Pixel Accurate Reclocking	X	✓	X	X	X	✓	✓	✓	✓	X	X
Audio	Analog audio de-embedding	X	X	X	X	X	X	X	X	✓	X	X
	S/PDIF audio de-embedding	X	X	X	X	X	X	X	X	✓	X	X
Input	Optical connector	SC	NT, LC	LC	LC	NT, LC	SC	SC	SC	SC	Any	Any
Output Connectors	HDMI output	X	X	X	X	X	✓	✓	✓	✓	n/a	n/a
	DVI output	✓	✓	✓	✓	✓	X	X	X	X	n/a	n/a
	Dual buffered output	X	✓	X	X	X	X	X	✓	X	n/a	n/a
	Audio output	X	X	X	X	X	X	X	X	✓	X	X
	RS-232	X	X	X	X	X	X	✓	✓	✓	n/a	n/a
Misc	Software control	X	✓	X	X	X	X	✓	✓	✓	✓	✓
	USB-KVM	X	X	X	X	X	X	X	X	X	X	X

Mounting Accessories

Under-Desk (UD) Mounting Kit Part No: 5240 0275

The UD-kit makes easy to mount a single device on any flat surface (e.g. furniture).

Compatible products:

- DA2DVI-DL
- DP-OPT-TX100
- DP-OPT-RX100
- DVI-TP-TX200
- DVI-TP-TX300
- DVI-TP-RX100
- DVI-TP-TX200DL
- DVI-TP-RX100DL
- DVI-HDCP-TPS-TX95

- DVI-HDCP-TPS-RX95
- DVI-HDCP-TPS-TX97
- DVI-HDCP-TPS-RX97
- DVI-HDCP-TP-TX50
- DVI-HDCP-TP-TX100R
- DVI-HDCP-TP-RX50
- DVI-HDCP-TP-RX100R
- HDMI-OPT-TX100
- HDMI-OPT-TX100R

- HDMI-OPT-TX200R
- HDMI-OPT-RX100
- HDMI-OPT-RX100R
- HDMI-OPT-RX200R
- HDMI-3D-OPT-RX150RA
- HDMI-TP-TX50
- HDMI-TP-RX50
- HDMI-TP-TX100R

- HDMI-TP-RX100R
- HDMI-TP-TX200R
- HDMI-TP-RX200R
- HDMI-TP-RX100RA
- HDMI-TPS-TX95
- HDMI-TPS-RX95
- HDMI-TPS-TX97
- HDMI-TPS-RX97

Dimensions with rack mounting ears: 131,4 W x 67,6 D x 27,5 H mm
Dimensions without rack mounting ears: 103,4 W x 67,6 D x 27,5 H mm

---

Under-Desk (UD) Mounting Kit Double Part No: 5240 0276

The UD-kit double makes it easy to mount a single device or multiple devices on any flat surface (e.g. furniture).

Compatible products:

- DA2DVI-DL
- DP-OPT-TX100
- DP-OPT-RX100
- DP-OPT-TX150
- DP-OPT-RX150
- DP-TPS-TX210
- DP-TPS-TX220
- DVI-TP-TX200
- DVI-TP-TX300
- DVI-TP-RX100
- DVI-TP-TX200DL
- DVI-TP-RX100DL

- DVI-HDCP-TP-TX50
- DVI-HDCP-TP-TX100R
- DVI-HDCP-TP-RX50
- DVI-HDCP-TP-RX100R
- DVI-HDCP-TPS-TX210
- DVI-HDCP-TPS-TX220
- DVI-HDCP-TPS-TX95
- DVI-HDCP-TPS-RX95
- HDMI-OPT-TX100
- HDMI-OPT-TX100R
- HDMI-OPT-TX200R
- HDMI-OPT-RX100

- HDMI-OPT-RX100R
- HDMI-OPT-RX200R
- HDMI-3D-OPT-RX150RA
- HDMI-3D-OPT-TX210A
- HDMI-3D-OPT-TX210RAK
- HDMI-TP-TX50
- HDMI-TP-RX50
- HDMI-TP-TX100R
- HDMI-TP-RX100R
- HDMI-TP-TX200R
- HDMI-TP-RX200R
- HDMI-TP-RX100RA
- HDMI-TPS-TX95

- HDMI-TPS-RX95
- HDMI-TPS-TX210
- HDMI-TPS-TX220
- HDMI-TPS-RX110AY
- UMX-OPT-TX150R
- UMX-TP-TX100R
- UMX-TPS-TX120
- UMX-TPS-TX130
- UMX-TPS-TX140
- MMX4X2-HT200
- MMX4X2-HDMI
- SW4-TPS-TX240
- SW4-OPT-TX240RAK

Dimensions with mounting ears: 252 W x 67,6 D x 27,5 H mm
Dimensions without mounting ears: 224 W x 67,6 D x 27,5 H mm

Mounting Bracket Part No: 5240 0274

The mounting bracket makes through-furniture and under-desk mounting easy and allows truss mounting with standards clamps. The bracket can be ordered separately.

Compatible products:

- DVI-OPT-TX220-Pro
- DVI-OPT-RX220-Pro
- DVI-OPT-TX220-ST-Pro
- DVI-OPT-RX220-ST-Pro

Mounting Bracket V2 Part No: 5240 0273

Compatible products:

- MODEX frames
- MMX6x2-HT200
- MMX6x2-HT210
- MMX6x2-HT220

Rack Cover Part No: 5240 0272 (half) 5240 0271 (quarter)
Rack shelf false faceplates in 1/4 and 1/2 RU width

Lightware Rack Cover Half is designed for use with Lightware Rack shelf. Rack covers are available in two versions: Quarter with quarter-width enclosure and Half with half rack width enclosure. Both versions provide additional thermal management and complement rack aesthetics.

Rack cover half dimensions: 221 W x 100 D x 42,2 H mm
Rack cover quarter dimensions: 110 W x 100 D x 42,2 H mm

Rack Shelf Part No: 5240 0935

1U high rack shelf provides mounting holes for fastening two half-rack or four quarter-rack sized units. Pocket sized devices can also be fastened on the self.

Compatible products:

- DA2DVI-DL
- DA2DVI-HDCP-Pro
- DA4-3GSDI
- DP-OPT-TX100
- DP-OPT-RX100
- DP-OPT-TX150
- DP-OPT-RX150
- DP-TPS-TX210
- DP-TPS-TX220
- DVI-HDCP-TPS-TX210
- DVI-HDCP-TPS-TX220
- DVI-OPT-TX220-Pro
- DVI-OPT-RX220-Pro
- DVI-OPT-TX220-ST-Pro
- DVI-OPT-RX220-ST-Pro
- DVI-TP-TX200

- DVI-TP-TX300
- DVI-TP-RX100
- DVI-TP-TX200DL
- DVI-TP-RX100DL
- DVI-HDCP-TP-TX50
- DVI-HDCP-TP-TX100R
- DVI-HDCP-TP-RX50
- DVI-HDCP-TP-RX100R
- DVI-HDCP-TPS-TX95
- DVI-HDCP-TPS-RX95
- DVI-HDCP-TPS-TX97
- DVI-HDCP-TPS-RX97
- DVIDL-OPT-TX200
- DVIDL-OPT-RX100
- HDMI-OPT-TX100
- HDMI-OPT-TX100R

- HDMI-OPT-TX200R
- HDMI-OPT-RX100
- HDMI-OPT-RX100R
- HDMI-OPT-RX200R
- HDMI-3D-OPT-RX150RA
- HDMI-3D-OPT-TX210A
- HDMI-3D-OPT-TX210RAK
- HDMI-TP-TX50
- HDMI-TP-RX50
- HDMI-TP-TX100R
- HDMI-TP-RX100R
- HDMI-TP-TX200R
- HDMI-TP-RX200R
- HDMI-TP-RX100RA
- HDMI-TPS-TX95
- HDMI-TPS-RX95

- HDMI-TPS-TX97
- HDMI-TPS-RX97
- HDMI-TPS-TX210
- HDMI-TPS-TX220
- HDMI-TPS-RX110AY
- MMX4X2-HT200
- MMX4X2-HDMI
- UMX-OPT-TX150R
- UMX-TP-TX100R
- UMX-TPS-TX120
- UMX-TPS-TX130
- UMX-TPS-TX140
- SW4-TPS-TX240
- SW4-OPT-TX240RAK

Dimensions with rack mounting ears: 485 W x 180 D x 44,25 H mm
Dimensions without rack mounting ears: 448 W x 180 D x 44,25 H mm

Power Supply and Accessories

Rack-Mountable Power Supply Units (PSU)
PSUx10-200-12V, PSUx10-200-5V, PSUx20-400-12V, PSUx20-400-5V
Part No: 9134 0001, 9134 0002, 9134 0003, 9134 0004

Power supply is the heart of all electrical devices, the core of any secure and reliable system.

Lightware provides four types of multiple output power supplies. All of them accept 115-230V AC, 47-63Hz housed in a 1U metal rack enclosure for durability and easier mounting. 5V and 12V DC output versions are available with either 10 or 20 separate output connectors, each version is cooled by two fans integrated on the left side of the housing.

These PSUs are designed to power 10 to 20 Lightware products: TP, TPS and OPT extenders, distribution amplifiers and the EDID Manager V4 with 100.000 hours MTBF value. Several protections are built-in against short circuit, overload, over-voltage, and overheating to enhance reliability.

