25th ANNIVERSARY

visual engineering
LIGHTWARE

COMMAND & CONTROL CENTER

MEETING & CONFERENCE ROOMS

TRAINING & SIMULATION

BRIEFING & DEMONSTRATION ROOMS

DEFENCE, INTELLIGENCE AND GOVERNMENT

—

Be Mission Prepared

VISUAL ENGINEERING
LIGHTWARE
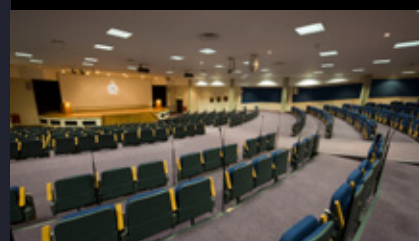
We Keep

Listening

Inventing

Delivering

Going the **Extra Mile**

Our mission has always been to deliver reliable and versatile, yet simple and consistent AV solutions that make life easier and that ensure that technology is not an obstacle but a powerful tool. **We focus on customers' needs and deliver viable solutions over expectations with an uncompromising level of customer service and support.**

Robust Build Quality

Zero
Zero to Extremely Low Latency

Open API
Enabling 3rd Party Interoperability

**Analytics and diagnostics**

Security
TEMPEST and Data Diode Solutions

Lightware's **portfolio of traditional AV, AV-over-IP, Unified Communication Rooms, and Control solutions** is growing in line with the pace of technology advancements. It can **support both mission-critical applications** such as Command and Control centers, Naval Combat Management Systems and non-mission critical installations such as simulators, AV and collaborative working for training schools, military and government meeting rooms, and offices. Supplied in safe and robust casings products of **Lightware are also able to withstand some of the harshest environments.**

Tested And Secured products of **Lightware have a proven track record of seamlessly integrating with industry-leading 3rd party devices** from network switchers to USB webcams, audio systems, and other AV/IT infrastructures.

Lightware provides **world-class support for system architects by offering 25 years of knowledge and expertise** in project development assistance, demonstration and proof-of-concept testing to ensure it delivers the solution that fits perfectly with their project's requirements.
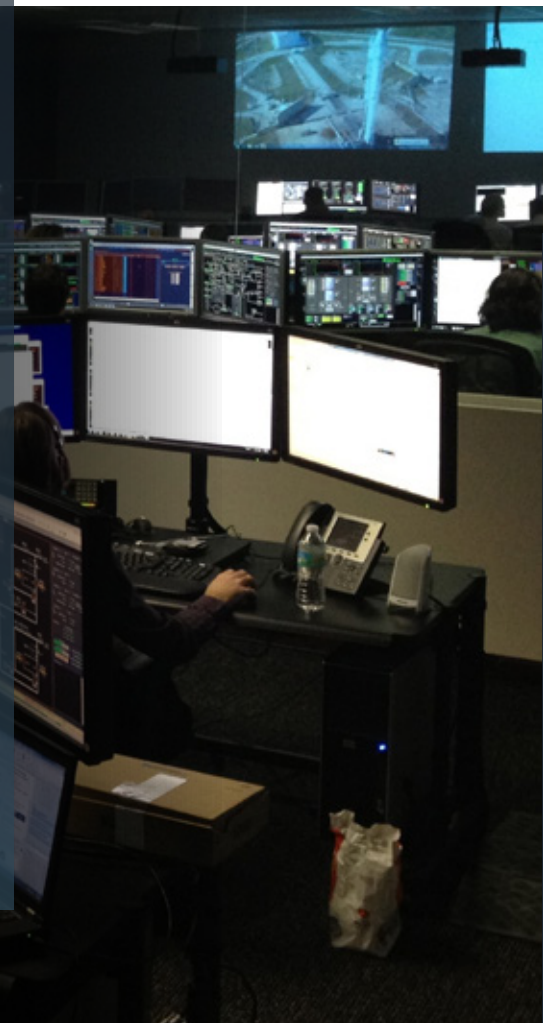
LIGHTWARE TEMPEST AND SECURITY

The demand for trusted and secure high-fidelity AV signal management solutions that enable cost effective mission outcomes is increasing, as is the pace of ICT technology advancements. **A selection of Lightware's products have achieved NATO SDIP 27 Level B TEMPEST accreditation,** more products are planned for TEMPEST accreditation and security enhancements soon.

TEMPEST - Eavesdropping Protection Of Classified Information

MX2-16X16-HDMI20-AUDIO

HDMI20-OPTJ-TX90 / RX90

MMX4X2-HDMI

UBEX-PRO20-HDMI-F100

HDMI-3D-OPT-RX110DD
HDMI-3D-OPT-TX210DD

MX2-8X8-HDMI20-CA

TEMPEST deals with radiated (and conducted) electromagnetic waves of equipment and assesses the eavesdropping risk.

All electrical and electronic equipment generates electromagnetic radiation. In Electromagnetic compatibility (EMC), radiation from data processing equipment, such as laptops, mobile phones or AV products contains sensitive information that can be intercepted by a 'receiver' without direct access to the original device, unless protection measures are in place. These protective measures would be conducted as part of the original product design and or adaptation. There are different TEMPEST levels (Full, Intermediate and Tactical; they are based on different Zones, Levels and Ranges e.g., NATO SDIP Level A is 1 meter (Zone 0), Level B – 20 meters (Zone 1) and Level C – 100 meters (Zone 2).

