



# LIGHTWARE

INNOVATIVE, RELIABLE, MADE IN EUROPE.



## LIVE EVENTS AND ENTERTAINMENT

Providing AV Solutions for Ultimate Immersive Experience



LIVE EVENTS AND RENTAL



ENTERTAINMENT



SPORTS AND ESPORTS



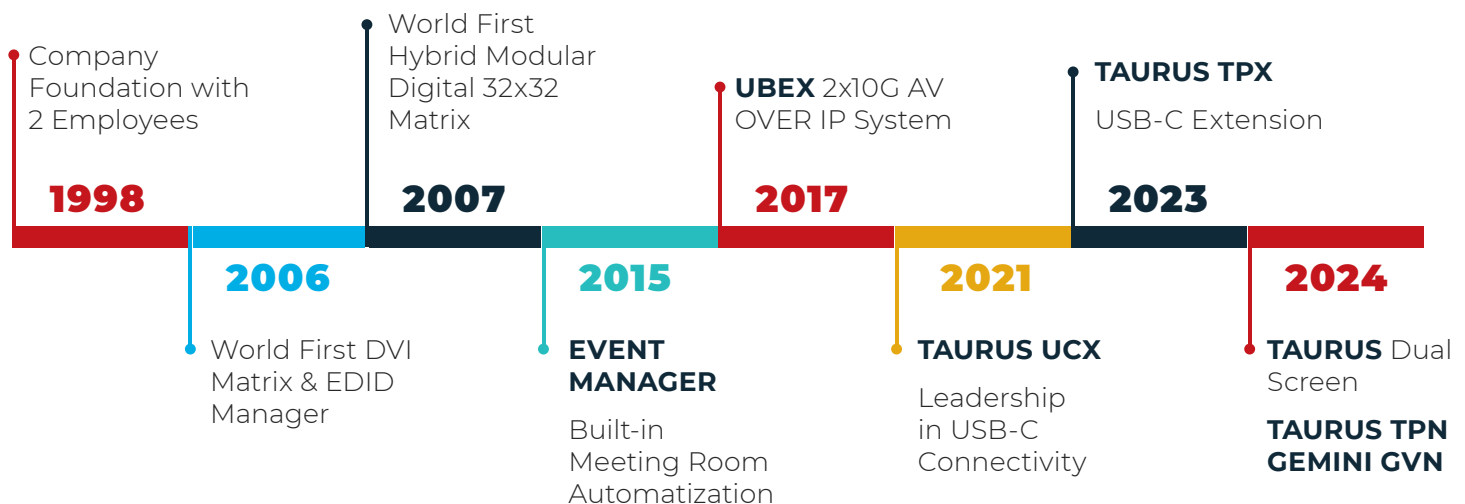
BROADCASTING,  
VIRTUAL PRODUCTION

# THE VALUES WE DELIVER TO OUR PARTNERS



Established in 1998, **Lightware Visual Engineering** has become a pioneer in the design, development, and manufacturing of reliable and innovative professional AV products and technologies. Our solutions have become a staple for AV signal management and transportation in the world of professional system integration.

## A few of our most important milestones include the following:



## Seven Reasons to Go for Lightware:

- 1.** We provide uncompromising solutions for video, audio, and control signal management. Many of our **products enable 4K@60Hz 4:4:4 uncompressed signal delivery with zero latency over long distances.**
- 2.** We offer **reliability, flexibility, and unrivaled features** to fit any project and attend to any task.
- 3.** **Easy and quick installation and configuration** coupled with **enhanced redundancy and robustness** of Lightware's devices give the operators perfect peace of mind at any show and in any challenging environment.
- 4.** Beyond the **intuitive from-panel control**, Lightware's **Cable Diagnostics** tool and **Advanced Analytics** capabilities provide real-time information on the system's operation.
- 5.** Over 25 years, we have built a unique expertise you can rely on.
- 6.** We take our customers' success personally and are ready to go the extra mile for you!
- 7.** As a European manufacturer, we design and manufacture our products in-house at our headquarters in Budapest, Hungary.

# OUR AWARD-WINNING SOLUTIONS

OUR PRODUCTS HAVE RECEIVED HIGH RECOGNITION FROM THE PROFESSIONAL AV COMMUNITY.

AV AWARDS 2022  
WINNER



**At ISE 2024**, Lightware won a **Best of Show Award** for the innovative Taurus UCX Dual Screen Solution.

**At ISE 2023**, Lightware marked its 25-Year anniversary with two **Best of Show Awards** for the UBEX and VINX AV-over-IP extenders.

**At Infocomm 2023**, our world premiere USB-C extension product – **Taurus TPX** - won the prestigious **Best of the Show Award** in the **AV Technology category**. Moreover, **PSNI Global Alliance awarded Lightware** with the Growth Driver prize after already recognizing the company last year with the Rising Star trophy.

**In 2022**, our products also won two **AV Awards**: UBEX received the **Event Technology** of the Year award, and the Taurus UCX took home the trophy for the Collaboration Technology of the Year.

**At ISE 2022**, Lightware received the **Best of Show Award** for Taurus UCX in the AV Technology category.

We are grateful to know that our award-winning devices continue to gain traction and praise among our professional peers!

**UBEX**



**TAURUS TPX**



**TAURUS UCX**



**VINX**  
VIDEO NETWORK EXTENDER



# SIGNAL EXTENSION OVER TWISTED PAIR AND FIBER OPTICS

LIGHTWARE'S CUTTING-EDGE, PROFESSIONAL-GRADE TPS (HDBASET™) VIDEO EXTENDERS FOR SINGLE CATX CABLE WITH POE, PROVIDE SIGNAL DELIVERY OVER DISTANCES WITHIN A 170-METERS RANGE AND FIT THE NEEDS OF SMALL TO MEDIUM PROJECTS FOR RENTAL, LIVE EVENTS, OR ESPORTS' NEEDS.

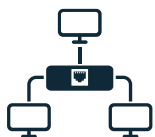


The **HDMI-TPS-TX220** flagship model of Lightware's **TPS product range** transmits universal video, audio, and control up to a **170-meter distance over a single CAT**.

The extender handles **HDMI 1.4** and **analog stereo** audio from local inputs, HDMI embedded audio up to 8 Channel PCM or HBR audio. It supports **HDCP encryption**, features **Advanced EDID Management** to force the required resolution from any video source, and fixes the output format to conform to the system requirements.