Features:
- Direct 1U rack mount
- Universal full range AC input
- Available with 5V or 12V power outputs
- Available with 10 or 20 output connectors
- 100.000 hours MTBF
- Two cooling fans integrated
- Built-in active PFC function
- High efficiency up to 90% (typical)
- Protections: Short circuit / Overload / Over voltage / Over temperature
- 3 years warranty

Available Cable Types and Compatible Products:

CAB-5V-U16U
Compatible Products:
- EDID Manager V4
- DVISL-Extender
- DVIDL-Extender
- HDMI-Extender
- DA2DVI-HDCP-Pro
- DA2DVI-DL
- DA2HDMI 4K-Plus-A
- DA2HDMI 4K-Plus
- DP-OPT-RX100
- DP-OPT-TX100
- DVIDL-OPT-RX100
- DVIDL-OPT-TX200
- HDMI-OPT-RX100
- HDMI-OPT-TX100
- HDMI-OPT-RX100R
- HDMI-OPT-TX100R
- HDMI-OPT-RX200R
- HDMI-OPT-TX200R
- HDMI-3D-OPT-TX210A
- HDMI-3D-OPT-TX210RAK
- HDMI 4K Manager
- HDMI-4K De-embedder
- UMX-OPT-TX150R
- DVI-TP-RX100
- DVI-TP-RX100DL
- DVI-TP-TX200
- DVI-TP-TX200DL
- DVI-TP-TX300
- SW4-OPT-TX240RAK
- Remote control panels

CAB-5V-U16S
Compatible Products:
- DVI-OPT-RX110
- DVI-OPT-TX110
- DP-OPT-RX150
- DP-OPT-TX150

CAB-5V-U16M
Compatible Products:
- DVI-HDCP-OPTS-RX90
- DVI-HDCP-OPTS-TX90
- DVI-HDCP-OPTM-RX90
- DVI-HDCP-OPTM-TX90

CAB-12V-U16U
Compatible Products:
- BR-TP-COM
- DP-TPS-TX210
- DP-TPS-TX220
- HDMI-TPS-RX95
- HDMI-TPS-TX95
- HDMI-TPS-TX210
- HDMI-TPS-TX220
- HDMI-TPS-TX97
- HDMI-TPS-RX97
- HDMI-TPS-RX110AY
- DVI-HDCP-TPS-TX210
- DVI-HDCP-TPS-TX210
- DVI-HDCP-TP-RX100R
- DVI-HDCP-TP-RX50
- DVI-HDCP-TP-TX100R
- DVI-HDCP-TP-TX50
- DVI-HDCP-TPS-TX97
- DVI-HDCP-TPS-RX97
- HDMI-TP-RX100R
- HDMI-TP-RX100RA
- HDMI-TP-RX200R
- HDMI-TP-RX50
- HDMI-TP-TX100R
- HDMI-TP-TX200R
- HDMI-TP-TX50
- UMX-TP-TX100R
- MMX4x2-HT200
- MMX4x2-HDMI
- SW4-TPS-TX240

Lightware developed several accessories to support mounting products in various environments. This compatibility table shows a summary on product compliance with the mounting accessories.
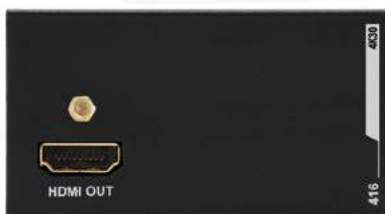
	Product name	Rack shelf	UD-kit double	UD-kit	Mounting bracket
	DA4-3GSDI	✔ (4)	x	x	x
	DA2DVI-HDCP-Pro	✔ (4)	x	x	x
	DA2DVI-DL	✔ (4)	✔ (2)	✔ (1)	x
Twisted pair extenders for DVI signal	DVI-TP-TX200	✔ (4)	✔ (2)	✔ (1)	x
	DVI-TP-TX200DL	✔ (4)	✔ (2)	✔ (1)	x
	DVI-TP-TX300	✔ (4)	✔ (2)	✔ (1)	x
	DVI-TP-RX100	✔ (4)	✔ (2)	✔ (1)	x
	DVI-TP-RX100DL	✔ (4)	✔ (2)	✔ (1)	x
Twisted pair extenders for HDMI signal	DVI-HDCP-TP-TX50	✔ (4)	✔ (2)	✔ (1)	x
	DVI-HDCP-TP-TX100R	✔ (4)	✔ (2)	✔ (1)	x
	DVI-HDCP-TP-RX50	✔ (4)	✔ (2)	✔ (1)	x
	DVI-HDCP-TP-RX100R	✔ (4)	✔ (2)	✔ (1)	x
	HDMI-TP-TX50	✔ (4)	✔ (2)	✔ (1)	x
	HDMI-TP-TX100R	✔ (4)	✔ (2)	✔ (1)	x
	HDMI-TP-TX200R	✔ (4)	✔ (2)	✔ (1)	x
	HDMI-TP-RX50	✔ (4)	✔ (2)	✔ (1)	x
	HDMI-TP-RX100R	✔ (4)	✔ (2)	✔ (1)	x
	HDMI-TP-RX100RA	✔ (4)	✔ (2)	✔ (1)	x
	HDMI-TP-RX200R	✔ (4)	✔ (2)	✔ (1)	x
Twisted pair extenders for universal signal	UMX-TP-TX100R	✔ (2)	✔ (1)	x	x
TPS extenders for DP signal	DP-TPS-TX210	✔ (2)	✔ (1)	x	x
	DP-TPS-TX220	✔ (2)	✔ (1)	x	x
TPS extenders for DVI signal	DVI-HDCP-TPS-TX95	✔ (4)	✔ (2)	✔ (1)	x
	DVI-HDCP-TPS-RX95	✔ (4)	✔ (2)	✔ (1)	x
	DVI-HDCP-TPS-TX210	✔ (2)	✔ (1)	x	x
	DVI-HDCP-TPS-TX220	✔ (2)	✔ (2)	x	x
TPS extenders for HDMI signal	HDMI-TPS-TX95	✔ (4)	✔ (2)	✔ (1)	x
	HDMI-TPS-RX95	✔ (4)	✔ (2)	✔ (1)	x
	HDMI-TPS-TX210	✔ (2)	✔ (1)	x	x
	HDMI-TPS-TX220	✔ (2)	✔ (1)	x	x
	UMX-TPS-TX120	✔ (2)	✔ (1)	x	x
	UMX-TPS-TX130	✔ (2)	✔ (1)	x	x
	UMX-TPS-TX140	✔ (2)	✔ (1)	x	x
	SW4-TPS-TX240	✔ (2)	✔ (1)	x	x
Optical extenders for DVI signal	DVI-OPT-TX110	x	x	x	x
	DVI-OPT-TX220-Pro	✔ (2)	x	x	✔ (1)
	DVI-OPT-TX220-ST-Pro	✔ (2)	x	x	✔ (1)
	DVI-OPT-RX110	x	x	x	x
	DVI-OPT-RX220-Pro	✔ (2)	x	x	✔ (1)
	DVI-OPT-RX220-ST-Pro	✔ (2)	x	x	✔ (1)
	DVI-HDCP-OPTS-TX90	x	x	x	x
	DVI-HDCP-OPTS-RX90	x	x	x	x
	DVI-HDCP-OPTM-TX90	x	x	x	x
	DVI-HDCP-OPTM-RX90	x	x	x	x
	DVIDL-OPT-TX200	✔ (4)	x	x	x
	DVIDL-OPT-RX100	✔ (4)	x	x	x
Optical extenders for HDMI signal	HDMI-OPT-TX100	✔ (4)	✔ (2)	✔ (1)	x
	HDMI-OPT-TX100R	✔ (4)	✔ (2)	✔ (1)	x
	HDMI-OPT-TX200R	✔ (4)	✔ (2)	✔ (1)	x
	HDMI-OPT-RX100	✔ (4)	✔ (2)	✔ (1)	x
	HDMI-OPT-RX100R	✔ (4)	✔ (2)	✔ (1)	x
	HDMI-OPT-RX200R	✔ (4)	✔ (2)	✔ (1)	x
	HDMI-3D-OPT-RX150RA	✔ (4)	✔ (2)	✔ (1)	x
Optical extenders for universal signal	UMX-OPT-TX150R	✔ (2)	✔ (1)	x	x
Optical extenders for DP signal	DP-OPT-TX100	✔ (4)	✔ (2)	✔ (1)	x
	DP-OPT-RX100	✔ (4)	✔ (2)	✔ (1)	x
	DP-OPT-TX150	✔ (4)	✔ (2)	x	x
	DP-OPT-RX150	✔ (4)	✔ (2)	x	x

The number after the ✔ signal shows the number of products that can be mounted in the accessory simultaneously.
Please note Lightware's standalone matrices, modular digital matrix frames and remote control panels are supplied with their own rack mounting ears. Interfaces and wallplate extenders are not compatible with any accessory listed above.

MODEX

Variable Modular Extenders

LOOP OUT   3GSDI IN   LOOP OUT   426

S/PDIF OUT   + L − − R +   ANALOG OUT   720

231

HDMI IN   DVI IN   4K30   410

RS-422   RS-232   714

229

DVI OUT   4K30   436

Ethernet 10/100   726

207

D OUT   422

ERR   SPD   ACT   LINK   ETHERNET   727

234

HDMI OUT   4K30   416

IR OUT   IR IN   RS-232   715

235

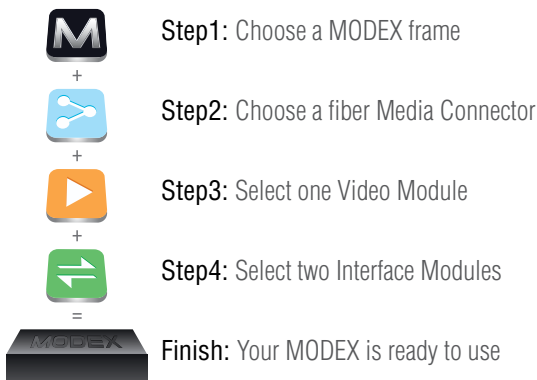## Application-Specific Modular Extenders

MODEX units are the world's fastest and probably the most reliable modular extenders supporting the AV and Broadcast industry formats. MODEX offers a full range of modular transmitters and receivers extending digital and analog video and audio, USB KVM, Ethernet and control signals over a single fiber cable. Customizing a MODEX is really simple:

Step1: Choose a MODEX frame

+

Step2: Choose a fiber Media Connector

+

Step3: Select one Video Module

+

Step4: Select two Interface Modules

=

Finish: Your MODEX is ready to use

The technology built into the MODEX family breaks with many standard limitations, allowing 30 meters DVI cable on input, Advanced EDID Management, Pixel Accurate Reclocking, LAN, RS-232, RS-422 and USB control and more.

The half unit extender allows one Video Module and two Interface Modules (which can be different or identical).

MODEX Front and Rear View

The MODEX frame unit received a thorough hardware and firmware upgrade in Q4 2015. The upgrade improves the cooling system, it has monitoring functions checking voltage and temperature and also separately checking the optical unit temperatures. Remote firmware upgrade via optical link is now also available. The front panel has an additional 10/100 Mbps Ethernet port (with full functionality, but can be used as control interface) and USB KVM connectors (transmitter has one USB-B for the computer; receiver has two USB-A connectors for the keyboard and mouse).

Digital video →
Digital & analog audio ←→
Ethernet ←→
USB KVM ←→
IR & CEC ←→
RS-232 & RS-422 ←→

→ Digital video
←→ Digital & analog audio
←→ Ethernet
←→ USB KVM
←→ IR & CEC
←→ RS-232 & RS-422

MODEX Modular Extenders have their own built-in websites for control. When a MODEX is connected to a controlling computer the user meets the MODEX Graphical User Interface. This GUI allows the user to control all the functions of both MODEX transmitters and receivers in an easy and user friendly way. The GUI is smart and intuitive and is also optimized for tablets. The EDID Manager, Frame Detector and advanced audio settings are also available from the GUI, with setup presets that can be saved and applied quickly any time.

