

## UBEX Ultra Bandwidth Extender

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.

*This also means that as UBEX can transfer two video signals over a single 10G link with minimal compression, which requires half the router size compared to the needs of similar, 10G IP based architectures. With a 20G configuration, UBEX can transfer 4K@60Hz 4:4:4 over two links uncompressed.*

UBEX units can connect to create a complex network, and with the help of a UBEX-MMU-X200 Matrix Management Unit (MMU) it is possible to create a virtual matrix with UBEX units as input and output endpoints and where a central Ethernet switch acts 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.

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.

*UBEX can also operate as a traditional, point-to-point extender pair, without an Ethernet router and transfer signals natively without compression, a feature most competition products lack. Therefore it can be an excellent choice for rental companies who can easily use both modes of operation as the actual project requires. It is also a rental specific feature that UBEX always remembers the last used setting configuration, so in case of a momentary lapse of electricity it can continue operation where it was left off automatically, as the last used configuration is re-loaded from memory.*

The UBEX design also favors dual-screen applications: each transmitter and each receiver handles 2x HDMI 2.0 video ports. The maximum reachable distance is ranging between 400 m and 80 km, depending on the type of singlemode or multimode optical modules installed in the device, and on the signal properties.

*SFP+ stands for 'Small Form-factor Pluggable Plus' as the SFP+ transceivers are an enhanced version of the 1Gbps SFP modules, and can support data rates of up to 16Gbps. In general, SFP and SFP+ are compact and hot-pluggable transceivers used in telecommunication and data communication equipment. It is an industry standard which is manufactured by many network component vendors. There are more types of SFP modules also existing for even higher speeds. An SFP+ module can be swapped to another type of SFP+ module by the user, by simply removing one and sliding the other into the connector slot. Depending on the SFP+ module and the optical cable used, UBEX can transmit signals to a distance between 400 m and 80 km.*

The UBEX F110 model also features balanced audio ports and RS-232 and IR connectors, while the UBEX F120 also offers full speed USB 2.0 and USB KVM (HID) features.

UBEX operates with zero frame latency, provides seamless switching and visually lossless reproduction of source signals of up to 4K60Hz 4:4:4, without artifacts. Uncompressed 4K60Hz 4:4:4 data transmission, or visually lossless compression at higher data rates.

UBEX Based Solutions For Every Demanding and Dynamically Changing Environment

UBEX provides uncompressed 10G IP switching technology in a rugged chassis, a high-end choice for numerous applications including Rental and Staging.

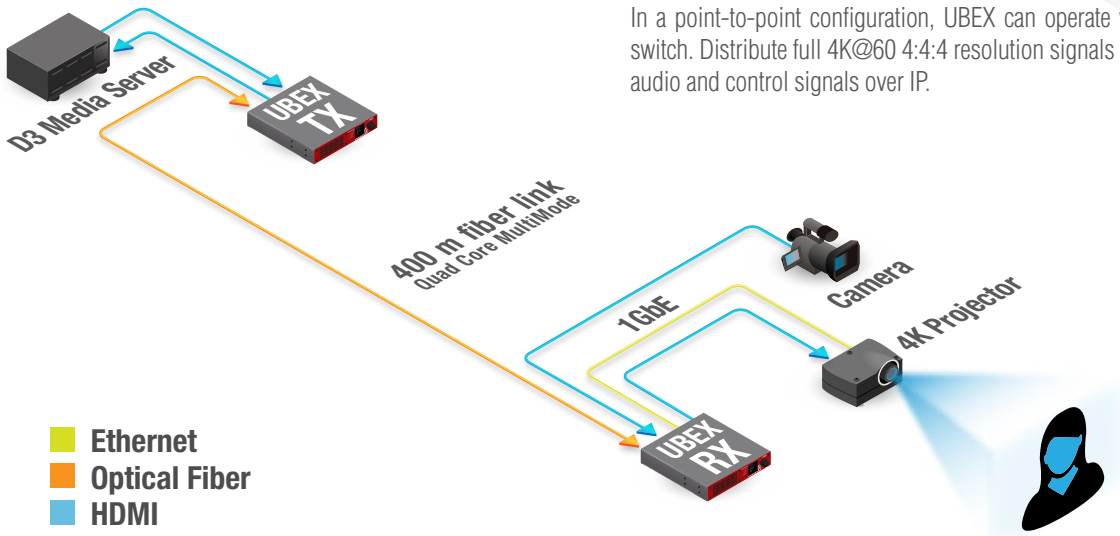
The UBEX has professional, standard SFP+ field connectors, which can be changed by the user to match the requirements of an actual project.