Remote powering is available via CAT 5e - CAT 7 cable and local power supply. It is rack-mountable or used standalone. It provides the following benefits:



Extension of DVI or HDMI 1.4, Audio, Ethernet (100 Mbps), RS-232, IR over one CAT5/6/7 cable



1920x1080@120Hz/4:4:4, 4096x2160@30Hz/4:4:4 or 60Hz/4:2:0 maximum resolutions (300MHz)



GPIO control ports



Bi-directional RS-232 and IR extension (pass-through and control)



Built-in Event Manager control and automation

**HDMI-TPS-TX220 is compatible with both HDBaseT™ extenders and matrix switchers.**



The **HDMI-TPS-RX220AK** HDBaseT™ compatible **TPS receiver** provides USB KVM connectivity, offering one PoE capable TPS input, one HDMI input, and two HDMI outputs as well as the **audio de-embedding feature**.





As a natural evolution from the TPS (HDBase™) range of devices, **Lightware's SDVoE™-based TPX Series** are point-to-point extenders that deliver HDMI 2.0 signals up to 4K@60Hz 4:4:4 with ultra-low latency (less than 0.1ms) over a single CATx up to 100 meters. They provide the following features and benefits:



HDCP 2.3 compliance and Dolby Vision support



Audio transmission



EDID Management storing one EDID or mirroring the EDID of the display



Versatile connectivity, inc. bi-directional RS-232 & IR command



Control of AV devices via Gigabit Ethernet, RS-232, CEC



Compact design allowing 4 units in the standard rack



Passive cooling, silent operation, efficient power consumption



 **TPX**

为你放弃了我所有

# OPTC - OPTICAL EXTENDER PAIR FOR RENTAL APPLICATIONS

For the verticals of Live Events & Rental, Entertainment & Theme Parks, Broadcasting, and Sports & eSports, where transmission of 4K@60Hz 4:4:4 without compression and zero latency over long distances is crucial, Lightware provides our **OPTC and OPTJ series** of fiber optic HDMI 2.0 capable extenders that are HDCP 2.2, HDR and Dolby Vision compliant. Boasting their unrivaled benefits, OPTC and OPTJ devices are particularly advisable for these markets.

The HDMI20-OPTC-TX/RX220-PRO, HDMI20-OPTC-TX/RX220-PCN, HDMI20-OPTC-TX/RX220-NTQ, and HDMI20-OPTC-TX/RX220-FOX are HDMI 2.0 multimode fiber optic extenders featuring transmission at 18Gbps over distances up to 700 meters, with video and Ethernet signals transferred via a single optical line.



**They support Advanced EDID Management to force the resolution to conform to the requirements of the installation.**

**The OPTC Series provides Pixel Accurate Reclocking, Lightware's proprietary technology to eliminate any flaws that originate from low quality sources.**

The OPTC fiber optic extenders support the following features:

- HDMI 2.0, HDMI 1.x and DVI 1.0 compliance
- HDR and Dolby Vision capability
- TX HDMI input 1 and input 2 can function as main/backup video input
- RX output 1 and output 2 can operate as mirrored
- 4K@60Hz signal splitting to two HDMI outputs
- Internal AC power supply
- Extension distance up to 2500 meters

## OPTJ OPTICAL EXTENDER PAIR FOR HDMI 2.0 HDMI20-OPTJ-TX/RX90



The small, rugged, and reliable **HDMI20-OPTJ-TX/RX90 fiber optic extenders** boast the following features and benefits:

- Resolutions up to 4K@60Hz with RGB 4:4:4 colorspace
- HDMI 2.0, HDCP 2.2, HDCP 1.4 compliance
- CEC, EDID transparency with 36-bit deep color support
- HDR and Dolby Vision support
- Zero frame latency, no compression
- One MM (multimode) fiber extending 4K signals up to 600 meters, and FullHD signals up to 2500 meters
- Support of audio Dolby TrueHD and DTS-HD Master Audio formats
- SC optical fiber connector
- Rack tray accessory with built-in power source encloses up to 16 units

HDMI  
2.0

4K  
UHD

2500M  
@1080p  
60Hz

HDCP  
2.2

HDR

DOLBY  
VISION



# EXTEND SIGNALS AND GET FLEXIBILITY FROM ANYWHERE



Lightware's SDVoE-compatible TPX devices are the next generation point-to-point extenders that allow HDMI 2.0 signal management over a single CATx cable with HDCP 2.3 and Dolby Vision support.



## EDID MANAGEMENT

Stores one EDID or mirrors the EDID of the display on the transmitter's HDMI input



## ULTRA-LOW LATENCY

Less than 0.1 ms signal latency for real-time visual experience



## AUDIO TRANSMITTER

Output on the transmitter side to send audio signal directly to local audio systems



## ETHERNET

Control AV equipment through Gigabit Ethernet, RS-232 or CEC



**SDVoE™**  
ALLIANCE

TPX is an SDVoE compatible extender product family that utilises this industry-accepted standard. As Lightware's first such device, it has laid the foundation for further variants and subsequent product lines to bring out the most of SDVoE technology.



Our latest OPTX family of products is a version of Lightware's **SDVoE-based TPX Series** point-to-point extenders that deliver HDMI 2.0 signals up to 4K@60Hz 4:4:4 with ultra-low latency (less than 0.1ms) over a single-mode or multi-mode fiber optics cable up to 300 meters or 10 km, depending on the SFP+ module used.

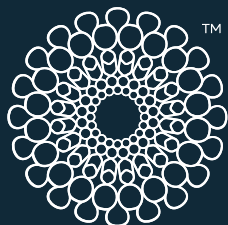
For the verticals of larger fixed installation spaces like Exhibitions, Museums, Live Events, Entertainment & Theme Parks, House of Worship, Stadiums, where transmission of **4K@60Hz 4:4:4 with zero latency across very long distances over single mode fiber optical cable** is crucial, OPTX technology will be the best option.



## Case Study

# HOW LIGHTWARE'S TECHNOLOGY POWERED THE DUBAI EXPO

**Technologies Featured in More than 20 Pavilions**, Highlighting the Global Need for Interactivity, Flexibility and Performance in Diverse Array of Industries and Applications.



**EXPO  
2020  
DUBAI  
UAE**

**Lightware Visual Engineering was showcasing its technologies on a world stage at Dubai Expo 2020.** The company's AV-over-IP, networking and collaboration technologies complemented the Expo's theme, "Connecting Minds and Creating the Future" with a focus on sustainability, mobility, and opportunity, clearly demonstrating the need for advanced AV solutions in nearly every industry worldwide.