To find out more about the MODEX GUI please read the Quick Start Guide, which has detailed description of the software. The Quick Start Guide is available at: modex.lightware.eu

Video Module

MODEX supports most video formats: DisplayPort 1.1, HDMI 1.4 with 3D, Dual-Link DVI, SDI, and 3G-SDI. The video format conversion is automatic if the two ends have different Modules.
The video&audio Modules are also capable of transmitting audio. External S/PDIF, RCA or the Embedded Audio present in different video signals are accepted as source. Embedding and extracting audio or transmitting in both directions simultaneously are also supported.

Interface Modules

MODEX architecture allows the transmission of a wide variety of auxiliary signal types through the interface Modules. All auxiliary signal types can be simultaneously transmitted at full bandwidth reducing the need for additional extenders and cabling.
Both modex frames have up to two module slots for interface modules, which can be any control signal, audio or Ethernet.

Media Connector

The MODEX range includes a family of long distance transmitters and receivers for sending and receiving video, audio, RS-232 and IR control, USB KVM and Ethernet over a single fiber cable. The Media Connector, the heart of the MODEX determines the signal transportation type and the direction of transport.

OPTS & OPTM Media Connectors

The OPTS and OPTM Media Connectors provide transmission over a one Single Mode (OPTS) or Multi Mode (OPTM) fiber. Most fiber connector types are available to choose the best option for your application such as Neutrik OpticalCON, industrial grade LC ODVA, ST, SC, HF4, EBCM, EBCJ or LEMO. For a cost-effective smart solution Lightware introduced the LC breakout Media Connector which allows the user to connect another MODEX extender with a patch cable at the end point to send signals to two MODEX units over a single Neutric OpticalCON duo cable. There are also two optional power connectors provided – to see the available combinations please check the 'Optional Fiber and Power Connectors' chart.

Optional Fiber and Power Connectors

	Mod. No.	Fiber connector	Power connector	Part number
OPTS (RX/TX)	227	Neutrik OpticalCON DUO	IEC C14 AC	9161 0227
	231	Neutrik OpticalCON DUO	PowerCON AC	9161 0231
	229	LC ODVA	IEC C14 AC	9161 0229
	235	ST	IEC C14 AC	9161 0235
	237	SC	IEC C14 AC	9161 0237
	233	HICON HI-FIBER4	IEC C14 AC	9161 0233
	223	Expanded Beam Mini (HMA)	IEC C14 AC	9161 0223
	207	Expanded Beam Junior (HMA)	IEC C14 AC	9161 0207
	239 (TX)	SMPTE 304M HDTV socket	IEC C14 AC	9161 0239
	240 (RX)	SMPTE 304M HDTV plug	IEC C14 AC	9161 0240
	241	Neutrik OpticalCON DUO and LC	IEC C14 AC	9161 0241
OPTM (RX/TX)	228	Neutrik OpticalCON DUO	IEC C14 AC	9161 0228
	232	Neutrik OpticalCON DUO	PowerCON AC	9161 0232
	230	LC ODVA	IEC C14 AC	9161 0230
	236	ST	IEC C14 AC	9161 0236
	238	SC	IEC C14 AC	9161 0238
	234	HICON HI-FIBER4	IEC C14 AC	9161 0234
	226	Expanded Beam Mini (HMA)	IEC C14 AC	9161 0226
	210	Expanded Beam Junior (HMA)	IEC C14 AC	9161 0210
	242	Neutrik OpticalCON DUO and LC	IEC C14 AC	9161 0242

OPTS: singlemode MODEX Media connector
OPTM: multimode MODEX Media connector

MODEX-CON-OPTS/M-NT

MODEX-CON-OPTS/M-NT-PCN

MODEX-CON-OPTS/M-SC

MODEX-CON-OPTS/M-ST

MODEX-CON-OPTS/M-ODVA

MODEX-CON-OPTS-LEMO

MODEX-CON-OPTS/M-NT-BRK-LC

MODEX-CON-OPTS/M-EBCJ

MODEX-CON-OPTS/M-HF4

4K UHD HDMI Input Module with Monitor Out
MODEX-AV-2HDMI-4K-IM-LH **new!**

Part No: 9161 0443

Features
- DVI 1.0, HDMI1.4 compliant
- Video connectors: 2xHDMI (input), HDMI (output)
- Resolution up to 4K UHD on both inputs and the output
- 3D support
- Deep color support up to 36bpp
- Embedded 7.1 HBR audio support
- HDCP 1.4 compliant
- EDID emulation
- Max cable length: 15m
- Autoselect function

The MODEX-AV-2HDMI-4K-IM-LH is a 4K UHD video module for the MODEX family which has two input connectors and one local output connector. The video from any of the inputs can be sent to the local output connector or to the Media Connector module, or both, in a 2:2 matrix fashion, with some restrictions apply. The audio stream on the local output can be switched to be the same as on the selected input connector, or a different audio stream. Simultaneous 4K video input signals are supported on both input connectors of the MODEX-AV-2HDMI- 4K-IM-LH. The EDID on the inputs can be changed to any type of EDID (factory, user or a dynamic from one of the two outputs). All HDMI connectors support Consumer Electronics Control (CEC). The local output and one input HDMI connector support HDMI1.4 Audio Return Channel (ARC).
A test pattern generator is available on both the local output and the core output. 480p60 and 576p60 resolutions are supported without input video signal; with input video signal the resolution can match the input resolution of the input video. The following patterns are available: solid red, green, blue, black, white, ramp, chessboard and color bar. These patterns can be cycled automatically.

4K UHD HDMI Input Module with Monitor Out
MODEX-AV-5HDMI-4K-IM-LH **new!**

Part No: 9161 0442

Features
- DVI 1.0, HDMI1.4 compliant
- Video connectors: 5xHDMI (input), HDMI (output)
- Resolution up to 4K UHD on both inputs and the output
- 3D support
- Deep color support up to 36bpp
- Embedded 7.1 HBR audio support
- HDCP 1.4 compliant
- EDID emulation
- Max cable length: 15m
- Autoselect function

The MODEX-AV-5HDMI-4K-IM-LH is a 4K UHD video module for the MODEX family including five input connectors and one local output connector. The video from any of the inputs can be sent to the local output connector or to the Media Connector module, or both, in a 5:2 matrix fashion, with some restrictions apply. The audio stream on the local output can be switched to be the same as on the selected input connector, or a different audio stream. The EDID on the inputs can be changed to any type of EDID (factory, user or a dynamic from one of the two outputs). All HDMI connectors support Consumer Electronics Control (CEC). The local output and one input HDMI connector support HDMI1.4 Audio Return Channel (ARC).
A test pattern generator is available on both the local output and the core output. 480p60 and 576p60 resolutions are supported without input video signal; with input video signal the resolution can be the same as the input resolution of the input video. The following patterns are available: solid red, green, blue, black, white, ramp, chessboard and color bar. These patterns can be cycled automatically.

4K UHD HDMI and DVI Input Module
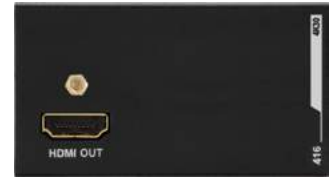MODEX-AV-HDMI-DVI-4K-IM

Part No: 9161 0410

Features
- HDMI 1.4, DVI and HDCP 1.4 compliant
- Resolution up to 3840x2160@30Hz, 1600x1200@60Hz
- Supports any 3D formats

HDMI 1.4 Input Module is a compliant receiver of HDMI 1.4 and DVI signals with HDCP with the resolution up to 4K. The input has 30 m copper cable compensation and the signal can be switched between the HDMI and DVI connector (simultaneously only one can be used). Advanced professional functions such as HDCP enable/ disable mode and Advanced EDID Management functions ensure professional setup and operation.

4K UHD HDMI Output Module
MODEX-AV-HDMI-4K-OM

Part No: 9161 0416

Features
- HDMI 1.4, DVI and HDCP 1.4 compliant
- Resolution up to 3840x2160@30Hz, 1600x1200@60Hz
- Supports any 3D formats

DVI Input Module is a HDCP compliant receiver of HDMI 1.3a and DVI signals. The input has 30m copper cable compensation. Built-in functions such as HDCP enable/ disable mode and Advanced EDID Management ensure professional setup and operation.

4K UHD HDMI and DVI Dual Output Module
MODEX-AV-HDMI-DVI-4K-OM

Part No: 9161 0439

Features
- HDMI 1.4, DVI and HDCP 1.4 compliant
- Resolution up to 3840x2160@30Hz, 1920x1080p@120Hz, 1600x1200@60Hz
- Supports any 3D formats

HDMI 1.4 Output Module is a compliant transmitter of HDMI 1.4 and DVI signals with HDCP with the resolution up to 4K. The same signal can be sent on both the HDMI and DVI connector simultaneously. Advanced professional functions such as HDCP enable/disable mode and Advanced EDID Management functions ensure professional setup and operation.

4K UHD DVI Output Module
MODEX-AV-DVI-4K-OM

Part No: 9161 0436

Features
- HDMI 1.4, DVI and HDCP 1.4 compliant
- Resolution up to 3840x2160@30Hz, 1920x1080p@120Hz, 1600x1200@60Hz
- Supports any 3D formats

This video Output Module with DVI connector can generate HDMI and DVI signal outputs with HDCP compliancy. The module is compatible with deep color formats and features Embedded Audio as well.

HDMI 1.3 and DVI Input Module
MODEX-AV-HDMI-DVI-IM
Part No: 9161 0407

Features
- HDMI 1.3, DVI and HDCP 1.3 compliant
- 36-bit deep color support

HDMI 1.3 Input Module is a HDCP compliant receiver of HDMI 1.3a and DVI signals. The input has 30m copper cable compensation and the signal can be switched between the HDMI and DVI connector (only one can be used at a given time). Built-in functions such as HDCP enable/disable mode and Advanced EDID Management ensure professional setup and operation.

DVI Input Module
MODEX-AV-DVI-IM
Part No: 9161 0433

Features
- HDMI 1.3, DVI and HDCP 1.3 compliant
- 36-bit deep color support

DVI Input Module is a HDCP compliant receiver of HDMI 1.3a and DVI signals. The input has 30m copper cable compensation. Built-in functions such as HDCP enable/ disable mode and Advanced EDID Management ensure professional setup and operation.

HDMI 1.3 Output Module
MODEX-AV-HDMI-OM
Part No: 9161 0413

Features
- HDMI 1.3, DVI and HDCP 1.3 compliant
- 36-bit deep color support

Video Output Module for HDMI 1.3 can generate HDMI and DVI signal outputs with HDCP compliancy. The module is compatible with deep color formats and features Embedded Audio as well.

