# PRODUCT LINE 2018

visual engineering
LIGHTWARE

# FULL 4K 60Hz @ 4:4:4

Full 4K 60Hz @ 4:4:4 | Audio Embedding and De-embedding | HDR | Front-to-Back Cooling

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MX2-8×8-HDMI20-Audio

# PRODUCT LINE 2018

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## 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.

| | |
|---|---|
| 2017 | UBEX - Ultra Bandwidth Latency-free video Over IP for 4K/UHD 60Hz 4:4:4 |
| 2016 | Full 4K/UHD 8x8 HDMI 2.0 Matrix |
| 2015 | MMX6x2-HT Matrix Series with Built-in Control Solution |
| 2014 | World's First 80×80 25G HDMI 1.4 Compliant Matrix (ISE 2014) |
| 2013 | 4K Live Demo (InfoComm USA 2013) |
| 2012 | World's First 160×160 25G HDMI 1.4 Compliant Matrix (ISE 2012) |
| 2011 | World's First DisplayPort Over Fiber Extender |
| 2010 | World's First 80×80 DVI & HDMI Matrix |
| 2007 | World's First 32×32 DVI & HDMI Matrix |
| 2006 | Invented EDID Manager<br>World's first 8×8 DVI Matrix |

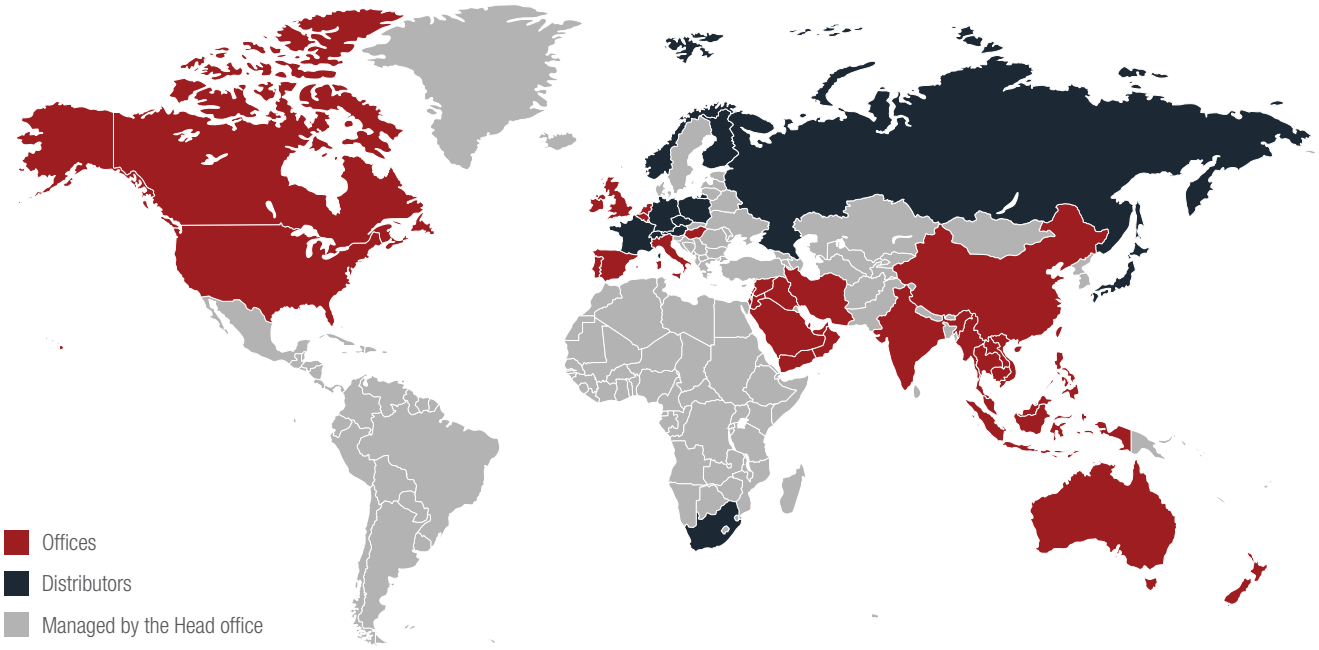
**High Fidelity Signal Management.** All Lightware products utilize pixel by pixel signal transmission between endpoints. The lack of latency and compression ensures that the signal keep its original quality. This is achieved by employing such proprietary Lightware technologies as Pixel Accurate Reclocking 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, Middle East and in North America 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.



# TECHNOLOGIES

## LIGHTWARE RESEARCH AND DEVELOPMENT


24/7
1101
1010
0101
2500M
@1080p
60Hz
7
YEARS
WARRANTY
EVENT
MANAGER
PoE
ADVANCED
GUI

## 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.

## 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 Compliancy

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.

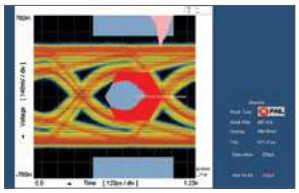
HDCP enabling/disabling function turns off HDCP capability on individual input ports while keeping other inputs HDCP compliant. Some computers choose to encrypt their output even when unprotected content is displayed, such as desktop images or presentations. This function forces the source to send an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

## Single Fiber Technology

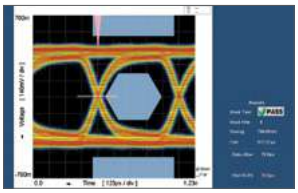
Single Fiber Technology is one of the main features of our OPT, OPTS, OPTM and OPTC fiber optical extenders. This technology allows sending several signals over one optical fiber core. All the bi-directional communication - necessary for HDCP handshaking or the control commands - is performed via the 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 among devices 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

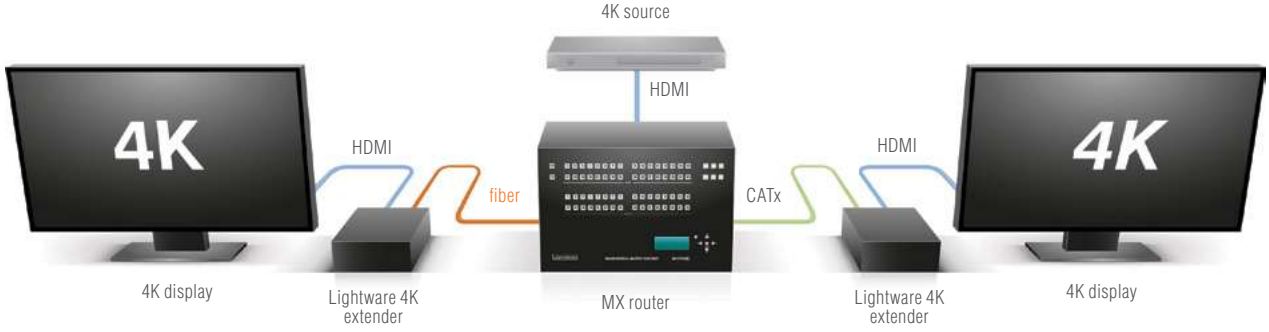
DVI, HDMI or SDI input ports have built-in cable equalizers in the Modular Matrix Switchers. The cable equalizer can be used in manual or automatic adaptive mode and extends the cable length on inputs as the actual signal format requires. Using a 22AWG high quality DVI or HDMI cable, the inputs are automatically 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.

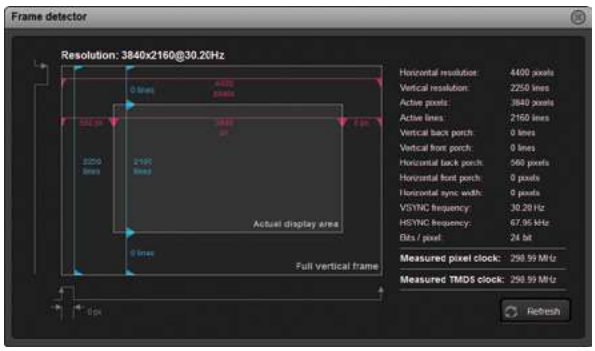
## 4K UHD

The MX series Hybrid Modular and the 25G HYBRID matrix switchers support 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 matrix switchers as far end points. Some of our latest matrix switchers and forthcoming extenders already support Full 4K / UHD at 60Hz with 4:4:4 colorspace.



## Frame Detector and Input Signal Analysis

Available in Lightware matrix switchers and certain extenders, 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.

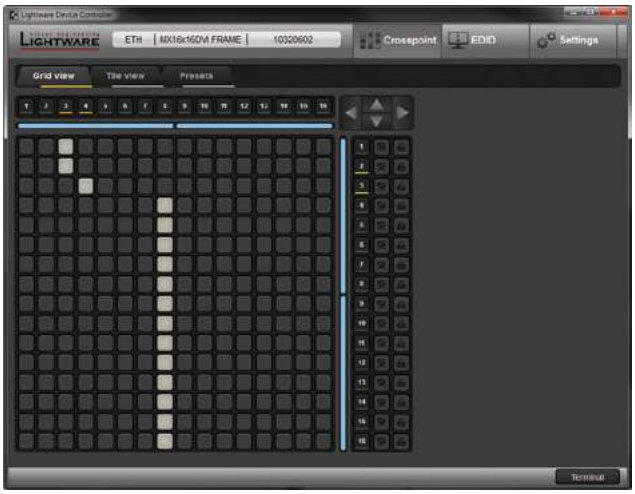



Frame Detector

## 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.

## Reliability and Redundancy

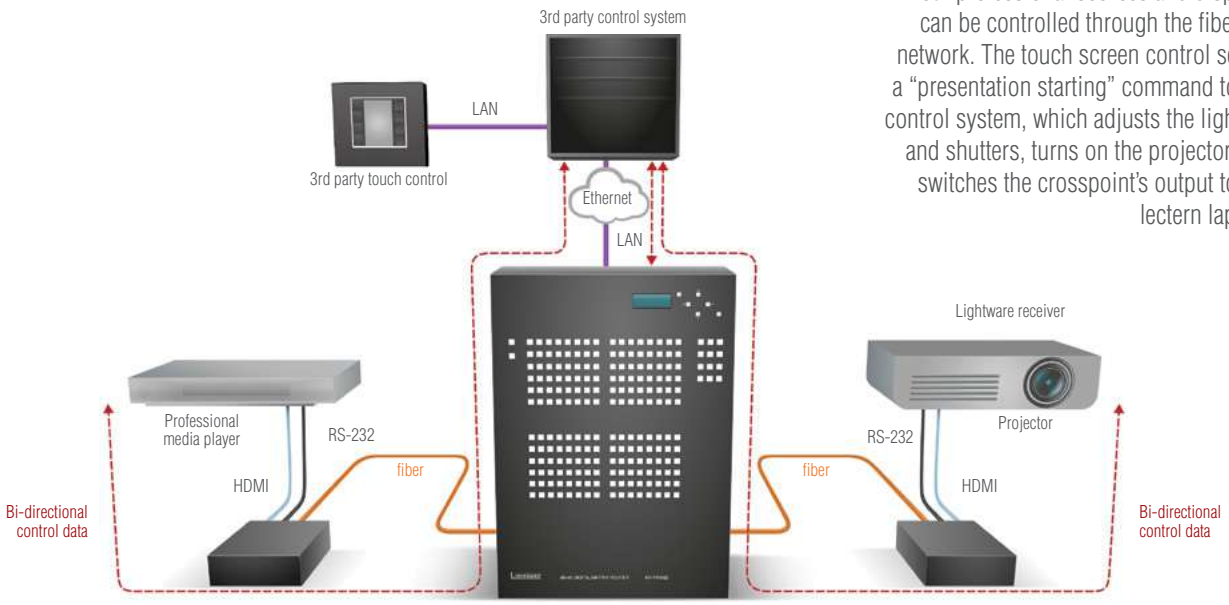
Lightware products are famous for their reliability. The MX-FR33R, MX-FR65R, MX-FR80R and 25G frames include hot-swappable N+1 redundant Power Supply Units (PSU). These frames were designed for mission critical operations where redundancy is key and high reliability is required. If one of the supplies 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.

## 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.

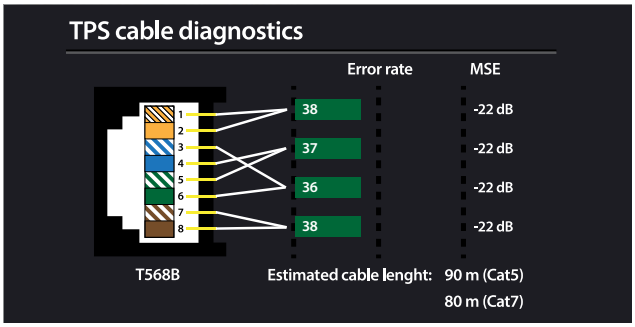
## RICOD (Remote Input Control over DDC)

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.com




TPS Cable Diagnostics Tool

# Who

dimmed the light?
drew the shades?
set the volume?
turned the projector on?


## THE BUTLER DID NOT DO IT
# EVENT MANAGER DID

Lightware devices with Event Manager:
all the control you need is already built-in

# Event Manager

**Event Manager** is a **smart, built-in feature** in the Lightware HDBaseT compatible TPS extender family, the MODEX line and in some select matrix switchers like the MMX6x2-HT series units. The feature is available through the freely downloadable **Lightware Device Controller software**.

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.

Event Manager application is continuously updated with **additional features** via firmware upgrades: a **delay** 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 saves time, cost and even installation space, which makes Lightware equipment the optimal choice in a number of different configurations. Currently the following Lightware products include Event Manager:

- **UMX-TPS**-TX120/130/140
- **MMX6x2**-HT200/210/220
- **MMX4x2**-HDMI/HT200
- **UMX-HDMI**-140
- **HDMI-TPS**-TX210/TX220
- **HDMI-TPS**-RX110AY
- **SW4-TPS**-TX240
- **HDMI-3D-OPT**-TX210A/TX210RAK
- **WP-UMX-TPS**-TX120-US/130-US
- **DVI-HDCP-TPS**-TX210/TX220
- **DP-TPS**-TX210/TX220
- **MODEX**
- **MMX8X4**-HT420M
- **MMX8X4**-HT400MC
- **MMX8X8**-HDMI-4K-A
- **HDMI20-OPTC** Series

## 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:

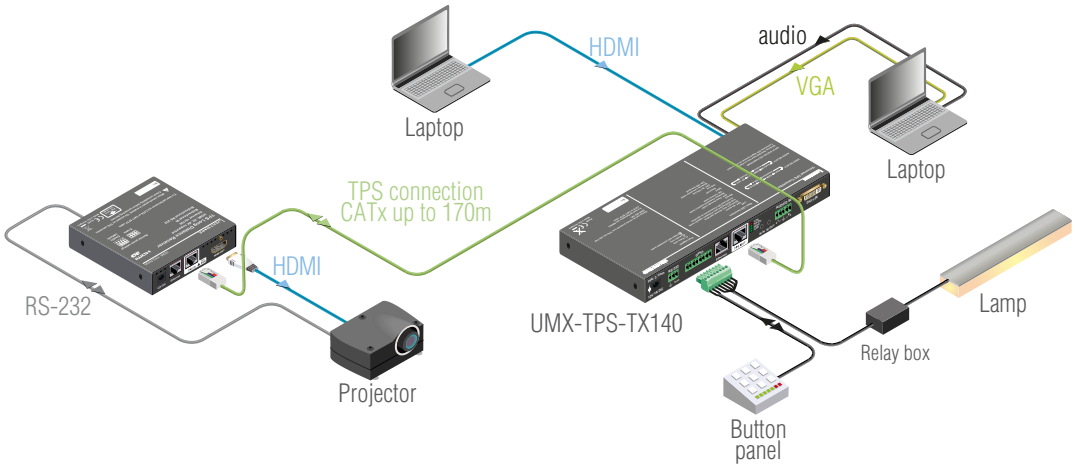
### Conditions

| | |
|---|---|
| **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 Dis-/Connected |

### Actions

| | |
|---|---|
| **Video** | Switch input to output |
| **Video** | Enable autoselect output |
| **Video** | Disable autoselect on output |
| **Ethernet** | Send TCP command |
| **Ethernet** | Send UDP command |
| **RS-232** | Send RS-232 message |
| **EDID** | Switch EDID |
| **Audio** | Set audio volume |
| **Audio** | Mute output |
| **Audio** | Unmute output |
| **Audio** | Increase/decrease volume |

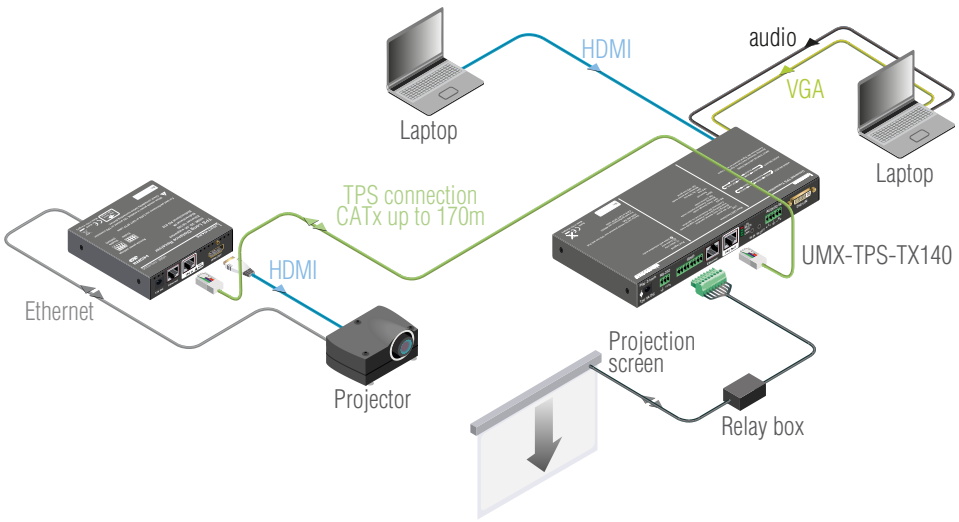
# EXAMPLE A




With a button panel connected through the GPIO port, the UMX-TPS-TX140 can be controlled from a remote location; input switching is available even if the transmitter is mounted underdesk. In the example above there are three actions followed by a condition. When an input selector button is pressed on the remote button panel, the selected input port is switched to the output, the projector turns on.

| Conditions | Actions |
|---|---|
| Press button panel | Input select on the TPS transmitter |
| | Switch on the projector using RS-232 |
| | Switch off the lamp using the transmitter's GPIO port |

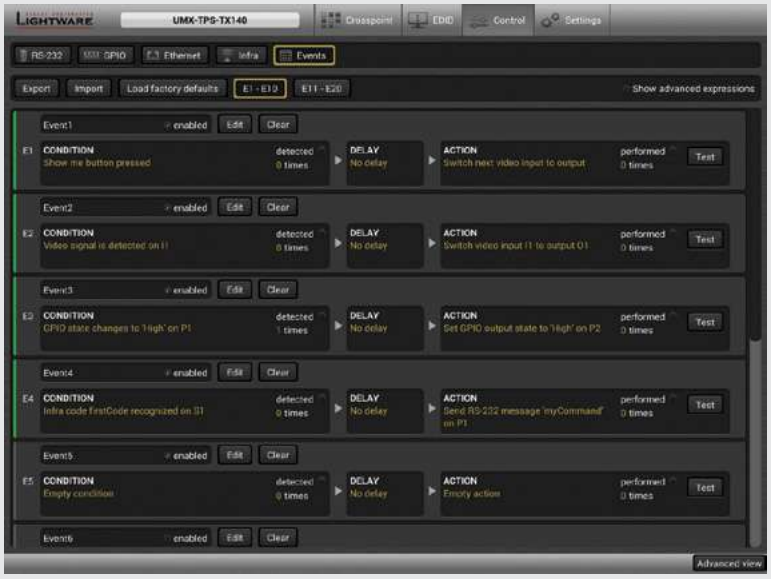
# EXAMPLE B




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.

| Conditions | Actions |
|---|---|
| Plug HDMI | Input select on the TPS transmitter |
| | Switch on the projector using TCP/IP |
| | Roll down the projection screen using the transmitter's GPIO port |

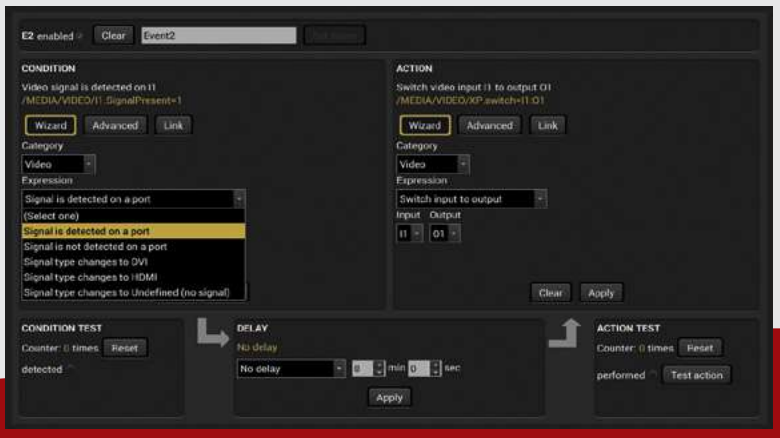
The Events menu contains separately configurable Events




The Event Wizard makes the setup easy with simple dropdown options


Green lines show which Event is configured and active, the rest stays grey

There are many default Expressions available to choose from



# 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.

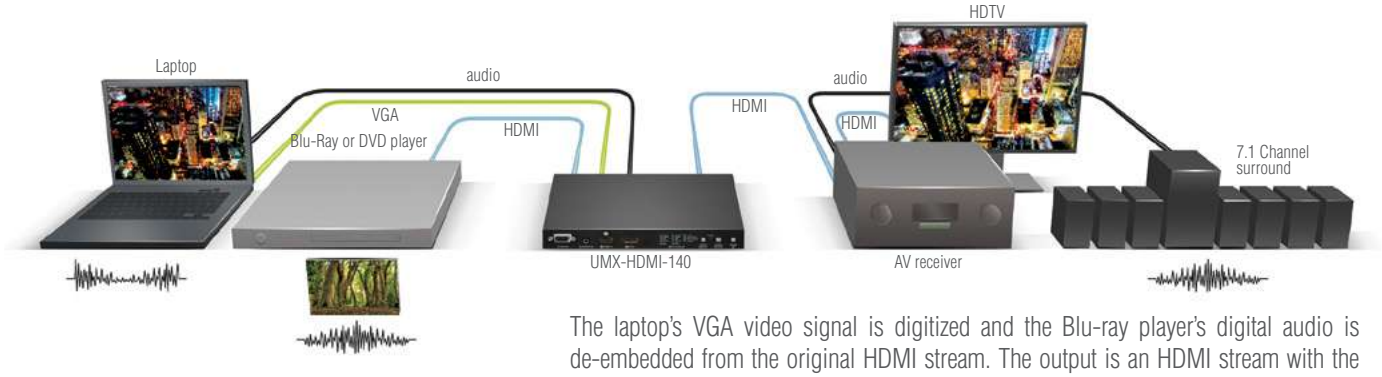
## Breakaway Audio/Video Switching

The UMX technology provides separate switching of audio and video including de-embedding and embedding from 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.

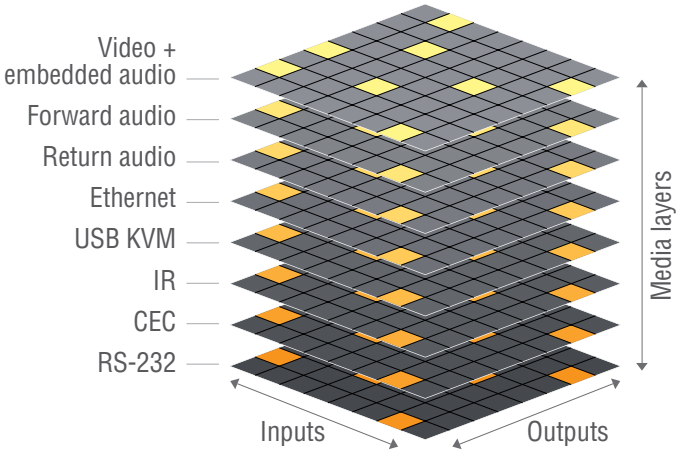
# 25G HYBRID signal management

## 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.



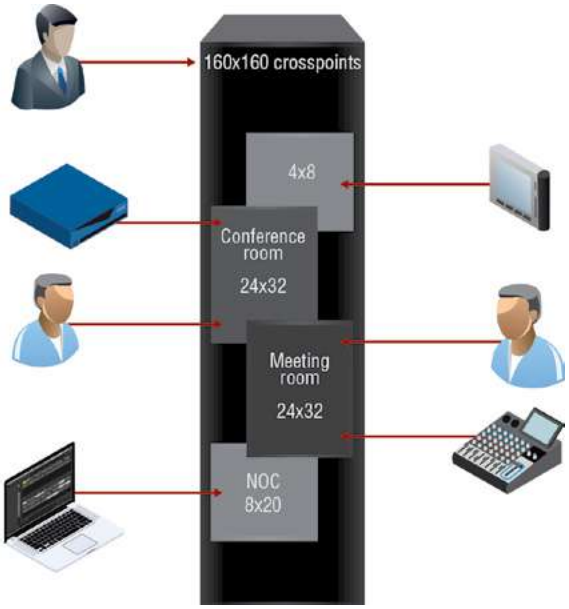
## Advanced Graphical User Interface

25G Hybrid matrix switchers 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 matrix switchers called 'rooms' can be programmed with their own sources and destinations, but can also share some resources if required.