The Dubai Expo began in October 2021 and ran through March 31, 2022. **Lightware solutions were highlighted in more than 20 country and partner pavilions at the Expo, including Hungary, Lebanon, DP World, Emirates National Oil Company (ENOC), United States of America, Austria, Palestine and many more.**



*"After COVID-19, being able to gather and share the collective knowledge has shown the world how important this event is to the advancement of global innovation and collaboration. Having the Dubai Expo return to a live in-person format benefited everyone and it's a perfect showcase for the worldwide relevance of AV and networking technologies. **We're proud Lightware was able to play such a prominent role in helping to showcase some of the most amazing cultures and modern technologies from across the globe.**" – said Gergely Vida, CEO of Lightware.*

Featuring the Lightware technologies on such a broad scale at Dubai Expo 2020 required the **extraordinary efforts of 15 Lightware offices** across the world. **The devices have been in constant use without any incidents from the beginning of the Expo for more than 6 months, proving their reliability and ability to perform at a high level over time.**

In the world of AV integration, decisions and design adjustments happen fast, hence having a dedicated local office to provide the right devices to accommodate these immediate demands was crucial, as well as having reliable and fast technical support from Lightware's HQ.

**The Lightware products on display ranged from traditional AV devices, such as matrices, to the most modern AV-over-IP solutions, including the UBEX series.** The award-winning UBEX 10G AV-over-IP system includes a double-scaling feature that halves the number of endpoints needed for videowalls and allows the UBEX system to function as a single device for this purpose as well as a single mode that proved to be very useful for this particular application. **This capability, combined with its transceiver capabilities and zero latency make it a perfect fit for live events, eSport arenas and more.**

Also for the **ENOC pavilion**, these devices were chosen to transmit uncompressed 4K signals. Two sets of **UBEX AV-over-IP delivered all the technical requirements** and also brought great flexibility into designing the final system.

In the **DP World pavilion**, a **Lightware HDMI 2.0 matrix with 16x16** crosspoint

size was added as the project called for a matrix to link together the network of 1G VINX AV-over-IP endpoints with local 4K sources. These sources were split to the LED video wall processor and to the live streaming processor used to broadcast the events.

**Practically, it was acting as a massive distribution amplifier (DA) to split the source signals between the venue's main LED display and allowing a different mix to be streamed.** Besides the matrix, the network of **more than fifty VINX devices provided the backbone for transferring signals around this large-scale venue** in a mixture of use from screens to podium laptops and other sources.

Cross the Expo's various pavilions, many exhibitors highlighted LED and 4K screens, ideal for use with Lightware devices that are optimized for these types of technologies.

During this Dubai expo, **Lightware Visual Engineering once again proved that its devices and technologies can seamlessly power large-scale venues** with all their AV needs and provide inspiration for system designers to expand their horizons.





## Case Study

# Illuminarium Experiences Creates the Next Generation in Immersive Experiences

Lightware's UBEX solution, pushes the boundaries of technology innovation for experiential entertainment company Illuminarium.

**Illuminarium Experiences**, a breakthrough global experiential entertainment company, **is creating the next generation in immersive experiences.** Illuminarium Experiences enables visitors to experience recreated worlds. **Actual filmed content is used to showcase realworld, authentic sights and scenes, presented in custom-designed venues called "Illuminariums."** Illuminariums are reprogrammable, immersive theaters that surround visitors in a sensory space of sight, sound and scale unlike any other — providing access to the most amazing but typically out-of-

**never before experienced, through state-of-the-art technology," said Brian Allen, executive vice president of technology and content for Illuminarium Experiences.** *"Delivering this sort of immersive experience requires us to have the highest quality audio and video."* *"From a technical standpoint, it requires us to deliver the highest-quality audio and video. Our content is incredibly realistic and, because of that, we have to integrate technology that doesn't look like a projector and a screen but the African Serengeti."* Among the brands at work in Illuminarium is Lightware, whose UBEX is being used to deliver reliable content with zero-latency. *"UBEX enabled us to push the boundaries of technology and innovation by delivering truly uncompressed content without any degradation in our signal from camera, playback and projector,"* noted Allen. *"We integrated UBEX because of the actual lossless quality, incredible flexibility and reliable video routing."* Allen added, *"UBEX delivered on the promise of eliminating signal loss. We also wanted to create a flexible, future-proofed system. We wanted the ability to transport additional information for future growth. An AV-over-IP system provided us with the flexibility for expansion."* Illuminarium's debut spectacle, **WILD: A Safari Experience**, transports visitors to Africa through cinematic content on location across South Africa, Kenya and Tanzania, showcasing the majestic animals in their native habitats. Complementing the exotic sights of a safari, visitors will also be immersed in its authentic sounds and scents, all without leaving Atlanta's BeltLine. **WILD** will be followed by **SPACEWALK**, a mind-blowing journey through our Solar System where audiences will experience what it's like to walk on the surface of the moon and Mars.

**UBEX is the professional AV industry's leading uncompressed AV-over-IP solution.** It can operate as a virtual matrix using a standard Ethernet switch as a crosspoint or work as a conventional point-to-point extender. The unit allows for **uncompressed, high-fidelity signal extension at 4K UHD at 60 hertz (4:4:4)** using packet-based transmission. UBEX can simultaneously

transmit and receive content with deep-color streams and multi-channel audio. It is designed to be futureproofed while catering to professional AV stakeholders' needs and expectations. For more information on Illuminarium's **WILD: A Safari Experience**, please visit [Illuminarium.com](http://Illuminarium.com). Illuminarium will open additional locations in Las Vegas, Nevada and Miami, Florida, in 2022.

*"We create different rendering pipelines for each show," Allen continued. "It was important that we integrated a flexible solution, like UBEX, that enables us to utilize existing technology as we create new shows. UBEX allows direct connectivity to different inputs and components that provides us with unparalleled flexibility across the massive facility."*



reach places, people and experiences. **They deliver one-of-a-kind sensory experiences, from exhilarating natural wonders to enriching cultural moments.** Illuminariums are brought to life by 4K laser projectors, audio beams, in-floor haptics and realistic aromas, which work in combination to create a **fully immersive experience.** Illuminarium Experience has opened its first Illuminarium in Atlanta, Georgia, with its debut spectacle, **WILD: A Safari Experience.** Through a convergence of cutting-edge technologies from the most impressive brands in the industry, the **immersive 8,000 square-foot** entertainment complex will showcase the beauty and splendor of Africa's most exotic animals in their natural habitats. **"An Illuminarium is a place that can take you to any place, in a manner**



**Read more case studies here:**  
[https://lightware.com/news/category/case\\_studies](https://lightware.com/news/category/case_studies)