NATO SDIP-27 - LEVEL B

This 'Intermediate' standard **applies to equipment handling Secret data that cannot be heard from a distance of over 20 meters (Zone 1) of unobstructed distance and a comparable distance through walls and obstacles.**

Network Authentication Protocol - IEEE 802.1X

Lightware has implemented IEEE 802.1X, a standard network authentication protocol, that allows organizations to control which endpoints can access their networks. By using 802.1X, Lightware devices can be trusted endpoints of secured defence, government and corporate networks that restrict access for guest computers and provide added protection against potential attackers.

IT Security Improvements

Security is always a key concern in the defence and government sector, therefore **Lightware continues to implement additional security features in its products,** including HTTPS support, password protection over HTTP and HTTPS as well as IEEE 802.1X support with the ability to create separate VLANs (use for Bring Your Own Device (BYOD) or Bring Your Own Meeting (BYOM) for control and AV).

WE ARE GREEN FOR THE SAKE OF THE GLOBE'S SUSTAINABLE FUTURE

Lightware is committed to managing all operations and services in an environmentally responsible manner and employing methods and policies to contribute **to environmental sustainability.**

We aim at **preventing and minimizing pollution from manufacturing, packaging, and daily operation** and constantly review our activities and **set goals to reduce** our impact on the environment. We pay attention to monitoring, evaluating, and refining our energy consumption and waste management.

Employees are encouraged to minimize paper waste: where possible, all administrative **documents are emailed rather than printed & posted,** incoming faxes are diverted to email while unavoidable paper waste is recycled. When it is absolutely necessary to print, **we use recycled paper in the printers** and copiers and print in eco mode to save ink and energy. Empty print cartridges and toners are collected, treated and when possible, recycled by a contracted service.

In developing our products, we take sustainability very seriously. **We design, develop, and assemble Lightware prototypes in Budapest and so reduce our carbon footprint on transportations.**

We consciously do not overdesign our products and so **reduce colorful but chemical painting.** Neither do we practice garish and heavy design of our packaging.

We strive to make our packaging smart using every inch of the inner space of each cardboard, packing up crates, and containers effectively. We always use **recycled paper for the packaging** and have minimum plastic inside.

We have **consciously reduced accessories to accompany master products** to reduce the amount of wiring that is likely to be excessive and so wasted away.

Our offices incorporate energy-efficient lighting systems and our air-conditioning infrastructure is regularly maintained by professional technicians. When a lighting tube or bulb goes out, we always change it to an LED-based solution.

We participate regularly in Corporate Social Responsibility (CSR) events and actions. Besides ad hoc events, the Lightware team cleans a designated area of trash in the city on the annual 'Clean-Up Day', under the Let's Clean Up Europe initiative. ewwr.eu/take-part/#LCUE

We also pay attention to **keeping our own minds conditioned to 'green mentality'** and have placed posters and stickers everywhere in the Lightware office to remind everyone to think and act green whenever possible.

We would also like to highlight that **data and charging cable for Taurus UCX is made of 35% biodegradable materials,** and USB 2.0 type-C connectors are 90% biodegradable. **This eco-friendly cable for charging and data transfer is a product created to respect the environment.**

Operationally, the **latest Taurus UCX firmware enables users to optimize the use of resources such as heat and power by configuring settings** that, in particular, automatically turn the light and the devices off when people leave the meeting room.

Your Suppliers

Where possible, **outgoing deliveries are consolidated to save fuel.** Packaging methods and materials are reviewed periodically, and where possible, replaced with environmentally friendly alternatives. We **exclusively use environment-friendly, biodegradable cleaning materials and detergents.** We support the use of electric cars (we have an EV charger) and travel by bike.

We introduced selective waste management to collect metal, paper, and plastics for recycling. European Union (EU) regulations are designed to minimize the volume of electrical and electronic equipment waste disposal and current regulations require producers of electronic equipment to collect, reuse, recycle and appropriately treat such waste material for which Lightware employs a specialized subcontractor.
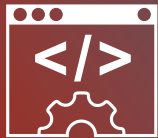
Lightware Benefits ////////////////////////////

OPEN API AND NO VENDOR LOCK-IN

Lightware aims to meet the current and future challenges of defence and government's AV high-fidelity signal management requirements. Lightware recognises that its **customers no longer want to be Locked-In to one vendor to meet all their ICT or AV requirements,** this single vendor approach may seem cost-effective on initial purchase, but through life, it is rarely the case.

Lightware's approach to **providing complimentary access to its Open API solutions and products is changing the AV landscape** – enabling customers to have the flexibility of fully meeting its enduring requirements across multiple brands – interoperability and seamless compatibility via openness is fundamental to Lightware – its success to date is built on this approach. **Every bit of data in a system powered by us, all the way down to the device level, is openly available for higher-level management and monitoring systems for troubleshooting and diagnostic purposes.**

WHAT IS AN API?

An 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 stands at the forefront of AV and high-fidelity signal management technologies, and the key to this is its transparent approach to openness (via API), its solutions not only provide high resilience and redundancy, zero-to-extremely low latency, but 3rd party and end-user access to analytics and diagnostics across its traditional AV and AV-over-IP products.