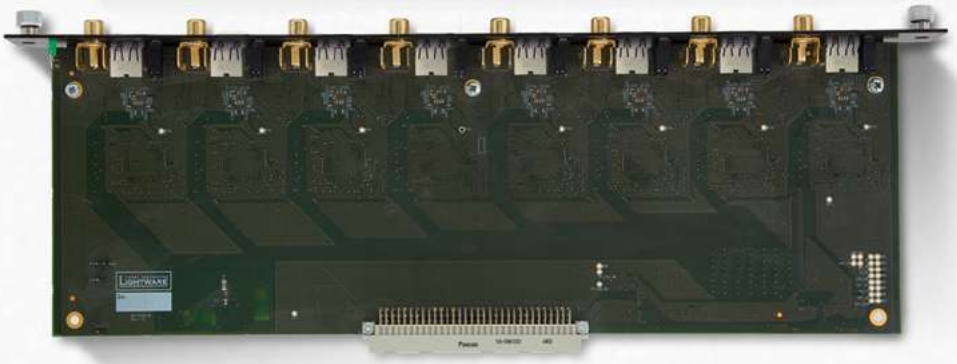

## User Access Management

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

# HYBRID MODULAR MATRIX SWITCHERS

## THE STANDARD FOR VARIABLE MATRIX ROUTERS



## 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-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-4TPS2-4HDMI-OB..... TPS and HDMI Output board for Ethernet, audio and Control
- 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

# 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 matrix switsers.

## 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.


## Remote Control Panels (RCP)

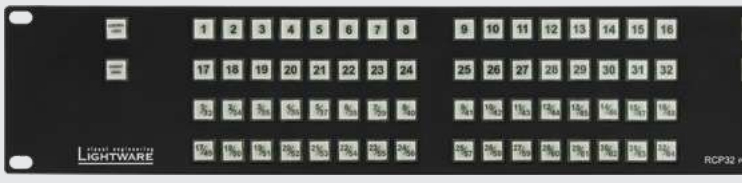
### MX-RCP16 and MX-RCP-32

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

## Available MX Frames Sizes and 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 |

Available Models, Rear Views

MX-FR80R, MX-FR65R

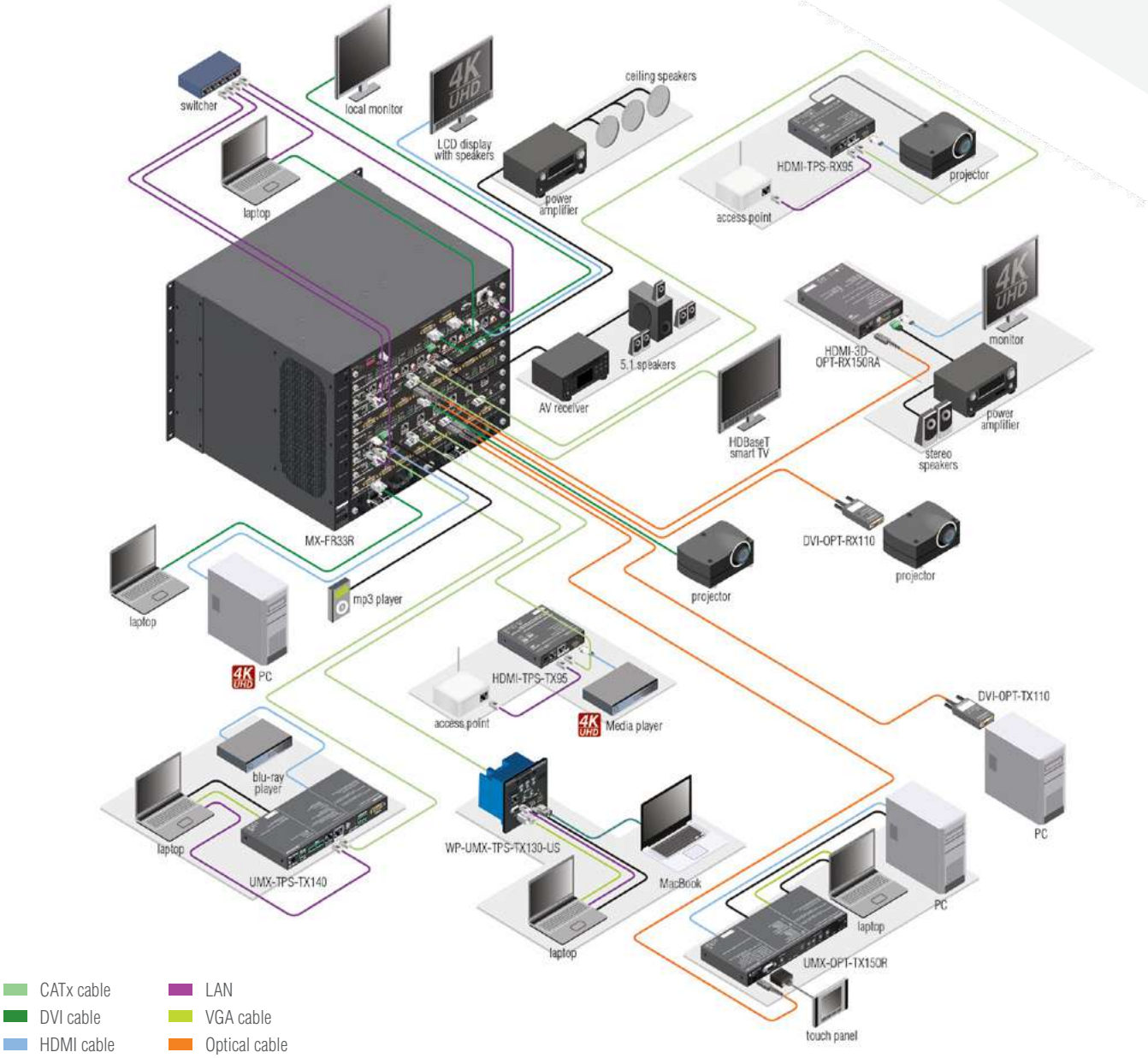
MX-FR33R

MX-FR33L

MX-FR17

MX-FR9

## Limitless Variations:

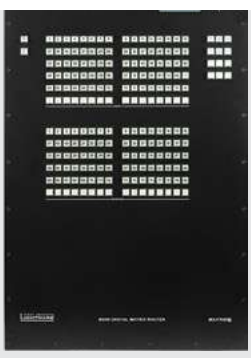



MX-FR9

MX-FR17

MX-FR33L

MX-FR33R



MX-FR80R, MX-FR65R

## Single-Link DVI Input Board

**MX-DVID-IB**

Part No: 9112 0001


The MX-DVID-IB Input Board has eight input channels accepting digital-only DVI signals.

### Features:

- 8 DVI-D input ports
- Adaptive and manual equalization for up to 60 m DVI cable
- Advanced EDID Management
- Compatible with HDCP and non-HDCP sources
- Supports resolutions from 640 x 480 to 1920 x 1200 or 2048 x 1080 with interlaced or progressive scan

## Dual-Link DVI Input Board

**MX-DVIDL-IB**

Part No: 9112 0005


MX-DVIDL-IB is a four-channel Dual-Link DVI Input Board.

### 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
- Designed for high video resolutions of 2560 x 1600 or 4096 x 2400 as well as 100 or 120 Hz 3D signals

## DVI, HDCP and HDMI Compliant Input Board

**MX-DVI-HDCP-IB**

Part No: 9112 0002


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.

### Features:

- 8 DVI input ports
- HDMI 1.3; DVI and HDCP compliant with or without HDCP encryption
- 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 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.

### 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**

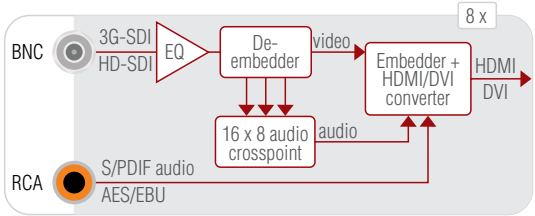
Part No: 9112 0010


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.

### 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
- Supporting stereo PCM and 5.1 AC3 encoded formats

### Port Diagram:



## 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.

### 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
- 4K / UHD (30Hz RGB 4:4:4, 60Hz YCbCr 4:2:0), 1080p @ 120 Hz, 2560 x 1600, 2048 x 2048, HDCP enable/disable mode, 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

### With Digital S/PDIF Audio Add-On: MX-HDMI-3D-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) to the HDMI signal
- S/PDIF can be sent over ARC back to the source device

### With Analog Stereo Audio Add-On: MX-HDMI-3D-IB-A

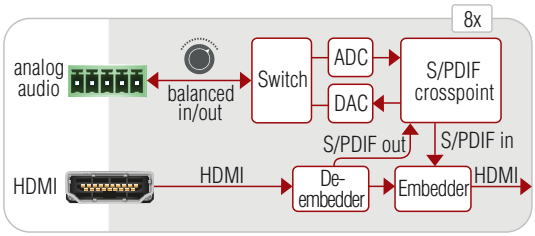
- Bi-directional configurable analog stereo port with 5-pole Phoenix connector
- Stereo PCM audio up to 96 kHz can be de-embedded from the HDMI signals
- Digitalized audio (PCM 48 kHz) can be embedded (or replaced) to the HDMI signal
- Volume, gain, balance, bass and treble control
- Phase invert and de-emphasis option

MX-HDMI-3D-IB

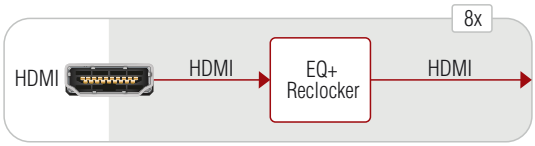
MX-HDMI-3D-IB-A

MX-HDMI-3D-IB-S

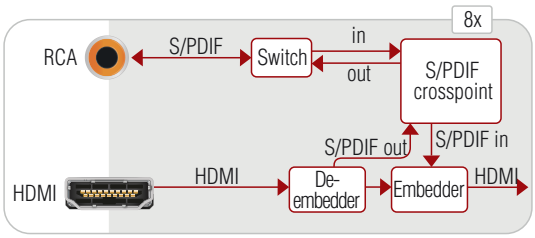
Port Diagrams:




MX-HDMI-3D-IB-A

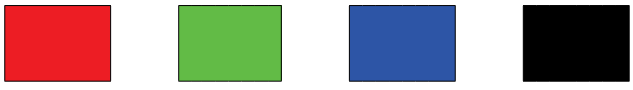



MX-HDMI-3D-IB

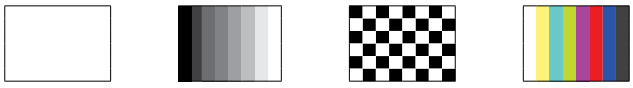



MX-HDMI-3D-IB-S

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

# The MX Half & Half Board

HDBT™ | HDMI™

THE *WHOLE* IS *GREATER* THAN THE SUM OF ITS PARTS.

*Aristotle*


MX-4TPS2-4HDMI-IB-AP

visual engineering
LIGHTWARE

lightware.com

## 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 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.

### 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 with or without HDCP
- 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
- Pixel Accurate Reclocking
- Advanced EDID Management
- Frame Detector
- Compatible with deep color, Dolby TrueHD and DTS-HD audio

| 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 |

### With PoE Add-on

MX-4TPS2-4HDMI-IB-P

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

### With Analog Audio and PoE Add-on

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 and de-emphasis option

Attention: The built-in PoE injector function requires the supplied PSU-48vp external power source to be connected directly to the board!

### With Digital Audio and PoE Add-on

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

Attention: The built-in PoE injector function requires the supplied PSU-48vp external power source to be connected directly to the board!

### With Analog Audio Add-on

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 and de-emphasis option

### With Digital Audio Add-on

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

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

## 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.

### 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 with or without HDCP
- 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
- Compatible with deep color, Dolby TrueHD and DTS-HD audio
- Features PCM audio sample rate conversion
- Pixel Accurate Reclocking, Advanced EDID Management and Frame Detector

### With Digital S/PDIF Audio Add-On

### MX-TPS-IB-S

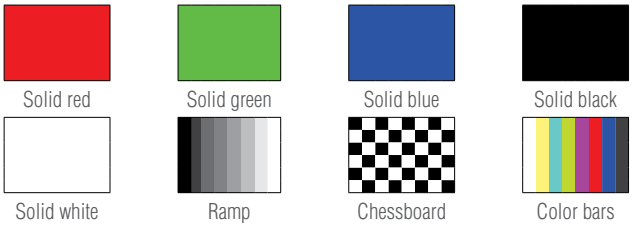
- S/PDIF breakout for every port
- Bi-directional configurable S/PDIF connectors:
  audio can be de-embedded from the HDMI signals or
  audio can be embedded (or replaced) to the HDMI signal

### With Analog Stereo Audio Add-On

### MX-TPS-IB-A

- 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 and de-emphasis option

### Available Video Patterns:




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

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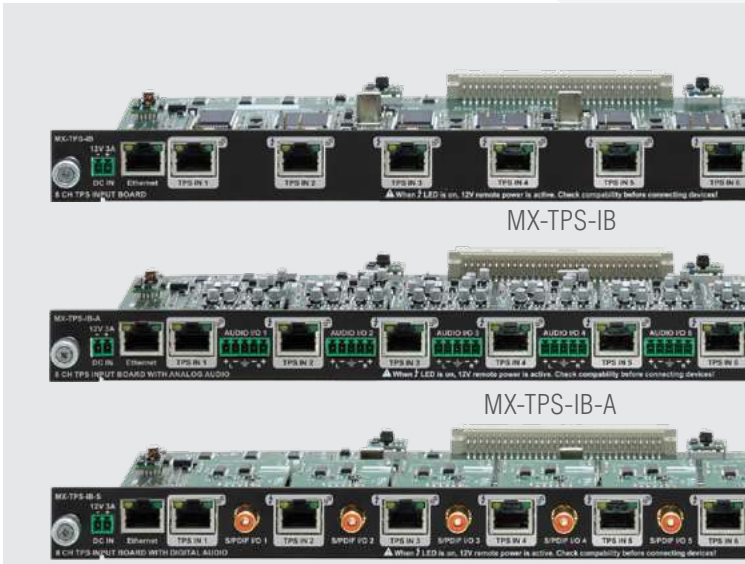
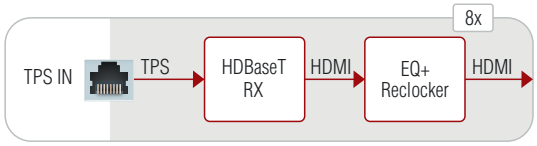
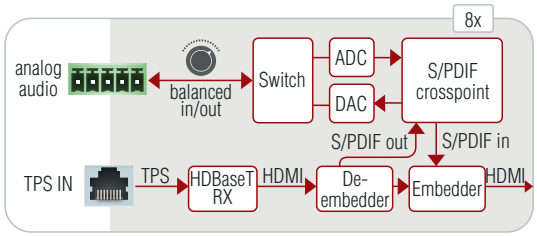


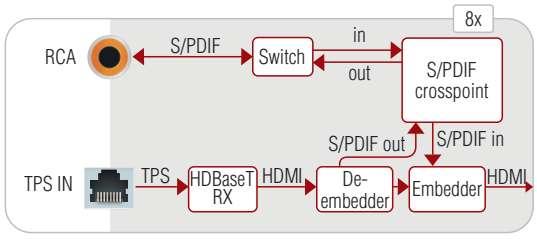

### Port Diagrams:




MX-TPS-IB




MX-TPS-IB-A




MX-TPS-IB-S

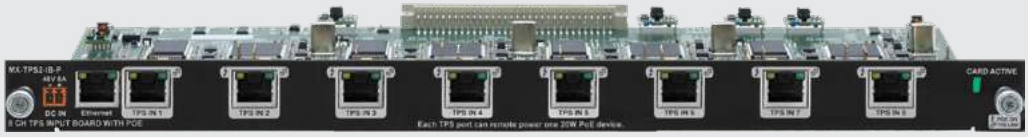
### Supplied Accessory Required for the PoE Function

Part No: 9134 0007
Power adaptor with IEC plug.
Power supply for 12V remote powering function.
Universal input: 100-240 V AC, 50-60 Hz.
Output: 12 V DC, 6,67 A.

## TPS Input Board with PoE

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

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.

### Features:

- HDMI extension supporting 3D and 4K
- Accepts HDMI + Ethernet + RS-232 over one CAT5/6/7 cable to up to 170m distance
- HDMI 1.4; DVI with or without HDCP
- 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
- Pixel Accurate Reclocking, Advanced EDID Management and Frame Detector
- Compatible with deep color, Dolby TrueHD and DTS-HD audio
- Features PCM audio sample rate conversion

| 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 |

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## With Analog Audio Add-On

### 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

## With Digital Audio Add-On

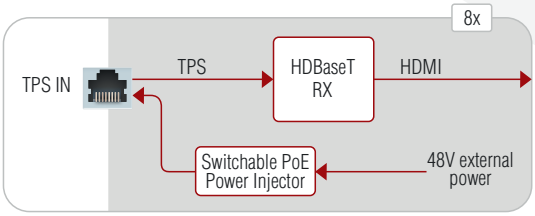
### MX-TPS2-IB-SP

- 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

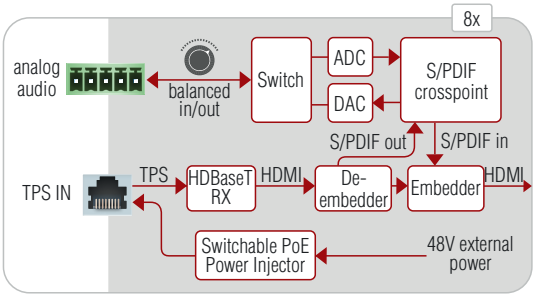
### Supplied Accessory Required for the PoE Function

Part No: 9134 0015
Power adaptor with IEC plug.
Power supply for PoE 48V remote powering function.
Universal input: 100-240 V AC, 50-60 Hz.
Output: 48 V DC, 2.5 A.

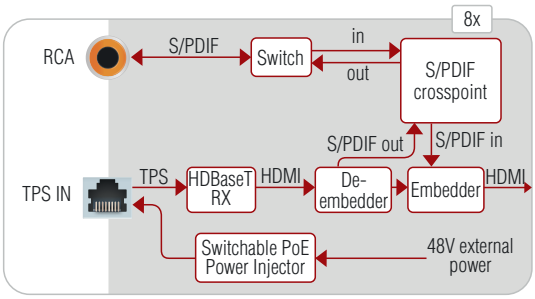
### Port Diagrams:




MX-TPS2-IB-P




MX-TPS2-IB-AP



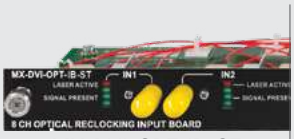

MX-TPS2-IB-SP

## 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.

### Features:

- 8 x single Multimode fiber input
- Selectable connectors: Neutrik OpticalCON, -LC, -SC, -ST
- Laser detect feedback LED for each input
- No video compression
- Zero frame delay
- Extension distance: up to 2500 m (1600 x 1200 @ 60Hz)
- Incoming signals are converted to DVI-D

### Compatible Products:

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

---

## Fiber Optical Dual-Link DVI Input Board

**MX-DVIDL-OPT-IB-LC, -SC, -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.

### Features:

- 4 Dual-Link DVI Multimode fiber input
- Selectable connectors: Neutrik OpticalCON, -LC, -SC, -ST
- Dual-Link DVI Multimode fiber input for DUAL-Link DVI
- Supports Dual-Link DVI video resolutions and 120 Hz 3D signals
- Selectable connectors: Neutrik OpticalCON, -LC, -SC, -ST
- Laser detect feedback LED for each input
- No video compression
- Preserves signal integrity with zero frame delay
- Extension distance: up to 2500 m

### Compatible Products:

- Transmitters:
  DVIDL-OPT-TX200

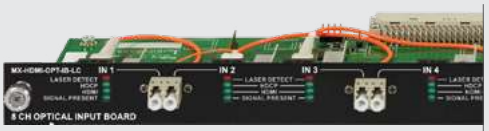
## 4K, 3D and Deep Color HDMI Optical Input Board

**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.

### Features:

- 8 channels with 4K resolution and 3D format support
- Single Multimode fiber for HDMI, DVI and VGA signals
- 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, no latency
- 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
  HDMI-3D-OPT-TX210A
  HDMI-3D-OPT-TX210RAK
  SW4-OPT-TX240RAK
  HDMI-3D-OPT-RX150RA
  MX-HDMI-OPT-OB-LC
  MX-HDMI-OPT-OB-SC
  25G-MX-HDMI-OPT-OB

# TPS and HDMI Output Board for Ethernet, Audio and Control new!

**MX-4TPS2-4HDMI-OB, -A, -S, -P, -AP, -SP**

Part no: 9113 0046, 9113 0047 (A), 9113 0048 (S), 9113 0050 (AP), 9113 0051 (SP), 9113 0049 (P)

HDBT™

Call sales for availability


MX-4TPS2-4HDMI-OB

MX-4TPS2-4HDMI-OB is a mixed output board with four HDMI and four HDBaseT™ single CAT outputs 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.

## 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 with or without HDCP
- 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
- Pixel Accurate Reclocking
- Advanced EDID Management
- Frame Detector
- Compatible with deep color, Dolby TrueHD and DTS-HD audio

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

## With PoE Add-on

MMX-4TPS2-4HDMI-OB-P

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

## With Analog Audio and PoE Add-on

MMX-4TPS2-4HDMI-OB-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 and de-emphasis option

Attention: The built-in PoE injector function requires the supplied PSU-48vp external power source to be connected directly to the board!

## With Digital Audio and PoE Add-on

MMX-4TPS2-4HDMI-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) into the HDMI signal
- PoE compatible
- 48V remote powering
- Remote powering on/off switching
- Status feedback

Attention: The built-in PoE injector function requires the supplied PSU-48vp external power source to be connected directly to the board!

## With Analog Audio Add-on

MMX-4TPS2-4HDMI-OB-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
- Stereo audio (up to PCM 48 kHz) can be embedded (or replaced) into the HDMI signal
- Volume, gain, balance, bass and treble control
- Phase invert and de-emphasis option

## With Digital Audio Add-on

MMX-4TPS2-4HDMI-OB-S

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

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## TPS Output Board for HDMI, Ethernet, Audio and Control

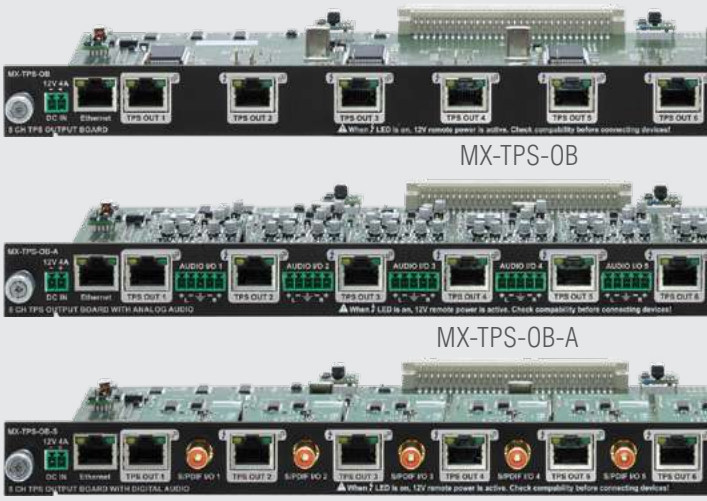
**MX-TPS-OB, -A, -S**

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.

### Features:

- 8 channel twisted pair Output Board
- HDMI extension supporting 3D and 4K
- Accepts HDMI + Ethernet + RS-232 over one CAT5/6/7 cable to 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
- Compatible with deep color, Dolby TrueHD and DTS-HD audio
- PCM audio sample rate conversion
- 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
- HDCP enable/disable mode, Pixel Accurate Reclocking, Advanced EDID Management and Frame Detector
- 12V Remote powering of compatible devices



MX-TPS-OB



MX-TPS-OB-A



MX-TPS-OB-S

Attention: The built-in remote powering injector function requires the supplied PSU-12vp external power source to be connected directly to the board!

### With Digital S/PDIF Audio Add-On:

### MX-TPS-OB-S

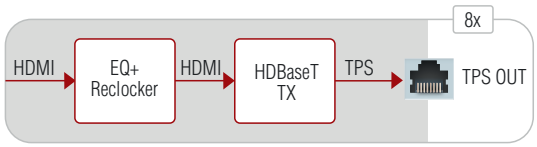
- S/PDIF breakout for every port
- Bi-directional configurable S/PDIF connectors: audio can be de-embedded from the HDMI signals or audio can be embedded (or replaced) to the HDMI signal

### With Analog Stereo Audio Add-On:

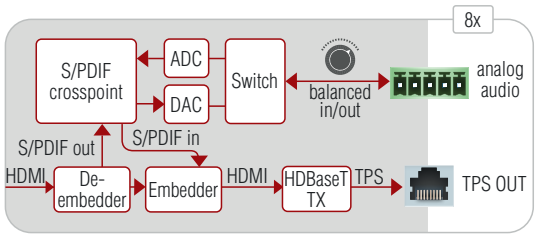
### MX-TPS-OB-A

- 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 and de-emphasis option

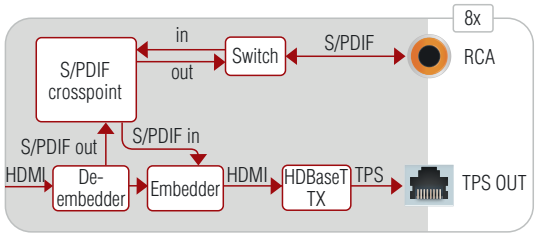
### Port Diagrams:




MX-TPS-OB




MX-TPS-OB-A

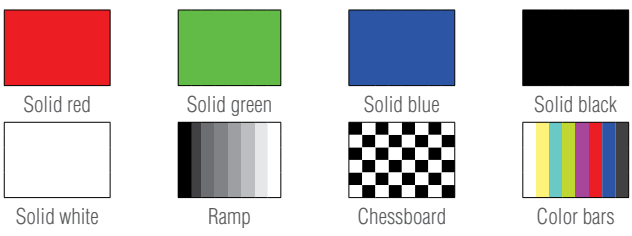



MX-TPS-OB-S

### Supplied Accessory Required for Remote Powering:

Part No: 9134 0007
Power adaptor with IEC plug.
Power supply for 12V remote powering function.
Universal input: 100-240 V AC, 50-60 Hz.
Output: 12 V DC, 6,67 A.

### Available Video Patterns:




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

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# 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 and local audio support.

### Features:

- 8 HDMI output ports
- HDMI 1.4a; DVI with or without HDCP
- 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
- HDMI (24 bit RGB) to DVI conversion
- Dolby TrueHD and DTS-HD Master Audio
- 36-bit deep color support

### With Digital S/PDIF Audio Add-On:

#### MX-HDMI-3D-OB-S

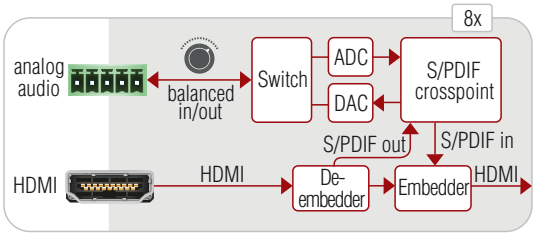
- S/PDIF breakout for every port
- Bi-directional configurable S/PDIF connectors: audio can be de-embedded from the HDMI signals or audio can be embedded (or replaced) to the HDMI signal

### With Analog Stereo Audio Add-On:

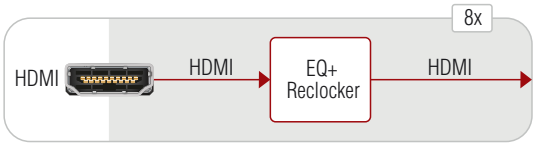
#### MX-HDMI-3D-OB-A

- 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

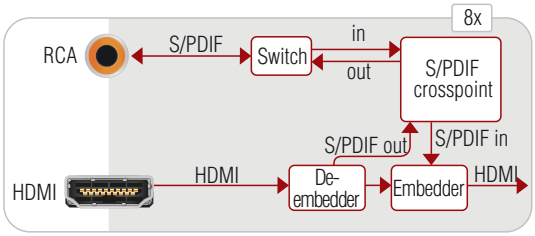
### Port Diagrams:




MX-HDMI-3D-IB-A

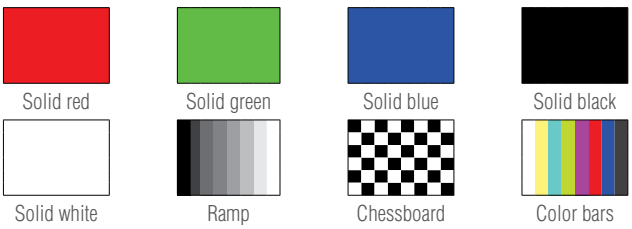



MX-HDMI-3D-IB




MX-HDMI-3D-IB-S

### Available Video Patterns:




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

## Analog Audio Output Board
**MX-AUDIO-OB-A**
Part no: 9113 0045


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.

Features:
- Analog audio breakaway switching
- 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 is a cost effective solution for routing DVI signals.

Features:
- 8 DVI-D connectors
- Advanced EDID Management
- Pixel Accurate Reclocking
- +5 V fiber extender powering powering with up to 500 mA current (comparible device: DVI-OPT-TX110)

---

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


MX-DVIDL-OB is a Dual-Link DVI Output Board supporting four Dual-Link DVI-D connectors.

Features:
- 4 gold plated DVI connectors
- Pro series Dual-Link I/O board
- Advanced EDID Management
- TMDS Reclocking
- Fiber adapter powering on output
- Supports High Definition computer signals and 120Hz 3D

---

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

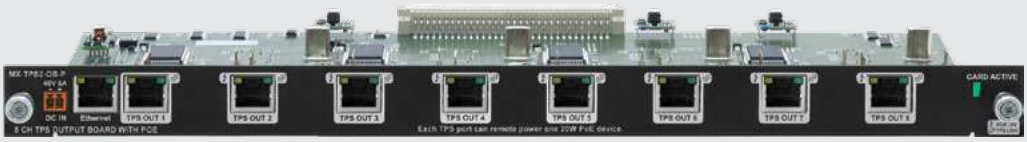

MX-DVI-HDCP-OB is an eight channel Output Board with DVI connectors able to receive digital DVI and HDMI 1.3 signals with or without HDCP encryption.