# MATRICES

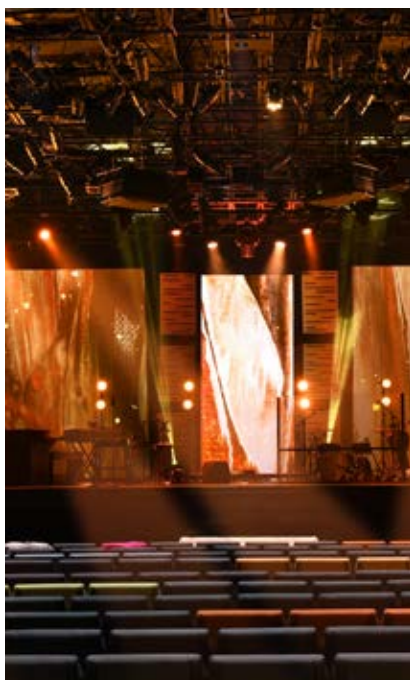
LIGHTWARE BOASTS THE WORLD'S LARGEST PORTFOLIO OF MATRIX SWITCHERS THAT STAND OUT FOR THEIR EXCEPTIONAL VERSATILITY, UNMATCHED FUNCTIONALITY, PERFORMANCE, AND RELIABILITY. LIGHTWARE'S MATRICES ARE THE PREFERRED OPTION FOR AV PROFESSIONALS AROUND THE WORLD.

With **our proprietary technologies**, we offer **standalone and modular** matrix switchers that deliver the following features and benefits:

- **Zero latency:** with no added frame or line-period to the video signal, switching is performed instantaneously;
- Identification and analysis of the source video format through **Frame Detector and Signal Analysis technology** to spot any issues while displaying signal properties, including timing, frequency, scan mode, HDCP encryption, colour range, space, and audio sample rate;
- **Advanced EDID Management** that provides storing up to 100 user EDID files and factory preloaded EDID versions that include all standard resolutions; HDMI EDIDs and audio channels and codecs are also supported.

We offer the widest selection of crosspoint sizes, from small 4x4 up to 80x80, which allows you to choose the right matrix for any particular application.

## MX2



The **MX2 Series** are standalone matrix switchers that provide uncompromising **4K@60Hz 4:4:4 signal management over HDMI 2.0 and DisplayPort 1.2 connections**.

MX2 Series are available from 4x4 up to 48x48 crosspoint sizes. Their main features and characteristics are:

- **Zero latency** which is critical for shows, sports, and similarly challenging applications
- Support of **HDR, Dolby Vision, 3D**
- Compliance with **HDCP 2.2 and HDCP 1.4**
- **High bitrate audio support**, including Dolby Atmos, TrueHD, DTS-HD
- **Full end-to-end DisplayPort** options
- Control available via **Ethernet, RS-232, and USB-ports**
- All models offer a **front LCD screen and a jog -dial** enabling direct adjustments and services
- **Versatility of models** featuring rich options of compatibility, connectivity, and functionality
- **Focus on rental applications** through enhanced robustness
- **Redundancy provided with 2 independent power sources with separate mains connectors**. The power connectors, RS-232 and Ethernet connectors are reinforced rugged types to minimize wear-and-tear of everyday use.

**Our richest assortment of standalone MX2 matrix switchers makes them a perfect fit for the most demanding applications like rental, stage, live events, and XR volumes in high-end broadcasting and film production.**

# MX2M



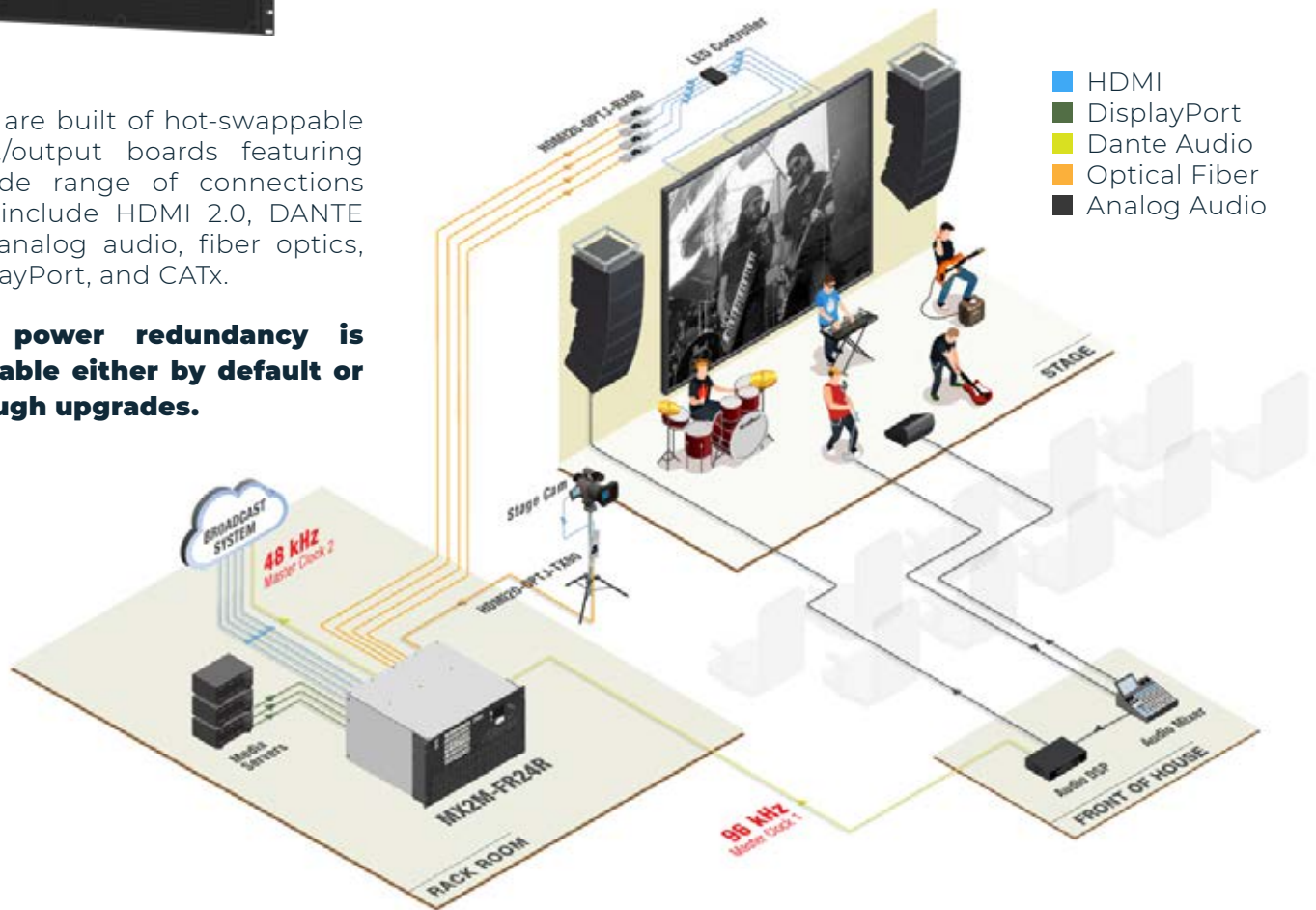
They are built of hot-swappable input/output boards featuring a wide range of connections that include HDMI 2.0, DANTE and analog audio, fiber optics, DisplayPort, and CATx.