Lightware has a **proven track record of seamlessly and effectively working together with 3rd party systems and applications** to create a powerful combination for users and unlock the possibilities in any AV operation. **Lightware's video signal analytics and diagnostics tools are built into its products:** enabling users and IT Teams to be more efficient and proactive; saving time and cost whilst delivering timely and effective mission outcomes.

ANALYTICS

Lightware products have a built-in video frame rate analyzer, a tool unmatched and unrivalled in the industry. Users receive constant feedback about the exact pixel count and clock frequency in real-time. Having the possibility of constantly monitoring this data brings peace of mind to critical AV operations, whilst the transparent data that Lightware's devices provide about the system status can be used for higher-level integration.

DIAGNOSTICS

The cable diagnostics is a useful tool to determine any cable related issues in case of TPS connection 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 their cables are securely connected, having this information readily available on their screens saves a tremendous amount of time.

Various Application Areas in the Defence Market

1. ■ Defence and Government Meeting and Briefing Rooms

Lightware has extensive experience in providing innovative meeting and briefing room products that are user friendly, adaptable and interoperable; they are also easy for AV and IT engineers to install, configure and manage. **Lightware solutions provide low cost of ownership and ease of use.**

The defence and government sector is no different to other sectors – it has meeting, briefing and conference rooms where their staff have many internal meetings and also host external visitors in person and / or virtually. **Meetings can be unclassified or classified and be held on different video platform types** (e.g., MS Teams and Webex) **dependant on any specific government or organisation policies and procedures.**

TAURUS UCX

ACCESS MULTIPLE VIDEO CONFERENCE PLATFORMS IN ONE ROOM

Taurus UCX is an award-winning Unified Communications platform that **allows you to securely and conveniently collaborate** by simply connecting your own device **via a single USB-C cable** to share your content and control the meeting room easier than ever before. Any laptop can benefit from **sharing USB peripherals** (USB cameras, speakers, or speakerphones, keyboard and mouse).

The Taurus UCX combines video, audio, control and ethernet signals into one single cable, and together with the auto-switching and intuitive room control capabilities it brings you the experience of the future – today.

THE POWER OF USB-C

BYOM | COLLABORATION | CONNECTIVITY | CHARGING
WITH ONLY ONE USB-C PLUG

It's time to forget about the frustration, the delays and added overhead cost caused by the confusing amount of tangled cables and dozens of plugs or stubborn webcams that somehow 'never want to work' and need lot of costly IT support to administer.

Built-In Superspeed USB Hub

Achieving 4K60 Video

**Compatibility with variety of USB-C devices**

Easy and Intuitive Meeting Room Solution

- Bring Your Own Meeting (BYOM)
- Share video and audio content
- Share room peripherals
- Charge your device
- One single USB-C cable

The post Covid-19 defence and government sector has realized the **efficiency and effectiveness benefits of hybrid and collaborative working,** including the **utility of BYOD and BYOM;** the key to the enduring success of this approach is the IT industry adoption of USB-C. Lightware is the **AV Industry leader in developing and exploiting USB-C technology** which forms a key part of Taurus UCX and other Lightware USB-C related products.

USB-C

USB Data	USB Peripherals	Ethernet	USB HID Devices	Audio and Video	Charging Power
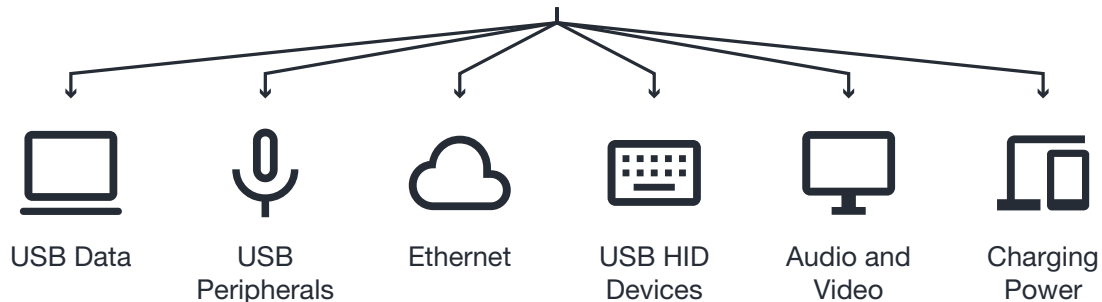
LARA
LIGHTWARE ADVANCED ROOM AUTOMATION

Taurus UCX embeds LARA (Lightware Advanced Room Automation), **which is Lightware's innovative, and progressive room automation platform** created for AV integrators and meeting room participants to help them **simplify their everyday interaction with AV technology.**

LARA's vision is to provide a future-proof room automation platform for system integrators so they can seamlessly and effectively support people's virtual or in-person collaboration with zero to minimum preconfiguring and programming.

LARA Offers:

- User-friendly, easily-parametrizable software solution

- Modules that eliminate the need of complex programming skills

- Possibility for experienced programmers to write their own modules via JavaScript

LARA Provides a Seamless Meeting Experience

LARA runs on Taurus UCX and MMX2 and is **easily configurable through a web browser while meeting room users have access to their room's control via a single touch panel.**

LARA is available in both Taurus UCX and MMX2, **users and staff can expand their control and management of room assets and benefit from room automation.** LARA will contribute to:

Meeting and briefing rooms' seamless user experience by enabling control over the assets from a single touchscreen; LARA eliminates multiple device controls. Enables the participants to focus on ideation and collaboration while LARA sets up the technical space for them.