Features:
- 8 channel Output Boardwith screw-locable DVI connectors
- HDMI 1.3 and DVI with or without HDCP
- 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

# TPS Input Board with PoE

## MX-TPS2-OB, -AP, -SP

Part No: 9113 0042 (P), 9113 0043 (AP), 9113 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.

### Features:

- HDMI extension supporting 3D and 4K
- Accepts HDMI + Ethernet + RS-232 over one CAT5/6/7 cable to up 170m distance
- HDMI 1.4 and DVI with or without HDCP
- 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
- Compatible with deep color, Dolby TrueHD and DTS-HD audio
- Features PCM audio sample rate conversion
- Pixel Accurate Reclocking, Advanced EDID Management and Frame Detector
- Integrated PoE power injection option for TPS extenders

Attention: The built-in PoE remote powering function requires the supplied PSU-48vp external power source to be connected directly to the board!

### With Analog Audio Add-On

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

### With Digital Audio Add-On

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

### Supplied Accessory Required for the PoE Function

Part No: 9134 0015
Power adaptor with IEC plug.
Power supply for PoE 48V remote powering function.
Universal input: 100-240 V AC, 50-60 Hz.
Output: 48 V DC, 2.5 A.

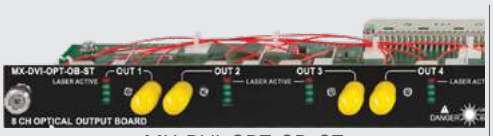
## Fiber Optical Single-Link DVI Output Board

**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.

### Features:

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

---

## 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.

### Features:

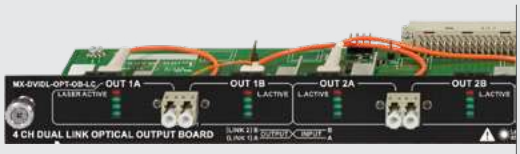
- 8 Single-Link DVI Multimode fiber output
- DVI Pixel Accurate Reclocking
- Selectable connectors: Neutrik OpticalCON, -LC, -SC, -ST
- No video compression
- Zero frame delay
- Extension distance: 2500 m (1600 x 1200 @ 60Hz)

## 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.

Features:

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

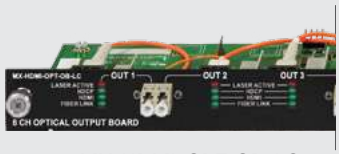
## 4K Fiber Optical HDMI Output Board

**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.

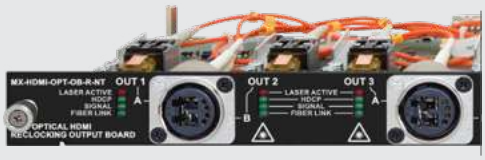
Features:

- 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 feedback LED
- No video compression
- Zero frame delay
- Extension distance: 2500 m (1600 x 1200 @ 60Hz)

## 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-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.

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

# 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

# STANDALONE MATRIX SWITCHERS

## ONE BOX SOLUTIONS FOR DYNAMICALLY CHANGING ENVIRONMENTS

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 matrix switchers 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.

## UMX Series Switcher for VGA, DVI-I, HDMI and DisplayPort

**UMX-HDMI-140**

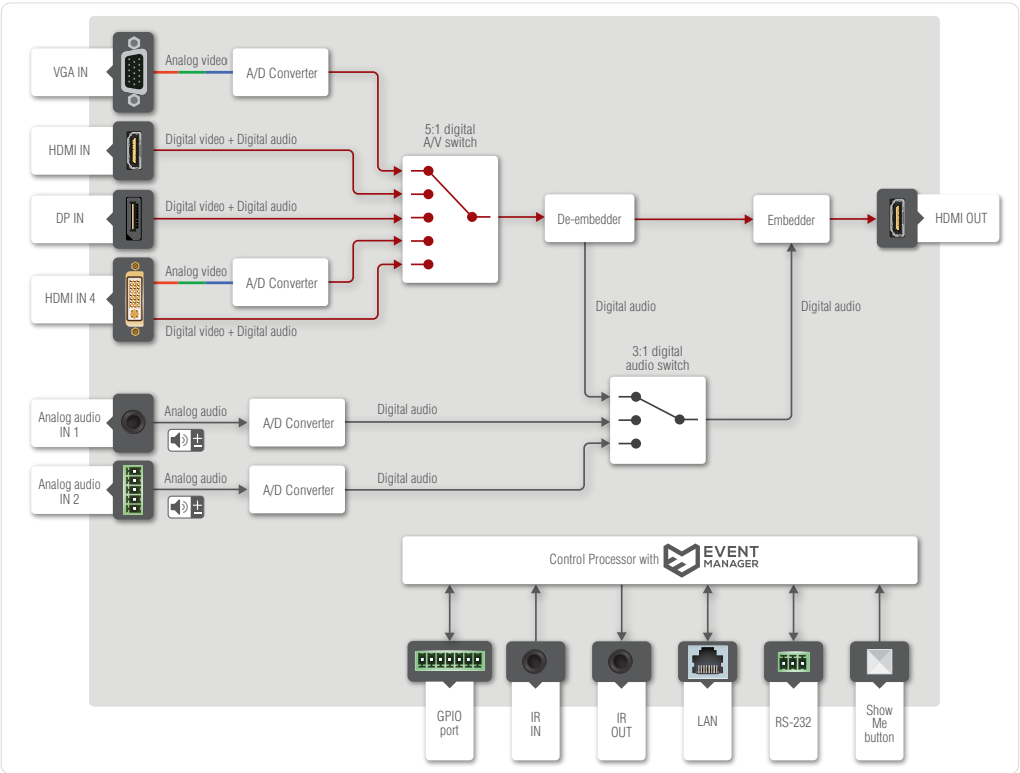
Part No: 9156 0001


UMX-HDMI-140 switches universal 4K video and audio to a HDMI output port. This device was designed for digital and analog video and audio signals: VGA, YPrPb, DVI, HDMI 1.4 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. 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.

### Features:

- 4K/UHD (30Hz RGB 4:4:4, 60Hz YCbCr 4:2:0) and 3D capabilities
- Switches DVI, HDMI, VGA or DisplayPort to a HDMI output port
- Video inputs: VGA, HDMI, DisplayPort, DVI-D and DVI-A
- Audio inputs: Stereo jack in, 5-pole Phoenix connector for balanced audio in
- Stereo jack, PHOENIX 1x5 pole Phoenix
- Embedded 7.1 HBR audio support
- Autoselect mode: video and audio priority modes
- Intuitive Control Software
- GPIO control port
- HDCP compliant
- Audio embedding
- Built-in Event Manager feature
- Advanced EDID management
- No signal latency
- Frame detector

### Port Diagram



## 8 x 8 HDMI 2.0 Full 4K Matrix Switcher new!

**MX2-8x8-HDMI20-Audio**

Part No: 9131 0033


The MX2-8x8-HDMI20-Audio is the first Lightware HDMI 2.0 standalone matrix switcher that supports uncompromised 4K UHD resolution at 60Hz 4:4:4.

Thanks to its compact size and silent design, it is particularly suitable for offices and meeting rooms, for 4K live events, and for futureproof operation centers. It is also a perfect choice for home theater enthusiasts who demand the highest quality along with HDMI 2.0 and 4K@60Hz video signals. This standalone product has 8 HDMI 2.0 inputs and 8 HDMI 2.0 outputs transmitting up to 4K at 60Hz in 4:4:4 format, while supporting 3D, Dolby TrueHD and DTS-HD Master Audio. Each input port has an audio connector for embedding analog audio into the HDMI stream. The audio connectors next to the output ports can provide de-embedded audio for amplifiers and audio systems; the output volume is adjustable.

Lightware's MX2-8x8-HDMI20-Audio matrix switcher supports both HDR10 and Dolby Vision in the HDMI signal at 10 or 12 bit speeds respectively, within its frame bandwidth of 18 Gbps maximum.

### Features:

- 4K @ 60Hz with RGB 4:4:4 colorspace, 18 Gbps data rate
- HDMI 2.0, HDMI 1.x and DVI 1.0 compliant
- HDCP 2.2 and HDCP 1.4 compliant with cross conversion capabilities
- Fully non-blocking switching architecture with zero frame delay
- Splitting of 4K UHD at 60Hz to two output ports with left half and right half of the original video**
- CEC support
- 4:4:4 to 4:2:0 subsampling**
- Built-in website
- RS-232, Ethernet and USB control options
- HDR and Dolby Vision support*
- Advanced EDID Management
- Compact and silent design
- LCD and push buttons for front panel control
- Front to back cooling airflow
- Volume control for all audio output ports

* Supported HDR formats are limited by the maximum bitrate of 18 Gbps in the HDMI 2.0 standard

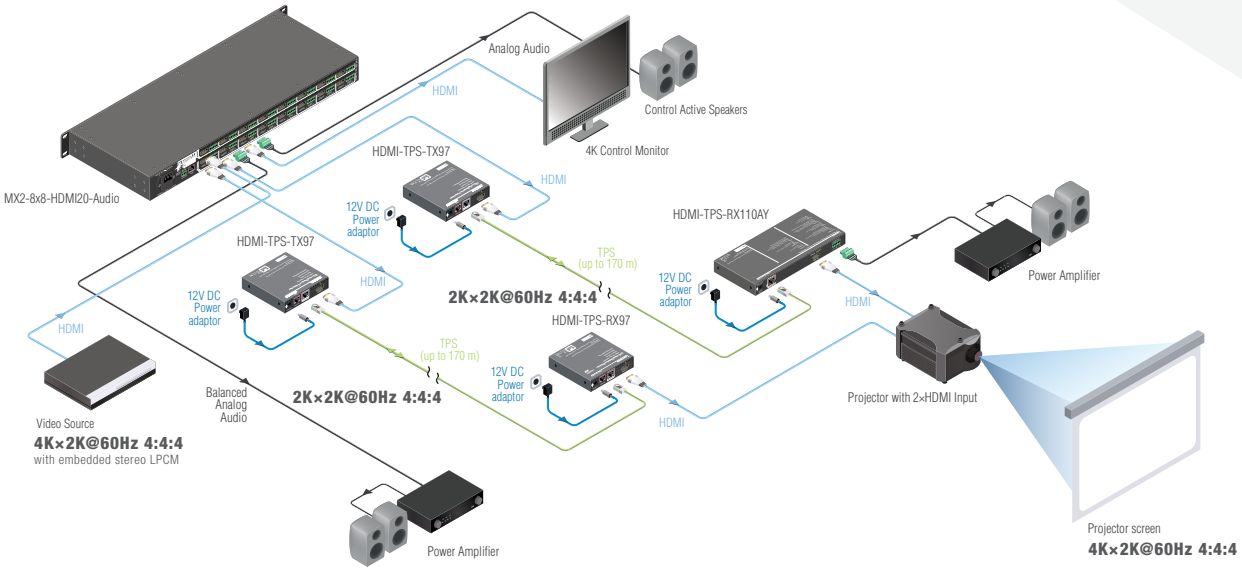
** Specifications are subject to change

### HDMI 2.0 to 2x HDMI 1.4 Splitting

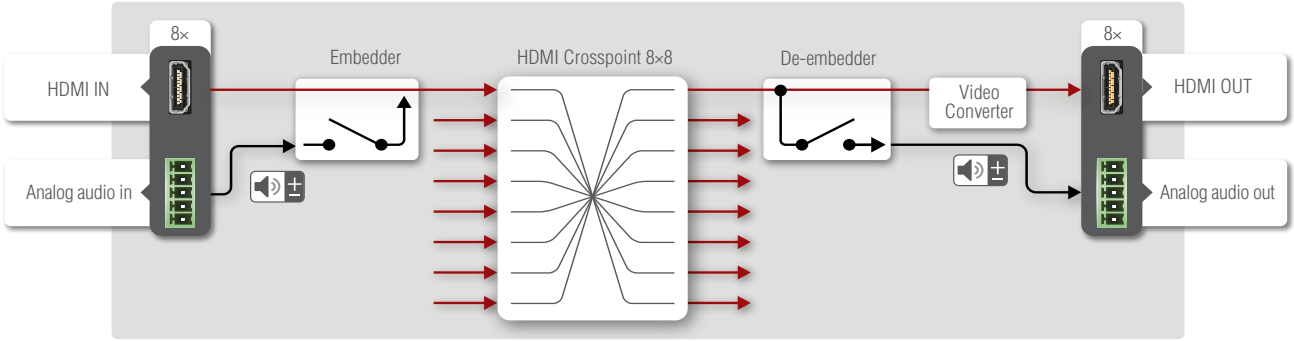
The device supports vertical splitting of an HDMI 2.0 4K @ 60Hz 4:4:4 input signal to left and right halves allowing for the transmission of a 18 Gbps HDMI 2.0 signal over two HDMI 1.4 compliant links. The two halves can then be recombined at the signal destination.

**Full 4K HDMI 2.0**
**60Hz @ 4:4:4** HIGH DEFINITION MULTIMEDIA INTERFACE

## Standalone Diagram




## Port Diagram





## Unique Front-to-Back Cooling Airflow Design

MX2-8x8-HDMI20-Audio includes a groundbreaking new cooling design with front-to-back airflow. Inside the chassis the airflow travels along guiding panes assuring that the most warm areas receive ample amount of cooling air volume. The smoothness of the airflow cooling greatly enhances its efficiency, which was achieved by optimizing the geometry of the air guiding flaps and redesigning construction parts within the housing.

# HDMI Matrix Switcher with Event Manager

**MMX8x8-HDMI-4K-A**

coming soon ! Call sales for availability


MMX8x8-HDMI-4K-A is a standalone matrix switcher with eight HDMI video inputs and eight HDMI video outputs. 4K / UHD (30Hz RGB 4:4:4, 60Hz YCbCr 4:2:0), 3D capabilities and HDCP are fully supported.

MMX8x8-HDMI-4K-A has 4+2 balanced, bi-directional, 5-pole Phoenix audio ports for embedding and de-embedding audio.

Using factory, custom or transparent EDID emulation users 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 to conform to the system requirements.

The unit can be controlled via RS-232, Ethernet or USB ports, but it also offers RS-232, Serial and IR command injection capabilities allowing to send any control command directly to end points.

The built-in Event Manager feature provides control via RS-232 and IR ports.

## Features

- 8x8 port HDMI matrix switcher
- 4K / UHD (30Hz RGB 4:4:4, 60Hz YCbCr 4:2:0) and 3D capabilities
- 8x HDMI inputs + 8x HDMI outputs
- 4+2 Balanced, analog, audio ports with user-selectable signal direction
- Front panel control buttons, LCD display and jog dial button
- 1x Ethernet input port for device control
- 2x bi-directional RS-232 ports
- 2x Serial/IR ports for display control
- 2x IR ports for display control
- Event Manager built-in control feature

# NEW 8x4 Matrix Switchers with

## SPECIAL AUDIO INPUT BLOCK DSP MIXER AND ENHANCED EVENT MANAGER CONTROL

**MMX8x4-HT420M** | **MX8x4-HT400MC**

Everything you need for a conference room environment

**Special Audio Input Block** includes input ports for **microphone and line-in**. The **built-in sound mixer** DSP allows for free mixing of the audio signals from the de-embedded HDMI, the microphone or the line-in. The **MIC port can also supply phantom power** to the connected microphone.

**Voice Activated Presenter Focus** allows the volume of the voice of the speaker to become automatically focused, and the volume of the rest of the sounds to be lowered, as soon as the presenter starts speaking.

The **built-in DSP** provides **audio mixer** services including fader, equalizer, mute, balance and gain.

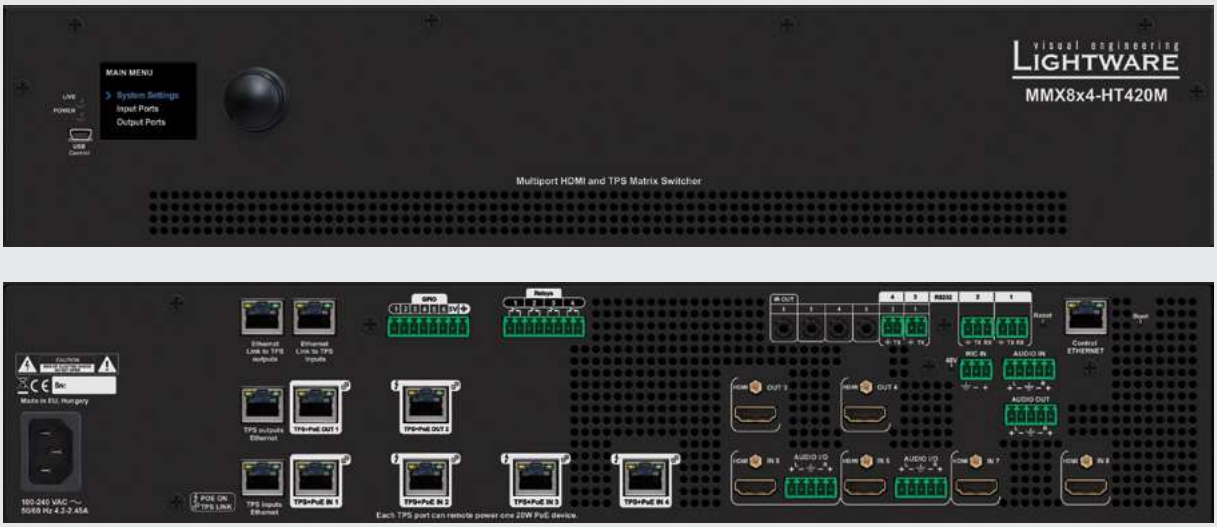
The unit offers **Ethernet, RS-232, Serial and IR command injection** services allowing to send any control command directly from the LAN connection to remote end points.

The **built-in Event Manager feature provides all the necessary control via multiple RS-232, IR, Ethernet, Relay and GPIO ports**.

# HDMI and TPS Matrix Switcher with Special Audio Inputs and Multiport Control Options

**MMX8x4-HT420M**

coming soon! Call sales for availability




## MMX8x4-HT420M

MMX8x4-HT420M is a standalone matrix switcher specifically designed for conference room environments. It has eight video inputs (four HDMI and four TPS) and four video outputs (two HDMI outputs and two TPS outputs). 4K / UHD (30Hz RGB 4:4:4, 60Hz YCbCr 4:2:0), 3D capabilities and HDCP are fully supported.

MMX8x4-HT420M has a dedicated Special Audio Input Block with input ports for microphone and line-in. The built-in sound mixer allows for free mixing of the audio signals from the de-embedded HDMI, the microphone or the line-in. The Special Audio Input block includes a voice activation feature, allowing the volume of the voice of a person speaking into the microphone to be automatically focused, and the volume of the rest of the sounds to be lowered as soon as the presenter starts speaking.

The device also has two balanced 5-pole Phoenix audio connectors at two of the HDMI inputs. The audio signal direction of the port can be changed with the Lightware Device Controller software, so these audio ports can be either input or output ports.

The audio signal presented by the built-in mixer is channeled to one shared, balanced 5-pole Phoenix audio output, including the mixed audio of a selected, de-embedded HDMI audio, the microphone and the Line-in.

PoE 48V remote powering is available on every I/O TPS ports for cost-effective installations.

MMX8x4-HT420M receives and transmits digital video, audio and control to a distance of up to 170m over a single CAT6 cable. Using 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 to conform to the system requirements. The unit can be controlled via RS-232, Ethernet or USB ports, but it also offers Ethernet, RS-232, Serial and IR command injection capabilities, allowing to send any control command directly from the LAN connection to remote end points.

The built-in Event Manager feature provides control via RS-232, IR, Ethernet, Relay and GPIO ports. The MMX8x4-HT420M is compatible with both HDBaseT™ extenders and HDBaseT™ compliant displays.

## MMX8x4-HT400MC

MMX8x4-HT400MC is a standalone matrix switcher specifically designed for conference room environments.

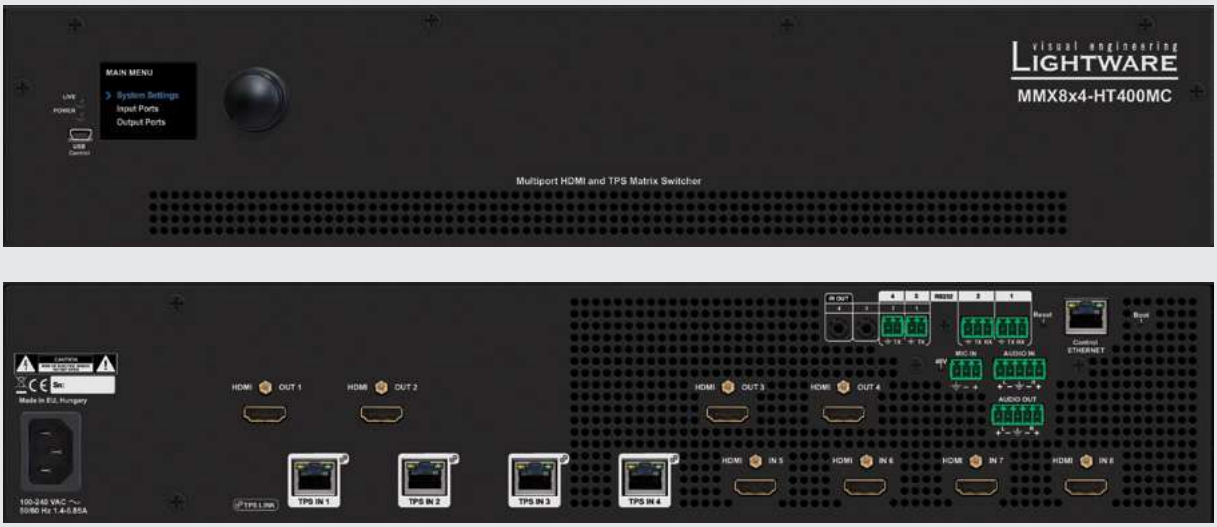
This device is a cost-effective version of the MMX8x4-HT420M with fewer features and services, and with four HDMI video outputs, lacking the two TPS output ports of the full feature product.

The below table lists the available features and services of the two products in comparison:

## HDMI and TPS Matrix Switcher with Special Audio Inputs

**MMX8x4-HT400MC**

coming soon! Call sales for availability




| Features and Services | MMX8x4-HT420M | MMX8x4-HT400MC |
|---|---|---|
| 4K / UHD (30Hz RGB 4:4:4, 60Hz YCbCr 4:2:0) and 3D capabilities | Yes | Yes |
| HDMI input ports | 4x | 4x |
| TPS (HDBaseT) input ports | 4x | 4x |
| HDMI output ports | 2x | 4x |
| TPS (HDBaseT) output ports | 2x | No |
| Up to 170 m transmission over TPS Long Reach Mode for Full HD signals | Yes | No |
| Balanced bi-directional analog audio ports | 2x | No |
| Balanced analog audio output for the built-in mixer | 1x | 1x |
| Special Audio Input Block for active microphone and line-in | Yes | Yes |
| Built-in sound mixer DSP with volume automation | Yes | Yes |
| Ethernet port for device control | 1x | 1x |
| Ethernet ports for external device control | 2x | No |
| Ethernet via TPS | Yes | No |
| Bi-directional RS-232 ports | 2x | 2x |
| Serial/IR ports for display control | 2x | 2x |
| IR ports for display control | 4x | 2x |
| Relay output ports | 4x | No |
| GPIO port | 6x GPIO + 5V + GND | No |
| PoE function to feed remote power to connected devices | Yes | No |
| Front panel LCD and jog dial button | Yes | Yes |
| Event Manager built-in control feature | Yes | Yes |

# MMX Series 6x2 HDMI TPS Matrix Switcher

**MMX6x2-HT220**

Part No: 9131 0032

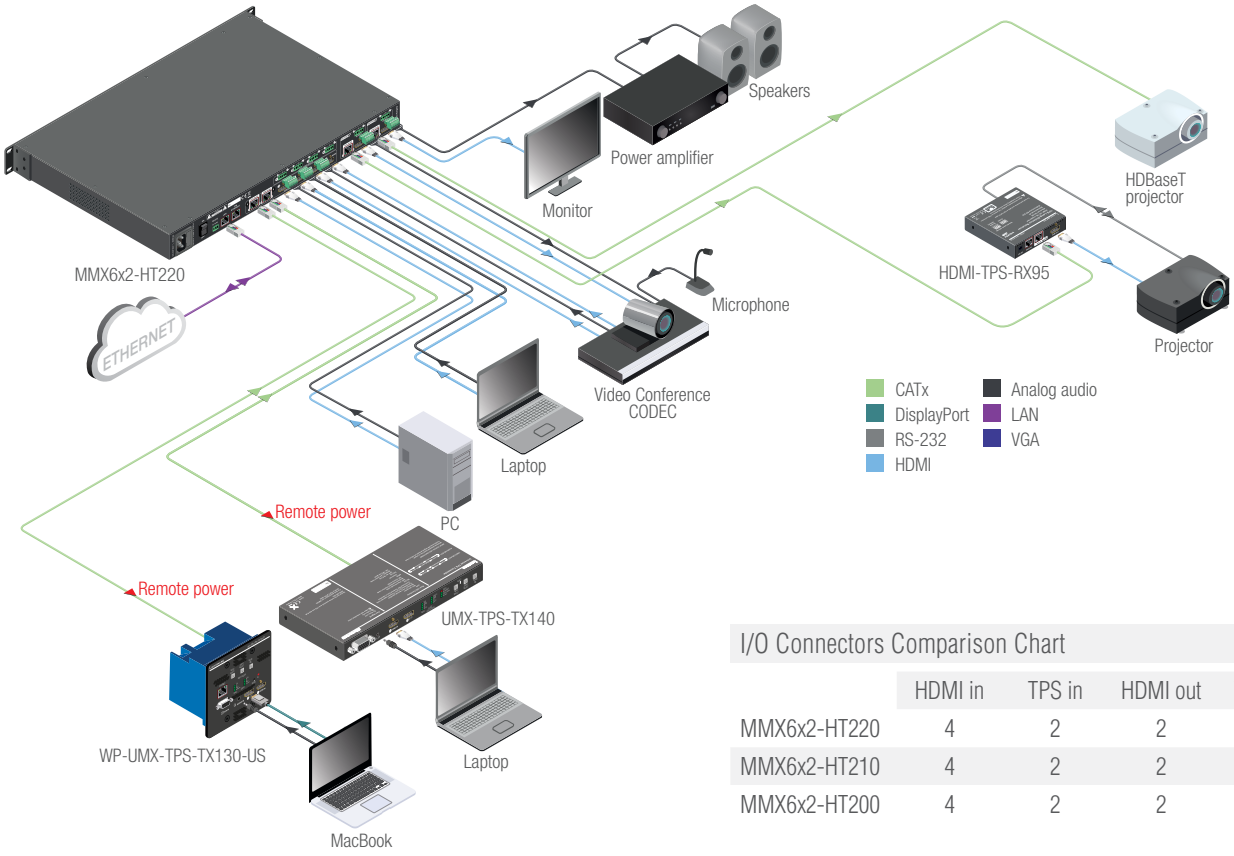

The MMX6x2-HT220 is our solution for a practical standalone matrix switcher specifically designed for meeting room and classroom environments. The compact MMX6x2-HT220 has six video inputs and two video outputs - four HDMI 1.4, two TPS inputs and two independent HDMI outputs, both outputs have mirrored 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
- PoE (48V) injector on every TPS port (both TPS inputs and outputs)
- Up to 170 m* transmission distance over TPS
- Balanced analog audio inputs and outputs with adjustable volume
- 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 |

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MMX6x2-HT220 Rear View

## MMX Series 6x2 HDMI TPS Matrix Switcher

**MMX6x2-HT210**

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.

### 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) injector 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**

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.