**Full power redundancy is available either by default or through upgrades.**

For projects that require even more flexibility and versatility, **Lightware offers modular matrix switchers of our revolutionary MX2M Series** that allow users to mix and match input/output boards to get the connectivity and customization they need to meet specific requirements and budgets.

The highest level of flexibility is achieved through a wide array of connectivity standards enabled by hybrid matrices.

**MX2M modular matrix switchers product line includes hybrid solutions to provide versatility and flexibility for any type of functionality.**



**MX2M modular matrices are available in 4 types, that differ by the number of PSU drawers, level of redundancy, and remote power capabilities:**

MX2M-FR24-F is fitted with 1 PSU to power the frame, a redundancy upgrade is available;

MX2M-FR24-RF is fitted with 2 PSUs to provide redundant power for the frame;

MX2M-FR24-FP is fitted with 1 PSU to power the frame and remote power via PoE, a redundancy upgrade is available;

MX2M-FR24-RFP is fitted with 2 PSUs to provide redundant power for the frame and also redundant powering via PoE.

With the above-listed features and benefits, MX2M Series remains unique and unrivaled in terms of performance, customization, and redundancy. MX2M removes any technological limitations. It empowers stage creativity, supports immersive show concepts, and allows the audience to share emotions with their loved athletes in sports arenas.



# Input & Output Boards for MX2M Matrices to Serve Every Requirement

LIGHTWARE OFFERS A WIDE RANGE OF INPUT AND OUTPUT BOARDS OFFERING THE MOST COMMON CONNECTIVITY STANDARDS AS WELL AS THE HOT-SWAPPABLE DESIGN TO ENABLE REPLACEMENTS WITHOUT DISRUPTING OPERATION.

## HDMI 2.0 Input/Output Boards MX2M-4HDMI20



- 4 HDMI connectors on a board to enable 4 inputs or outputs
- Resolution up to 4K@60Hz 4:4:4
- Audio signal embedding/extraction to the audio layer
- Flange for secure operation
- HDCP enable/disable mode
- HDR compliance
- Pixel Accurate Reclocking
- Advanced EDID Management
- Frame Detector

## HDMI 2.0 Single Fiber, Multimode Input/ Output Boards MX2M-4OPTJ-IB/OB



- 4 SC fiber connectors on a board to enable 4 optical inputs or outputs, compatible with the OPTJ transmitters and receivers
- HDMI 2.0, HDMI 1.x, and DVI compatible
- Extension distance of up to 600 meters for 4k@60Hz 4:4:4 signals and 2500 meters for Full HD signals
- Resolutions up to 4K@60Hz 4:4:4
- Uncompressed video up to 18 Gbps
- HDCP 2.3 and 1.4 compliance
- HDR10, Dolby Vision, HLG compliance
- Advanced EDID management
- No signal latency, zero frame delay

## DisplayPort 1.2 Input Board MX2M-DH-4DP12-IB



- DisplayPort 1.2 compliance with 4 ports offering direct connection
- Uncompressed video transmissions with resolution up to 4K@60Hz 4:4:4 at the rate up to 18Gbps; pass-through and de-embedding of HDMI 2.0 audio
- Manual triggering of link training with forcing lane count and lane data rate
- HDR & Dolby Vision as well as HDCP 2.2 and HDCP 1.3 compliance

## MX2M-AUX-8AUDIO



- 4 HDMI connectors on a board to enable 4 inputs or outputs
- 8 individually configurable audio input/output ports
- Possibility to specify which two audio channels in the LPCM stream to output as an analog stereo signal
- Adjustable analog audio settings (volume, gain, balance)



# MX2MBOARDS

## 2 x 16-channel Dante Input and Output Board MX2M-AUX-DANTE-32CH



- Dante Audio over IP and AES67 RTP compliant seen as two Dante devices
- Simultaneous transmission and reception of 2 x 16 mono audio channels
- The two Dante devices can be connected to the same or different Dante domains
- Redundant operation with distinct Primary and Secondary 1GbE connectors for each Dante device
- In-built high-quality ASRC for sampling frequency conversion (from 24-192 kHz to 44.1-96 kHz) LPCM audio support Analog Audio Input Output Board MX2M-AUX-AUDIO8
- 8 audio inputs or outputs, all configurable individually
- Adjustable gain, volume, and balance on the input
- Adjustable volume and balance on the output
- Possibility to specify which two audio channels in the LPCM stream to be output as an analog stereo signal

## TPX Input and Output Board HDMI 2.0 MX2M-4TPX-IB/OB



- 4 RJ45 connectors on a board to enable 4 inputs or outputs
- HDMI 2.0, HDMI 1.x, and DVI compatible
- HDCP 2.3 and HDCP 1.4 compliant with cross-conversion capabilities
- Hot-swapping
- Pass-through of audio and de-embedding audio from the Audio layer including uncompressed or HBR formats
- Extension distance of up to 100 meters for 4k@60Hz 4:4:4 signals
- Dolby Vision compliance
- Less than 0.1 ms signal latency
- Compatible with TPX extenders and SDVoE-based third party products
- Advanced EDID Management
- Command injection on RS-232 and IR ports
- CEC support (command injection)
- Supports deep color signals (24/30/36 bit RGB/YCbCr 4:4:4)



**As the leaders in the industry of professional AV switching, we consistently contribute to our product line.**

Coming soon are more input/output boards to provide a full hybrid solution offering a feature-rich mix of AV-over-IP, fiber optics, DP, HDMI, and SDVoE signal formats switching.