DVI Output Module
MODEX-AV-DVI-OM
Part No: 9161 0430

Features
- HDMI 1.3, DVI and HDCP 1.3 compliant
- 36-bit deep color support

This video Output Module with DVI connector can generate HDMI and DVI signal outputs with HDCP compliancy. The module is compatible with deep color formats and features Embedded Audio as well.

Dual-Link DVI Input Module
MODEX-AV-DVIDL-IM

Part No: 9161 0401

Features
- Pro series Dual-Link DVI input module
- Resolution up to 2560 x 1600, 1920x1200@120Hz
- HDCP 1.1 compliant
- Advanced EDID Management

Dual-Link DVI Input Module was designed for higher video resolutions up to 2560x1600. It incorporates Advanced EDID Management and HDCP encryption besides Lightware Pro series technologies.

Dual-Link DVI Output Module
MODEX-AV-DVIDL-OM

Part No: 9161 0404

Features
- Pro series Dual-Link DVI output module
- Resolution up to 2560 x 1600, 1920x1200@120Hz

Dual-Link DVI video Output Module supports up to 2560 x 1600 pixel resolution video signals with HDCP 1.3 compliancy. The DVI output can power external peripheral devices on the +5V port with 500 mA max current limit.

3G-SDI Input Module with 2 SDI Loop Out
MODEX-AV-3GSDI-IM

Part No: 9161 0426

Features
- Accepts SD-SDI, HD-SDI and 3G-SDI video signals
- SDI multichannel audio de-embedding
- Auto detects input formats

3G-SDI input accepts SD-SDI, HD-SDI and 3G-SDI video signals with Embedded Audio on BNC connectors. SDI input signals are automatically equalized and reclocked. The module has two loop outputs for further transmission of the input signal.

DisplayPort 1.1 Input Module
MODEX-AV-DP-IM

Part No: 9161 0419

Features
- Accepts DisplayPort 1.1a signals with embedded audio
- Up to 2560 x 1600 pixel resolution
- Audio embedding, de-embedding
- HDCP 1.3 compliant

Input Module for DisplayPort 1.1a video signals extends high resolution video and Embedded Audio. The interface has 10.8 Gbps bandwidth speed and can transmit 2560 x 1600 pixel resolution video with full HDCP support.

DisplayPort 1.1 Output Module
MODEX-AV-DP-OM

Part No: 9161 0422

Features
- Transmits DisplayPort 1.1a signals with embedded audio
- Up to 2560 x 1600 pixel resolution,
- Audio embedding, de-embedding
- HDCP 1.3 compliant
- Compatible with Apple Cinema Display, 27" and 30" LCD displays

The DisplayPort Output Module transmits DisplayPort 1.1a high resolution video and Embedded Audio. The interface has 10.8 Gbps bandwidth speed and can transmit 2560 x 1600 pixel resolution video with full HDCP support.

Ethernet 10/100 Mbit Module
MODEX-IF-ETH
Part No: 9161 0718

Features
■ 10/100 Mbit Ethernet transmission

Ethernet interface module provides an additional 10/100 Ethernet port with full duplex autodetect connection service. Power over Ethernet is not supported but the module can be connected to PoE devices as well.

Ethernet 4x 10/100 Mbit Module
MODEX-IF-4ETH
Part No: 9161 0726

Features
■ Four RJ-45 connectors
■ 10/100 Mbit Ethernet transmission

Four additional 10/100 Ethernet port are available through this Ethernet interface module supporting a full duplex autodetect connection. Power over Ethernet is not supported but the module can be connected to PoE devices as well.

Ethernet 10/100 Mbit Module with EtherCON Connector
MODEX-IF-ETH-ECN
Part No: 9161 0727

Features
■ Durable latch lock Neutric EtherCON connector
■ 10/100 Mbit Ethernet transmission

Additional 10/100 Ethernet port is available through the Ethernet interface module supporting a full duplex autodetect connection. Power over Ethernet is not supported but the module can be connected to PoE devices as well.

RS-232 and 2x Ethernet 10/100 Mbit Module
MODEX-IF-2ETH-RS232
Part No: 9161 0730

Features
■ Two RJ-45 and an RS-232 connectors
■ 10/100 Mbit Ethernet transmission
■ Bidirectional RS-232 for AV device control
■ Configurable RS-232 baud rate

Two additional 10/100 Ethernet ports are available through this Ethernet – RS-232 interface module supporting a full duplex autodetect connection. Power over Ethernet is not supported but the module can be connected to PoE devices as well. Bi-directional RS-232 control signals can be transmitted alongside the video and audio signals, allowing the remote device to be controlled without additional cabling. The RS-232 baud rate can be configured for the need of the system.
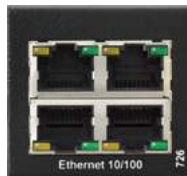
Digital and Analog Audio Input Module
MODEX-IF-AUDIN
Part No: 9161 0719

Features
■ SPDIF 5.1 audio input
■ Balanced analog audio input

Digital and Analog Audio interface module includes an S/PDIF and a balanced stereo input. S/PDIF input supports two-channel stereo and 5.1 digital audio up to 24-bit, 96 kHz. The balanced analog stereo audio can be used in audio breakaway applications. For more flexibility, the module has advanced setting options to customize the input, including gain, volume level control and phase inversion.

Digital and Analog Audio Output Module
MODEX-IF-AUDOUT
Part No: 9161 0720

Features
■ SPDIF 5.1 audio output
■ Balanced analog audio output

Digital and Analog Audio interface module includes an S/PDIF and a balanced stereo input. S/PDIF input supports two-channel stereo and 5.1 digital audio up to 24-bit, 96 kHz. The balanced analog stereo audio can be used in audio breakaway applications. For more flexibility, the module has advanced setting options to customize the input, including gain, volume level control and phase inversion.

Digital and Analog Bi-directional Audio Module
MODEX-IF-AUD
Part No: 9161 0721

Features
■ SPDIF 5.1 audio input and output
■ Balanced analog audio input and output

This Digital and Analog Audio interface module includes input and output with S/PDIF and stereo analog option. S/PDIF input and output supports two-channel stereo and 5.1 digital audio up to 24-bit, 96 kHz. It also offers balanced analog stereo audio that can be used in audio breakaway applications. For more flexibility, the module has advanced setting options to customize the input and output including gain, volume, bass, treble level control and phase inversion.

RS-232 Double Module
MODEX-IF-2xRS232
Part No: 9161 0713

Features
■ Bidirectional RS-232 for AV device control
■ Configurable RS-232 baud rate

Bi-directional RS-232 control signals can be transmitted alongside the video and audio signals with two individual connectors, allowing the remote device to be controlled without additional cabling. The RS-232 baud rate can be configured for system requirements.

RS-232 and IR Module
MODEX-IF-RS232-IR
Part No: 9161 0715

Features
■ Bidirectional RS-232 for AV device control
■ Bidirectional IR control
■ Configurable RS-232 baud rate

Bi-directional RS-232 control and IR signals can be transmitted alongside the video and audio signals, allowing the remote device to be controlled without additional cabling. The RS-232 baud rate can be configured for system requirements.

RS-232 and RS-422 Module
MODEX-IF-RS232-RS422
Part No: 9161 0714

Features
■ Bidirectional RS-232 for AV device control
■ Bidirectional RS-422 control
■ Configurable RS-232/422 baud rate

Bi-directional RS-232 and RS-422 control signals can be transmitted alongside the video and audio signals, allowing the remote device to be controlled without additional cabling. The RS-232 and RS-422 baud rate can be configured for system requirements.

RS-232 Module
MODEX-IF-RS232
Part No: 9161 0712

Features
■ Bidirectional RS-232 for AV device control
■ Configurable RS-232 baud rate

Bi-directional RS-232 control signals can be transmitted alongside the video and audio signals, allowing the remote device to be controlled without additional cabling. The RS-232 baud rate can be configured for system requirements.

RS-422 and 2x Ethernet 10/100 Mbit Module
MODEX-IF-2ETH-RS422

Part No: 9161 0731

Features
- Two RJ-45 and an RS-422 connectors
- 10/100 Mbit Ethernet transmission
- Bidirectional RS-422 for AV device control
- Configurable RS-422 baud rate

Two additional 10/100 Ethernet ports are available through this Ethernet – RS-422 interface module supporting a full duplex autodetect connection. Power over Ethernet is not supported but the module can be connected to PoE devices as well. Bi-directional RS-422 control signals can be transmitted alongside the video and audio signals, allowing the remote device to be controlled without additional cabling. The RS-422 baud rate can be configured for the need of the system.
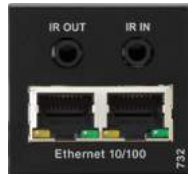
IR and 2x Ethernet 10/100 Mbit Module
MODEX-IF-2ETH-IR

Part No: 9161 0732

Features
- Two RJ-45 and an IR
- 10/100 Mbit Ethernet transmission
- IR for AV device control

Two additional 10/100 Ethernet ports are available through this Ethernet – IR interface module supporting a full duplex autodetect connection. Power over Ethernet is not supported but the module can be connected to PoE devices as well. IR control signals can be transmitted alongside the video and audio signals, allowing the remote device to be controlled without additional cabling.

25G HYBRID
signal management

Video Has Never Travelled So Fast

25G Hybrid by Lightware: Complex Signal Management at Incredible Speed

25G Hybrid is a comprehensive line of digital matrix switchers, transmitters and receivers, which enhances switching with a powerful suite of diagnostic software tools. A true technology for the digital age, delivering a superior user experience.

Incredible speed - no video router ever built before is able to carry signals so fast.

MultiLayer Switching for the flexibility and freedom of independent signal switching per Media Layer.

Advanced audio functions with 3 different audio Layers: Embedded Audio, Forward Audio and Return audio.

Control signal management including RS-232, Ethernet, KVM and IR.

The data rate of the 25G Hybrid allows transferring and switching all existing standard video format, establishing a reliable and future-proof platform for all signal management purposes. It is the world's first fully compatible HDMI and DisplayPort matrix switcher that also provides ARC functions, supports 4K resolutions and full 3D formats. 25G Hybrid offers MultiLayer Switching, where signals are handled on eight, separate Media Layers. Inside a 25G Hybrid router there are as many Media Layers as signal types, which are managed by a router each. Media Layers, in a sense, add a third dimension to switching inputs and outputs.

Advanced GUI

25G Hybrid matrices have a built-in front panel touch screen capable of showing the 25G control software with full control options. Unit information, crosspoint setup and switching, EDID Management, User & Room Management, maintenance, troubleshooting and every other tool is available on the front panel display.

The control interface for these routers has been designed to accomplish 3 main principles:

- **Simplicity.** Crosspoint switching has never been easier. By pressing the buttons on the touchscreen interface you can perform multiple switches. The colors and icons are very informative with meaningful details.
- **Seamless control.** Straightforward control interface for all of the inputs and outputs on all 8 Layers.
- **Exceptional diagnostics.** Maintain the strong diagnostic features already provided by present in Lightware architectures, such as Advanced EDID Management, Input Signal Analysis and the Frame Detector.