Effective group work by making in-person, distance, and hybrid meetings a seamless experience. LARA ensures that devices in the meeting space are ready to use at the start of the session and manages their after-session behavior.

Environment protection by setting LARA to manage automated room shut-down. Establishments will optimize costs and shrink their environmental footprint by reducing control units in each meeting space.

Lightware a CISCO Solution Plus Partner

Expand, extend, share and control in a simple and consistent way

Working at the HQ or the unit's office, or operating in a hybrid working system, collaborating teams might wish to connect more presentation sources to their Cisco Room Devices as well as use their own work laptops to host meetings in Cisco-powered rooms.


Expand

Extend

Camera Share

Divisible Rooms

Lightware and Cisco have created configured packages designed for small to large meeting spaces and other working environments

Using the Power of Cisco Room Devices and Lightware Together, Users Can:

- Take control of environment
- Acces new sources
- Control meeting room assets such as lights and projector screens
- Share and utilize their Room Kit such as a USB camera
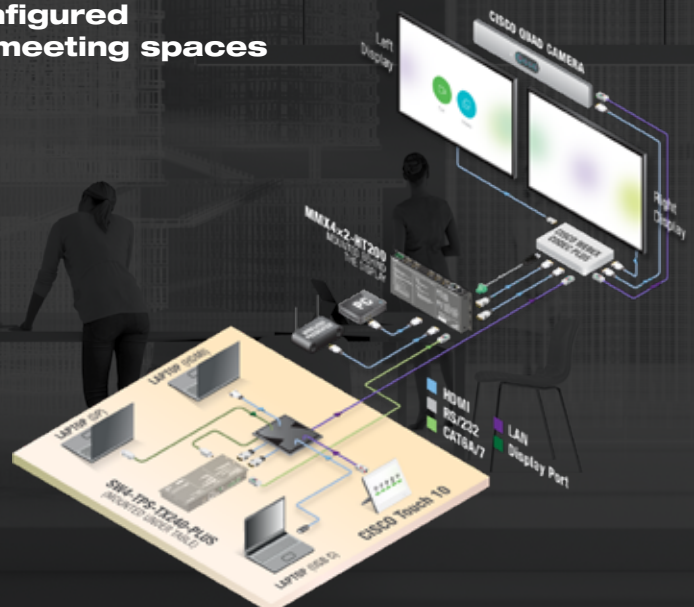
Training and Simulation

The training and simulation market is crucial to **military and defence organisations** as they continue to grow, evolve and **move away from just Live training to Virtual and Constructive** and also the gradual adoption of harmonised Live, Virtual and Constructive (LVC) systems in real-time. **Simulation has grown to be one of the most efficient modern learning instruments, boasting higher efficiency, time, and significant cost reduction.**

The key to the **success of training and simulation** especially simulators (e.g., flight and bridge simulators) and LVC **is the quality, reliability and interoperability of the immersive AV experience** offered to the students, users and instructors.

Whether LVC or more simple point-to-point architectures, the **need for high-fidelity immersive experiences and seamless integration of legacy and new solutions is essential** – this puts **Lightware** in a strong position to support its customers by offering innovative AV technology, reliability, redundancy and interoperability.

Lightware delivers resilient and proven high fidelity uncompressed 4K60Hz solutions that can be integrated into a wide range of immersive environments.

BE MISSION PREPARED: SIMULATORS
INDIVIDUAL OR COLLECTIVE SIMULATOR TRAINING SESSIONS

Lightware's award winning UBEX AV-over-IP product line, which includes a **TEMPEST approved model, supports** standalone **simulator operations** or can be linked with multiple trainers and trainees for team or collective training to simulate the specific domains and environments the military will encounter on their mission.

For establishments operating on **10Gbps** Ethernet **networks,** Lightware offers the **UBEX fiber-optical scaling system,** capable of delivering **uncompressed 4K60Hz 4:4:4** with close to **zero latency** and providing maximum signal fidelity over **distances beyond 100m.**
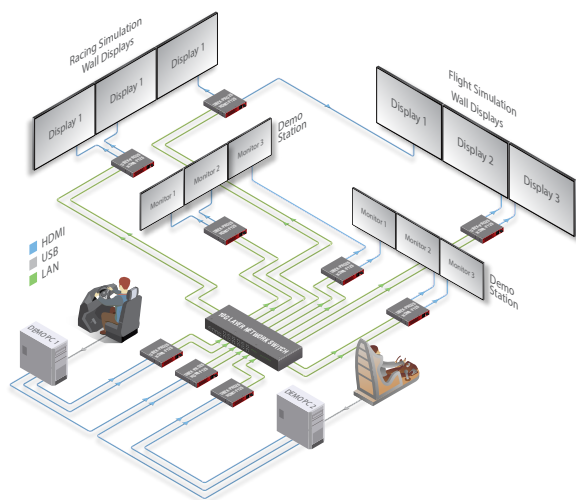
Whether it be **Air-to-Air, Air-to-Ground, Surface-to-Air, Close Air Support,** or **Forward Air Controller missions** or a range of **Naval Bridge training** scenarios the students and instructors can train or conduct mission rehearsals with confidence knowing that only the **most reliable, resilient and best immersive AV technology with build in redundancy is provided** to ensure there is never a gap in training. This means more effective, realistic and repeatable training before the mission ever begins.