**The MX series are the highest performance, modular expandable DVI and HDMI compliant switchers, available in five different frame sizes, from 9x9 up to 80x80 crosspoints, allowing the building of custom input/output sized matrices.**

The built-in sophisticated software and hardware features make these routers a perfect gear for applications in practically every segment of the industry. They support the following features:

### **4K UHD & 3D with zero latency**

### **Cross compatibility,**

enabled by non-blocking topology with any input switchable to any one or more outputs without limitations. One source can be tied to multiple destinations at the same time

### **Advanced EDID Management**

### **HDCP compatibility**

with the non-blocking topology allowing for HDCP and non-HDCP boards to be compatible within the same chassis

### **Built-in Cable Compensation**

enabled by manual or automatic adaptive mode extending the cable length at inputs respective to the signal format. Using a 22AWG high-quality DVI or HDMI cable, the inputs are automatically compensated for up to 60-meter cable length at 1080p, WUXGA, and 2K computer resolutions at 24bpp. This feature eliminates the need for additional cable extender boxes in the system rack

### **Frame detection and input signal analysis**

### **Advanced control options**

to ease system control via multiple TCP/IP and WEB controls, and RS-232 enabling 3rd party systems to manage the matrix. The touch-panel allows for system customization and offers simplicity in system control and operation

**The MX-FR33R, MX-FR65R and MX-FR80R frames have hot-swappable N+1 redundant power supplies. These frames were designed for applications where redundancy is key and high reliability is required.**

# APPLICATION PROGRAMMING INTERFACE (API)

is a set of protocols, commands, functions, and objects that programmers can use to create software or interact with an external system. The API developed by Lightware for its video signal management equipment is an open environment protocol, where every bit of data is openly available for higher-level management, control, and monitoring systems.

Lightware's approach to providing complimentary access to its **Open API solutions** enables customers to have the flexibility of fully meeting the requirements of interoperability and seamless compatibility across multiple brands.

Lightware has a **proven track record of effective integration with 3rd party systems and applications** to create a powerful combination for users and unlock possibilities in any AV operation. Our Open API ensures the following:

**LW3 is a sophisticated protocol** of Lightware's API, allowing detailed fine-tuning processes. LW3 is present in the Lightware devices. It is transparent, browsable, and parametrizable. LW3 has a tree structure. The commands can be sent over various types of connections including Ethernet, RS-232, and USB – depending on the capabilities of the device.

Lightware's video signal **analytics** and **diagnostics** tools are built into its products to enable users and IT Teams to be more efficient in preempting any failovers in real time.



**Analytics:** Frame Detector and Signal Analysis technology to spot any issues while displaying signal properties, including timing, frequency, scan mode, HDCP encryption, colour range, space, and audio sample rate. Having the possibility of constantly monitoring this data brings peace of mind to critical AV operations.



**Diagnostics:** The cable diagnostics tool can monitor the status of each and every cable in the system and provide real-time feedback for the operators including the exact transmission error rate between transmitter and receiver.

Integrators and technicians no longer have to physically check if the cables are securely connected, having this information readily available on their screens.



**Lightware offers a variety of control options to manage and automate Lightware devices.**

Lightware Advanced Room Automation (**LARA**) firmware in **Taurus UCX/TPX/TPN switchers** enables control, management, and automation of USB-C featured assets and room utilities without the need for external processing or sophisticated programming. With its ever-growing library of pre-written driver modules and the ability to configure and create new modules in JavaScript, LARA ensures ease of use and configuration.

**Event Manager is a built-in control feature available in the HDBaseT-compatible TPS Series and select Lightware matrix switchers.**

**Event Manager is available with Lightware's downloadable Device Control software.** Device Control supports the management of room peripherals, such as drapes, HVAC systems, lights, and more. Event Manager is continuously evolving to include more features and offer an improved user experience via firmware upgrades.





# VISUAL EUROPE GROUP USED LIGHTWARE'S TECHNOLOGY TO DEPICT GLORIOUS HISTORY OF HUNGARY ON VIDEO MAPPING CANVAS

One of the top-rank AV event and rental providers of Central and Eastern Europe, **Visual Europe Group**, utilized **Lightware's AV** signal matrix switching and fiber optic extension **solutions to create a stunning 30-minute video mapping show** on the banks of beautiful Danube on August 20, 2022.

Being one of the oldest nations in Europe, with their country founded more than thousand years ago in 896, the Hungarians respect their history and promote their culture across the nation and internationally. History says that on August 20, 1000, István (Stephen) I was crowned on the Hungarian throne to become the first king of Hungary.

**St. Stephen's Day, Hungary's birthday, is celebrated with a special sentiment and splendor.** On this day, **Budapest turns into a huge stage to host a magnificent festival of culture, history, and technological advances.** Since 2021, the Hungarian capital has

**witnessed** the most fascinating and technically ambitious **video mapping shows sited on the beautiful banks of the Danube.** A number of iconic locations, including the buildings of the Hungarian Parliament, the National Gallery, the Buda Castle, and Gellért Hill become an epic canvas for a dazzling night projection performance to reflect on the nation's history and culture.

The Hungarian AV production and integration company **Visual Europe Group**, being one of the biggest operators of the live events and rental market in Central and Eastern Europe has provided the production, installation, and performance for the country's

birthday video mapping show for three years in a row. **In August 2022, the company created 20 outdoor stages** across the capital, including the main attraction area on the Danube's banks. Visual Europe Group **developed a project to deploy 54 units of powerful 35000 lm projectors and 4 units of 50000 lm machines** from Panasonic, as well as **700 units of moving lights, and sound systems with more than 1000 speakers** and Unilum Upad III video walls covering approximately 200m2 all around the city.

For this challenging project of audiovisual narrative, **Visual Europe Group utilized Lightware's technology for the AV signal**



routing and delivery over a distance of 4.8km and across the river at 400 mtr. In particular, there were deployed Lightware's

**MX2-48x48 matrix switcher** x 2 units (1 + 1 as backup) providing

**4K60Hz 4:4:4 signal management over HDMI 2.0 and featuring Display Port 1.2 connections;**

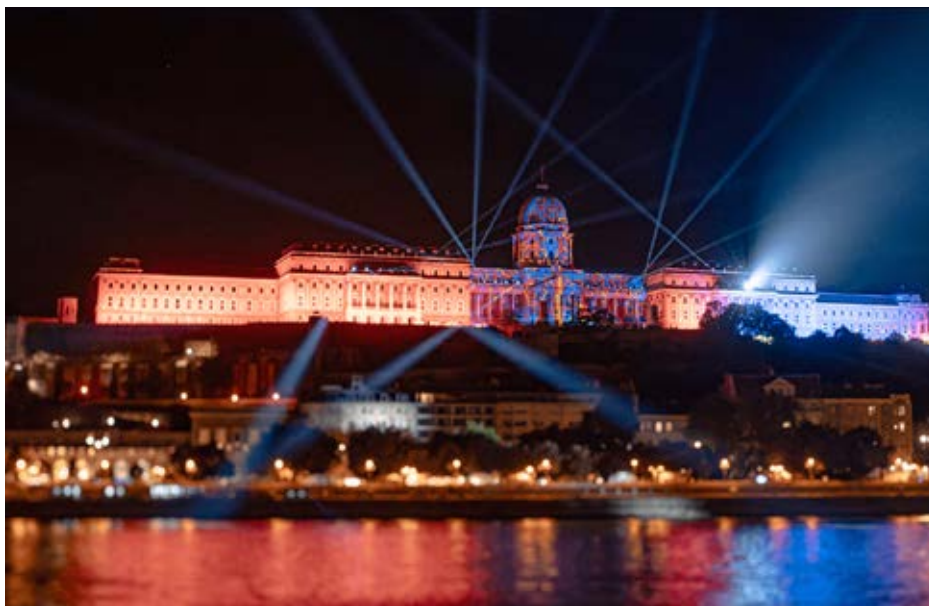
**MX-17x17DVI PRO matrix switcher with CPU2 board x 1 unit with 20 pairs of Lightware DVI extenders;**