Room Management

As the maximal crosspoint area in the 25G Hybrid routers is a large switching plane, we have introduced 'Room Management'. All the user-created virtual rooms can be programmed with their own sources and destinations, but can also share some resources if required. If, for example, you want to prohibit an operator in one room from accidentally making switches in another, the maximal crosspoint area can be divided into smaller virtual matrices called 'rooms'.

User Access

For security, a user password can be set to access system control.

Reliability

The components used in this technology are industrial grade and typically designed for the telecom industry. All printed circuit boards are gold plated in order to achieve reliable and stable hardware performance. This technique results in better soldering and contact performance and eliminates corrosion problems caused by salt and humidity in naval military environments.

All boards that contain active electronic components are hot swappable. The front load design makes it easy to replace failed components. All fans and Power supplies can also be replaced in a simple movement.

The 25G matrix routers are designed for 24/7 operations and optional redundant CPU and Power supplies can be also added for further reliability.

The 25G CPU stores the settings of all boards and send backups for the second CPU. If the first CPU fails the second takes over automatically with the same settings. With the redundant power supplies N+1 and N+2 redundancies can be reached.

Configuration

The 25G Hybrid routers have three main components. To configure the best 25G solution for a particular application you need to choose a frame, need to find out what Media Layers you will use for your application and then populate the selected frame with the input and output boards. The main point of this structure is that you only need to pay for what you need and won't have extra unused functions.

FRAMES

The first step is to choose the right frame. The largest 25G frame handles 160 input and 160 output ports, this frame is also available with the same functionality but with fewer ports as well in sizes 120x120, 128x128, 144x144, 160x80 or 80x160. The smaller 25G frame has 80 inputs and 80 outputs.
CPU and power redundancy are available for the 25G matrices for a high level of security: it is possible to add a second redundant CPU and more redundant power supplies as well.

25G Hybrid Matrix Frame

25G-FR160x160 / 25G-FR144x144 / 25G-FR128x128
25G-FR120x120 / 25G-FR160x80 / 25G-FR80x160
Part No: 9121 0001 (FR160x160), 9121 0025 (FR144x144), 9121 0026 (FR128x128)
          9121 0002 (FR120x120), 9121 0003 (FR160x80), 9121 0004 (FR80x160)

The 25G-FR160x160 Frame handles up to 160 input and 160 output ports, making this frame one of the largest on the market. This frame manages signals on eight different Layers which creates a three-dimensional signal management structure.

The 25G frames can transmit video signals up to 4K resolution, support all 3D formats, handle forward, transmit USB-KVM, Ethernet, bi-directional RS-232/RS-422, IR and CEC signals. The intuitive graphical user interface offers easy and user-friendly control accessing all available features. Advanced EDID Management is included in the frame which is also HDCP compliant.

Changing the configuration is easy and quick, as all boards are hot swappable: the system can work 24/7 without delays. In case of a malfunction, it can easily be fixed without switching the matrix off. Redundant power supplies, CPU board and monitoring board are also available for this frame for fail safe operation in mission critical applications.

This frame can be configured with 120x120, 128x128, 144x144, 80x160 and 160x80 crosspoints. Software upgrade for these frames is available in case the user wants to raise the capacity up to 160x160.

Features:

■ Multilayer signal management – signal switching in 3 dimensions
■ 160x160, 120x120, 144x144, 128x128, 80x160, 160x80 video crosspoint versions
■ 42 rack units high metal chassis
■ Independent switching of audio and video
■ USB KVM extension
■ Built-in 320 port 100 Mbit Ethernet switch with 1 gigabit uplink
■ Dual redundant CPU processor boards for fail safe operation
■ Hot swappable components
■ RS-232 / RS-422 bidirectional transmission and control
■ IR and CEC transmission
■ Intuitive GUI interface for easy handling of all functions
■ Room Management
■ Front panel touch screen
■ Advanced error handling and logging with time code
■ Combine non-HDCP and HDCP capable I/O boards in the same frame
■ TCP/IP Ethernet control (multiple connections)
■ Advanced EDID Management
■ HDCP compliant
■ Redundant power supplies – 24/7 secure operation
■ Supports former LW protocols
■ Barco Encore and Vista Spyder compatible
■ Hybrid Modular technology

25G Hybrid 80x80 Crosspoint Matrix Frame
25G-FR80x80
Part No: 9121 0010

The 25G-FR80x80 frame handles 80 input and 80 output ports and manages the signals on eight different Layers resulting in a three-dimensional switching structure.

The 25G frames can transmit video signals up to 4K resolution, support all 3D formats, handle forward and return audio, transmit USB-KVM, Ethernet, bi-directional RS-232/RS-422, IR and CEC signals. The audio signals of the Forward and Return Audio Layers run through the same crosspoint which allows the user to switch Return Audio Signals to the Forward Audio Layer and vica-versa.

The intuitive graphical user interface offers easy and user-friendly control accessing all available features. Advanced EDID Management is included in the frame which is also HDCP compliant.

Changing the configuration is easy and quick, as each board are hot swappable: the system can work 24/7 without delays. In case of a malfunction, it can easily be fixed without switching the matrix off. Redundant power supplies, CPU board and monitoring board are also available for this frame for fail safe operation in mission critical applications.

Features:
- Multilayer signal management – signal switching in 3 dimensions
- 80x80 video crosspoints
- 29 rack units high metal chassis
- Independent switching of audio and video
- Same crosspoint for the Forward and Return audio layers
- USB KVM extension
- Built-in 160 port 100 Mbit Ethernet switch with 1 gigabit uplink
- Dual redundant CPU processor boards for fail safe operation
- Hot swappable components
- RS-232 / RS-422 bidirectional transmission and control
- IR and CEC transmission
- Intuitive GUI interface for easy handling of all functions
- Room Management
- Front panel touch screen
- Advanced error handling and logging with time code
- Combine non-HDCP and HDCP capable I/O boards in the same frame
- TCP/IP Ethernet control (multiple connections)
- Advanced EDID Management
- HDCP compliant
- Redundant power supplies – 24/7 secure operation
- Supports former LW protocols
- Barco Encore and Vista Spyder compatible
- Hybrid Modular technology

Second CPU for Redundancy
25G-CPUB1
Part No: 9121 0005

Features:
- Configuration of all other boards
- Controller connection (LAN, RS-232)
- LW3, LW2 protocol
- Advanced logging
- Redundant – hot swappable

The CPU board, which controls the whole system, can be doubled in the frames. In this case the first CPU is actively operating while the second is a "hot spare". If the main CPU fails, the second takes over the control instantly and reports the failure of the previous one.
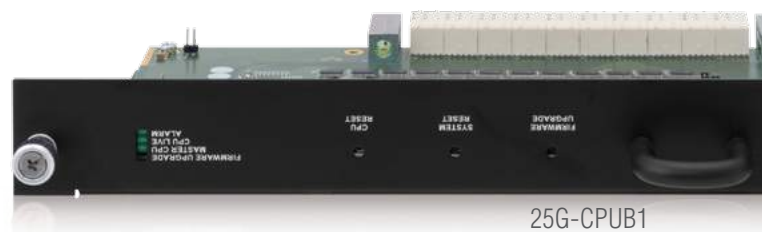
25G-CPUB1

Additional Power Supply for Redundancy
25G-PSU-1600 (1200)
Part No: 9121 0006

Features:
- Up to N+2 redundancy
- 24/7 operation

Power supplies are arranged for N+1 or N+2 redundancy. Depending on the configuration, one or even two power lines can fail while the system remains active. In addition, our approach to power supplies is to ensure that the load never exceeds 60% of their maximum rated output level. These two features will go a long way to providing a robust system capable of 24/7 operation in even the harshest environments.

MEDIA LAYERS

The second step of building a configuration is to find out which Layers the application requires. The Video Layer with the Embedded Audio is always included in the frame by default. If an application requires more Layers you canselect from the seven Media Layer options. Selecting the Layers means deciding what type of signals the 25G router will have to handle.

Video Layer with Embedded Audio
included in the frame by default

Features:
- Up to 160 inputs and 160 outputs
- 3D formats supported
- Featured video signals: VGA (input only), Single-Link DVI, Dual-Link DVI, HDMI 1.4, 3G-SDI (input only), DisplayPort 1.1

The Video layer comprises of up to 160 video inputs and 160 video outputs.

The video could be analog VGA, Interlaced Composite Video, DVI, Dual-Link DVI, HDMI1.4 with 3D, SDI, 3G-SDI and/or DisplayPort 1.1. No matter which video format you input, the pixels will be extended and switched by the 25G Hybrid router. Users can mix various video standards and any input signal can be switched to any output display.

The 25G Hybrid architecture has 3 different audio layers: Embedded Audio, Forward Audio and a Return Audio. The embedded audio lies within the 25G video layer itself, carrying up to 8 high definition audio channels. This audio is always routed with the video and runs from source to display.

Forward Audio Layer
25G-LAYER-FWD-160, 25G-LAYER-FWD-80
Part No: 9121 0008 (160), 9121 0016 (80)

Features:
- A fully separate audio channel
- Supports Stereo PCM, 5.1 Dolby Digital, 5.1 DTS audio formats

The Forward Audio channel is a second independent S/PDIF audio stream not related to the Embedded Audio. A separate S/PDIF matrix switch manages Stereo PCM, 5.1 Dolby Digital and DTS

Examples

- You have a set-top box that outputs the HDMI video and audio. The same set-top box outputs the audio with a different language on it's S/PDIF audio output. This box is connected to the 25G Hybrid network. Different customers can listen to the same content in different languages in different rooms.
- A media server is connected to the 25G Hybrid network inside the server room along with CD players and other equipment. The LCD displays are located in the demonstration rooms. On a certain display the picture may come from the media server, but the sound from the CD player.

Return Audio Layer
25G-LAYER-RET-80
Part No: 9121 0022

Features:
- A fully separate audio channel routed the opposite way to the Forward Audio Layer
- Supports Stereo PCM, 5.1 Dolby Digital, 5.1 DTS audio formats

Return Audio Layer creates the ability to send two different multichannel audio streams, one from source to display and another, return channel in the opposite direction.

Audio Return Channel (ARC) was introduced by the HDMI 1.4.standard. This S/PDIF signal is sent in the opposite direction to the video signals. Usually displays send ARC to source devices - typically TV sound to audio receivers, or microphone sound from headsets to computers.

Examples

When using microphones in a KVM environment, the operator has an LCD display, 5.1 speakers, Keyboard, Mouse and a microphone. The microphone audio signal from his headset is sent in the opposite direction to the video and the embedded audio.