UBEX connects single or multiple pilots or various bridge configurations within a virtual environment to achieve simple to complex mission training with high-fidelity immersive AV. This approach makes training for multiple users, realistic, space and cost-efficient.
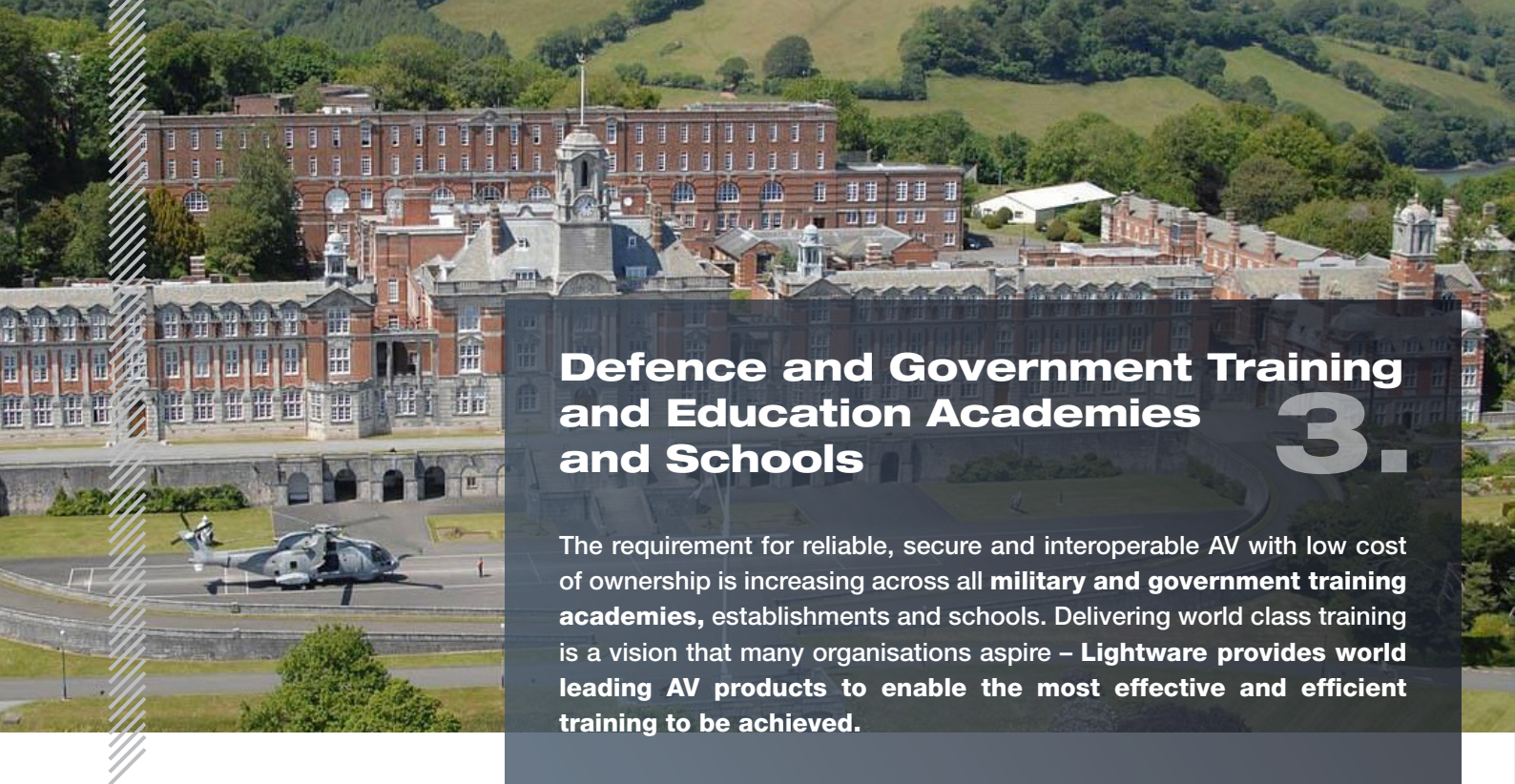
Defence and Government Training and Education Academies and Schools

3.

The requirement for reliable, secure and interoperable AV with low cost of ownership is increasing across all **military and government training academies,** establishments and schools. Delivering world class training is a vision that many organisations aspire – **Lightware provides world leading AV products to enable the most effective and efficient training to be achieved.**

Having low cost of ownership, innovative and **reliable AV solutions** fitted across military and government training and education establishments **plays a large part in getting highly trained people to the front-line faster;** it also has improved outcomes for all stakeholders, such as

INCREASED ANNUAL STUDENT THROUGHPUT
- Significantly improve classroom and lecture hall availability and flexibility of use
- Ease of use for instructors and directing staff

LOW COST OF OWNERSHIP
- Simple AV set up, configuration and management for IT/AV teams
- Analytics and diagnostics features enable pro-active system monitoring by IT teams
- Reduced need for additional products, power supplies and peripherals

MEETING STUDENTS' HIGH EXPECTATION
- Students expect their employers to invest in modern training approaches and technologies to improve and enhance their training experiences

Military and government training establishments have challenging requirements to train and educate their recruits and students - often at pace, so they achieve operational effectiveness faster. Delays in students passing courses or exams because of issues with IT/AV in classrooms have a knock-on effect to Top Line Budget costs and personnel resource allocation to operational units. **With Lightware, any large or small military or government training organisation will improve its efficiency** using the benefits of the **best in the AV industry products and solutions** that offer

- seamless **USB-C connectivity,**
- efficient zero/close-to-zero **AV-over-IP signal delivery,**
- **open API** features,
- robust, reliable, and redundant **matrix switchers,**
- **smart cabling products,** and many more valuable features.