One of the primary features advantageous to the Rental and Staging sector is versatility. The combination of transmitter, receiver and transceiver modes, UBEX is able to perform and to improve any function of all traditional AV product classes: extender, splitter, switcher and matrix.



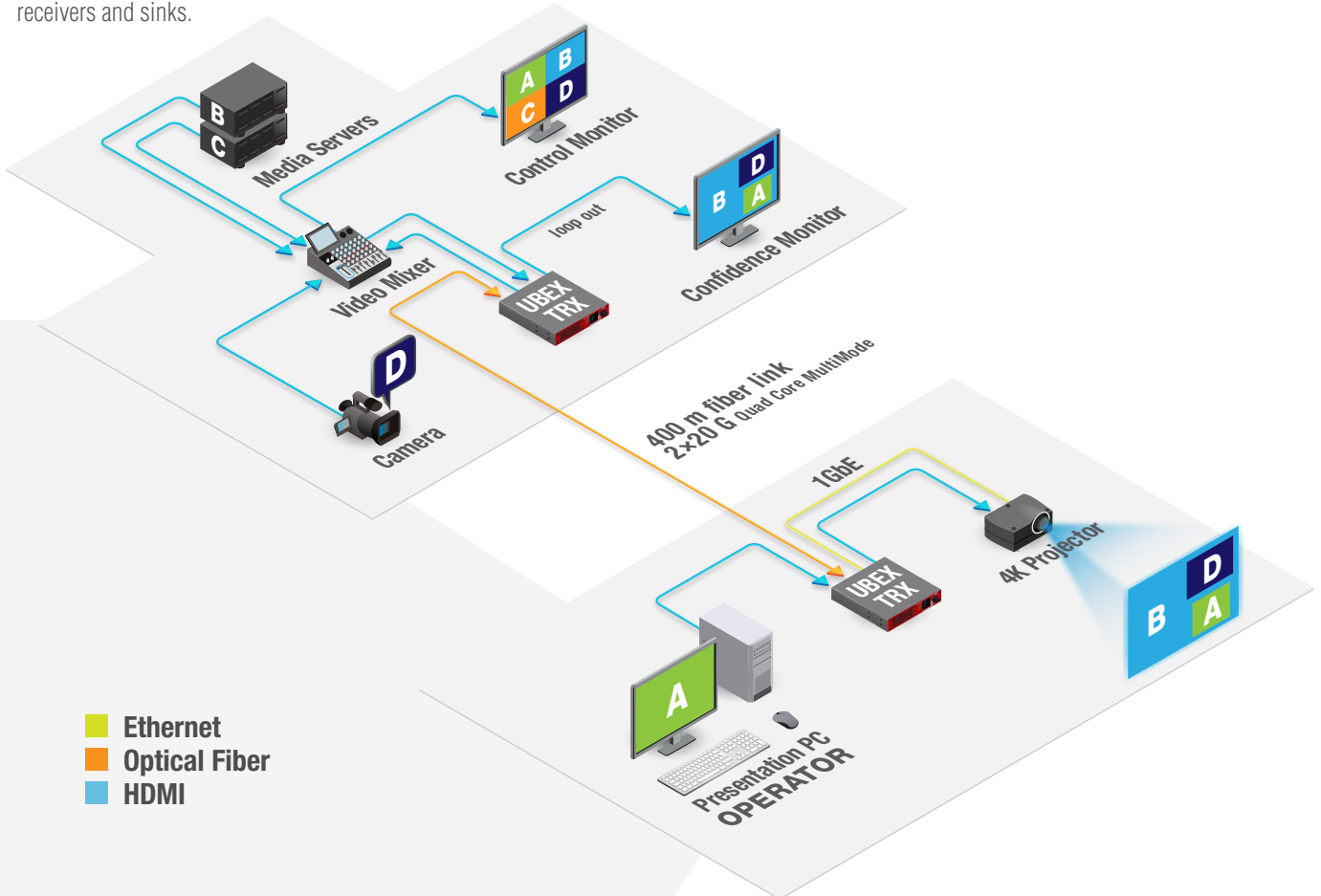
### Extender

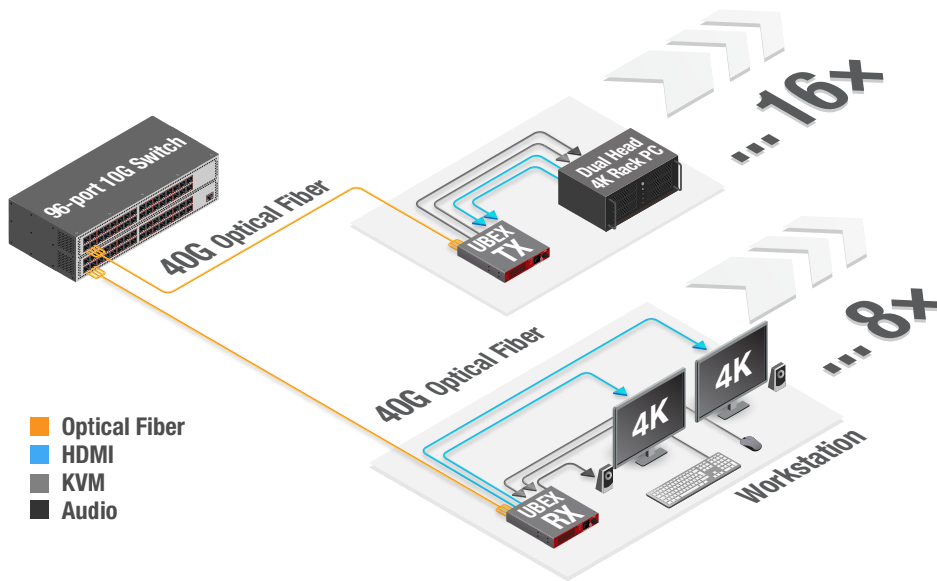
In a point-to-point configuration, UBEX can operate without a control switch. Distribute full 4K@60 4:4:4 resolution signals with 1G Ethernet, audio and control signals over IP.