### 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) injector 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

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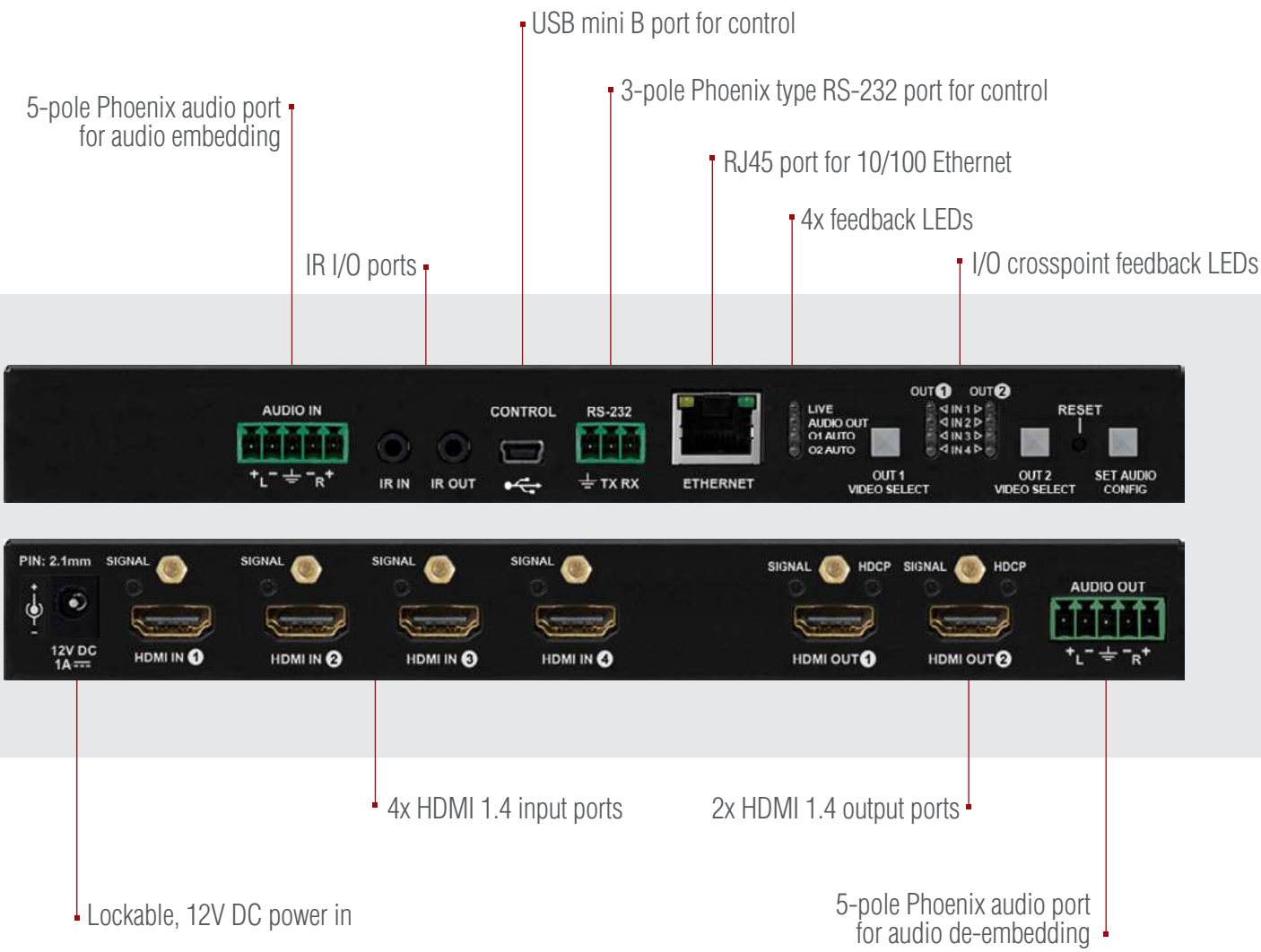
## 4K UHD 4x2 HDMI Matrix Switcher new!

**MMX4x2-HDMI**

Part No: 9131 0034




### 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

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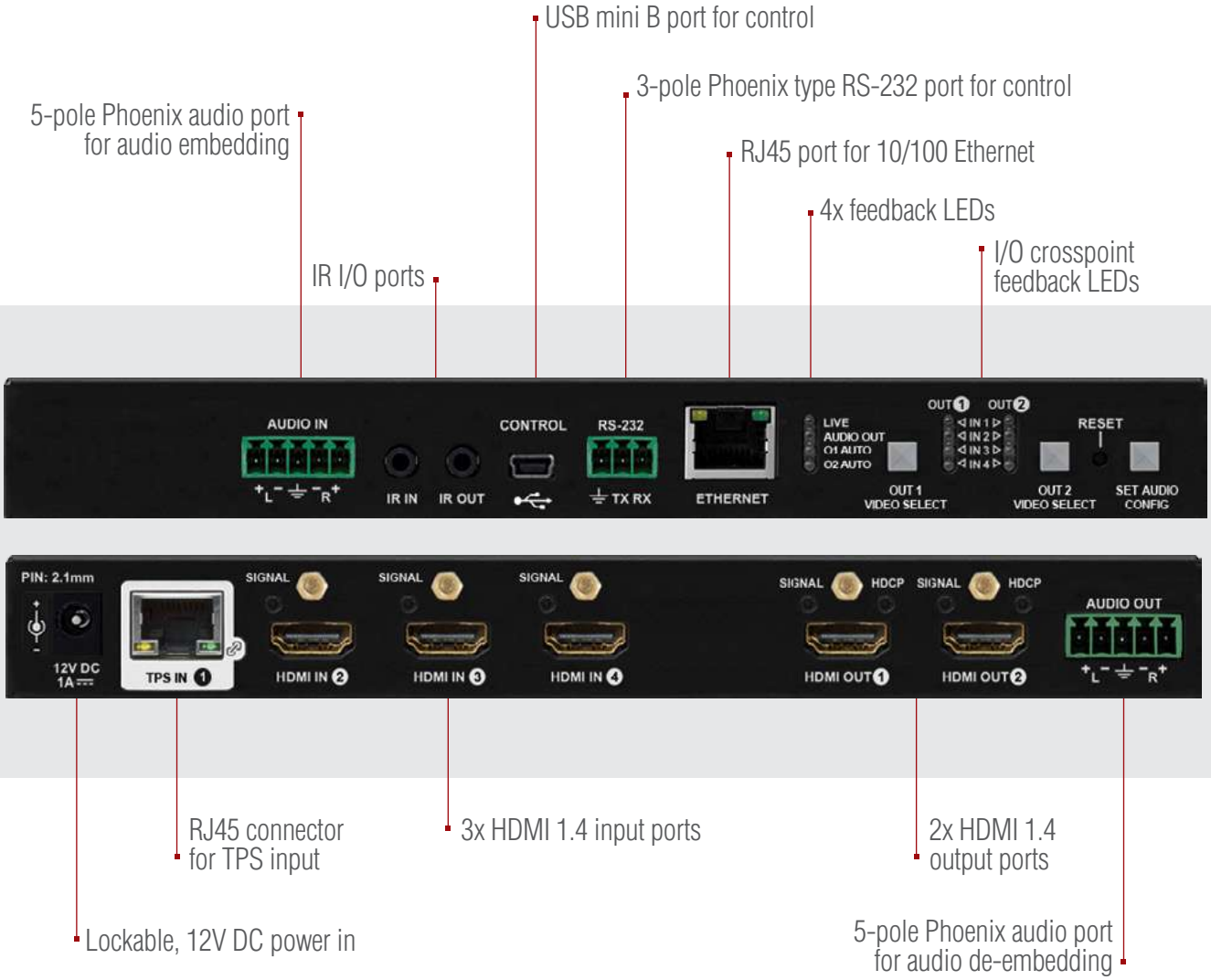
## 4K UHD 4x2 Matrix Switcher with HDBaseT™ and HDMI new!

**MMX4x2-HT200**

Part No: 9131 0035




## Features:

- 4x2 HDMI matrix switcher, with HDMI and TPS ports
- Up to 170 m 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
- RS-232, IR, Ethernet control capabilities
- Compact size

* Depends on cable category and quality

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## Pro Series DVI Switcher

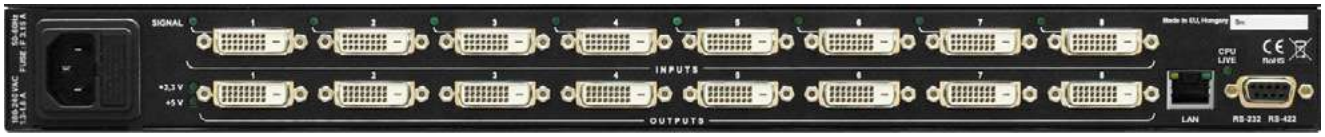
**MX8x8DVI-Pro** and **MX8x4DVI-Pro**

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.

### Features:

- 8 input 8 output or 8 input 4 output DVI matrix router supporting all DVI-D resolutions
- 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 feedback 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


MX8x8DVI-HDCP-Pro digital video router is the most advanced DVI router that supports DVI 1.0, HDCP 1.2 and even HDMI.

### 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.

## 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)
- Control via tRS-232 / RS-422 port, TCP/IP LAN connection or through the built-in website


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 matrix switchers in a single standalone 4x4, 6x6 or 8x8 design.

### Features:

- 4x4/6x6/8x8 I/O size Single and 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)
- Outputs support 500 mA power on DVI +5V pin to power fiber optical DVI cables
- 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 0010 (16x16)

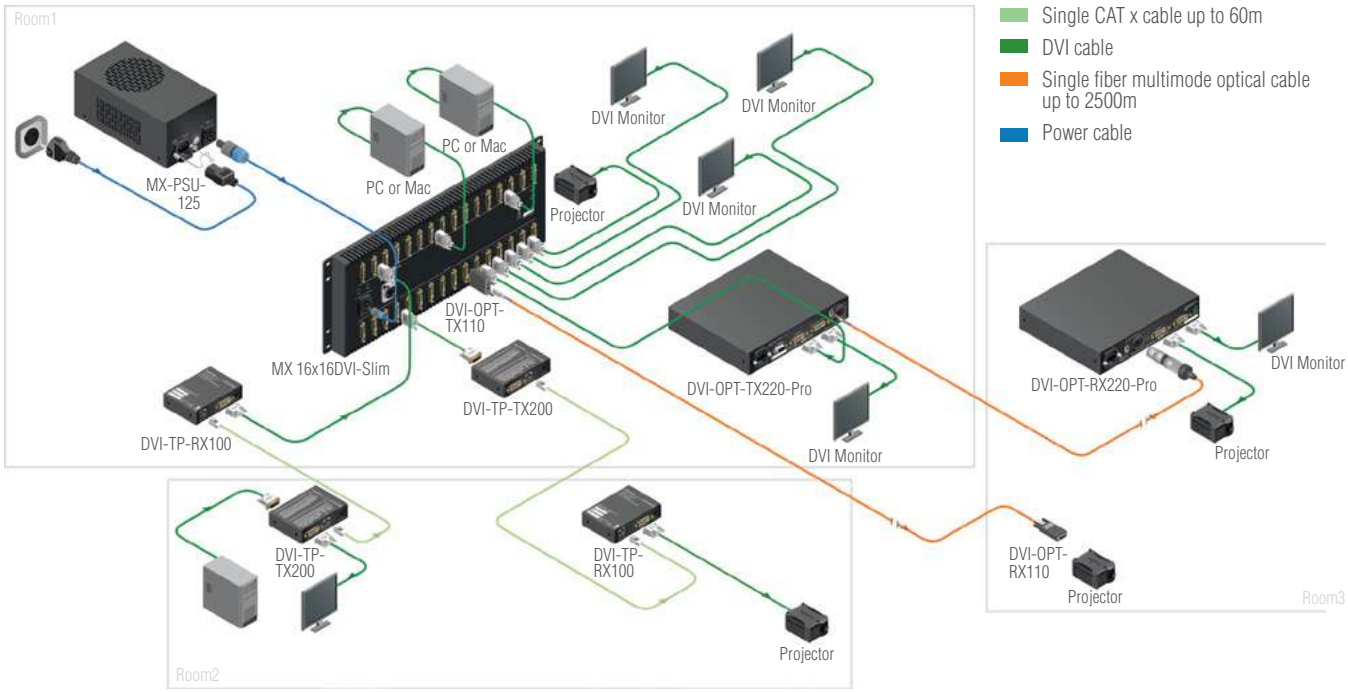

MX16x16DVI-Slim

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.

### Features:

- Industry's lightest and most narrow (1.2 inch depth) frame, can even fit behind other rack mounted equipment
- Aluminum alloy body and fan-less design
- No signal or switching latency
- Routing 9x9/12x12/16x16 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
- Christie (ex-Vista) Spyder and Barco Encore compatibility
- Full crosspoint configuration saving and reloading as preset (32 presets)
- Available I/O sizes: 9x9, 12x12, 16x16
- +12 dB input cable equalization allows using up to 20 meter long DVI cables
- Outputs supply 500 mA current on DVI +5V pin to power long distance fiber optical transmitters, like DVI-OPT-TX110

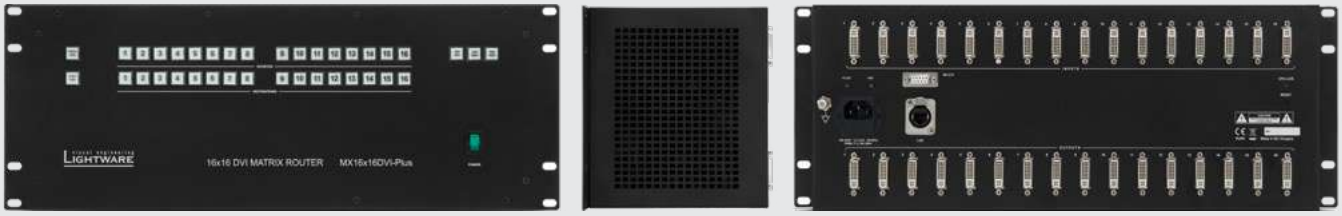
### Connection Diagram:



## Plus Series DVI Matrix Switchers

**MX9x9DVI-Plus, MX12x12DVI-Plus and MX16x16DVI-Plus**

Part No: 9131 0005 (9x9), 9131 0006 (12x12), 9131 0007 (16x16)



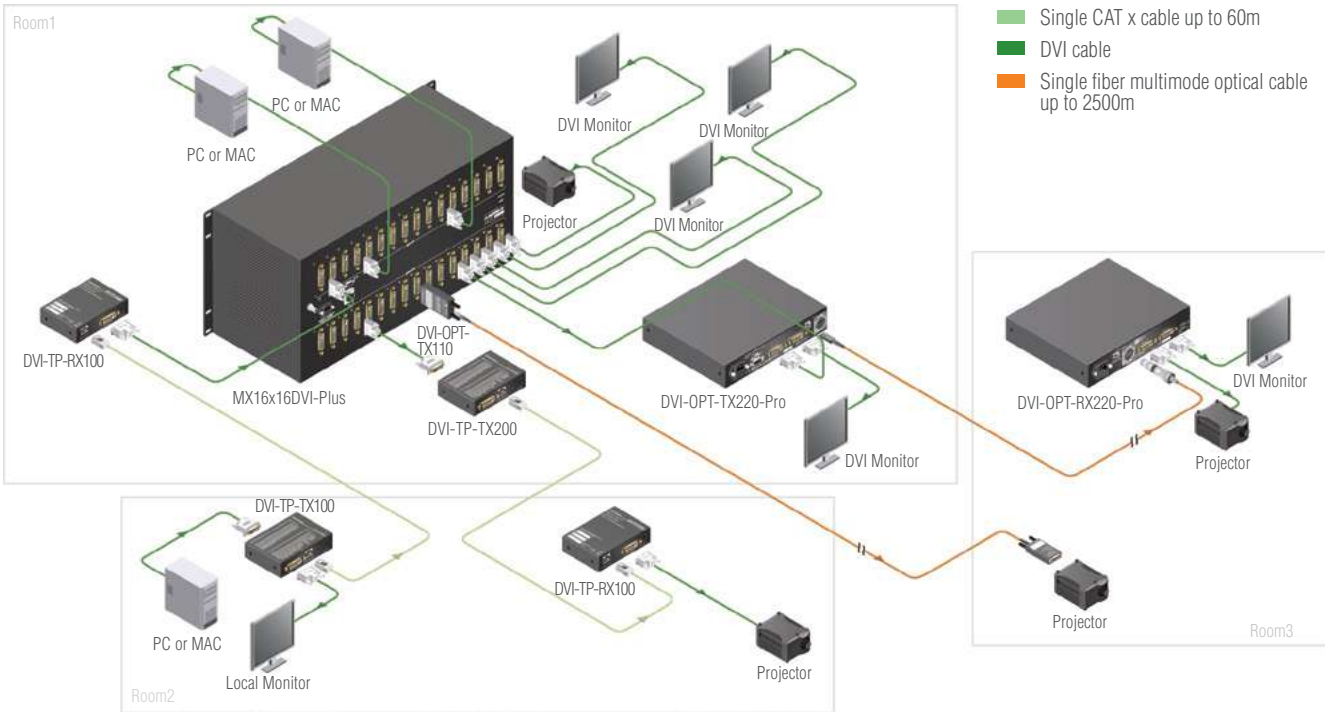

MX16x16DVI-Plus

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 matrix switchers 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.

### Features:

- Integrated power, 7 inch depth, 4 RU height, low noise
- 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:



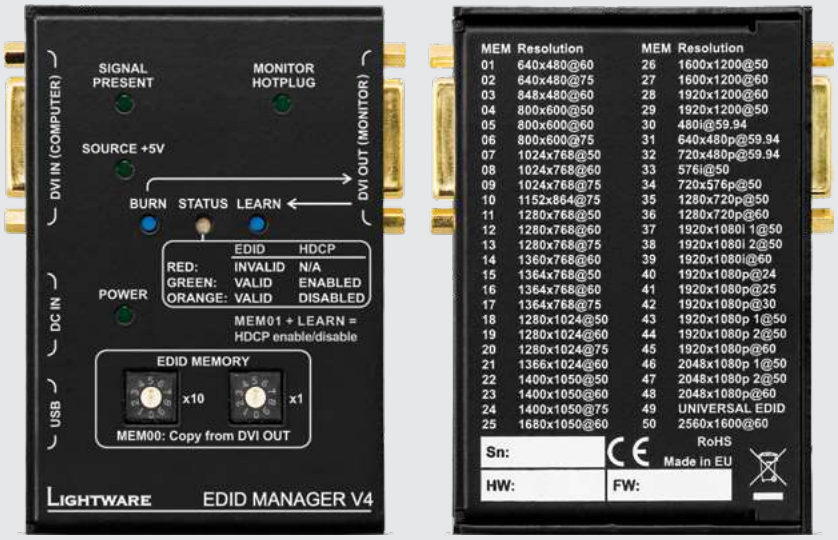
# INTERFACES

Besides the full line of matrix switchers and extenders we also produce interfaces, distribution amplifiers, as well as mounting and other accessories. This is how we make sure you find everything for your desired application in the best Lightware quality under one roof.

## HDCP Compliant HDMI and DVI EDID Emulator

**EDID Manager V4**

Part No: 9133 0001




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.

### Features:

- HDMI/DVI EDID emulator and repeater which emulates and keeps a fixed EDID for the source
- 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 (to integrate certain laptops into a non-HDCP AV environment)
- Signal detection, source detection and monitor detection LEDs
- USB control
- Free Easy EDID Creator software

### 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.

### Applications:

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

### Features:

- Multifunctional HDMI interface
- 4K / UHD (30Hz RGB 4:4:4, 60Hz YCbCr 4:2:0) and 3D capabilities
- Multiple powering options over DC plug, USB or HDMI 5V input
- 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
- Gold-plated connectors

## 4K UHD HDMI Audio De-embedder new!

**HDMI-4K De-embedder**

Part No: 9133 0008



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.

### Applications:

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

### Features:

- Multifunctional interface for de- embedding the PCM audio stream
- 4K / UHD (30Hz RGB 4:4:4, 60Hz YCbCr 4:2:0) and 3D capabilities
- Multiple powering options over DC plug, USB or HDMI 5V input
- 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
- Free Easy EDID Creator PC software
- Rack mounted or standalone use
- Gold-plated connectors

## Reclocking DVI and HDMI Distribution Amplifier

**DA2DVI-HDCP-Pro**

Part No: 9132 0002


DA2DVI-HDCP-Pro 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.

### Features:

- Multifunctional distribution amplifier
- 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
- Free Advanced EDID Editor software

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## 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

## 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.

### Features:

- Multifunctional Dual-Link DVI distribution amplifier
- 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
- Free Easy EDID Creator software
- Installable on rack or used standalone

## SD, HD-SDI and 3G-SDI Distribution Amplifier

**DA4-3GSDI**

Part No: 9132 0001


### Features:

- 3GSDI serial distribution amplifier
- 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

## 4K UHD HDMI Distribution Amplifier with Breakaway Audio

new!

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

Part No: 9132 0006


DA2HDMI-4K-Plus-A is a multifunctional distribution amplifier with audio embedding and de-embedding.

Built-in EDID Management and Pixel Accurate Reclocking, support 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.

### 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
- Multiple powering options over DC plug, USB or HDMI 5V input
- 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 for audio embedding
- 5-pole Phoenix Balanced Output
- 3.5mm Headphone Output for monitoring
- Built-in Video Testpattern Generator
- Deep color support
- Daisy chain support
- Free Easy EDID Creator software
- Installable on rack or used standalone

## 4K UHD HDMI Distribution Amplifier

new!

**DA2HDMI-4K-Plus**

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.

### Applications:

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

### Features:

- Multifunctional distribution amplifier
- 4K / UHD (30Hz RGB 4:4:4, 60Hz YCbCr 4:2:0) and 3D capabilities
- Multiple powering options over DC plug, USB or HDMI 5V input
- 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
- Free Easy EDID Creator software
- Installable on rack or used standalone

# SIGNAL EXTENDERS

## LOSSLESS TRANSMISSION SOLUTIONS

# TPS EXTENDERS

Lightware TPS extenders include HDBaseT™ integration with additional Lightware technology enhancements.
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

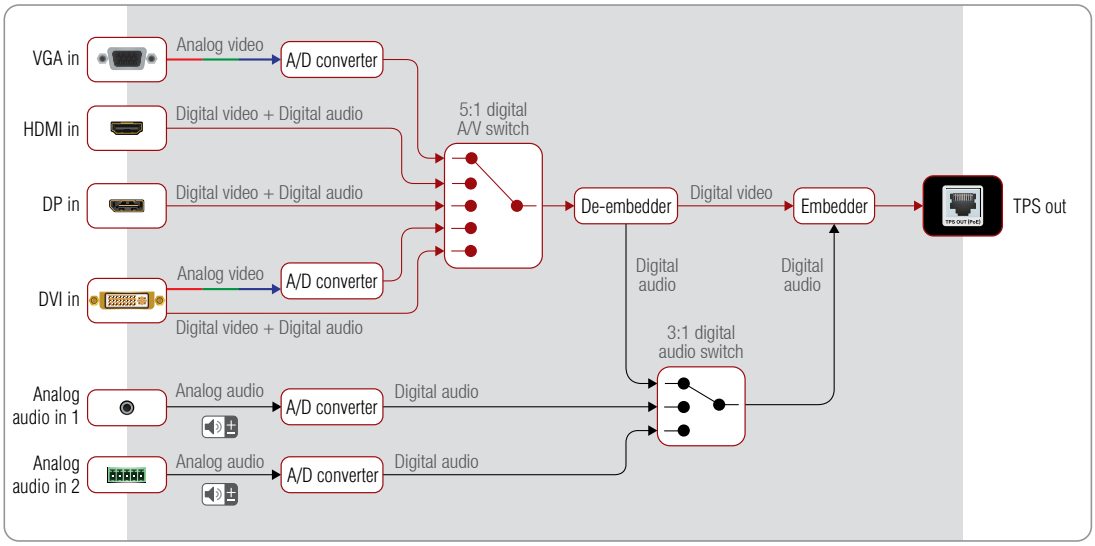

UMX-TPS-TX140 transmits universal 4K video, audio and control up to a 170 m distance* over a single CAT cable. This transmitter was designed for digital and analog video and audio signals: VGA, YPrPb, HDMI 1.4 and DP 1.1 with analog stereo audio from local inputs or embedded 7.1 HBR audio. The unit can also handle HDCP encryption.

### Features:

- Multiport mini switch extender with local monitoring
- 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 to up to 170 m distance*
- Event Manager built-in control application
- Audio and video connectors: DVI-I, HDMI, VGA, DisplayPort, Stereo jack, PHOENIX 1x5-pole
- 10/100 Ethernet transmission
- Bi-directional RS-232 and IR supporting command injection, allowing the sending of any IR or RS-232 control command directly from the LAN connection
- GPIO control port
- HDCP compliant, CEC, EDID transparent
- Local audio embedding
- Advanced EDID Management forces the required resolution from any video source and fixes the output format conforming the system requirements
- Remote (PoE) or local power source
- Standalone or rack-mounted use

*Depends on cable category and quality

### Port Diagram

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## UMX Series TPS Transmitter for VGA, DVI-I, and HDMI

**UMX-TPS-TX130**

Part No: 9154 0013

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 HDMI 1.4 with analog stereo audio from local input or embedded 7.1 HBR audio. It also handles HDCP encryption.

### Features:

- HDBaseT™ compatible TPS transmitter
- 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 asingle CAT5e-CAT7e cable up to 170 m distance*
- Event Manager built-in control application
- Audio and video connectors: DVI-I, HDMI, VGA, Stereo jack
- 10/100 Ethernet transmission
- Bi-directional RS-232 and IR support command injection, allowing the sending of IR or RS-232 control commands directly from the LAN connection
- GPIO control port
- HDCP compliant, CEC, EDID transparent
- Local audio embedding
- Advanced EDID Management forces the required resolution from any video source and fixes the output format conforming the system requirements
- Remote (PoE) or local power source
- Standalone or rack-mounted use

*Depends on cable category and quality

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## UMX Series TPS Transmitter for VGA and HDMI

**UMX-TPS-TX120**

Part No: 9154 0012

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 HDMI 1.4 with analog stereo audio from local input or embedded 7.1 HBR audio

### Features:

- HDBaseT™ compatible TPS transmitter
- 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 built-in control application
- Audio and video connectors: HDMI, VGA, Stereo jack
- 10/100 Ethernet transmission
- Bi-directional RS-232 and IR support command injection, allowing the sending of IR or RS-232 control commands directly from the LAN connection
- HDCP compliant, CEC, EDID transparent
- Local audio embedding
- Advanced EDID Management forces the required resolution from any video source and fixes the output format conforming the system requirements
- Remote (PoE) or local power source
- Standalone or rack-mounted use

*Depends on cable category and quality

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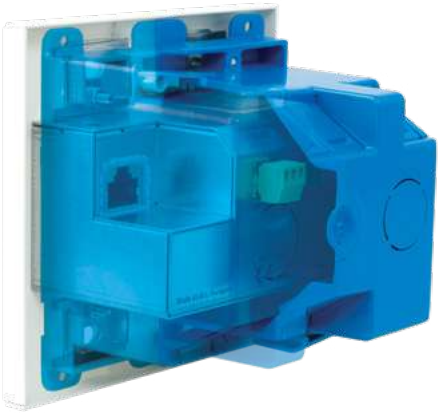
## UMX Series TPS Wallplate for VGA and HDMI DisplayPort

**WP-UMX-TPS-TX130-US** Black
**WP-UMX-TPS-TX130-US** White
Part No: 9154 0009 (Black)
Part No: 9154 0040 (White)



The WP-UMX-TPS-TX130-US Black 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, HDMI 1.4 and DP 1.1 with analog stereo audio from local inputs or embedded 7.1 HBR audio.