**Fiber optical HDMI 2.0 extension pair of 220Pro Series supporting EDID Management HDMI-OPTC-220-Pro x 20 units.**

Visual Europe Group managed to complete the installation of the huge fleet of devices, including focusing for masking, wrapping, and adjustment in the record 3 days. **Many years of seamless use of Lightware's devices made the choice of technology for the project an easy job for the integrator.** Visual Europe Group opted for Lightware being **confident of its excellent performance, exceptional reliability and redundancy.**

Lightware's team extended its experienced helping hand to the engineers of Visual Europe Group to offer its broad support at the time of the project development and during the show.

The **Budapest monumental projection performance entered the list of the best global video mapping events.** Its success is the result of the colossal amount of creativity and cooperation between Visual Europe Group and technology suppliers. For Lightware, it was a matter of honor to provide its flagman solutions for its hometown's iconic video mapping project.



**Read more case studies here:**

[https://lightware.com/news/category/case\\_studies](https://lightware.com/news/category/case_studies)

# AV-OVER-IP: TECHNOLOGY AND COMPARISON

IN APPLICATIONS THAT NEED UNCOMPRESSED ZERO-LATENCY DELIVERY OF THE PIXEL-PERFECT 4K@60HZ 4:4:4 ACROSS LONG DISTANCES TO MULTIPLE DESTINATIONS, LIGHTWARE'S TECHNOLOGY HAS BEEN THE PREFERRED CHOICE FOR YEARS.

Our award-winning **AV-over-IP UBEX** and **VINX** Series provide unprecedented scalability, flexibility, and rapid deployment to attend to the needs of live events, shows, and sports; and the just introduced **TPN family** is the perfect answer for the high-quality 4K@60Hz transmission needs with additional built-in features coming soon.

They are a perfect match to create a powerful immersive experience and elevate the emotions of the audience. They support a valuable set of functionality, among which is

- **point-to-point up to unlimited end-points architecture, meaning asymmetrical I/O design is possible**
- **EDID to ensure seamless and instantaneous handshaking for multiple displays on the network**
- **USB 2.0 ports to enable KVM functionality**



**SDVoE compatible networked TPN extension devices are the latest development of Lightware's product family.**

The new TPN Series includes HDMI-TPN-TX107 and HDMI-TPN-RX107. The devices enable zero latency and virtually flawless quality extending HDMI 2.0 signals up to 4K@60Hz 4:4:4 video resolution from a single source to multiple destinations through 10G Ethernet networks via CAT6a with PoE support for video, audio, 1G user Ethernet and RS-232 transmission over 10G through standard 10G network switches.

They are HDR, Low Latency Dolby Vision, HDCP 2.3 compliant; support command injection through IR, RS-232; and are compatible with third-party SDVoE devices and controllers.

**Control Unit for TPN Series:** TPN-CTU-X50 is a Control Unit for Lightware's TPN AV Over IP product line. With this control unit and an off-the-shelf 10G Ethernet switch installed as a crosspoint in the system, a virtual matrix can be created for TPN devices connected to the IP network as input and output endpoints.



**VINX (Video Network Extender)** for 1 Gigabit Ethernet networks is a multimedia extender and virtual matrix, that delivers 4K@30Hz, supports Smart Bandwidth management, features Dante/AES67-compliance in dedicated models, and delivers commands via RS-232, IR, USB. It provides output scaling and rotation.

VINX offers a built-in video wall wizard, EDID management, and a frame detector. It is a perfect choice for 1Gb network infrastructure, needs no costly Data Center switches, supports low power consumption, operates on copper/fiber infrastructure, and fits for short to long-range deployment.





**UBEX – Ultra Bandwidth Extender - offers unique benefits of uncompressed 4K@60Hz signal extension via 2x10Gb platform and offers the following features:**



- 20 Gbps bandwidth that enables link aggregation and load balancing
- Each unit holds two software configurable signal paths: dual channel transmitter, dual channel receiver or bidirectional transceiver
- Scaling with 2 scalers in each UBEX endpoint unit supporting specific resolutions (often present in XR volumes) and video wall support
- Seamless switching
- Almost zero latency
- Subsampling with the built-in dual color space converter: convert 4:4:4 to 4:2:2 to fit 2x4K@60Hz signals in 20Gb bandwidth (and convert back to 4:4:4 for full display compatibility)
- 12-bit video transmission
- Flexible cable compatibility: SFP+ for single mode or multimode fiber, BIDI SFP+ module for fiber saving, SPF+ module for CATx cables and DAC-cable compliance
- Redundancy, switching between 20Gb and 10Gb operation\*
- Quick rebooting in 18 seconds
- Dolby Vision and Dolby Atmos compliance
- Easy management from front LCD and jog dial button
- Externally controllable with Open API (LW3 commands)
- Rental version is available too (R-type)

## NEW MULTIVIEW FEATURE

The UBEX multiviewer operation mode can receive 5 video streams (in matrix mode) from the network and create two output videos from them. The 1st output is the multiview built from the 4 streams, and the 5th stream is the 2nd output.

**UBEX of R-type Series features advanced mounting and handling options offering threads for truss mounting and handles, its front-to-back ventilation is filter fitted. The R-type UBEX is built with secure connectors to enhance their durability.**



\*Lightware's **UBEX offers unique redundancy** for extremely large-scale solutions by featuring dual network ports, each going to a dedicated network switch, which enables zero downtime operation. In case of a failure of the Primary Network switch, UBEX will migrate to the Secondary Network Switch within a fraction of a second unnoticeable to the human eye.

# WE DESIGN PRODUCTS CONFORMING TO HIGHEST AV STANDARDS

LIGHTWARE HAS ALWAYS BEEN AT THE FOREFRONT OF TECHNOLOGICAL DEVELOPMENT AND INNOVATION, DESIGNING PRODUCTS THAT STAY COMPLIANT WITH THE HIGHEST AV STANDARDS.