Ethernet Layer
25G-LAYER-ETH-160, 25G-LAYER-ETH-80
Part No: 9121 0015 (160), 9121 0017 (80)

Features:
- 1 Gigabit uplink
- 100 Mbit connection for all matrix I/O ports
- Ethernet extension over TPS cable and OPTS/OPTM fiber
- Layer 2 Ethernet switch

All built-in 100 Mbit Ethernet ports can be used for controlling devices such as projectors and media players or can provide Ethernet access for all connected devices from a 1 Gigabit uplink. Ethernet, as with every other Layer, can be extended over a single fiber or single CAT cable. The VLAN function also allows the user to set up Virtual Networks inside the 320 port domain.

25G Hybrid matrix architecture is the world's first fully compatible HDMI1.4 matrix switcher that provides HEC and ARC functions, supports 4K resolutions and 3D formats.

USB KVM Layer
25G-LAYER-USB-KVM-160
25G-LAYER-USB-KVM-80
Part No: 9121 0014 (160), 9121 0021 (80)

Features:
- 2 USB HID devices per 25G I/O port
- Keyboard combinations for matrix control
- USB HUB can be connected to the outputs (Keyboard, Mouse, Smart Card)
- Point to point connections

With the USB KVM option, users can utilize the 25G Hybrid signal management for KVM matrix purposes. Up to 160 computers can be controlled by up to 160 operators. 25G allows point to point control. This method allows multiple operators to control one single computer or one operator to control multiple computers.

Special key command can also be implemented in the 25G Hybrid routers. It is possible to control the matrix from any connected keyboard connected with these commands.

IR Layer
25G-LAYER-IR-160, 25G-LAYER-IR-80
Part No: 9121 0011 (160), 9121 0018 (80)

Features:
- Full transparent platform
- Bidirectional transmission
- Point to point, point to multipoint connection and switching

Infrared is commonly used for remote control based applications. This Media Layer helps maintain the structure of the overall AV system. Third party control systems may send IR control commands to endpoints turning them on and off or switching their inputs.

CEC
Consumer Electronics Control Layer
25G-LAYER-CEC-160, 25G-LAYER-CEC-80
Part No: 9121 0013 (160), 9121 0020 (80)

Features:
- Point to point, point to multipoint connection and switching
- Full transparent platform
- Command injections
- CEC device discovery

Consumer Electronics Control (CEC) is also commonly used for remote control based applications like IR. Third party control systems can also send CEC control commands to endpoints turning them on and off or switching their inputs. CEC was introduced by HDMI standard, and is a bi-directional CEC channel.

We can link sources and destinations via CEC communication while the router itself can initiate its own commands for example:
„SYSTEM ON" or „STANDBY" commands.

RS-232
RS-232 & RS-422 Control Layer
25G-LAYER-RS232-160
25G-LAYER-RS232-80
Part No: 9121 0012 (160), 9121 0019 (80)

Features:
- Full transparent platform
- Bidirectional transmission
- Configurable baud rates per port (any user specified)
- Input baud rate could be different from output baud rate
- Standards: 9600, 14400, 19200, 38400, 57600, 115200

Full duplex bi-directional, more robust and more reliable than IR, RS‑232 and RS-422 have become the standard control media for professional AV systems. The 25G Hybrid architecture is a fully transparent platform for RS-232 and RS-422 control signals. Ports can be linked together or handled separately, allowing any third-party control systems to be connected.

INPUT AND OUTPUT BOARDS

When we have selected the frame and we picked the layers the third step is to populate the matrix with the Input and Output boards. The following 25G boards are already available for order and the number of them is also continuously growing with new developments. Some of the MX series boards are available for the 25G matrices too.

4K DVI-D Input Board
25G-8DVID2-IB series
Part No: 9122 0019

25G-8DVID2-IB

25G-8DVID2-IB provides fully transparent HDMI 1.4 connectivity to the latest high-end digital sources including 3D functions between the endpoints. Supports resolution up to 4096x2160@30Hz in 4:4:4 mode or 3840x2160@60Hz in 4:2:0 mode. The new 300MHz board supports the latest 3D formats as well as HD multichannel audio. 25G 8DVID2 IB has eight DVI D connectors. Each input has 30m input cable equalization and individual EDID Management.

25G 8DVID2 IB handles embedded audio in the HDMI signal and can de embed 2-channel LPCM and various IEC 61937 audio streams from it to the Forward Audio Layer. Embedding of such streams from the Return Audio Layer to the HDMI signal is also supported. All audio options of the DVI D input board are software configurable on a per port basis.

Features:
- HDMI 1.4, DVI and HDCP 1.4 compliant
- 8 DVI-D input connectors
- Resolutions up to 4k / UHD (30Hz RGB or YCbCr 4:4:4)
- 3D signal support
- 36-bit Deep Color support
- Static EDID emulation with EDIDs from the Advanced EDID Management system
- Available video test patterns
- Pass-through of HDMI 1.4 embedded uncompressed LPCM audio and compressed audio (AAC, ATRAC, DTS, DTS ES, DTS-HD, Dolby Digital, Dolby Digital EX, Dolby Digital Plus, Dolby Digital Surround EX, Dolby Digital TrueHD, DST, MPEG1 Layer 1, MPEG1 Layer2, MPEG1 Layer 3, MPEG2, WMA Pro)
- Embedding or de-embedding of two-channel LPCM, Dolby Digital, Dolby Digital EX, Dolby Digital Plus, Dolby Digital Surround EX, DTS, DTS ES
- Pixel Accurate Reclocking
- 30m input cable equalization at 1080p60Hz on all inputs

25G-8DVID2-K2-IB

4K DVI-D Input Board with KVM
25G-8DVID2-K2-IB
Part No: 9122 0058

Additional Features:
- Handles two USB 2.0 HID devices per port
- USB-B connector per port with integrated USB HUB
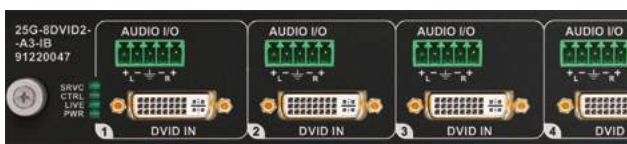

25G-8DVID2-A2-IB

4K DVI-D Input Board with Digital Audio
25G-8DVID2-A2-IB
Part No: 9122 0048

Additional Features:
- Bi-directional S/PDIF breakout for every port

25G-8DVID2-A3-IB

4K DVI-D Input Board with Analog Audio
25G-8DVID2-A3-IB
Part No: 9122 0047

Additional Features:
- Bi-directional, configurable analog stereo ports with 5-pole Phoenix connector

25G-8DVID2-A2K2-IB

4K DVI-D Input Board with Digital Audio and KVM
25G-8DVID2-A2K2-IB
Part No: 9122 0059

Additional Features:
- Bi-directional S/PDIF breakout for every port
- USB-B connector per port with integrated USB HUB

25G-8DVID2-A3K2-IB

4K DVI-D Input Board with Analog Audio and KVM
25G-8DVID2-A3K2-IB
Part No: 9122 0060

Additional Features:
- Bi-directional, configurable analog stereo ports with 5-pole Phoenix connector
- USB-B connector per port with integrated USB HUB

4K HDMI Input Board
25G-8HDMI2-IB
Part No: 9122 0057

25G-8HDMI2-IB

25G-8HDMI2-IB provides fully transparent HDMI 1.4 connectivity to the latest high-end digital sources including Audio Return Channel and 3D functions between the endpoints. Supports resolution up to 4096x2160@30Hz in 4:4:4 mode or 3840x2160@60Hz in 4:2:0 mode. The new 300MHz board supports the latest 3D formats as well as HD multichannel audio.

25G-8HDMI2-IB has eight HDMI connectors. Each input has 30m input cable equalization and an individual EDID Management.

25G 8HDMI2 IB handles embedded audio in the HDMI signal and can de embed 2-channel LPCM and various IEC 61937 audio streams from it to the Forward Audio Layer. Embedding of such audio streams from the Return Audio Layer to the HDMI signal is also supported. All audio options of the HDMI input board are software-configurable on a per port basis.

Features:
- HDMI 1.4 and HDCP 1.4 compliant
- Resolutions up to 4k / UHD (30Hz RGB or YCbCr 4:4:4)
- 3D signal support
- 36-bit Deep Color support
- Available video test patterns
- Static EDID emulation with EDIDs from the Advanced EDID Management system
- Pass-through of HDMI 1.4 embedded uncompressed LPCM audio and compressed audio (AAC, ATRAC, DTS, DTS ES, DTS-HD, Dolby Digital, Dolby Digital EX, Dolby Digital Plus, Dolby Digital Surround EX, Dolby Digital TrueHD, DST, MPEG1 Layer 1, MPEG1 Layer2, MPEG1 Layer 3, MPEG2, WMA Pro)
- Embedding or de-embedding of 2-channel LPCM, Dolby Digital, Dolby Digital EX, Dolby Digital Plus, Dolby Digital Surround EX, DTS, DTS ES
- Pixel Accurate Reclocking
- 30m input cable equalization at 1080p 60Hz on all inputs
- Audio Return Channel support
- CEC support

HDBaseT™ and the HDBaseT Alliance logo are trademarks of the HDBaseT Alliance

25G-8HDMI-K2-IB

4K HDMI Input Board with KVM
25G 8HDMI2-K2 IB
Part No: 9122 0064

Additional Features:
- Handles two USB 2.0 HID devices per port
- USB-B connector per port with integrated USB HUB

25G-8HDMI-A2-IB

4K HDMI Input Board with Digital Audio
25G-8HDMI2-A2-IB
Part No: 9122 0028

Additional Features:
- S/PDIF breakout for every port

25G-8HDMI-A3-IB

4K HDMI Input Board with Analog Audio
25G-8HDMI2-A3-IB
Part No: 9122 0029

Additional Features:
- Bi-directional, configurable analog stereo ports with 5-pole Phoenix connector

25G-8HDMI-A2K2-IB

4K HDMI Input Board with Digital Audio and KVM
25G-8HDMI2-A2K2-IB
Part No: 9122 0065

Additional Features:
- Handles two USB 2.0 HID devices per port
- S/PDIF breakout for every port

25G-8HDMI-A3K2-IB

4K HDMI Input Board with Analog Audio and KVM
25G-8HDMI2-A3K2-IB
Part No: 9122 0066

Additional Features:
- Bi-directional, configurable analog stereo port with 5-pole Phoenix connector
- Handles two USB 2.0 HID devices per port

LIGHTWARE
visual engineering

4K TPS Input Board with PoE Option new!
25G-8TPS2-IB
Part No: 9122 0067

HDBT

25G-8TPS2-IB

Featuring eight HDBaseT™ input ports, the board is compatible with the full range of Lightware TPS extenders and HDBaseT compliant third party transmitters. The HDBaseT technology provides a transparent medium for all video, audio, data and control signals in line with the 25G multilayer architecture and allows for a cost effective extension solution for up to 160 meters.