### Features:

- HDBaseT™ compatible TPS transmitter wallplate
- 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 to up to 170 m distance*
- Event Manager built-in control application
- Advanced EDID Management forces the required resolution from any video source and fixes the output format conforming the system requirements
- Frame detector
- Audio and video connectors: HDMI, VGA, DisplayPort, Stereo jack
- 10/100 Ethernet transmission
- Bi-directional RS-232 and IR, RS-232 supports command injection
- HDCP compliant, CEC, EDID transparent
- Active cooling
- Local audio embedding
- Also available in white colour
- Remote (PoE) or local power source

*Depends on cable category and quality

The US type wallplate extenders can come bundled with a matching Carlon box, which is required for the installation. Order it from Lightware and it will arrive to you packaged together with your extender.

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## UMX Series TPS Wallplate for VGA and HDMI

**WP-UMX-TPS-TX120-US** Black
**WP-UMX-TPS-TX120-US** White
Part No: 9154 0014 (Black)
Part No: 9154 0041 (White)

The specifications of WP-UMX-TPS-TX120-US Black and White extenders are fully identical with WP-UMX-TPS-TX130-US Black and White extenders, but these models do not have DisplayPort inputs.

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# TPS Switcher and Transmitter for DisplayPort, HDMI and DVI with Local Monitor Out

**SW4-TPS-TX240**

Part No: 9154 0007

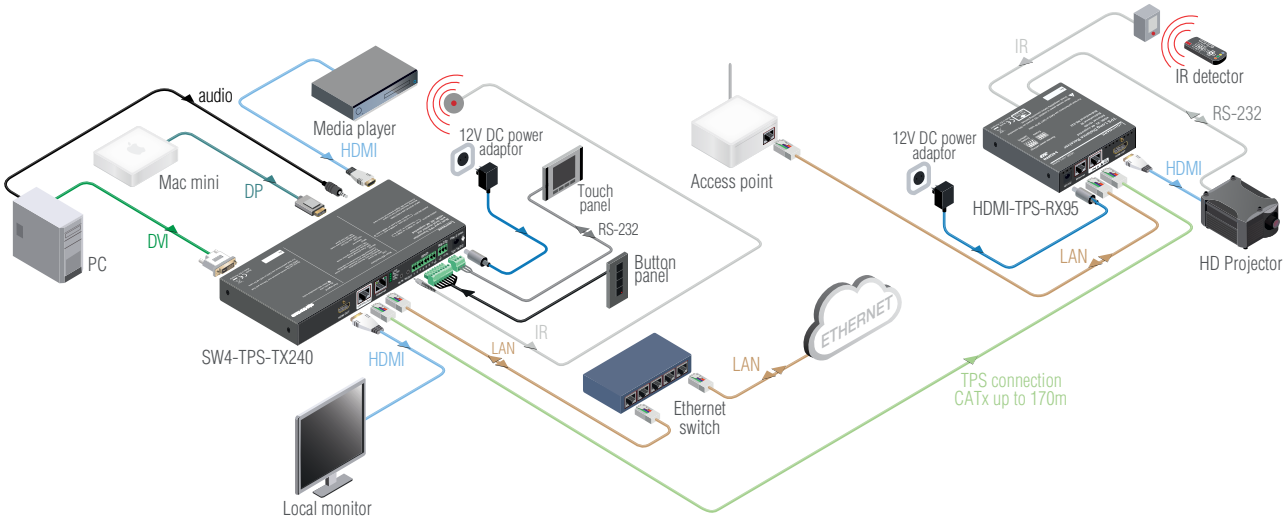

SW4-TPS-TX240 is a flagship model in the Lightware TPS (HDBaseT™ Transmitter) product family. The device can transmit universal video, audio and control up to a 170 meter distance over a single CAT cable in dynamically changing environments such as small board rooms and classrooms. The extender was designed to handle HDMI 1.4 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.

## Features:

- HDBaseT™ compatible mini-switch TPS transmitter for video, audio and control
- 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 to up to 170 m distance*
- Event Manager built-in control application
- Local HDMI port for monitoring
- Advanced EDID Management forces the required resolution from any video source and fixes the output format conforming to the system requirements
- Audio and video connectors: DVI-D, HDMI (input and output), DisplayPort, Stereo jack
- 10/100 Ethernet transmission
- Bi-directional RS-232 and IR supporting command injection
- GPIO control port
- HDCP compliant, CEC, EDID transparent
- Local audio embedding
- Remote (PoE) or local power source
- Standalone or rack-mounted us

*Depends on cable category and quality

## Standalone Application

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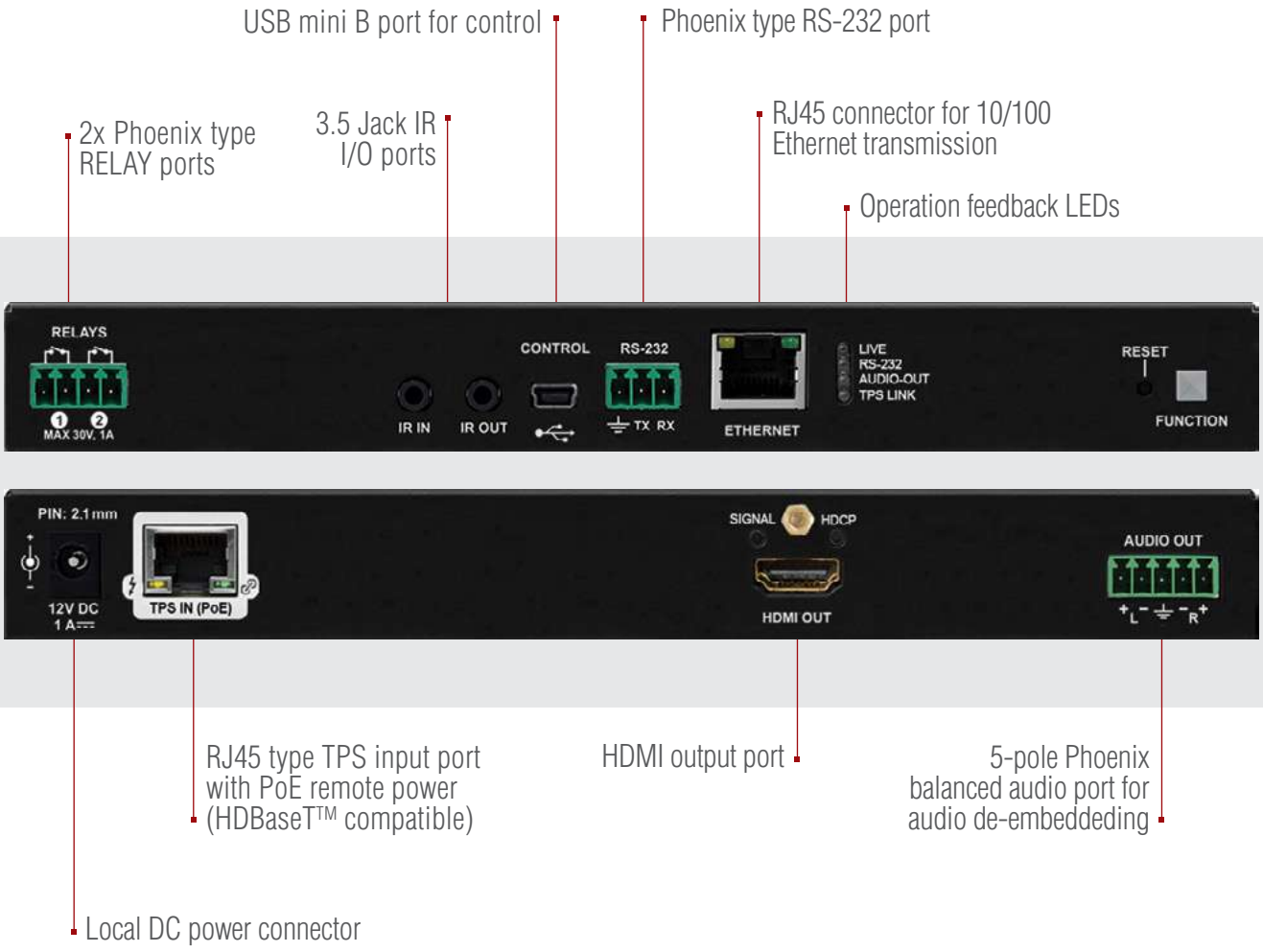
## TPS Receiver with Relay Modules and Balanced Audio Out

**HDMI-TPS-RX110AY**

Part No: 9154 0021




### Features:

- HDMI 1.4 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 de-embedding
- Audio volume and gain control
- 2x Relay modules
- Event Manager built-in control application
- Powered by local or PoE remote power
- RS-232, IR, Ethernet extension
- Advanced EDID Management and Frame Detector

*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 0026, 9154 0025


DVI-HDCP-TPS-TX97

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.

### Features:

- 4K UHD HDBaseT™ and PoE compatible DVI TPS extenders
- 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 oneCATx 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 - The auto operation mode allows the device to detect the far end extender's mode and adopt it.
- IR out mode switch (Wired / Emitter)
- Powered by local or PoE remote power

*Depends on cable category and quality

## TPS Extenders for Single CATx Cable with PoE

**HDMI-TPS-TX97** and **HDMI-TPS-RX97**

Part No: 9154 0024, 9154 0023


HDMI-TPS-TX97

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.

### Features:

- 4K UHD HDBaseT™ and PoE compatible HDMI TPS extenders
- Single-Link DVI and HDMI extension supporting 4K/UHD (30Hz RGB 4:4:4, 60Hz YCbCr 4:2:0) and 120Hz 3D signals
- 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) - The auto operation mode allows the device to detect the far end extender's mode and adopt it.
- IR out mode switch (Wired / Emitter)
- Powered by local or PoE remote power

*Depends on cable category and quality

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## TPS Extenders for Single CATx Cable

**DVI-HDCP-TPS-TX95** and **DVI-HDCP-TPS-RX95**

Part No: 9154 0001, 9154 0002


DVI-HDCP-TPS-RX95

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.

### Features:

- 4K UHD HDBaseT™ compatible DVI TPS extenders
- Single-Link DVI and HDMI extension supporting 4K and 120Hz 3D
- Extends Single-Link DVI or HDMI + Ethernet + RS-232 + IR over oneCATx 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)
  - The auto operation mode allows the device to detect the far end extender's mode and adopt it.
- Rack-mounted or standalone use
- Powered by local or 12V remote power

*Depends on cable category and quality

## TPS Extenders for Single CATx Cable

**HDMI-TPS-TX95** and **HDMI-TPS-RX95**

Part No: 9154 0005, 9154 0006


HDMI-TPS-RX95

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.

### 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

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## TPS Extenders for DVI with Local Monitor Out

**DVI-HDCP-TPS-TX220** and **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 (HDBaseT™ 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, HDMI 1.4 digital video signals and analog stereo audio from local inputs or HDMI Embedded Audio up to eight channel PCM or HBR audio.

### Features:

- 4K UHD HDBaseT™ compatible DVI TPS transmitter
- 4K / UHD (30Hz RGB 4:4:4, 60Hz YCbCr 4:2:0) and 3D capabilities
- Extends DVI, HDMI 1.4 + Ethernet + RS-232 + IR over a single CAT5e-CAT7e cable up to 170 m distance*
- Event Manager built-in control application
- Advanced EDID Management can force the required resolution from the input video source and fixes the output format conforming the system requirements.
- 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
- Powered by local or PoE remote power
- Rack-mounted or standalone use

*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** and **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 (HDBaseT™ 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 HDMI 1.4 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 HDMI 1.4 + 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

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## TPS Extenders for DisplayPort with Local Monitor Out

**DP-TPS-TX220** and **DP-TPS-TX210**

Part No: 9154 0018(220), 9154 0019(210)

DP-TPS-TX220

DP-TPS-TX210

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.

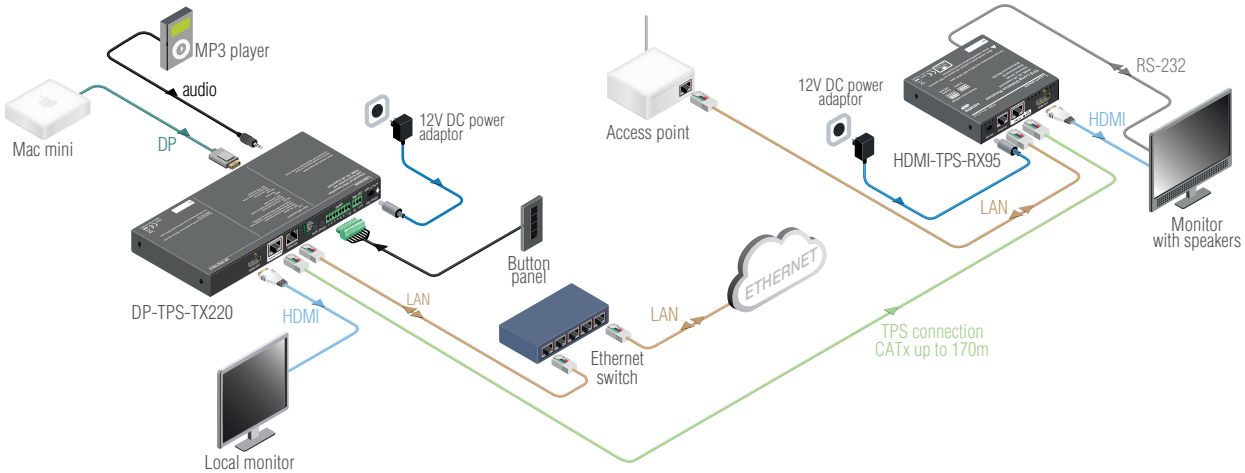
### Features:

- 4K UHD HDBaseT™ compatible DisplayPort TPS transmitter
- 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 built-in control application
- Advanced EDID Management can force the required resolution from the input video source and fixes the output format conforming the system requirements.
- 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
- Powered by local or PoE remote power
- Rack-mounted or standalone use

  *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

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# Single Port Standalone TPS Power Injector

**TPS-PI-1P1**

Part No: 9134 0010

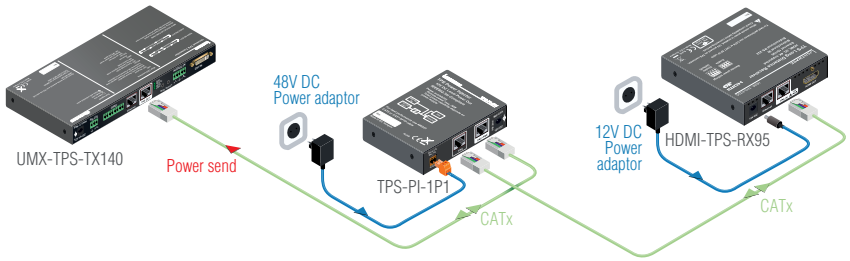

The TPS-PI-1P1 can power a TPS extender placed in the TPS transmission chain, anywhere between the transmitter and the receiver unit. The incoming data stays untouched, the signal quality is unaffected but a 48V DC remote power is added to the signal.

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

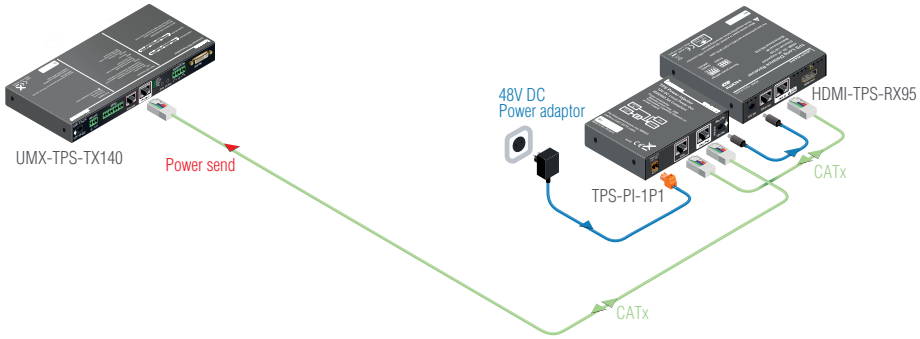
## Features:

- IEEE802.3at compatible high end remote power injector device
- Single port 48V remote power feed to a TPS endpoint
- Optimized for HDBaseT transmission
- 12V DC power output to feed a local device
- Feeding up to 30W power
- Four front panel feedback LEDs
- Up to 20% increase in reachable extension distance

## Typical Application




## 12V Local Powering Application Examples

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# HDBaseT™ Compatible HD Video Scaler and Receiver with Local HDMI Input

**HDMI-TPS-RX120-HDSR**

Part No: 91540046

new!


HDMI-TPS-RX120-HDSR is a TPS receiver with a local HDMI input and a built-in HD video scaler. Conversion between common formats and frame rates are supported. One common resolution can be used across the whole system configuration, independent of the requirements of the connected displays, which improves general performance.

The connected display receives continuous HDMI signal from the scaler when a switching in the input signal occurs.

## Features:

- Maximum resolutions of 1920x1200@60Hz (RB) and FullHD 1920x1080@60Hz
- Scaling of any incoming resolution to a fixed output resolution
- Low latency, visually seamless switching on output
- Configuration control over local or extended serial port
- Local HDMI input switching
- Optional IR remote controller for easy OSD setup
- Configuration via OSD (On Screen Display) with front panel buttons
- 155 m Long Reach Mode and 120 m automatic extension distance
- Factory-loaded EDID memory slots
- RS-232 pass-through for monitor control
- Ethernet control
- Dimensions: 160 W x 191.7 D x 30 H mm
- 1 mm metal casing

## Wallplate (WP) and Floorbox (FP) TPS Extenders for Single CATx Cable with PoE

**WP-HDMI-TPS-RX97, WP-HDMI-TPS-TX97, FP-HDMI-TPS-RX97, FP-HDMI-TPS-TX97**

new!

HDBT™

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.

### Features:

- 4K UHD HDBaseT™ compatible HDMI TPS extender wallplates and floorpanels
- Single-Link DVI and HDMI extension supporting 4K/UHD (30Hz RGB 4:4:4, 60Hz YCbCr 4:2:0) and 120 Hz 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) - The auto operation mode allows the device to detect the far end extender's mode and adopt it.
- New design fits standard wall and floor panel boxes while providing optimized cable connect and removal
- Fits in most common standard wall and floor panel boxes

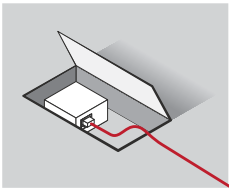
*Depends on cable category and quality

WP-HDMI-TPS-RX97-EU

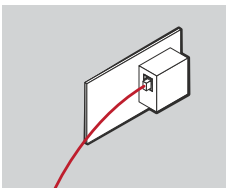
The following table lists additional versions of the same wall and floor panel series. For availability and other information please inquire at your Lightware sales contact.

| Product variants under development: | |
|---|---|
| Wallplates | WP-HDMI-TPS-RX97-EU |
| | WP-HDMI-TPS-RX97-US |
| | WP-HDMI-TPS-RX97-UK |
| | WP-HDMI-TPS-TX97-EU |
| | WP-HDMI-TPS-TX97-US |
| | WP-HDMI-TPS-TX97-UK |
| Floor panels | FP-HDMI-TPS-RX97-GB3 |
| | FP-HDMI-TPS-RX97-LEGRAND |
| | FP-HDMI-TPS-TX97-GB3 |
| | FP-HDMI-TPS-TX97-LEGRAND |

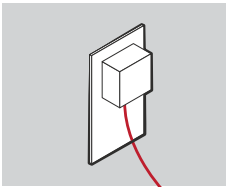
The thoroughly redesigned form factor of the wall and floor panels allows for easier connecting and removing cables in narrow spaces (behind TV sets, under floor panel lids) and reduces cable bending and breaking. The built-in cable tie-down points further ensure stable connection and reduce cable stress.



Cable access example with Floorbox extender



Cable access and orientation example with wallplate extenders.



Cable access and orientation example with wallplate 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 | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | RS-232 | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | IR | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | GPIO | | x | x | x | x | x | x | x | ✓ | ✓ | x | x | ✓ | x | ✓ | x | ✓ | x | ✓ |

*For the detailed features and setting options of the control connectors please consult the user manual documentation of the actual product.

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

Please consult the individual user manuals of products to learn more about the available settings and functions of ports in detail.

# 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.

## Single-Link DVI TP Extenders

**DVI-TP-TX200** and **DVI-TP-RX100**

Part No: 9152 0001 (TX200), 9152 0003 (RX100)


DVI-TP-TX200 DVI-TP-RX100

The TP series extenders offer cost-effective twisted pair extension transmitting Single Link DVI-D signals over a single CATx cable.

### Features:

- DVI TP extenders
- 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

## 50 Series HDMI TP Extenders

**HDMI-TP-TX50** and **HDMI-TP- RX50**

Part No: 9152 0010 (TX50), 9152 0013 (RX50)


HDMI-TP-TX50 HDMI-TP-RX50

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.

### Features:

- DVI and HDMI TP extenders
- 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

## Dual-Link DVI TP Extenders

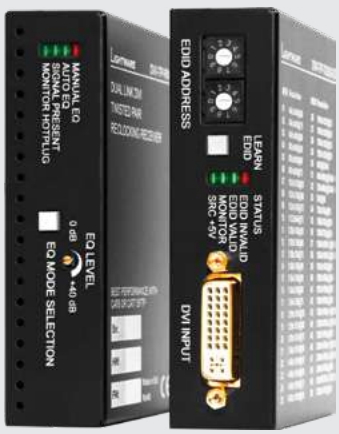
**DVI-TP-TX200DL** and **DVI-TP-RX100DL**

Part No: 9152 0004 (TX200DL), 9152 0005 (RX100DL)

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.

### Features:

- Dual-Link DVI TP extenders
- 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




DVI-TP-TX200DL DVI-TP-RX100DL

# FIBER OPTICAL EXTENDERS

Lightware Fiber Optical Extenders are designed to easily overcome large distances. We provide DVI, HDMI, universal video, analog and digital stereo 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.

# HDMI 2.0 Full 4K Fiber Optical Extenders new!

**HDMI20-OPTC-TX220-Pro**
**HDMI20-OPTC-RX220-Pro**

HDMI20-OPTC-TX220-Pro

HDMI20-OPTC-RX220-Pro

The HDMI20-OPTC-TX/RX220-Pro is a HDMI 2.0 compatible extender pair for video, RS-232 and Gigabit Ethernet signals, supporting uncompressed 4K UHD resolution at 60Hz 4:4:4. This extender pair is particularly recommended for rental and staging applications, 4K live events, and for future-proof operation centers. The extender can transmit HDMI 2.0 signals with 18Gbps over one multimode fiber to a distance up to 700 meters.

Using the factory, custom or transparent EDID emulation the user can fix and lock EDID data on the HDMI 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 transmission and two separate Gigabit Ethernet signals over the fiber connection.

All devices can be mounted on a rack shelf or used standalone, rack ears also serve easy handling and bump protection, mounting threads on top and one of the sides to conform strict installation safety regulations.

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 2.0 compliant without need of a second fiber cable or copper connections.

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.

Lightware's HDMI20-OPTC series supports both HDR10 and Dolby Vision in the HDMI signal at 10 or 12 bit speeds respectively, within its frame bandwidth of 18 Gbps maximum.

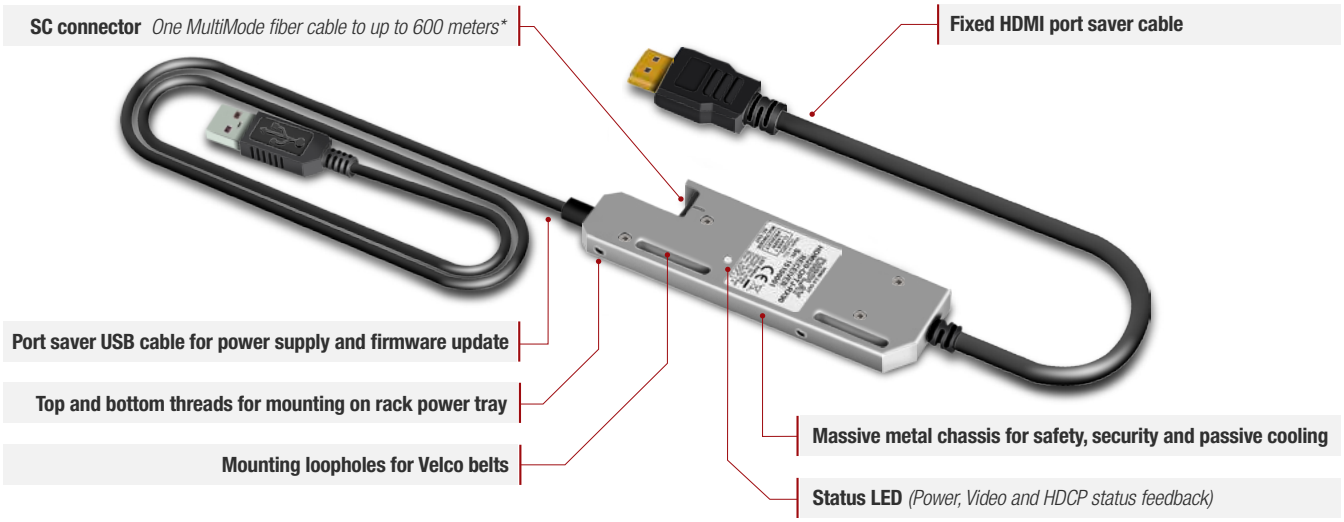
## Features:

- Resolutions up to 4K@60Hz with RGB 4:4:4 colorspace
- 18 Gbps bandwidth
- HDMI 2.0, HDMI 1.x and DVI 1.0 compliant
- Splitting of 4K UHD at 60Hz to two output ports with left half and right half of the original video
- HDR and Dolby Vision support
- 36-bit deep color support
- 3D signal compatibility with frame packing, side-by-side and top-bottom formats
- 2x HDMI inputs for main/backup sources with autoswitch
- Supports all HDMI audio formats: Dolby TrueHD and DTS-HD Master Audio
- 2x Gigabit Ethernet (control for both outputs)
- Ethernet and USB control options
- Pixel Accurate Reclocking on each input
- Advanced EDID Management
- Color graphic LCD and jog dial push button for front panel control on TX side
- Lightware Device Controller software control over Ethernet and USB
- Third party control with LW3 protocol over Ethernet or RS-232
- Firmware upgrade with Lightware Device Updater software over Ethernet
- Neutrik OpticalCON fiber connectors
- Breakout LC connector for Neutrik OpticalCON Duo
- Local monitor output on TX side
- Built-in universal power supply
- Mounting thread on top and one of the sides and fixed mounting ears for safe and secure installation
- Handles for rigging and safety wire rope

M10 mounting threads on the chassis for truss clamps

## HDMI 2.0 Full 4K Fiber Optical Extenders new!

**HDMI20-OPTJ-TX90** and **HDMI20-OPTJ-RX90**



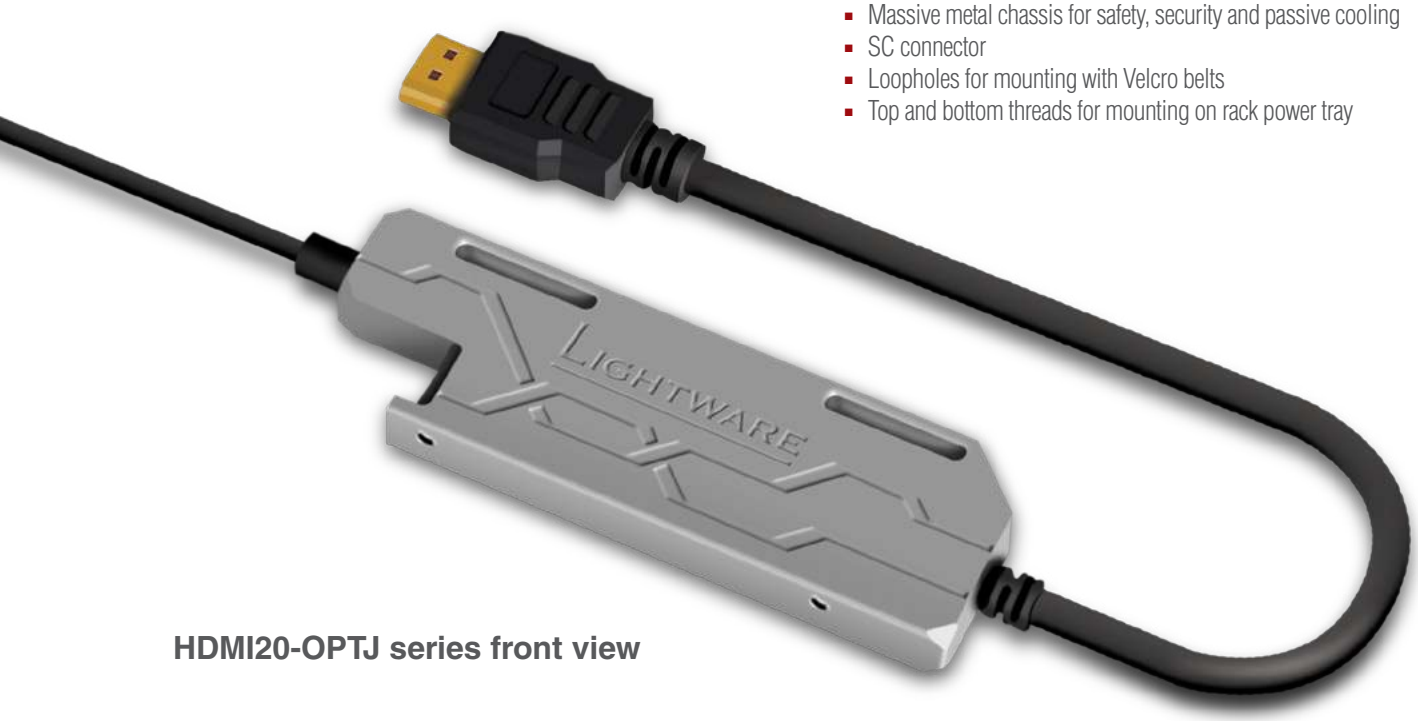

The HDMI20-OPTJ-TX90 and HDMI20-OPTJ-RX90 are HDMI 2.0 compatible optical fiber extenders. These units transfer uncompressed HDMI 2.0 class signals with embedded audio up to 600 m distance, over one MultiMode fiber cable. Embedded HDMI audio signals include Dolby TrueHD and DTS-HD Master Audio.