OPEN API FEATURES TO BUILD IDEALLY INTEGRATED LEARNING SPACES

With the open API available in Lightware devices, **training school AV/ IT teams and system integrators can enjoy great freedom in creating efficient learning spaces.**

USB-C Connectivity of TAURUS UCX

With **TAURUS UCX, Lightware's flagship USB-C connection platform,** instructors are spared of any technical issues that such heavily wired spaces are likely to hold for them. **TAURUS provides seamless connectivity** which removes every frustration and barrier that directing staff or instructors habitually have while using multimedia and peripheral equipment. With this unrivaled unique AV-industry device in the heart of the training and or education environment, **instructors are enabled to effectively engage and collaborate with their students,** this while students are given instruments they are best used to, **which contributes to the quality of their learning and retaining information.**

Full HDMI 2.0 Compatibility
Allowing 4K 60Hz 4:4:4 Signals

USB-C Connectivity
and Charging Up To 60W

USB 3.1 Gen1 Connectivity
and Host Switching Layer

Analog and Dante/AES67
audio de-embedding

Simplified and Automated
Room Utility Controls

Enhanced Ethernet
Security Features

AV-over-IP Technology with VINX and UBEX

AV-over-IP, being widely acknowledged as the best industrial method of multimedia signal delivery, **is the optimal option for most defence and government training establishments.** Driven by our customers' needs, **Lightware offers transceivers for both, 1Gbps (VINX) and 10Gbps (UBEX) Ethernet networks.**

Lightware's **VINX and UBEX product families** provide audio-video signal transportation in applications where scalability, flexibility, and rapid deployment are required.

• Offer extension from point-to-point architecture up to hundreds of end-points
• EDID functionality secures seamless handshaking for multiple displays on the network
• Built-in USB 2.0 ports support KVM functionality and deliver USB mass storage

Hundreds of endpoints
VINX can be expanded from a simple point-to-point application to hundreds of endpoints for the ultimate in virtual matrix switching, digital signage and signal extension.

Built-in USB 2.0 ports
The built-in USB 2.0 ports support KVM function and can also handle USB mass storage.

Advanced EDID Management
The extenders include our Advanced EDID Management system and decoders are capable of scaling the video signal up to 4K UHD @ 30 Hz. RS-232 and IR control channels are supported.

HDCP compliant
The units are HDCP compliant and their streaming maximum bit rate is variable between 10 Mbps and 800 Mbps.The feature options include gap and bezel adjustment and cropping which can be performed in batch.

MX2M

Lightware's MX2M 4K modular matrix switcher product line offers a hybrid solution for scenarios where a high level of versatility and flexibility is required and system designers are no longer limited to a certain set of connections.

A great selection of hot-swappable input and output boards are available with a wide range of connections including HDMI 2.0 and optical fiber as well as a plethora of features such as HDR support and Zero Frame Latency.

Whether it is video, audio, Ethernet or even control signals that need to be managed, the MX2M offers unparalleled flexibility for a wide-range of applications and environments.

Active Learning Room Example of 3rd Party Control

Large spaces with multiple sources and multiple displays are a great example of where third-party control solutions integrate with the Lightware API. In this active learning environment, students are at small group tables around the room. The connected laptops are shared to a central switch where the MX2M-FR24R-RFP switch can route any table to any screen or table in the room using the HDMI20-OPTJ-RX90 fiber receivers at each display.

The GUI on the third-party control allows the instructor full control of the routing in the room. Lightware makes the integration easy with the open API. At the same time the Lightware switcher can be monitored and managed over the network by any third-party system.

Command and Control Rooms

The proliferation of multi-domain – pan government intelligence, surveillance, and reconnaissance (ISR) information and data has **changed the** landscape of strategic and operational thinking and **execution for military and civilian mission commanders.**

Real-time analysis and an increasing demand for high fidelity ISR information through AV has influenced the form and function of all command and control centers' design and operation; **transforming fixed infrastructure or deployed platforms into flexible collaboration platforms** better able to support dynamic mission requirements.

Monitoring and sharing an ever-expanding volume of video and data is essential for control room collaboration. **Rapid analysis of evolving situations often embraces tracking multiple sources on a video wall, where high-quality capture and scaling is important for communicating critical information.** Control rooms around the world rely on **Lightware technology to capture, extend, stream, display, switch, and manage content required for effective decision making platforms into flexible collaboration platforms better able to support dynamic mission requirements.**

WARSHIPS – COMMAND AND CONTROL (OPERATIONS ROOM OR COMBAT INFORMATION CENTRE)

Command and control spaces across defence and government sectors are increasingly expected to ensure

- visual clarity;
- flexibility of architecture and KVM functionality;
- seamless data sharing with one or multiple displays and efficient manipulating with AV sources;
- software enabling remote management,
- analysis, diagnostics and trouble shooting for system elements, allowing collaboration with the room and beyond with minimum downtime;
- enhanced cyber security;

In order for a warship to be fully operationally effective the ships' Combat Management System (CMS) must keep pace with the latest technologies to be able to harvest and disseminate the vast amounts of data and information required for the Commander and users / operators to assimilate before any decision making can be undertaken. The **expanding, information-driven mission** with an increasing amount of organic and non-organic C5ISR sensors and effectors, which are essential to achieve situation awareness **require a CMS architecture with a highly adaptable, resilient AV solution with sufficient bandwidth** to deliver high resolution AV with zero-latency from source to the point of 'users' demand. Use of legacy traditional work stations, each being hard-wired for specific functions, can limit collaborative workflows and dynamic ISR data analysis.