### Splitter

Using one transmitter and a 10G Ethernet switch, A/V signals can be distributed fast and error-free to a virtually limitless number of receivers and sinks.



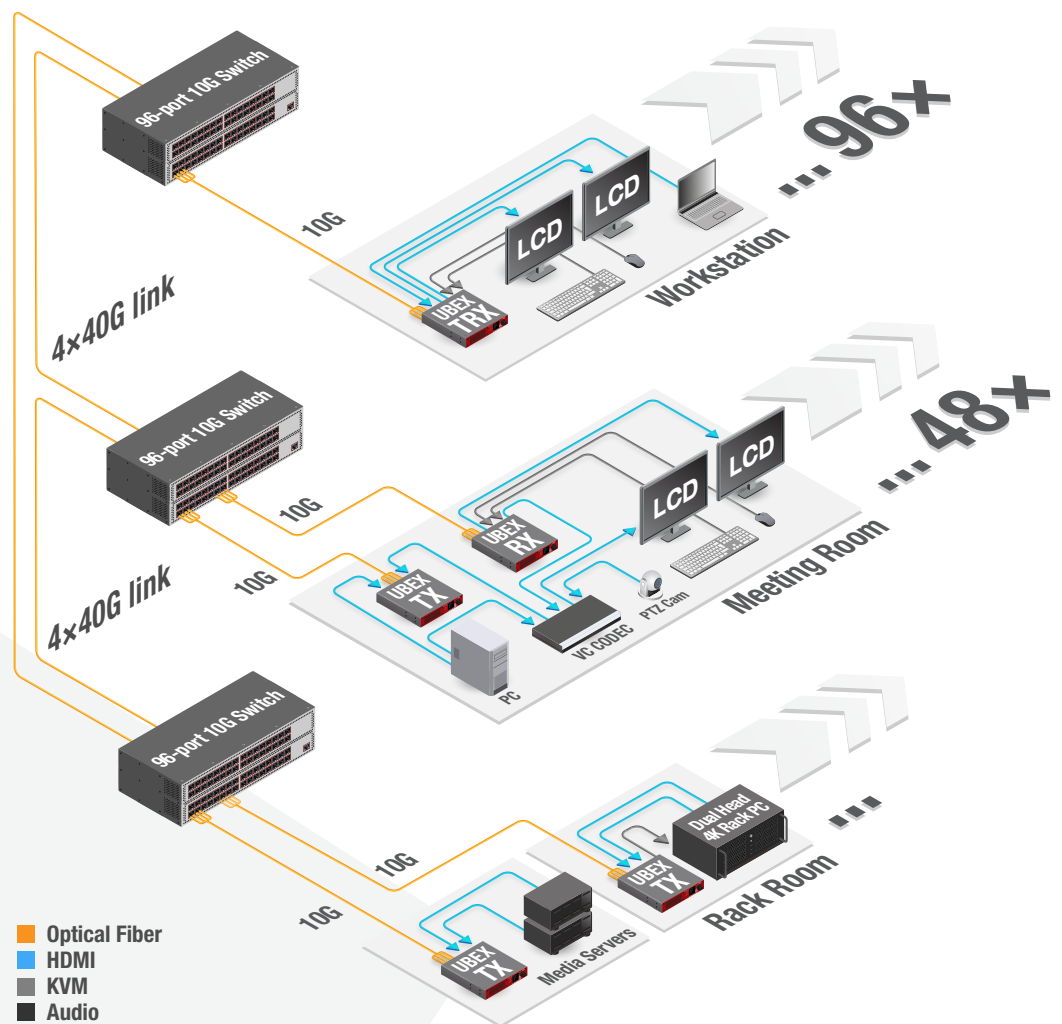


### Switcher

A single UBEX in receiver mode connected to a 10G Ethernet switch can distribute a huge number of sources to a single screen, where the number of sources is only limited by the number of ports on the Ethernet switch.