The maximum resolution is based on the HDMI 2.0 standard: extending uncompressed signals of 4K@60Hz with RGB 4:4:4 colorspace, 36 bit deep color and HDCP 2.2.

These devices have massive, solid aluminum casings, providing excellent cooling, safety, and maximum reliability. There are loops in the chassis for Velcro belts, to fasten the extender to basically anywhere. The device has an SC optical connector.

### Features:

- Resolutions up to 4K@60Hz with RGB 4:4:4 colorspace
- 18 Gbps bandwidth
- HDMI 2.0, HDMI 1.x and DVI 1.0 compliant
- HDCP 2.2, HDCP 1.4 compliant and CEC, EDID transparent
- 36-bit deep color support
- 3D signal compatibility with frame packing, side-by-side and top-bottom formats
- Zero frame delay – no latency
- No compression
- One MultiMode fiber cable to up to 600 m distance
- Supports all HDMI audio formats:
  Dolby TrueHD and DTS-HD Master Audio
- Status LED
- Plug & Play
- Massive metal chassis for safety, security and passive cooling
- SC connector
- Loopholes for mounting with Velcro belts
- Top and bottom threads for mounting on rack power tray




**HDMI20-OPTJ series front view**

# UMX Series Fiber Optical Transmitter

## UMX-OPT-TX150R

Part No: 9151 0020

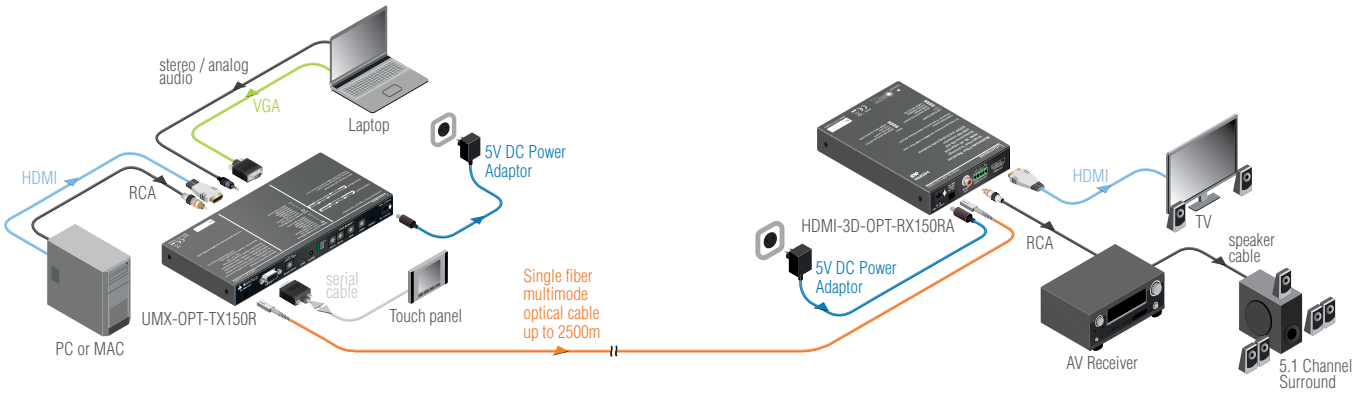

UMX-OPT-TX150R

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.

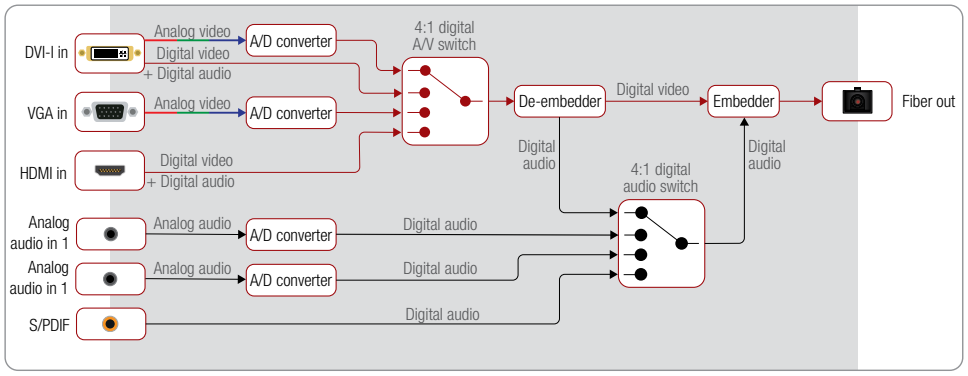
### Features:

- 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, HDCP enable/disable
- 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




## Standalone 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. The new, redesigned housing and ports of these units further enhances operation safety and security.

### Features:

- DVI Multimode 50/125 fiber extender
- 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
- Galvanic isolation against ground loops and humming

*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:

- DVI-D Single Fiber extender
- 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),


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.

### Features:

- HDMI Single Fiber optical extenders
- 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

*See in compatibility table

## 200 Series HDMI Fiber Optical Extenders

**HDMI-OPT-TX200R, HDMI-OPT-RX200R**

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


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.

### Features:

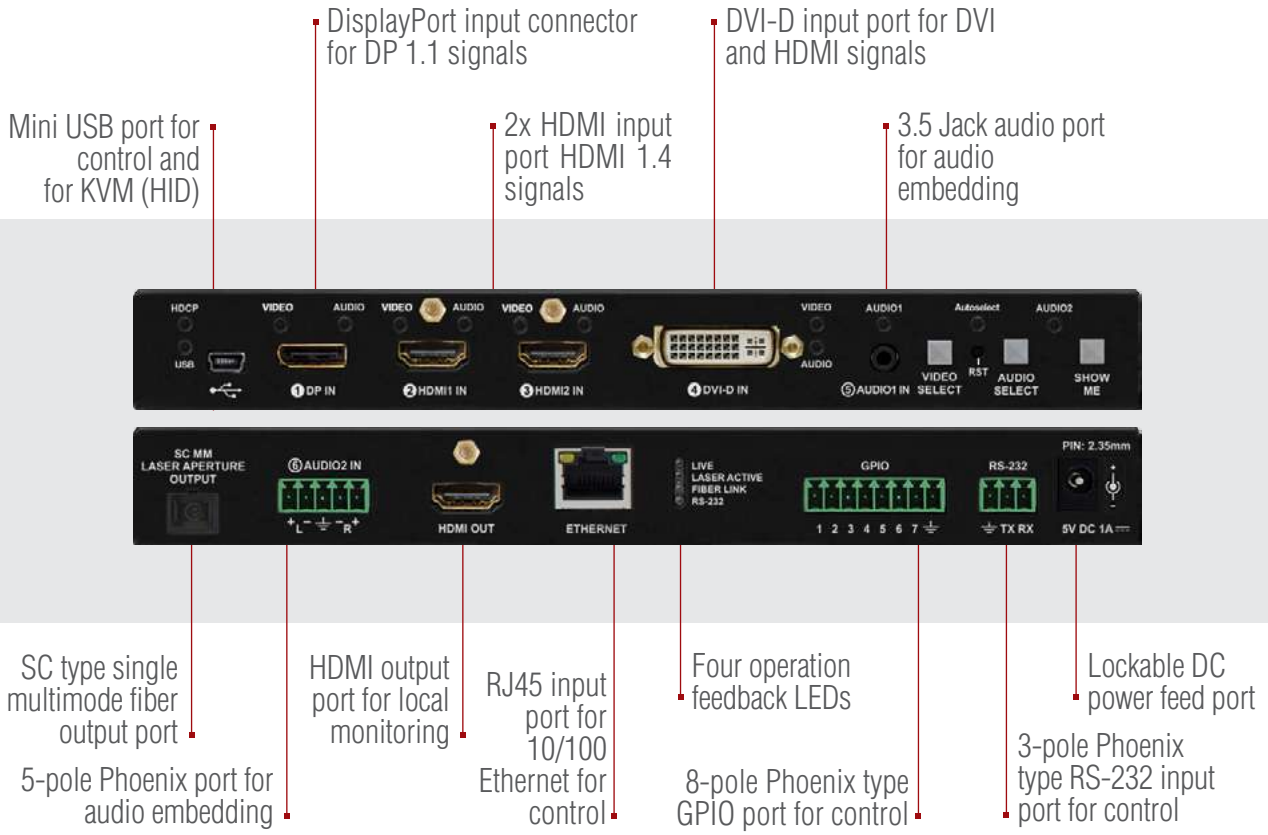
- HDMI Single Fiber optical extenders with local HDMI monitor-ingSC fiber optical connectors
- Extends DVI or HDMI signals over one multimode fiber core
- HDMI to DVI conversion (when using DVI monitor)
- 1920 x 1200 or 2048 x 1080 maximal resolutions
- RS-232 pass through and remote control over fiber
- 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 HDMI output in transmitter
- Two identical HDMI outputs in receiver
- Robust metal housing, rack mountable

*See in compatibility table

## 4K UHD HDMI and DisplayPort Switcher and Multimode Fiber Transmitter new!

**SW4-OPT-TX240RAK**

Part No: 9151 0027




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

### Applications:

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

### Features:

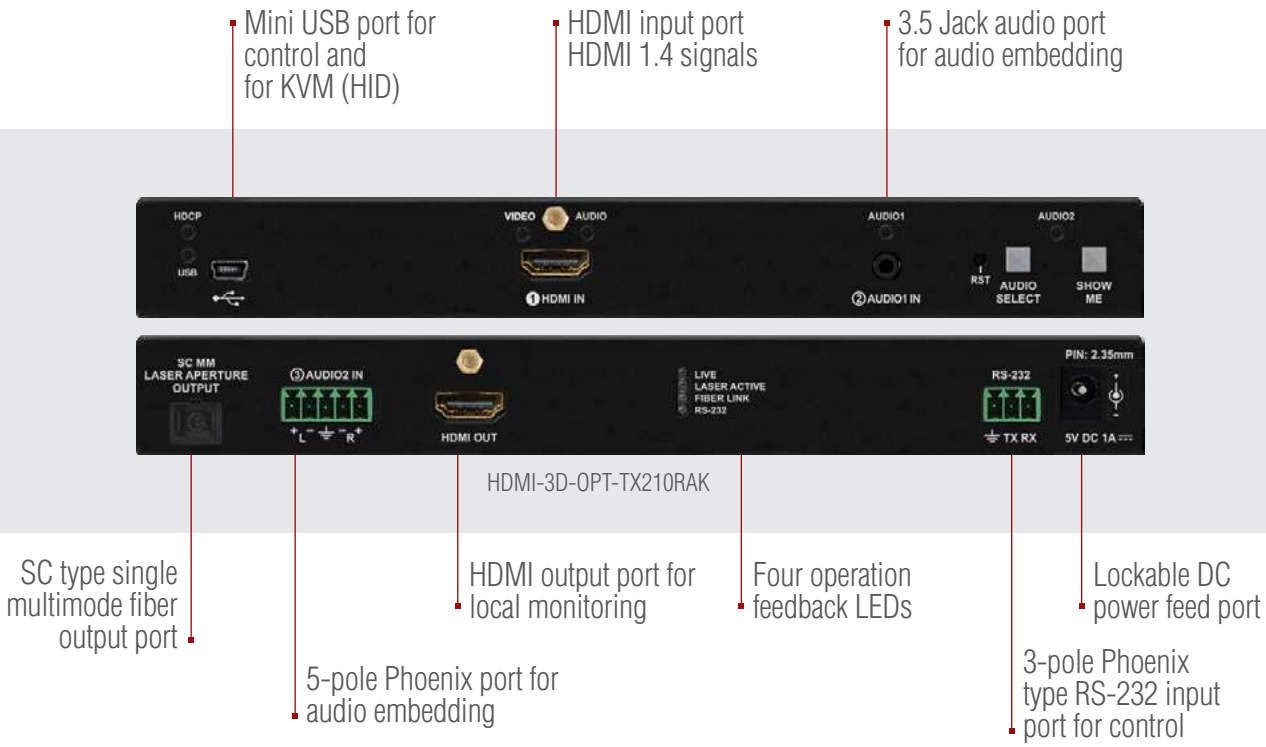
- Multimode single fiber transmitter and mini switcher
- 4K/UHD (30Hz RGB 4:4:4, 60Hz YCbCr 4:2:0) and 3D capabilities
- Extends DVI, HDMI or DisplayPort
- Single fiber technology
- **USB KVM (HID) extension**
- Local monitor output
- Analog audio embedding from 3.5mm jack or 5-pole balanced Phoenix 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

## 4K UHD HDMI Multimode Single Fiber Extender

new!

**HDMI-3D-OPT-TX210A** and **HDMI-3D-OPT-TX210RAK**

Part No: 9151 0028 (A), 9151 0030 (RAK)




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.

### 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:

- Multimode single fiber transmitter
- 4K/UHD (30Hz RGB 4:4:4, 60Hz YCbCr 4:2:0) and 3D capabilities
- Multimode single fiber technology
- **USB KVM (HID) extension***
- Extends HDMI 1.4 + Audio + RS-232 over a single multimode fiber
- Local monitor output
- Analog audio embedding from 3.5mm jack or 5-pole balanced Phoenix ports
- RS-232 pass through*
- Control via, 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

*Only on the TX210RAK version

## 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.

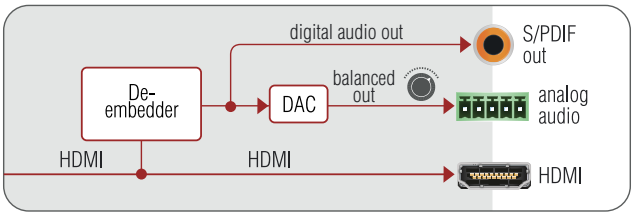
### Features:

- 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
- Audio output: digital S/PDIF and symmetrical analog audio
- Volume, balance, bass and treble control
- Phase invert and de-emphasis option
- **USB KVM (HID) extenion**
- 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-OPT-RX100


DVIDL-OPT-TX200

# FAR AWAY, SO CLOSE

## EXTEND YOUR SIGNALS TO 2.5 KM


**HDMI-3D-OPT-TX210RAK** OPTICAL EXTENDER

- 4K/UHD
- USB/KVM
- RS-232
- Event Manager
- Advanced EDID Manager
- Pixel Accurate Reclocking
- 3D Formats Support
- Audio Embedding

visual engineering
LIGHTWARE
lightware.com

# DisplayPort Fiber Optical Extender

**DP-OPT-TX100** and **DP-OPT-RX100**

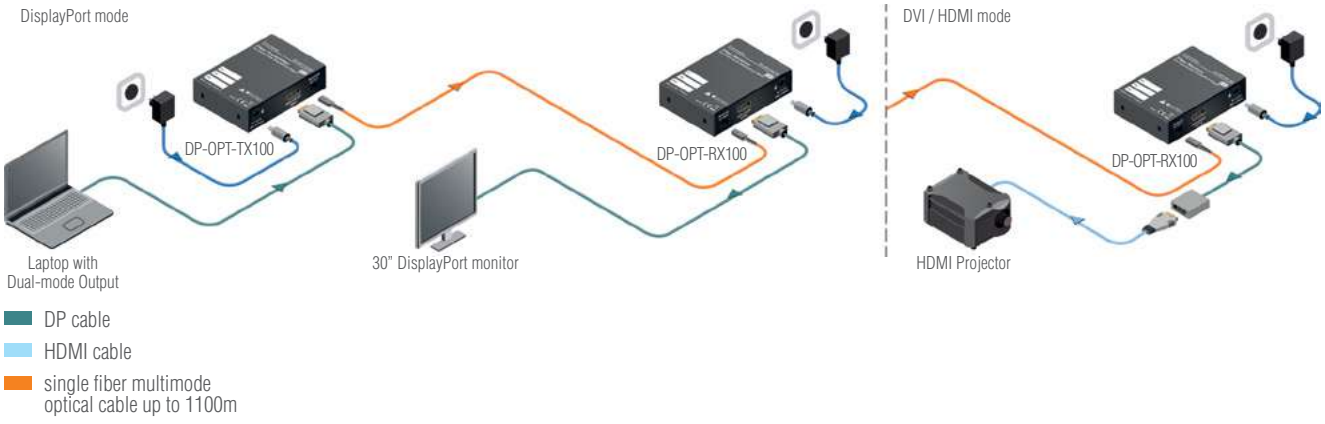
Part No: 9151 0016 (TX100), 9151 0017 (RX100)


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.

## 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

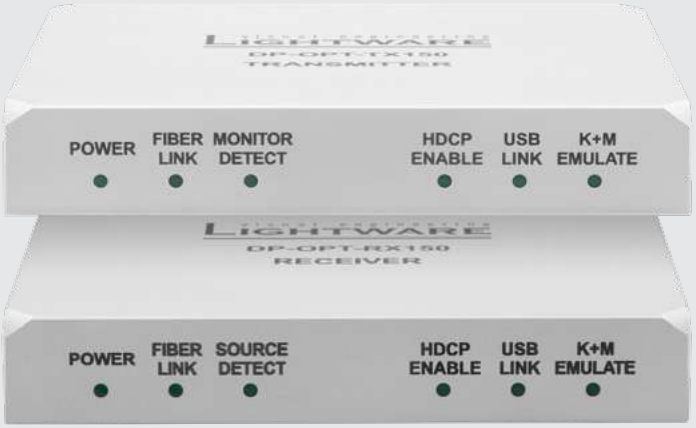
## Standalone Diagram



## KVM DisplayPort Fiber Optical Extender

**DP-OPT-TX150** and **DP-OPT-RX150**

Part No: 9151 0018 (TX150), 9151 0019 (RX150)




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

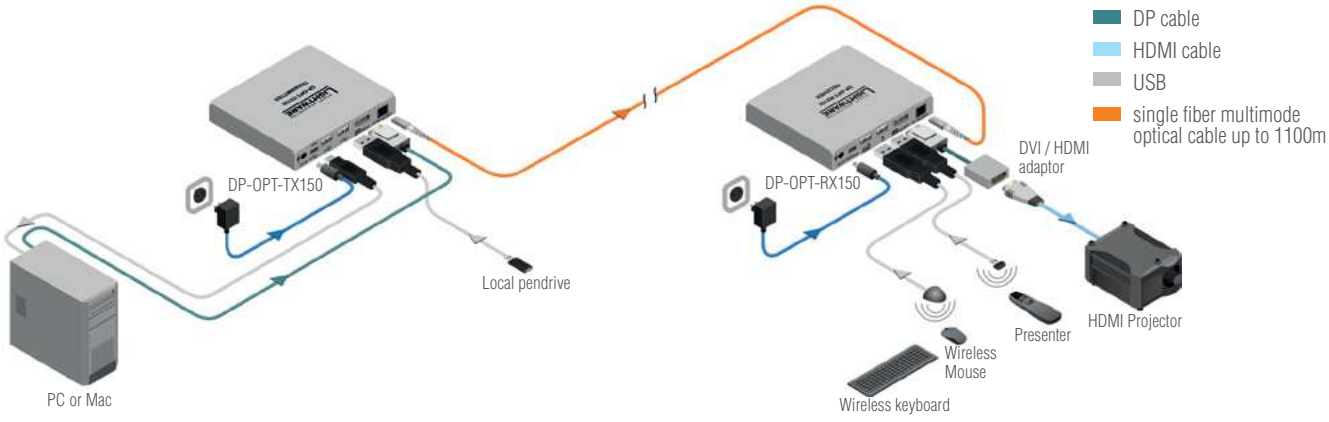

DP-OPT-RX150 rear view

USB control

USB-A connectors for extended devices

SC fiber connector

### Standalone Diagram



# 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 Singlemode 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 Singlemode 9/125 fiber. Massive solid metal casing provides excellent cooling and maximum reliability.

**NEW DESIGN!**


**Fully reinforced housing and connectors!**

## 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. The new, redesigned housing and ports of these units further enhances operation safety and security.

**NEW DESIGN!**


**Fully reinforced housing and connectors!**

### 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-mountable

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## 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. No power supply is required as the devices have no active electrical parts.

### 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-NT


SP2OPT-LC


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-RX90 | DVI-HDCP-OPTS-RX90 | DVIDL-OPT-RX100 | DVI-OPT-RX220-Pro | HDMI-OPT-RX100 | HDMI-OPT-RX100R | HDMI-OPT-RX200R | HDMI-3D-OPT-RX150RA | HDMI20-OPTC-RX220-Pro | HDMI20-OPTJ-RX90 | MX-HDMI-OPT-IB | MX-DVI-OPT-IB |
| DP-OPT-TX100 | DP | | | | | | | | | | | | | | |
| DP-OPT-TX150 | | DP K | | | | | | | | | | | | | |
| DVI-OPT-TX110 | | | 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 | 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 K | | | H H | [D] |
| SW4-OPT-TX240RAK | | | D | | | D | D | H[H] | H[H]R | H[H]R | H[H]R K | | | H H | [D] |
| HDMI20-OPTC-TX220-Pro | | | | | | | | | | | | H2 R | | | |
| HDMI20-OPTJ-TX90 | | | | | | | | | | | | | [H]H2 | | |
| MX-HDMI-OPT-0B | | | D | | | D | D | H[H] | H[H] | H[H] | H[H] | | | H[H] | D |
| MX-DVI-OPT-0B | | | D | | | D | D | D | D | D | D | | | D | D |
| MX-DVI-OPT-0B-RCLK | | | D | | | D | D | D | D | D | D | | | D | D |

Remote power
No remote power

H HDMI/DVI transmission
H2 HDMI 2.0
DP DisplayPort

[H] HDCP compliant
D DVI transmission
[D] DVI Dual-Link

R RS-232 pass-through
K USB KVM extension
– None of the above

# FIBER OPTICAL EXTENSION SYSTEM COMPARISON CHART

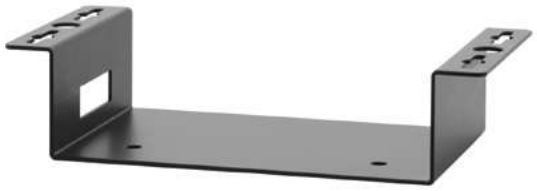
| | | Rack and Desk Mount Units | | | | | | | | | | | | MX Boards | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | DVI-OPT-TX110 | DVI-OPT-TX220-Pro | DVI-HDCP-OPTS-TX90 | DVI-HDCP-OPTM-TX90 | DVIDL-OPT-TX200 | HDMI-OPT-TX100 | HDMI-OPT-TX100R | HDMI-OPT-TX200R | UMX-OPT-TX150R | HDMI-3D-OPT-TX210A | HDMI-3D-OPT-TX210RAK | SW4-OPT-TX240RAK | MX-DVI-OPT-OB | MX-DVI-OPT-OB-RCLK | MX-HDMI-OPT-OB |
| 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 |

# 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

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## 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
- DVI-HDCP-TPS-TX97
- DVI-HDCP-TPS-RX97
- 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
- UMX-OPT-TX150R
- UMX-TP-TX100R
- UMX-TPS-TX120
- UMX-TPS-TX130
- UMX-TPS-TX140
- UMX-HDMI-140
- 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 appearance.

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
- UMX-HDMI-140
- 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

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#### 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

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#### 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 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-TX97 | ✓ (4) | ✓ (2) | ✓ (1) | x |
| | DVI-HDCP-TPS-TX97 | ✓ (4) | ✓ (2) | ✓ (1) | x |
| | 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-TX97 | ✓ (4) | ✓ (2) | ✓ (1) | x |
| | HDMI-TPS-RX97 | ✓ (4) | ✓ (2) | ✓ (1) | x |
| | 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 ✓ sign shows the number of products that can be mounted by the accessory simultaneously.
Please note that Lightware's standalone matrix switchers, modular digital matrix frames and remote control panels are delivered with their own rack mounting ears. Interfaces and wallplate extenders are not compatible with any accessory listed above.

# UBEX

ULTRA BANDWIDTH EXTENDER



# Uncompressed Video Over IP

under development!

# UBEX

UBEX (Ultra Bandwidth Extender) is a new generation AV Over IP optical extender product line, transferring 4K UHD@60Hz 4:4:4 uncompressed video signals on a 10 Gbit Ethernet Network without frame latency.

Standard, certified 10 Gbps SFP+ optical modules are installed in the device, which are plug and play and field-exchangeable by the user. Modules can be duplex multimode/singlemode or bi-directional singlemode. The maximum reachable distance is ranging between 400 m with multimode modules (OM4) and 80 km with long range singlemode modules. In a typical application with a standard, non-blocking 10 Gbps Ethernet switch, it is necessary to use both directions of the link. The number of necessary fibers depends on the optical link speed and the optical module: for 10 Gbps one or two fibers, for 20 Gbps two or four fibers are needed.

One of the primary advantages of the new architecture is scalability.