Fiber Optic Solutions for Defence and Government

The defence and government's **demand for resilient and robust AV-over-IP Fiber Optic extenders is increasing fast** – this includes Command and Control, use within a Ships' Combat Management System, many other control room applications and also increased use in training and simulation for military and government establishments.

In particular, Lightware's **award-winning UBEX, which is a fiber-optical, scaling AV-over-IP system with TEMPEST accreditation allows uncompressed 4K60 4:4:4 signal extension.** UBEX meets signal management requirements set by command and control uses and boasts the following functionality and features:

- operation over 10G Ethernet networks with 2x10G links
- **end-to-end redundancy** and double scaling
- **minimum rack space**
- **rapid booting**
- **seamless and rapid switching** between video sources
- **high compatibility** with network equipment
- a plethora of more features, that together contribute to building a command and control solution complying with the most demanding requirements set by military and government customers.

UBEX

Lightware offers both AV-over-IP and traditional matrixes and switches for Command and Control and Control room applications. Some of those products have been approved for **NATO TEMPEST SDIP 27 Level B, other Fibre Optic and Data Diode products are also available.**

OPTJ

Small, rugged and reliable fiber optical extenders: Lightware offers **Full 4K HDMI 2.0 Compatible Fiber Optical Extenders** for Command and Control / Control room applications as well as other special uses such as government enforcement agencies for ad-hoc operations where **easy set-up, rugged housing, reliability, and fault-free signal extension are advantageous.**

The HDMI20-OPTJ-TX90 and HDMI20-OPTJ-RX90 are HDMI 2.0 compatible optical fiber extenders. These units transfer uncompressed HDMI 2.0 class 4K signals with embedded audio to up to 600m or a FullHD **signal up to 2500m distance over one multimode fiber cable.**
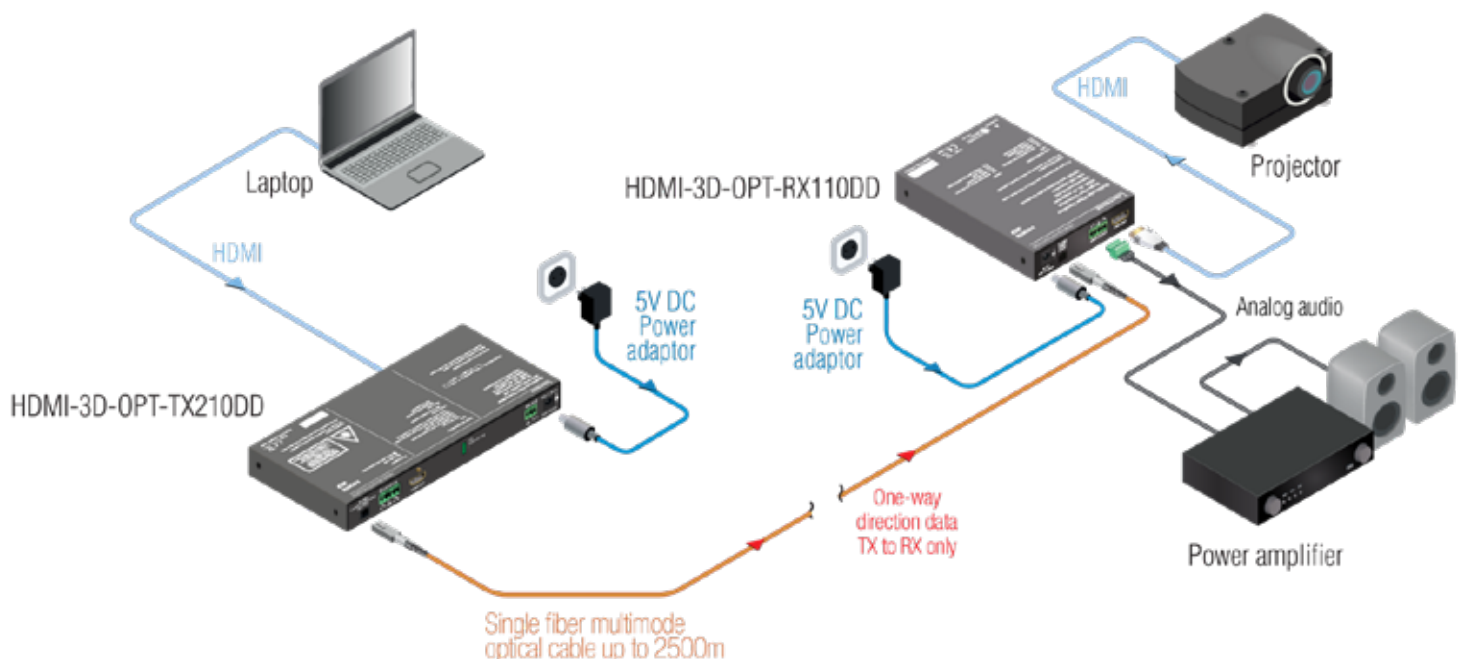
Data Diode (DD) //////////////////////////