25G-8TPS2-IB handles embedded audio in the HDMI substream of the HDBaseT signal and can de-embed 2-channel LPCM and various IEC 61937 audio formats from it to the Forward Audio Layer. Embedding of such audio streams from the Return Audio Layer to the HDMI signal is also supported. All audio options of the TPS2 input board are software-configurable on a per-port basis.

Features:
- Resolutions up to 4k / UHD (30Hz RGB or YCbCr 4:4:4)
- Pass-through of 4:2:0 3840x2160@60 Hz video input
- Support for HDMI 1.4 embedded uncompressed LPCM audio or compressed high bitrate audio (LPCM, AC-3, MPEG1 Layer 1, MPEG1 Layer2, MPEG1 Layer 3, MPEG2, AAC, DTS, ATRAC, Dolby Digital+, DTS-HD, Dolby Digital TrueHD, DST, and WMA Pro, Dolby Digital EX, Dolby Digital Surround EX)
- De-embedding of IEC 60958-1 (only stereo LPCM), and IEC 61937 (only AC-3, Dolby Digital Plus, Dolby Digital EX, Dolby Digital Surround EX, DTS, DTS ES)
- Video test pattern generation
- Cable length and link quality estimation
- Frame detector functionality with frame rate, color space, pixel clock rate, and active and total area detection
- HDCP 1.4 support
- Deep color support for up to 36 bpp
- Automatic Ethernet only mode support when an Ethernet only device is connected
- Extension for up to 160 meters over CAT6a or CAT7 depending on the video clock used

25G-8TPS2-P1-IB

4K TPS Input Board with Remote Powering
25G-8TPS2-P1-IB
Part No: 9122 0070

Additional Features:
- Remote powering according to IEEE 802.3af-2003 with increased output power

25G-8TPS2-A2-IB

4K TPS Input Board with Digital Audio
25G-8TPS2-A2-IB
Part No: 9122 0068

Additional Features:
- Bi-directional S/PDIF breakout for every port

25G-8TPS2-A3-IB

4K TPS Input Board with Analog Audio
25G-8TPS2-A3-IB
Part No: 9122 0069

Additional Features:
- Bi-directional, configurable analog stereo ports with 5-pole Phoenix connector

25G-8TPS2-A2P1-IB

4K TPS Input Board with Digital Audio and Remote Powering
25G-8TPS2-A2P1-IB
Part No: 9122 0071

Additional Features:
- Bi-directional S/PDIF breakout for every port
- Remote powering according to IEEE 802.3af-2003 with increased output power

25G-8TPS2-A3P1-IB

4K TPS Input Board with Analog Audio and Remote Powering
25G-8TPS2-A3P1-IB
Part No: 9122 0072

Additional Features:
- Bi-directional, configurable analog stereo ports with 5-pole Phoenix connector
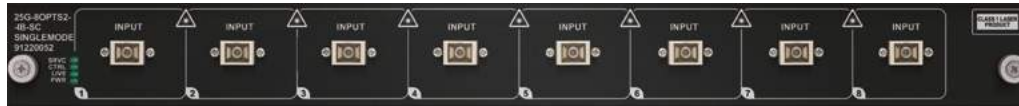- Remote powering according to IEEE 802.3af-2003 with increased output power

4K Singlemode Optical Input Board
25G-8OPTS2-IB- LC, -SC, -ST, -NT
Part No: 9122 0049 (NT), 9122 0050 (LC), 9122 0051 (ST) 9122 0052 (SC)

25G-8OPTS2-IB-NT

25G-8OPTS2-IB-SC

25G-8OPTS2-IB-LC

25G-8OPTS2-IB-ST

25G-8OPTS2-IB-LC, -SC, -ST, -NT is a new 4K compatible fiber optical input board for the 25G router family and available with a variety of fiber optical connectors like LC, SC, ST or Neutrik OpticalCON. These optical boards can extend up to 10.000m distance with singlemode fiber technology. The OPTS technology provides a transparent medium for all existing video, audio and control signal formats according to the 25G multilayer architecture (Video, Audio, Ethernet, USB KVM, RS-232, IR and CEC transmission), and allows the extension from MODEX transmitter units.

Supported Maximum Resolutions at the Input Board

Resolution	Bit Depth	Color Space
1080p@50/60Hz	24-36 bit	RGB/YUV 4:4:4
1080p@120Hz	24 bit	YUV 4:2:2
3840x2160@24Hz	24 bit	YUV 4:2:2
3840x2160@30Hz	24 bit	YUV 4:2:2
3840x2160@50/60Hz	Not supported	

Features:
- Up to 10km extension distance
- Video and audio transmission
- Ethernet, USB KVM, RS-232, IR, CEC transmission
- Extension from MODEX transmitters
- Resolutions up to 4K x 2K @ 30Hz,
  2560 x 1440 (WQXGA) @ 60 Hz YCbCr 4:2:2
- Deep color support up to 1920 x 1080 @ 36 bit, 60 Hz

4K Multimode Optical Input Board
25G-8OPTM2-IB- LC, -SC, -ST, -NT
Part No: 9122 0045 (NT), 9122 0053 (ST), 9122 0054 (LC), 9122 0055 (LC)

25G-8OPTM2-IB-NT

25G-8OPTM2-IB-SC

25G-8OPTM2-IB-LC

25G-8OPTM2-IB-ST

25G-OPTM2-IB-LC, -SC, -ST, -NT is a 4K compatible fiber optical input board for the 25G matrix family and available with a variety of fiber optical connectors like LC, SC, ST or Neutrik OpticalCON. These optical boards can extend up to a 300m distance with Multimode fiber technology. The OPTM technology provides a transparent medium for video, audio, Ethernet, USB KVM, RS-232, IR and CEC data according to the 25G multilayer architecture, and allows the extension from MODEX transmitter units.

Features:
- Resolutions up to 4k / UHD (30Hz YCbCr 4:2:2)
- Up to 300m extension distance
- Video and audio transmission
- Ethernet, USB KVM, RS-232, IR, CEC transmission
- Extension from MODEX transmitters
- 3D signal support
- 36-bit Deep Color support for up to 1080p@ 60 Hz

Supported Maximum Resolutions at the Input Board

Resolution	Bit Depth	Color Space
1080p@50/60Hz	24-36 bit	RGB/YUV 4:4:4
1080p@120Hz	24 bit	YUV 4:2:2
3840x2160@24Hz	24 bit	YUV 4:2:2
3840x2160@30Hz	24 bit	YUV 4:2:2
3840x2160@50/60Hz	Not supported	

4K DVI-D Output Board
25G-8DVID2-OB
Part No: 9123 0013

25G-8DVID2-OB

25G-8DVID2-OB provides fully transparent HDMI 1.4 connectivity to the latest high-end digital sources including 3D functions between the endpoints. Supports resolution up to 4096x2160@30Hz. The new 300 MHz board supports the latest 3D formats as well as HD multichannel audio. Each output has 30m copper cable compensation at 1080p60Hz on all outputs and individual EDID Management.

25G-DVID2-OB handles Embedded Audio in the HDMI signal, which can be the Embedded Audio with the video (25G Video Layer) or can be embedded in the HDMI signal from the Forward Audio Layer.

Features:
- HDMI 1.4, DVI and HDCP 1.4 compliant
- Resolutions up to 4k / UHD (30Hz RGB or YCbCr 4:4:4)
- 3D signal support
- 36-bit Deep Color support
- Submission of EDID information read from the sink to the Advanced EDID Management system
- Available video test patterns
- Pass-through of HDMI 1.4 embedded uncompressed LPCM audio and compressed audio (AAC, ATRAC, DTS, DTS ES, DTS-HD, Dolby Digital, Dolby Digital EX, Dolby Digital Plus, Dolby Digital Surround EX, Dolby Digital TrueHD, DST, MPEG1 Layer 1, MPEG1 Layer2, MPEG1 Layer 3, MPEG2, WMA Pro)
- Embedding or de-embedding of two-channel LPCM, Dolby Digital, Dolby Digital EX, Dolby Digital Plus, Dolby Digital Surround EX, DTS, DTS ES
- Standard compliant output

25G-8DVID2-A2-OB

4K DVI-D Output Board with Digital Audio
25G-8DVID2-A2-OB
Part No: 9123 0034

Additional Features:
- Bi-directional S/PDIF breakout for every port

25G-8DVID2-A3-OB

4K DVI-D Output Board with Analog Audio
25G-8DVID2-A3-OB
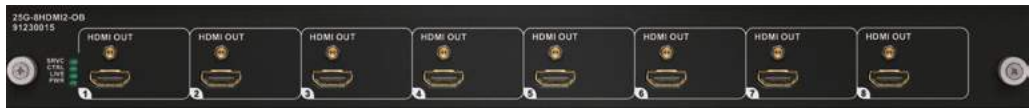Part No: 9123 0033

Additional Features:
- Bi-directional, configurable analog stereo ports with 5-pole Phoenix connector

4K HDMI Output Board
25G-8HDMI2-OB
Part No: 9123 0044

25G-8HDMI2-OB

25G-8DVID2-OB provides fully transparent HDMI 1.4 connectivity to the latest high-end digital sources including 3D functions between the endpoints. Supports resolution up to 4096x2160@30Hz. The new 300 MHz board supports the latest 3D formats as well as HD multichannel audio. Each output has 30m copper cable compensation at 1080p60Hz on all outputs and individual EDID Management.

25G-DVID2-OB handles Embedded Audio in the HDMI signal, which can be the Embedded Audio with the video (25G Video Layer) or can be embedded in the HDMI signal from the Forward Audio Layer.

Features:
- HDMI 1.4, DVI and HDCP 1.4 compliant
- Resolutions up to 4k / UHD (30Hz RGB or YCbCr 4:4:4)
- 3D signal support
- 36-bit Deep Color support
- Submission of EDID information read from the sink to the Advanced EDID Management system
- Available video test patterns
- Pass-through of HDMI 1.4 embedded uncompressed LPCM audio and compressed audio (AAC, ATRAC, DTS, DTS ES, DTS-HD, Dolby Digital, Dolby Digital EX, Dolby Digital Plus, Dolby Digital Surround EX, Dolby Digital TrueHD, DST, MPEG1 Layer 1, MPEG1 Layer2, MPEG1 Layer 3, MPEG2, WMA Pro)
- Embedding or de-embedding of two-channel LPCM, Dolby Digital, Dolby Digital EX, Dolby Digital Plus, Dolby Digital Surround EX, DTS, DTS ES
- Standard compliant output

25G-8HDMI2-A2-OB

4K HDMI Output Board with Digital Audio
25G-8HDMI2-A2-OB
Part No: 9123 0016

Additional Features:
- Bi-directional S/PDIF breakout for every port

25G-8HDMI2-A3-OB

4K HDMI Output Board with Analog Audio
25G-8HDMI2-A3-OB
Part No: 9123 0017

Additional Features:
- Bi-directional, configurable analog stereo ports with 5-pole Phoenix connector

4K TPS Output Board with PoE Option
25G-8TPS2-OB
Part No: 9123 0045

new!