- Uncompressed 4K UHD@60Hz 4:4:4
- Frame Detector (Input signal analysis)
- Pixel Accurate Reclocking
- Multilayer Signal Routing
- Instantaneous Switching without Signal Latency
- Advanced EDID Management
- USB HID (KVM)
- Reliability and Redundancy
- 4K Scaling

# 3D VISUALIZATIONS

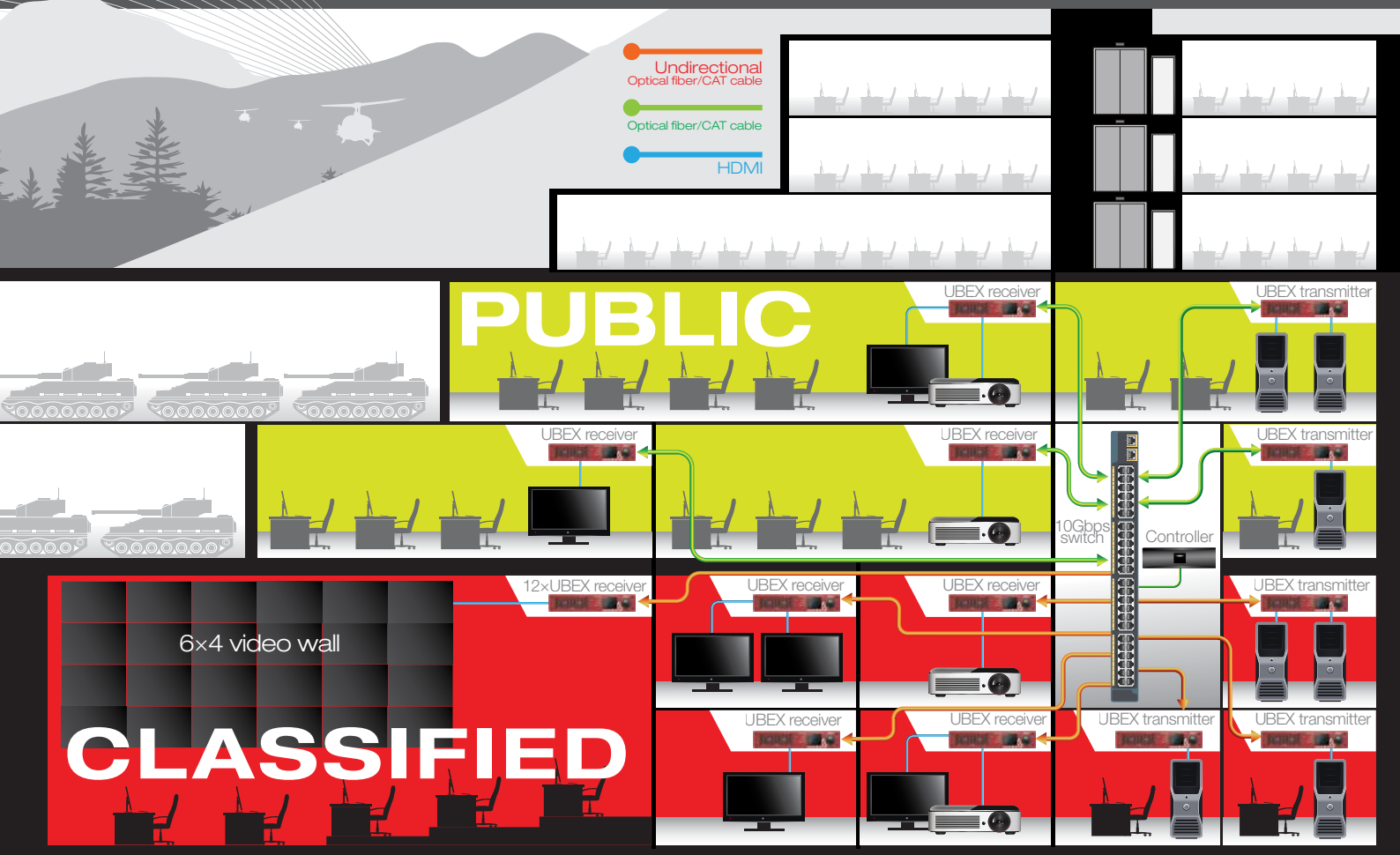
Visualization of data or concepts in order expose meaning, increase understanding and help, or to actively contribute to designing in engineering all need low latency, high detail visual imaging.

Designing an architectural space that needs to be experienced before being built, or sometimes even a mere theory can also be better shared visually, employing virtual and augmented reality and stereographic 3D.

The speed, the color accuracy and the low latency video transfer provided by UBEX are key to 3D visualization that can greatly contribute to a wide variety of projects including 2D/3D/4D image analysis, scientific research visualization, 3D animation, 3D object scanning and also macro-photography and video, to list just a few of the possible applications.

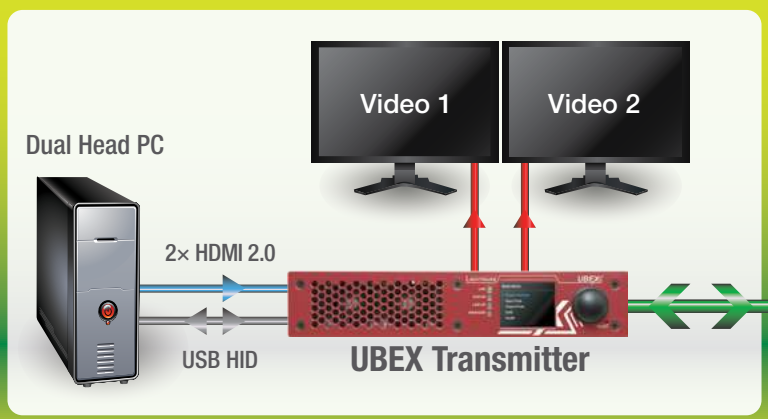
An UBEX based medical visualization system can help examine human anatomy and reconstruct it in a real-time 3D environment for use in education, simulation, and training.

# SAFETY - CRITICAL SYSTEMS

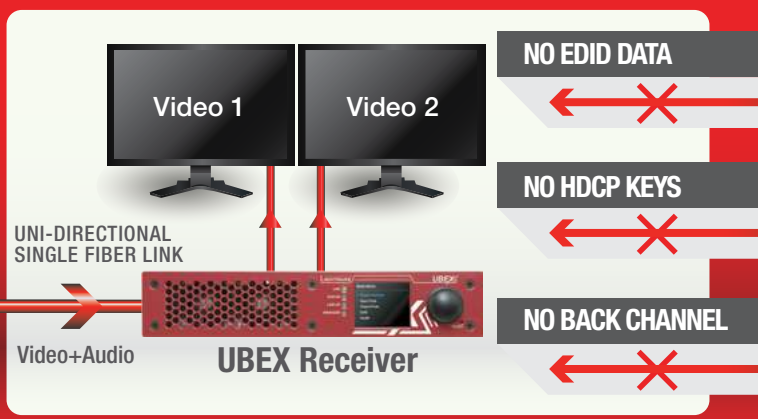



In a sensitive situation wasting a millisecond or failure to send a signal can be catastrophic. A UBEX based system provides fail-safe operation, can guarantee unidirectional, high speed data transmission and can be applied for unique purposes with special safety and security criteria including separate security zones and individually set privileges.

## PUBLIC ZONE

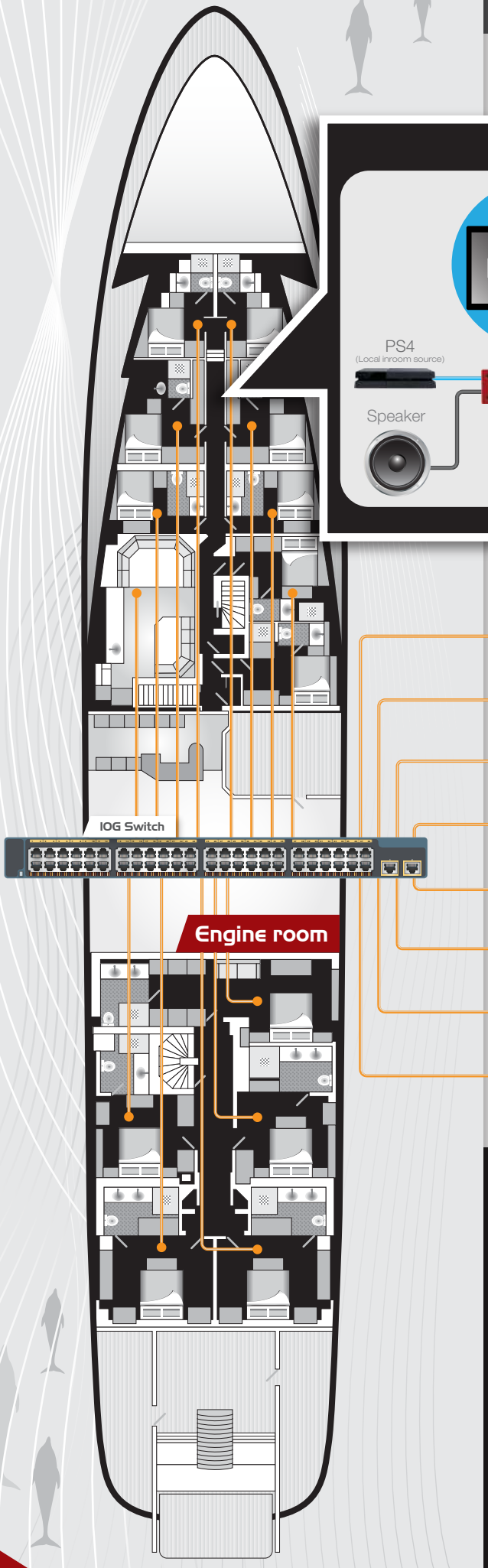


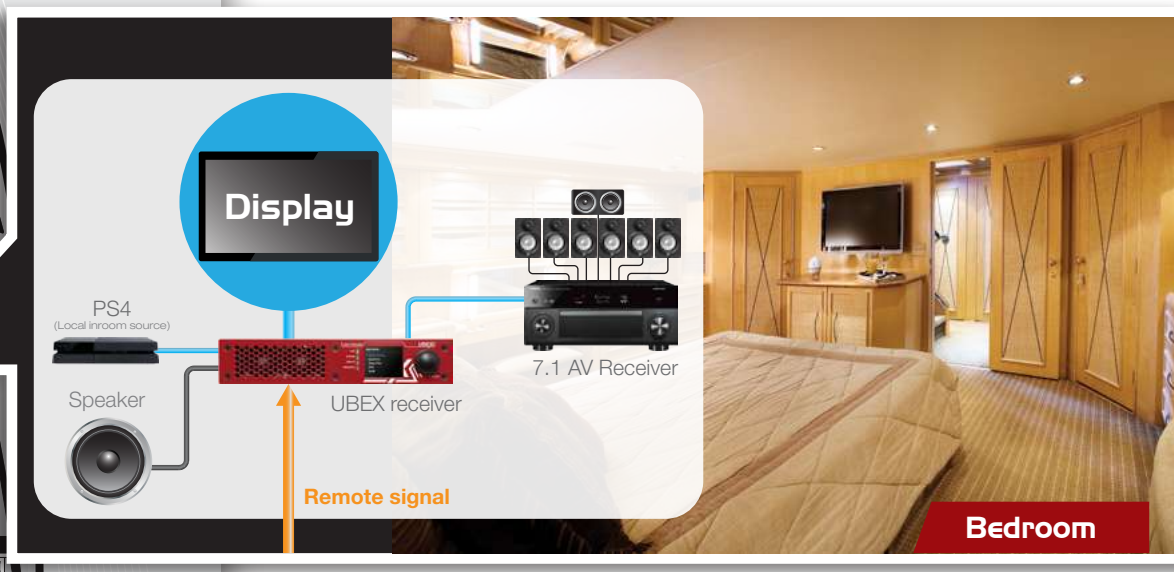

## CLASSIFIED ZONE

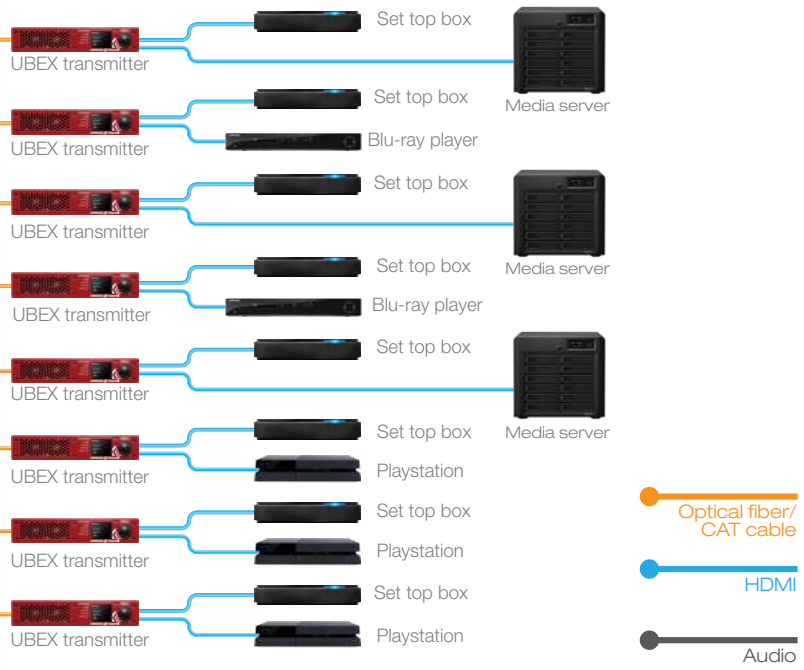



In a **data diode network** (also referred to as a unidirectional network) data travels only in one direction to guarantee information security. These networks are common in high security environments such as defense, electric power generation facilities, nuclear power stations and similar high security installations. Typically in these configurations two or more networks are connected with differing security classifications.
The physical nature of unidirectional networks only allows data to pass from one side (low side) of a network connection to another (high side), and never the other way around.

# MARINE APPLICATIONS



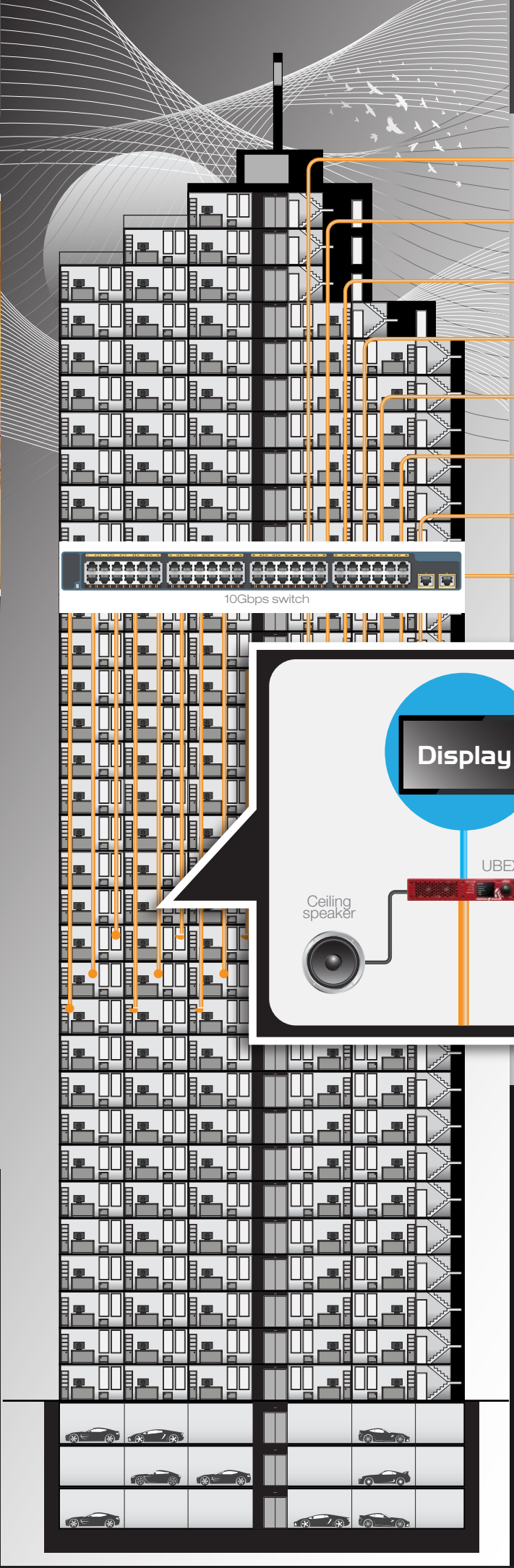



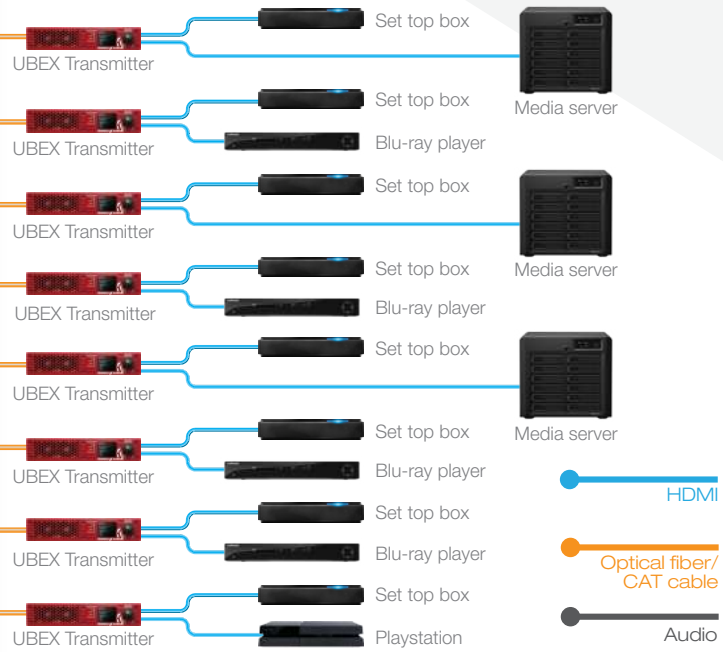




Designing and installing AV equipment on a yacht is a sensitive process. The installed system has to fulfill customer demands and possibly exceed them, and it is best if it's versatile and easily integrable with third party systems, devices and networks.

Based upon our previous experience gained at marine AV installations, we believe UBEX has optimal product properties and features for this purpose. It is particularly well applicable to yacht-like environments, and being an Ethernet based system it can greatly cooperate with any standard central Ethernet switch.

# BUSINESS OFFICE CENTERS



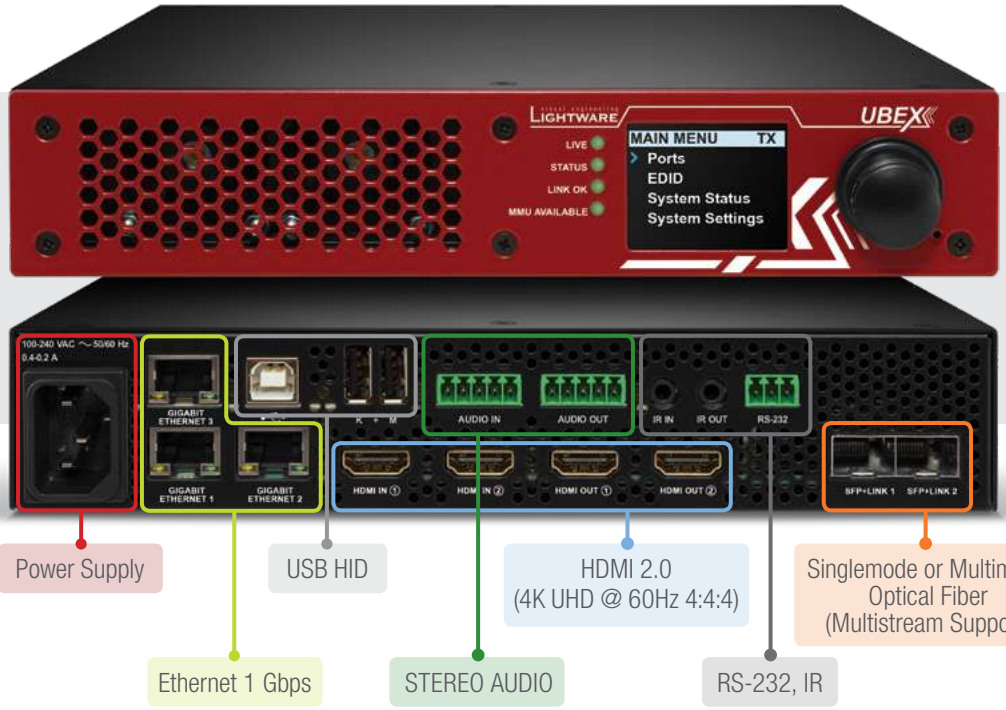


When corporate organizations move into existing office buildings they need solutions to design, install and integrate AV technology into their conference rooms, boardrooms and other spaces to create efficient ways for company communications in the existing building setting. A virtual matrix can be created by integrating into even an already existing 10 Gbit Ethernet network, where the role of crosspoint will be taken by a standard Ethernet switch. Such a virtual matrix can be extremely asymmetric with any number of input and output endpoints. The UBEX system is flexible and expandable so it is an excellent choice conforming both existing and newly developed office environments.

# UBEX Ultra Bandwidth Extender

**UBEX-PRO20-HDMI-F110**

coming soon! Call sales for availability




UBEX is an optical scaling extender which allows 4K UHD@60Hz 4:4:4 uncompressed signal extension with latency-free multistreaming. The device is designed to use Video Over IP transmission on a 10G Ethernet network, it has standard, 10 Gbps SFP+ optical modules installed, which are field-exchangeable by the user.

UBEX units can connect to create a complex network with the use of a standard Ethernet switch.

An UBEX-MMU-X200 Matrix Management Unit (MMU) is required to control and supervise a virtual matrix, which can be created by connecting UBEX units as input and output endpoints to an Ethernet switch acting as crosspoint.

One of the prime advantages of such new architecture is scalability: the virtual matrix created can have a virtually infinite number of endpoints, limited only by the number of open ports on the Ethernet switch used. Such a virtual matrix can be also extremely asymmetrical, as e.g. it could have only a few (or one) devices on the input side, while an almost unlimited number of output end units.

Using visually lossless compression, UBEX can extend two Full 4K UHD signals over a single, 10 Gbps Ethernet port. This generates substantial cost saving on the required Ethernet switch side, as with UBEX only half the router size is required compared to the needs of similar, 10 Gbps IP based architectures.

The UBEX design also favors dual-screen applications: each transmitter and each receiver handles 2x HDMI 2.0 video ports.

UBEX can also be used in a point to point setup as a conventional extender pair between endpoints. It is not required to use an Ethernet switch when point to point extension is required.

The maximum reachable distance is ranging between 400 m and 80km, depending on the type of singlemode or multimode optical modules installed in the device, and on the signal properties.

The extender also features audio and optional full speed USB 2.0, USB KVM (HID), balanced audio ports and RS-232 and IR connectors.*

*Only UBEX-PRO20-HDMI-F110

## Features

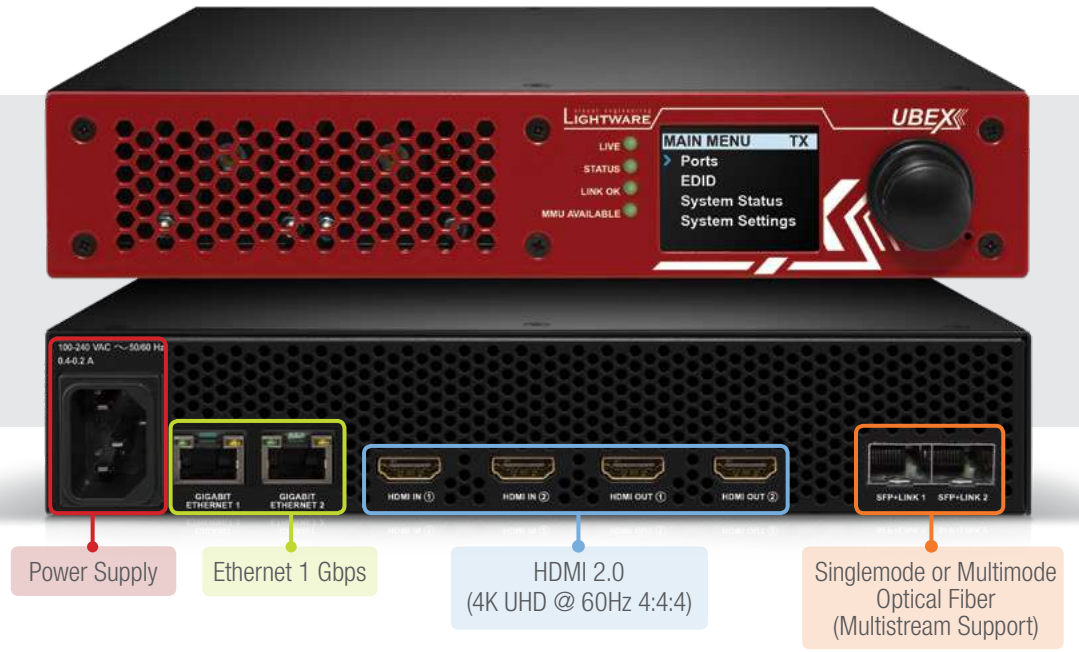
- 4K UHD @ 60Hz 4:4:4 Scaler
- Multistreaming technology (multiple video transmission on a single optical link)
- Video Over IP OR Point-to-Point operation modes: UBEX can also work as a conventional extender, no Ethernet switch is required for simple extension
- Versatile operation modes: dual channel 4K transmitter or receiver or transceiver mode: sending and receiving signals simultaneously
- Operation modes can be changed by rebooting and selecting the desired mode
- Field replaceable SFP+ modules: up to Singlemode (SM) 80 km or Multimode (MM) 400 Meters
- Advanced EDID Management
- 10 Gbps on one (or two) fibers OR 20 Gbps on two (or four) fibers
- Configurable video compression
- Virtual Matrix mode with UBEX units connected to a central Ethernet switch serving as crosspoint, supervised and controlled by a UBEX MMU-X200 Matrix Management Unit
- Front panel jog dial push button and color display
- Front panel feedback LEDs
- Internal power supply and front-to-back cooling air trail

## UBEX-PRO20HDMI-F110 Add-on

- USB HID (KVM)
- Balanced stereo audio connectors
- Optional control speed connectors (RS-232, IR)

## UBEX Ultra Bandwidth Extender
**UBEX-PRO20-HDMI-F100**

coming soon! Call sales for availability




| | | UBEX-PRO20-HDMI-F100 | UBEX-PRO20-HDMI-F110* |
|---|---|---|---|
| HW features | Link | 20G | 20G |
| | Optical | ✓ | ✓ |
| | Type of videos | HDMI 2.0 | HDMI 2.0 |
| | Nr. of video inputs | 2 | 2 |
| | Nr. of video outputs | 2 | 2 |
| | USB HID (KVM) | × | ✓ |
| | 1 Gbps Ethernet | ✓ | |
| | Nr. of fibers (W/STANDARD SFP+) | 4 | 4 |
| | Nr. of fibers (W/BIDI SFP+) | 2 | 2 |
| SW features | 4K scaling | ✓[1] | ✓[1] |
| | Framerate conversion | ✓[1] | ✓[1] |
| | Deinterlacing | x | x |
| | 4K UHD @ 60Hz 4:4:4 | ✓ | ✓ |
| | 30 bit deep color support | ✓ | ✓ |
| | Advanced edid management | ✓ | ✓ |
| | HDCP 2.2 compliant | ✓ | ✓ |
| | Seamless switching | ✓ | ✓ |

*: available soon
[1]: for only one video stream

# UBEX Matrix Management Unit

**UBEX-MMU-X200**

coming soon! Call sales for availability


UBEX-MMU-X200 is a Matrix Management Unit (MMU) for the UBEX AV Over IP optical extender product line. With a standard Ethernet switch installed as crosspoint, a virtual matrix can be created with UBEX devices connected to the IP network as input and output endpoints. The virtual matrix established requires to be managed and controlled by the MMU also connected to the Ethernet switch.

The MMU builds and constantly updates a database of the UBEX endpoints connected, displaying a traditional crosspoint view of the virtual matrix in the Lightware Device Controller (LDC) software, also displaying connected, but inactive units.

Users connect and communicate directly with the MMU in matrix mode, and MMU connects to and relays communication to the endpoint UBEX units.

The MMU displays information about endpoints and the overall virtual AV network, backup and restore functions are also provided to save and load the configuration.