Lightware's **HDMI-3D-OPT-DD** series extenders offer **data diode technology,** which means that an optical fiber with a sender on one side and a receiver on the other ensures **that data can only be transferred in a forward direction,** and never in reverse. This means there is **only a one-way transfer, preventing leakage and manipulation.**

The transmitter and receiver pair extends HDMI 1.4 and DVI 1.0, signals over one multimode fiber, and transmits video signals with embedded audio to a distance of **up to 2500 meters.**

HDMI-3D-OPT-TX210DD transmitter is designed to **handle HDMI 1.4 digital video signal** and analog stereo audio from local inputs, or HDMI embedded audio from up to eight channel PCM or HBR audio. Analog audio is converted into digital format. The device has a local HDMI video output for monitoring. The video and the embedded audio of the local output is the same as the one transmitted via the OPT link.

Typical Application

Laptop

HDMI

HDMI-3D-OPT-TX210DD

HDMI-3D-OPT-RX110DD

5V DC Power adaptor

5V DC Power adaptor

HDMI

Projector

Analog audio

One-way direction data TX to RX only

Single fiber multimode optical cable up to 2500m

Power amplifier

Traditional Modular Matrix Switchers and Fixed Frame Matrices for Command and Control, Meeting and Briefing Applications

MMX4x2-HDMI

The MMX4x2-HDMI is a uniquely **mini size matrix switcher which is compatible with CISCO Video Conferencing and TEMPEST accredited at NATO SDIP 27 Level B.** This product has utility for **command and control rooms and also meeting and briefing rooms.**

It has **four HDMI inputs and two independent HDMI outputs. Audio can be de-embedded** from the HDMI signal to a balanced 5-pole Phoenix (Euroblock) port and **external audio signal can be embedded** into the HDMI stream from another 5-pole Phoenix input port. The v**olume and gain** properties of the audio signal can be modified at both input and output. The unit is **fully 4K/UHD/3D capable and HDCP compliant.** The device has a **built-in Event Manager** configurable via the Lightware Device Controller software to enhance efficiency and overall user experience. Further control options are served by the **USB, RS-232, IR (in and out) and Ethernet ports.**

MX2-16x16-HDMI20-Audio

MX216-x 16-HDMI20-Audio - TEMPEST SDIP 27 Level B

The **MX2-16x16-HDMI20-Audio** is a member of the **HDMI 2.0 standalone matrix switcher family that supports uncompromised 4K UHD resolution at 60Hz 4:4:4** and allows embedding audio to and de-embedding audio from the HDMI stream.

It has an outstanding port density that makes it particularly suitable for fix-install applications and for **future-proof Command and Control and Operation centers.** It is also a perfect choice for installations where a huge number of HDMI 2.0 compliant input and output ports are required along with audio inputs and outputs.

This standalone product has **16x HDMI 2.0 inputs and 16x 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.**

Four of its input ports have audio connectors for embedding analog stereo audio into the HDMI stream, while eight audio connectors (four connectors next to the output ports, plus four independent audio connectors) can **provide de-embedded stereo LPCM** (Line Pulse Code Modulation) audio from any of the inputs for amplifiers and audio systems.

The MX2M series offers best in class modular and scalable options for its military and government users

MX2M-FR24R-RFP is a member of the Lightware MX2 **modular matrix switcher** series, supporting **uncompromised 4K UHD resolution at 60Hz with 4:4:4** sampling pattern. The non-blocking matrix architecture distributes and switches 24 video signals to 24 outputs, **distributed along six 4-port boards** respectively per direction.

This versatile and **customizable device is suitable for various types of defence and government applications,** the actual application determining the choice of input and output boards to be included in the frame at that specific time – so truly modular.

MX2M-FR24R-RFP

It is a perfect choice for installations where a huge number of HDMI 2.0 compliant and other types of input and output video ports are required, including **HDMI 2.0, DisplayPort 1.2 and compressed AV-over-IP standards,** as well as extension through fibre. **This modular matrix is equipped with two PSUs to provide redundant hot swappable power supply for the frame itself and also redundant remote powering via PoE.**

25th ANNIVERSARY

VISUAL ENGINEERING
LIGHTWARE

Lightware Visual Engineering is consistent in designing and manufacturing award-winning AV signal management solutions for the most challenging markets of Defence and Government.

Lightware is aware of the AV requirements for the Defence and Government market; which includes the visual clarity of the data fed from multiple sources for processing and distribution, the need for a **flexible, resilient and efficient open architecture, high integration and remote management, redundancy, reliability and cyber security.** Lightware offers its global defence and government customers products and solutions that boast low cost of ownership and a plethora of benefits and features.

25 years of expertise, in-house European design, development and production with a trusted secure supply chain and sustainable approach and ethos; Lightware's provides innovative solutions that are reliable, robust and user friendly; **its customer centered approach and commitment from pre-sales to project development, delivery and after-sales support is mirrored across its global presence in over 30 countries.** Lightware looks forward to working with our current and future Defence and Government partners.

Together we are Making the Globe More Efficient and Safer!

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