**Dolby Vision** is a proprietary HDR standard created by Dolby Laboratories. Dolby Vision content is mastered with a 12-bit color depth, it includes frame-by-frame metadata to tell the display exactly how to display each frame of video.

**The UBEX, OPTC, OPTJ, TPX, and TPN extenders and matrix switchers are Dolby Vision compliant** boasting crystal-clear picture quality of the images powered by Lightware.



The features of **HDMI 2.0 standard that enables 4K@60Hz 4:4:4 at the 18 Gbps bandwidth** are supported by a great number of Lightware's signal management devices, including our fiber optical extenders of UBEX, OPTJ, OPTC series, and versatile MX2 Series of matrices **where I/O sizes range from 4x4 up to 48x48 and I/O configurations include full HDMI 2.0, full DP 1.2 and hybrid HDMI 2.0 + DP 1.2.**



**Lightware supports HDBaseT** standard in a number of its extenders and matrices to deliver universal video, audio, and control up to 170 meters over a single CATx.

With its **legacy-friendly approach**, Lightware supports analog audio signal management with dedicated analog audio i/o boards or ports available with its matrix families, particularly with MX2M, MX2, MX series.



TPX, OPTX and TPN are SDVoE compatible extender product families that utilize this industry-accepted standard. The extenders allow HDMI 2.0 signal management over a single CATx cable (or optical fiber) with HDCP 2.3 and Dolby Vision support.



Lightware provides **Dante and AES67 compatible devices** and input/output boards for its versatile and powerful matrix switchers.







# TAURUS TPX

## EXTEND USB-C SIGNALS UP TO 100 M



UTILIZED IN LIVE EVENTS AND ENTERTAINMENT ENVIRONMENTS, TAURUS TPX PROVIDES UNPARALLELED TRANSMISSION OF AV SIGNAL SOURCED FROM PRO AV CAMERAS AND MICROPHONES, OR RECORDING DEVICES VIA DISTANCES UP TO 100 METERS. SUPPORTING BIDIRECTIONAL CONTROL SIGNAL EXCHANGE, TAURUS TPX SETS ENABLE DISTANT MANAGEMENT FUNCTIONALITY TO SECURE TROUBLE-FREE PERFORMANCE.

The **Taurus TPX** provide networked system architecture allowing for even larger **USB-C powered solutions enabling delivery of a single source to multiple destinations through 10G Ethernet networks.**

### THE INNOVATIVE TAURUS TPX DEVICES EMPOWER SYSTEM

It offers **4k video, audio, USB data, bi-directional ethernet delivery, charging over a single cat cable** and also provides **room automation and control** via its LARA firmware, making user experience even more simplified.

**They operate in a transmitter-receiver configuration,** offering unrivaled set of Lightware's UCX product range features and functionality, such as:

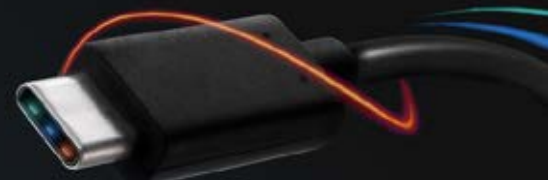
Powered by



- Single CAT6 connectivity between TX and RX devices, up to 100m, with power delivery from TX to RX, video, audio, USB 2.0, Ethernet, OCS and Serial
- Uncompressed HDMI 4K signal formats (4K@60Hz RGB 4:4:4, up to 18 Gbps, 600 MHz pixel clock)
- USB-C input connectivity to deliver 4K Video, Audio, Data, and Power
- Charging via USB-C up to 100W
- Multiple USB 2.0 (480 Mbps) connectivity for any USB room peripheral
- Independent USB host switching layer for up to 8 devices (4x at the TX side, 4x at the RX side)
- Multiple Ethernet network configurations fitting various corporate network topologies and IT security standards
- SSH, SSL, and HTTPS for IT security
- Occupancy sensor (OCS) connection at the RX device (with 24V power supply), GPIO control ports at TX device
- Welcome Screen for custom corporate logo and on-screen display warning messages
- CEC at the HDMI outputs
- Audio de-embedding
- Room device control via Ethernet (TCP/IP) or Serial (2x at TX device, 1x at RX device)
- Room automation and control with LARA firmware

THE POWER OF  
**USB-C**

Collaboration • Control • Connectivity  
Convenience • Charging





## WE ARE COMMITTED TO ENVIRONMENTAL SUSTAINABILITY

In our offices, we **minimize paper waste** by eliminating unnecessary printing and **using recycled paper**. We are conscious with our office lighting to **reduce power consumption**. We **use eco-friendly cleaning materials and apply smart waste management** routines to support recycling.

With our suite of **Room Automation solutions**, we promote lower room power consumption by being able to turn off connected products and systems.

We regularly participate in **corporate social responsibility (CSR) events** such as the annual Let's Clean Up Europe initiative.

- We go to great lengths to **prevent and minimize pollution from manufacturing, packaging**, and all other daily operations.
- We **minimize our carbon transportation footprint** by keeping as much design and manufacturing as possible in-house.
- We **simplify our packaging design** to reduce the use of chemical-based printing.
- We consciously provide only necessary accessories to **reduce the use of materials** that would go to waste.
- We **apply a smart packaging layout** to minimize packaging materials that end up in the trash.
- We **consolidate our shipments** to reduce our environmental impact from transportation.



**Learn more about our green policy:**  
[lightware.com/about-us/green-policy](https://lightware.com/about-us/green-policy)





# WE STAND BEHIND OUR PRODUCTS WITH OUR EXPERTISE AND COMPREHENSIVE SUPPORT

Lightware Visual Engineering is continuously **strengthening its presence around the globe** and providing comprehensive technical support and training for our partners and end users:

- We are now present in **more than 30 countries**.
- **Our AV Integration Team is available to assist in developing the optimum project for your unique requirements.** You can reach our AV Integration team at [av-projects@lightware.com](mailto:av-projects@lightware.com)

Our **Experience Centers** are located in prominent locations in **Paris, London and Sydney**. They are available for our partners to receive demonstrations of Lightware's award-winning products and solutions. **In 2024, more experience centers and a new training facility will open** their doors to welcome visitors in **Europe and Middle East**.



## ACADEMY

**Discover Lightware Academy, our new training platform,** master the art of the AV market and stay ahead of the competition. **Choose the course that matches your level** and start your learning journey today.



Learn More:  
[academy.lightware.com](https://academy.lightware.com)

**We treasure our partnerships and strong relationships and we aspire for long-term successful cooperation with you.**  
**This is how we stay innovative and successful.**



**Contact us!**



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