25G-8TPS2-OB

Featuring eight HDBaseT™ output ports, the board is compatible with the full range of Lightware TPS extenders and HDBaseT compliant 3rd party transmitters. The HDBaseT technology provides a transparent medium for all video, audio, data and control signals in line with the 25G multilayer architecture and allows for a cost effective extension solution for up to 160 meters.

25G-8TPS2-OB can de-embed 2-channel LPCM and various IEC 61937 audio formats from the HDMI substream of the HDBaseT signal to the Return Audio Layer. It can also embed such audio streams from the Forward Audio Layer to the output HDBaseT signal.

The audio options of the TPS2 output board are software-configurable on a per-port basis.

Features:
- Resolutions up to 4k / UHD (30Hz RGB or YCbCr 4:4:4)
- Pass through of 4:2:0 3840x2160@60 Hz video
- Support for HDMI 1.4 embedded uncompressed LPCM audio or compressed high bitrate audio (LPCM, AC 3, MPEG1 Layer 1, MPEG1 Layer2, MPEG1 Layer 3, MPEG2, AAC, DTS, ATRAC, Dolby Digital+, DTS HD, Dolby Digital TrueHD, DST, and WMA Pro, Dolby Digital EX, Dolby Digital Surround EX)
- De-embedding of IEC 60958 1 (only stereo LPCM), and IEC 61937 (only AC 3, Dolby Digital Plus, Dolby Digital EX, Dolby Digital Surround EX, DTS, DTS ES)
- Video test pattern generation
- Cable length and link quality estimation
- Frame detector functionality with frame rate, color space, pixel clock rate, and active and total area detection
- HDCP 1.4 support
- Deep color support for up to 36 bpp
- Automatic Ethernet only mode support when an Ethernet only device is connected
- Extension for up to 160 meters over CAT6a or CAT7 depending on the video clock used

HDBaseT™ and the HDBaseT Alliance logo are trademarks of the HDBaseT Alliance

25G-8TPS2-P1-OB

4K TPS Output Board with Remote Powering
25G-8TPS2-P1-OB
Part No: 9123 0048

Additional Features:
- Remote powering according to IEEE 802.3af-2003 with increased output power

25G-8TPS2-A2-OB

4K TPS Output Board with Digital Audio
25G-8TPS2-A2-OB
Part No: 9123 0046

Additional Features:
- Bi-directional S/PDIF breakout for every port

25G-8TPS2-A3-OB

4K TPS Output Board with Analog Audio
25G-8TPS2-A3-OB
Part No: 9123 0047

Additional Features:
- Bi-directional, configurable analog stereo ports with 5-pole Phoenix connector

25G-8TPS2-A2P1-OB

4K TPS Output Board with Digital Audio and Remote Powering
25G-8TPS2-A2P1-OB
Part No: 9123 0049

Additional Features:
- Bi-directional S/PDIF breakout for every port
- Remote powering according to IEEE 802.3af-2003 with increased output power

25G-8TPS2-A3P1-OB

4K TPS Output Board with Analog Audio and Remote Powering
25G-8TPS2-A3P1-OB
Part No: 9123 0050

Additional Features:
- Bi-directional, configurable analog stereo ports with 5-pole Phoenix connector
- Remote powering according to IEEE 802.3af-2003 with increased output power
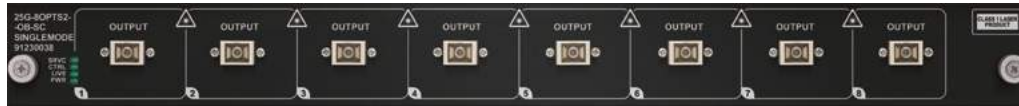
4K Singlemode Optical Output Board
25G-8OPTS2-OB- LC, -SC, -ST, -NT
Part No: 9123 0035 (NT), 9123 0036 (LC), 9123 0037 (ST), 9123 0038 (SC)

25G-8OPTS2-OB-NT

25G-8OPTS2-OB-SC

25G-8OPTS2-OB-LC

25G-8OPTS2-OB-ST

25G-8OPTS2-OB-LC, -SC, -ST, -NT is a 4K compatible fiber optical output board for the 25G matrix family available with LC, SC, ST or Neutrik OpticalCON. type fiber optical connectors. These optical boards can extend up to a 10,000m distance using singlemode fiber technology. The OPTS technology provides a transparent medium for video, audio, Ethernet, USB KVM, RS-232, IR and CEC data according to the 25G multilayer architecture and allows the extension to MODEX receiver units.

Features:
- Resolutions up to 4k / UHD (30Hz YCbCr 4:2:2)
- Up to 10km extension distance
- Video and audio transmission
- Ethernet, USB KVM, RS-232, IR, CEC transmission
- Extension to MODEX receivers
- 3D signal support
- 36-bit Deep Color support for up to 1080p60

Supported Maximum Resolutions at the Output Board

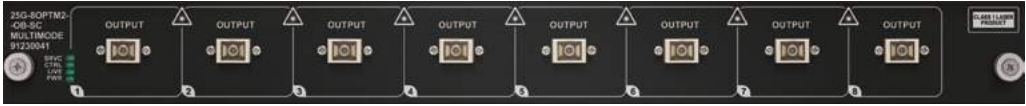| Resolution	Bit Depth	Color Space
1080p@50/60Hz	24-36 bit	RGB/YUV 4:4:4
1080p@120Hz	24 bit	YUV 4:2:2
3840x2160@24Hz	24 bit	YUV 4:2:2
3840x2160@30Hz	24 bit	YUV 4:2:2
3840x2160@50/60Hz	Not supported	

4K Compatible Multimode Optical Output Board
25G-8OPTM2-OB- LC, -SC, -ST, -NT
Part No: 9123 0031 (NT), 9123 0041 (SC), 9123 0039 (ST) 9123 0040 (LC)

25G-8OPTM2-OB-NT

25G-8OPTM2-OB-SC

25G-8OPTM2-IB-LC

25G-8OPTM2-IB-ST

25G-OPTM2-OB-LC, -SC, -ST, -NT is a 4K compatible fiber optical output board for the 25G matrix family and available with a variety of fiber optical connectors: LC, SC, ST or Neutrik OpticalCON. These optical boards can extend up to a 300m distance with Multimode fiber technology. The OPTM technology provides a transparent medium for video, audio, Ethernet, USB KVM, RS-232, IR and CEC data according to the 25G multilayer architecture. It also allows extension to MODEX receiver units.

Features:
- Resolutions up to 4k / UHD (30Hz YCbCr 4:2:2)
- Up to 300m extension distance
- Video and audio transmission
- Ethernet, USB KVM, RS-232, IR, CEC transmission
- Extension to MODEX receivers
- 3D signal support
- 36-bit Deep Color support for up to 1080p@60Hz

Supported Maximum Resolutions at the Output Board

Resolution	Bit Depth	Color Space
1080p@50/60Hz	24-36 bit	RGB/YUV 4:4:4
1080p@120Hz	24 bit	YUV 4:2:2
3840x2160@24Hz	24 bit	YUV 4:2:2
3840x2160@30Hz	24 bit	YUV 4:2:2
3840x2160@50/60Hz	Not supported	

There are six main types of 25G compatible boards available at request, please enquire at a Lightware sales or distributor office. The available 25G MX boards are the following:

25G-MX-3GSDI-IB	25G MX 3GSDI Input Board
25G-MX-DVII-HDCP-IB	25G MX DVII HDCP Input Board
25G-MX-DVI-OPT-IB-LC-NT-SC-ST	25G MX DVI Optical Input Board
25G-MX-HDMI-OPT-IB-LC-NT-SC-ST	25G MX HDMI Optical Input Board
25G-MX-DVI-OPT-OB-LC-SC-ST	25G MX DVI Optical Output Board
25G-MX-HDMI-OPT-OB-LC-NT-SC-ST	25G MX HDMI Optical Output Board

VISUAL ENGINEERING
LIGHTWARE

Lightware Headquarters
Peterdy 15, Budapest H-1071, Hungary
Tel: +36 1 255 3800
sales@lightware.eu
support@lightware.eu
www.lightware.eu

Lightware Visual Engineering Asia
Unit A, 9/F, Hang Seng Ctr. 95-97 Tung Chau Street Tai Kok Tsui, Kowloon, Hong Kong
Tel: + 852 3678 9951
sales.asia@lightware.eu
www.lightware.asia

Lightware Visual Engineering Australia
Unit 18, Leighton Industrial area, 22 Leighton Place, Hornsby, Sydney, NSW, 2077
Tel : +(02) 9476 8850
Mob : +61 437 307 577
sales.anz@lightware.eu
support.anz@lightware.eu
www.lightware.com.au

Lightware Visual Engineering Canada
103 Ontario St.,Georgetown,
Ontario, Canada L7G 3L2
Tel: +416 818 6418
sales.ca@lightware.eu
www.lightware.eu

Lightware Visual Engineering India
No-1AAC-214, G Floor, East of NGEF Layout, Kasturinagar, Bangalore - 560043, India
Tel: +91 9663 652058
sales.india@lightware.asia
www.lightware.asia

Lightware Visual Engineering Italy
Via Mons. Bagnoli, 49 67051 Avezzano (AQ)
Tel: +39 086 3186 0437
Mob: +39 392 281 9135
adriano.dalessio@lightware.eu
www.lightware.eu

Lightware Visual Engineering Middle East
P.O. Box 410595, Techno Point 223, Silicon Oasis, Dubai, UAE
Tel: +9714 3336072
Mob: +971 50 2449964
sales.me@lightware.eu
www.lightware.eu

Lightware Visual Engineering Netherlands BV
Tel: +31 35 631 3295
sales.nl@lightware.eu
www.lightware.eu

Lightware Visual Engineering USA
40 Engelwood Drive Suite C, Lake Orion, MI 48359 USA
Tel: +1 888 587 5587 ext 108
Mob: +(702) 673–8831
sales@lightwareusa.com
www.lightwareusa.com

Lightware Visual Engineering UK
Dunley Hill Court, Ranmore, Dorking, Surrey, RH5 6SX
Tel: +44(0) 1483 28 13 10
Mob: +44(0) 7879 991 889
sales.uk@lightware.eu
www.lightware.eu