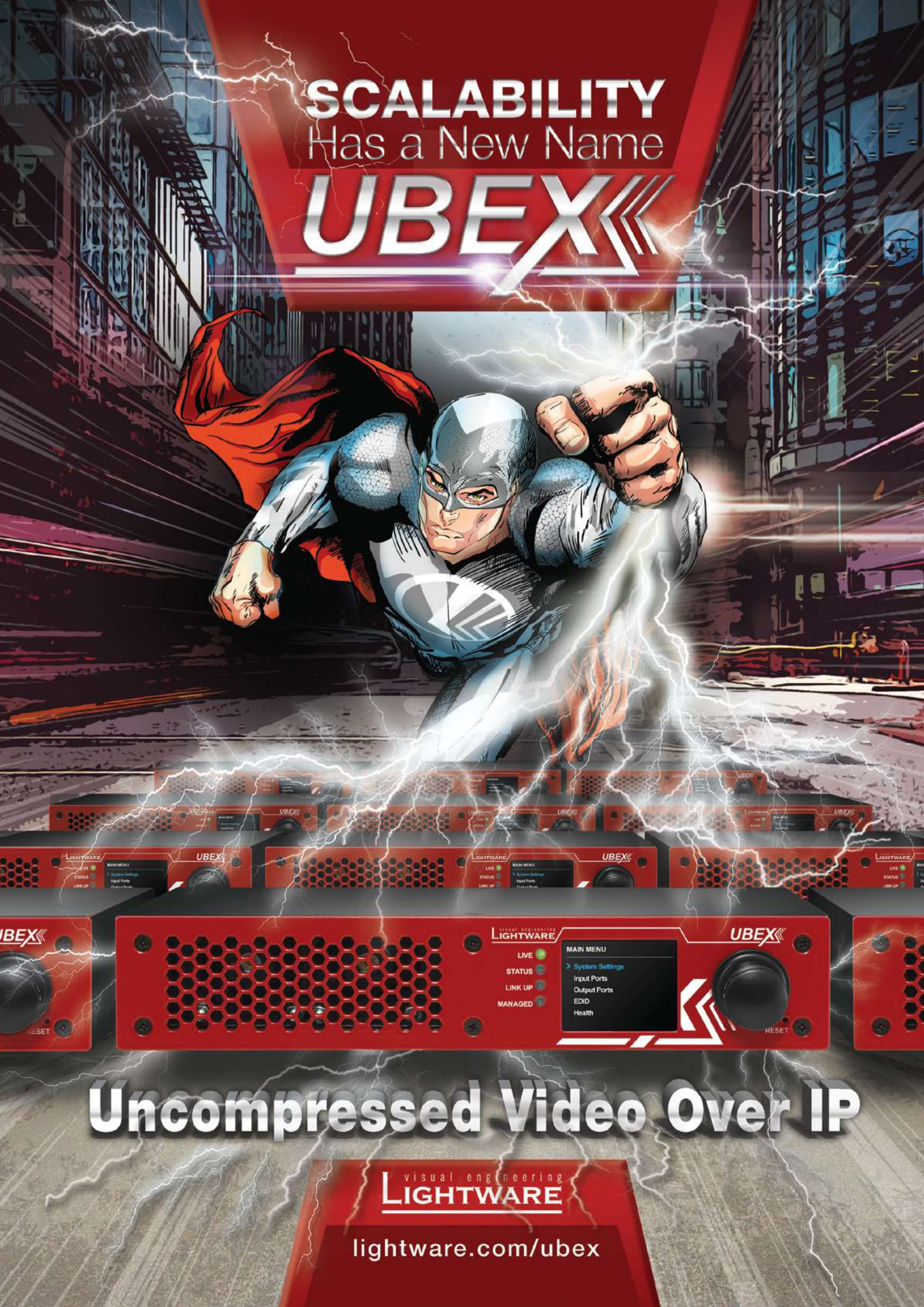
The MMU also manages the firmware upgrades of the connected endpoint UBEX devices, it is possible to initiate and update of the firmware on all UBEX units present in the network. Based on the communication with the UBEX endpoints, the MMU manages and supervises bandwidth use efficiency.

The MMU also serves as an interface for third party control systems and includes Lightware's proprietary Advanced EDID Management technology.

This device has standard one RU size and can be installed in a rack with the help of the rack ears. UBEX-MMU-X200 has an internal power source running on standard 110/220V connected via a standard IEC port to mains.

## Features

- Easy access front panel Ethernet and USB ports for device control
- Rear panel RS-232 and Ethernet ports for third party control input
- UBEX network connection: RJ45 1 Gbps Ethernet port or 1 Gbps SFP link module
- Jog-dial push button and color display
- Advanced EDID Management
- IEC standard, 110/220V power inlet port
- Standard, 1 RU size to be installed on rack with supplied rack ears


SCALABILITY
Has a New Name
UBEX
LIGHTWARE
UBEX
LIVE
STATUS
LINK UP
MANAGED
MAIN MENU
System Settings
Input Ports
Output Ports
EDID
Health
RESET
Uncompressed Video Over IP
visual engineering
LIGHTWARE
lightware.com/ubex

## AV Over IP Scaling Multimedia Extender with USB KVM, RS-232 and IR

new!

**VINX-120-HDMI-ENC** and **VINX-110-HDMI-DEC**

Part No: 91810002 (ENC), 91810003 (DEC)


VINX-120-HDMI-ENC


VINX-110-HDMI-DEC

VINX-120-HDMI-ENC and VINX-110-HDMI-DEC are LAN based multimedia extender devices transferring HDMI video between endpoints. The VINX encoder and decoder devices connect either via a direct CATx cable connection, or through a Gigabit Ethernet switch in between. The maximum delivery distance can reach to up to 100 m (if connected directly) with minimal latency and employing a quality, proprietary wavelet transform based image compression.

The maximum supported resolution is 3840 x 2160 @ 30Hz with 7.1 audio.

VINX devices support both static and dynamic (DHCP) IP address settings. 100 factory EDID presets and five user EDIDs are stored in the encoder. These units feature embedded web for control.

Front panel DIP switches serve quick manual setting for pairing maximum 15 encoder devices to decoders over the network, a quick and easy installation advantage for digital signage applications. More than 15 units can be paired by software configuration via embedded web page or external controller.

Gap and bezel compensation can be adjusted for video walls. Scaling is available on the decoder side and videos can be freely cropped. With the help of the VINX Video Wall Wizard, the installation of a video wall can be reduced to one tenth of the usual time needed when using similar, third party products.

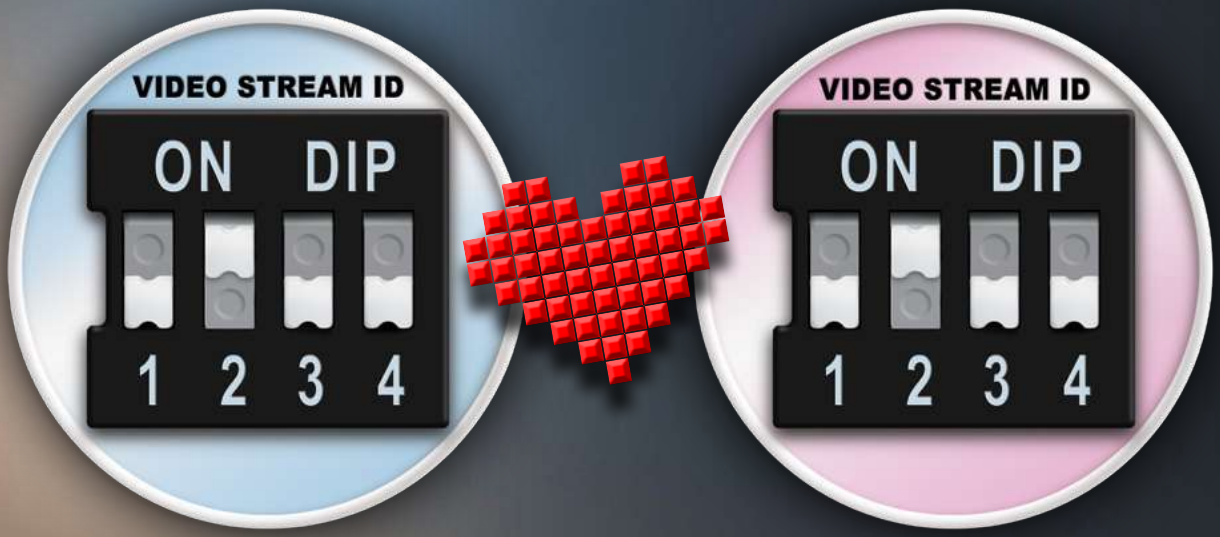
### Feature

- 3840 x 2160 @ 30Hz resolution over a 1 Gigabit network with very low latency
- Audio supports LPCM and Dolby Digital /Dolby Digital Plus/ DTS/ Dolby TruHD/DTS-HD bit stream
- HDCP compliant
- Local HDMI port for monitoring on the Encoder
- Variable maximum bit rate (10 Mbps ~ 800 Mbps)
- USB KVM and USB 2.0
- LED feedbacks, DIP switches and physical buttons for quick and easy setup and operation
- Embedded web control, direct and networked control via PC
- The device can be controlled via Lightware's proprietary LW3 protocol commands
- Gap and bezel compensation for video wall applications, cropping adjustment capability
- Output video signal scaling to adjust to sink properties

# We Believe in Long Distance Relationships

## When It's a

# *Perfect Match!*




Your VINX Encoder and Decoder have found each other!

## Easy pairing on a 1 Gb Ethernet network with the front panel DIP switches


VINX
VIDEO NETWORK EXTENDER

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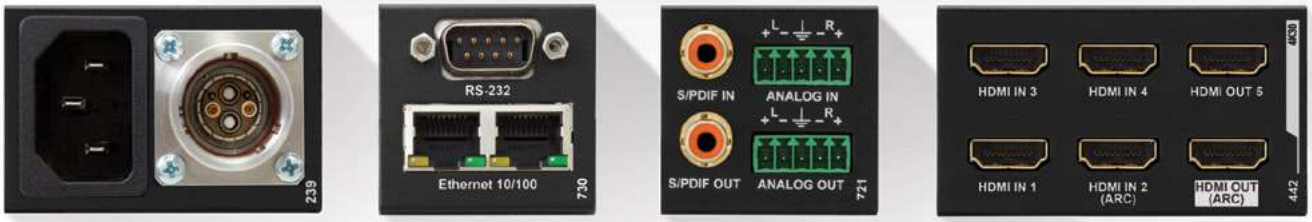
# MODEX

## VARIABLE MODULAR EXTENDERS



HDMI IN
DVI IN
410


S/PDIF OUT
ANALOG OUT
720


231


DVI OUT
436


RS-232
RS-232
713


229


IN
419


RS-232
712


207


OUT
422


IR OUT
IR IN
RS-232
715


234

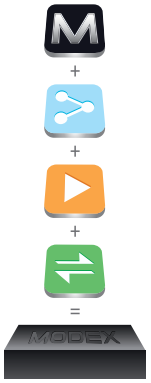

HDMI OUT
416


ERR
SPD
ACT
LINK
ETHERNET
727


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 of 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).


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: lightware.com/product-families/modex


## 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.

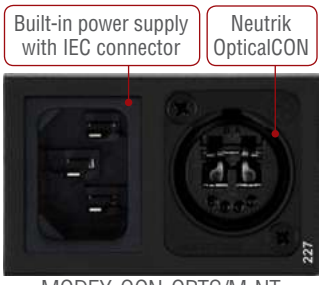
## OPTS & OPTM Media Connectors

The OPTS and OPTM Media Connectors provide transmission over 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

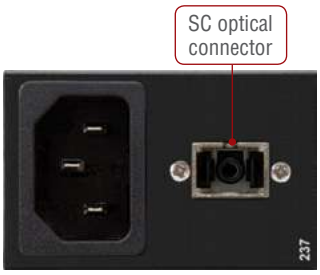
| | Mod. No. | Fiber connector | Power connector | Part number |
|---|---|---|---|---|
| OPTS (RX/TX) | 227 | Neutrik OpticalCON DUO | IEC C14 AC | 9161 0227 |
| | 231 | Neutrik OpticalCON DUO | PowerCON AC | 9161 0231 |
| | 229 | LC ODVA | IEC C14 AC | 9161 0229 |
| | 235 | ST | IEC C14 AC | 9161 0235 |
| | 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

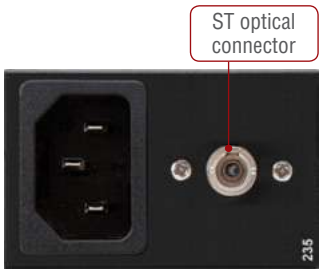


MODEX-CON-OPTS/M-NT

MODEX-CON-OPTS/M-NT-PCN



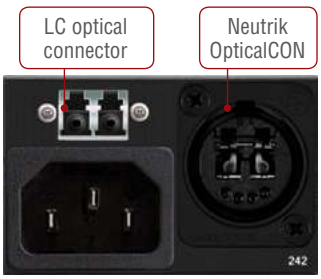
MODEX-CON-OPTS/M-SC



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**

Part No: 9161 0443


### Features

- DVI 1.0, HDMI 1.4 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
- CEC
- Audio Return Channel (ARC) support
- Built-in test pattern generator

## 4K UHD HDMI Input Module with Monitor Out

**MODEX-AV-5HDMI-4K-IM-LH**

Part No: 9161 0442


### Features

- DVI 1.0, HDMI 1.4 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
- CEC
- Audio Return Channel (ARC) support
- Built-in test pattern generator

## 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
- 30 m copper cable compensation
- HDCP enable/disable
- Advanced EDID Management

## 4K UHD HDMI Input Module with Monitor Out

**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
- 30 m copper cable compensation
- HDCP enable/disable
- Advanced EDID Management

## 4K UHD HDMI and DVI Dual Output Module

**MODEX-AV-HDMI-DVI-4K-OM**

Part No: 9161 0439


### Features

- HDMI 1.4 and DVI signals
- HDMI and DVI connectors output the same signal simultaneously
- HDCP 1.4 compliant with enable/disable
- Resolution up to 3840x2160@30Hz, 1920x1080p@120Hz, 1600x1200@60Hz
- Supports any 3D formats
- Advanced EDID Management

## 4K UHD DVI Output Module

**MODEX-AV-DVI-4K-OM**

Part No: 9161 0436


### Features

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

## 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

## 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 with 10.8 Gbps bandwidth speed
- Audio embedding, de-embedding
- HDCP 1.3 compliant

## 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
- HDCP 1.3 compliant
- DVI output can power external peripheral devices on the +5V port with 500 mA max current limit.

## 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 with 10.8 Gbps bandwidth speed
- Audio embedding, de-embedding
- HDCP 1.3 compliant
- Compatible with Apple Cinema Display, 27” and 30” LCD displays

## Ethernet 10/100 Mbit Modul

**MODEX-IF-ETH**

Part No: 9161 0718


### Features

- 10/100 Mbit Ethernet transmission
- Full duplex autodetect connection
- PoE is not supported, but can connect to PoE devices

## 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
- Bi-directional RS-232 for AV device control
- Configurable RS-232 baud rate
- Full duplex autodetect connection
- PoE is not supported, but can connect to PoE devices

## Digital and Analog Audio Input Module

**MODEX-IF-AUDIN**

Part No: 9161 0719


### Features

- SPDIF 5.1 audio input with two-channel stereo and 5.1 digital audio up to 24-bit, 96 kHz
- Balanced analog audio input
- 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 input with two-channel stereo and 5.1 digital audio up to 24-bit, 96 kHz
- Balanced analog audio input
- Gain, volume level control and phase inversion

## 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
- Full duplex autodetect connection
- PoE is not supported, but can connect to PoE devices

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


### Features
- SPDIF 5.1 audio input and output with two-channel stereo and 5.1 digital audio up to 24-bit, 96 kHz
- Balanced analog audio input and output
- Gain, volume level control and phase inversion

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


### Features
- Bi-directional RS-232 for AV device control
- Configurable RS-232 baud rate

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


### Features
- Bi-directional RS-232 for AV device control
- Bi-directional IR control
- Configurable RS-232 baud rate

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


### Features
- Bi-directional RS-232 for AV device control
- Configurable RS-232 baud rate

# The World's Greatest HDBT™ Matrix


160×160 Multilayer Switching | Power over Ethernet (PoE) | Audio Embedding/De-embedding

25G HYBRID signal management

visual engineering LIGHTWARE

lightware.com

# 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.

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 formats, 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 matrix switchers 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 matrix switchers 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 operation and optional redundant CPU and Power supplies can be also added for further reliability.

The 25G CPU stores the settings of all boards and sends 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

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. One of the main advantages 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 matrix switchers 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 audio, 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 boards 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

visual engineering
LIGHTWARE

## 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 boards 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 unit 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.

## 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 even in 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 can select 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, HDMI 1.4 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 and other 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, and various other formats.

### 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 and other audio formats

Return Audio Layer creates the ability to send two different multichannel audio streams, one from source to display and another, a 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.

25G Hybrid matrix architecture is the world's first fully compatible HDMI 1.4 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.

## 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.

## 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-422 Control Layer

**25G-LAYER-RS-232-160**
**25G-LAYER-RS-232-80**
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.

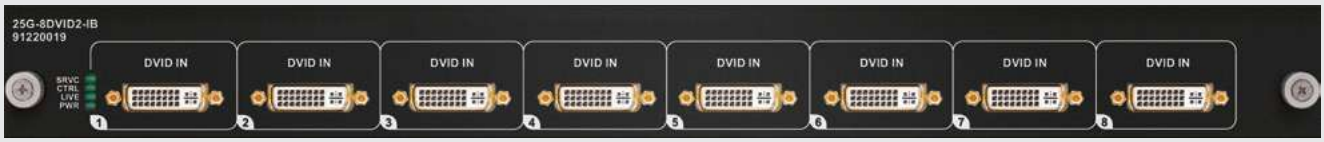
# INPUT AND OUTPUT BOARDS

When we have selected the frame and picked the layers the third step is to populate the matrix with the Input and Output boards.

## 4K DVI-D Input Board

**25G-8DVID2-IB series**

Part No: 9122 0019

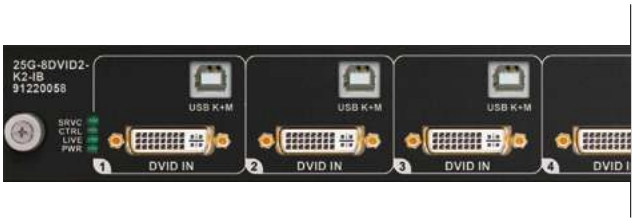



25G-8DVID2-IB

25G-8DVID2-IB provides fully transparent HDMI 1.4 connectivity to the latest high-end digital sources including 3D between the endpoints.

### 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



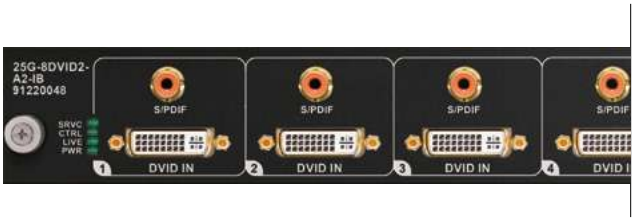

## 4K DVI-D Input Board with KVM

**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



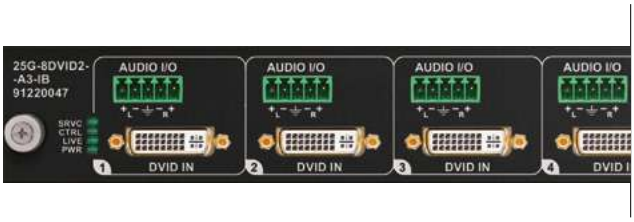

## 4K DVI-D Input Board with Digital Audio

**25G-8DVID2-A2-IB**

Part No: 9122 0048

### Additional Features:

- Bi-directional S/PDIF breakout for every port




## 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


## 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


## 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

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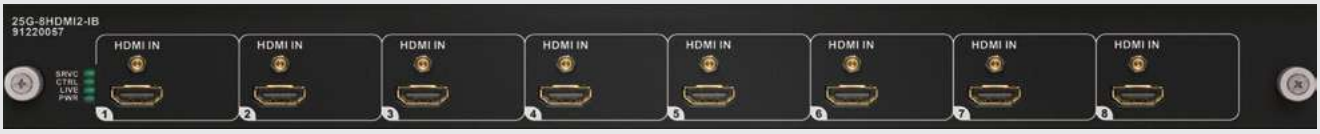
# 4K HDMI Input Board

**25G-8HDMI2-IB**

Part No: 9122 0057




25G-8HDMI2-IB provides fully transparent HDMI 1.4 connectivity to the latest high-end digital sources including Audio Return Channel and 3D functions.

## 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

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## 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


## 4K HDMI Input Board with Digital Audio

**25G-8HDMI2-A2-IB**

Part No: 9122 0028

### Additional Features:

- S/PDIF breakout for every port


## 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


## 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


## 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

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# 4K TPS Input Board with PoE Option

**25G-8TPS2-IB**

Part No: 9122 0067


Featuring eight HDBaseT™ input ports, this board is compatible with the full range of Lightware TPS extenders and HDBaseT compliant third party transmitters.

## 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)
- Signal extension to up to 170 m
- 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

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## 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


## 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


## 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


## 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


## 4K TPS Input Board with Analog Audio and Remote Powering

**25G-8TPS2-A3P1-IB**

Part No: 9122 0072

### Additional Features:

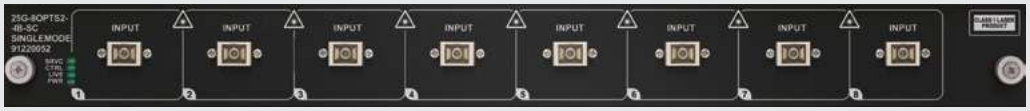
- Bi-directional, configurable analog stereo ports with 5-pole Phoenix connector
- Remote powering according to IEEE 802.3af-2003 with increased output power

# 4K Singlemode Optical Input Board

## 25G-8OPTS2-IB- LC, -SC, -ST, -NT

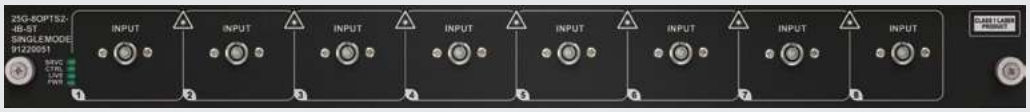
Part No: 9122 0049 (NT), 9122 0050 (LC), 9122 0051 (ST) 9122 0052 (SC)

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 4K compatible fiber optical input board for the 25G router family and available with a variety of fiber optical connectors 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.

### Features:

- Up to 10 km 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

### Supported Maximum Resolutions at the Input Board

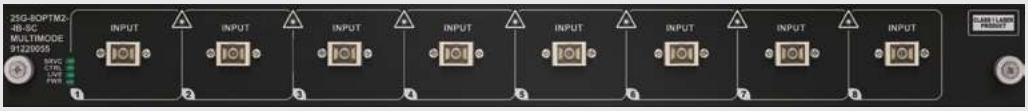
| Resolution | Bit Depth | Color Space |
|---|---|---|
| 1080p@50/60Hz | 24-36 bit | RGB/YUV 4:4:4 |
| 1080p@120Hz | 24 bit | YUV 4:2:2 |
| 3840x2160@24Hz | 24 bit | YUV 4:2:2 |
| 3840x2160@30Hz | 24 bit | YUV 4:2:2 |
| 3840x2160@50/60Hz | Not supported | |

## 4K Multimode Optical Input Board

### 25G-8OPTM2-IB- LC, -SC, -ST, -NT

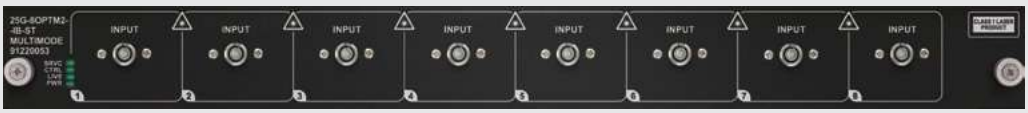
Part No: 9122 0045 (NT), 9122 0053 (ST), 9122 0054 (LC), 9122 0055 (LC)

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 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

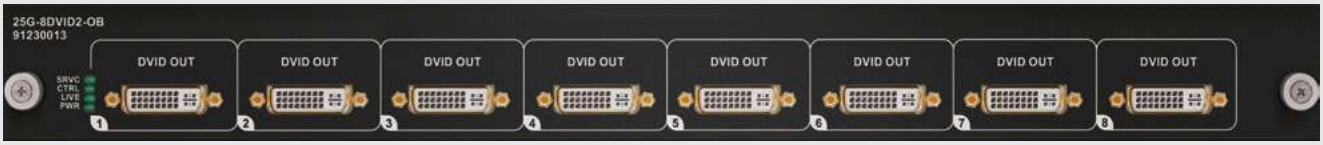
### Supported Maximum Resolutions at the Input Board

| 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**

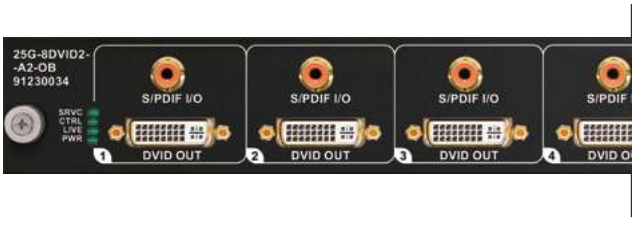
Part No: 9123 0013




25G-8DVID2-OB provides fully transparent HDMI 1.4 connectivity to the latest high-end digital sources including 3D between the endpoints.

### 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
- 30m copper cable compensation
- 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



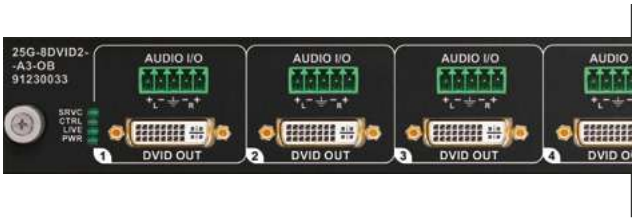

## 4K DVI-D Output Board with Digital Audio

**25G-8DVID2-A2-OB**

Part No: 9123 0034

### Additional Features:

- Bi-directional S/PDIF breakout for every port




## 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-8DVID2-OB provides fully transparent HDMI 1.4 connectivity to the latest high-end digital sources including 3D between the endpoints.

### 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
- 30m copper cable compensation
- 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


## 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


## 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

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# 4K TPS Output Board with PoE Option

**25G-8TPS2-OB**

Part No: 9123 0045


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.

## 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

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## 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


## 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


## 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


## 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


## 4K TPS Output Board with Analog Audio and Remote Powering

**25G-8TPS2-A3P1-OB**

Part No: 9123 0050

### Additional Features:

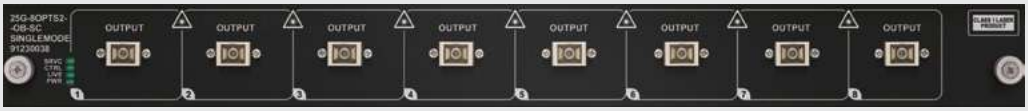
- Bi-directional, configurable analog stereo ports with 5-pole Phoenix connector
- Remote powering according to IEEE 802.3af-2003 with increased output power

# 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

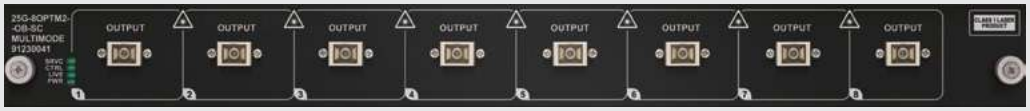
| Resolution | Bit Depth | Color Space |
|---|---|---|
| 1080p@50/60Hz | 24-36 bit | RGB/YUV 4:4:4 |
| 1080p@120Hz | 24 bit | YUV 4:2:2 |
| 3840x2160@24Hz | 24 bit | YUV 4:2:2 |
| 3840x2160@30Hz | 24 bit | YUV 4:2:2 |
| 3840x2160@50/60Hz | Not supported | |

## 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 |

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