### Matrix

By combining UBEX units and a central Ethernet switch a completely scalable matrix system can be created, which can be fully managed by the Matrix Management Unit connected to the same switch. Route video, audio, KVM and control signals from any source to any endpoint.



### Highlight 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-F120 Add-on

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

### Comperation Chart:

		UBEX-PRO20-HDMI-F100	UBEX-PRO20-HDMI-F110	UBEX-PRO20-HDMI-F120
HW features	Link	20G	20G	20G
	Optical	✓	✓	✓
	Type of videos	HDMI 2.0	HDMI 2.0	HDMI 2.0
	Nr. of video inputs	2	2	2
	Nr. of video outputs	2	2	2
	USB HID (KVM)	x	x	✓
	Balanced stereo analog audio I/O ports	x	✓	✓
	IR I/O and RS.232 control ports	x	✓	✓
	1 Gbps Ethernet	✓	✓	✓
	Nr. of fibers (W/STANDARD SFP+)	4	4	4
	Nr. of fibers (W/BIDI SFP+)	2	2	2
SW features	4K scaling	✓ <sup>1</sup>	✓ <sup>1</sup>	✓ <sup>1</sup>
	Framerate conversion	✓	✓	✓
	4K UHD @ 60Hz 4:4:4	✓	✓	✓
	30 bit deep color support	✓	✓	✓
	Audio embedding and de-embedding	x	✓	✓
	Advanced edid management	✓	✓	✓
	HDCP 2.2 compliant	✓	✓	✓
Seamless switching	✓	✓	✓	

<sup>1</sup>: for only one video stream

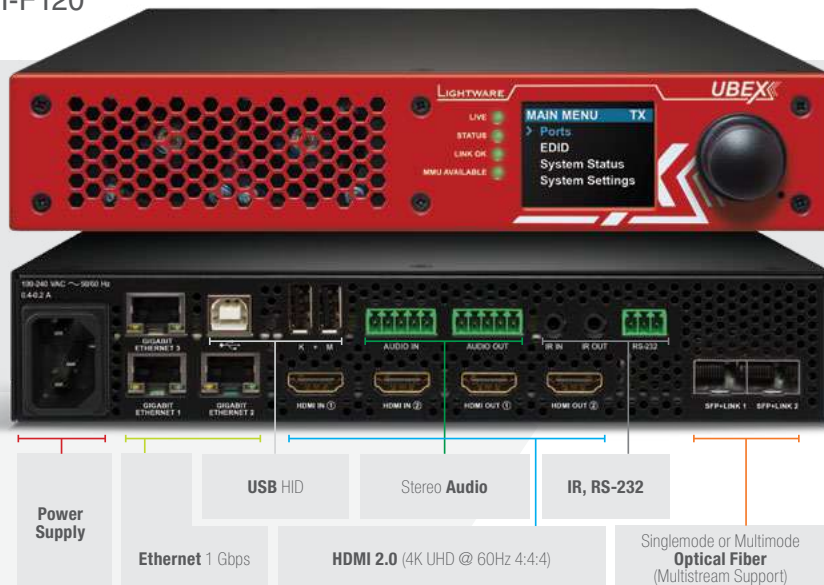
UBEX-PRO20-HDMI-F100



UBEX-PRO20-HDMI-F110



UBEX-PRO20-HDMI-F120





## Most Versatile Reliability

The UBEX series provides the greatest flexibility in a single device, adjustable to be always the right tool for an actual job: from point-to-point extension over an optical network, to multi-zone matrix switching you can be sure that UBEX can handle any task with ease. However, there are some unique UBEX features and matching application areas worth devoting a special attention.

## 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, it has to be versatile and easily integrable with third party systems, devices and networks. Based upon our previous experience gained in marine AV installations, UBEX was designed to have 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 cooperate glitch-free 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. AN UBEX-based virtual matrix can be created by integrating into 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, also taking care of the transfer of audio, control and KVM signals.



## Safety-critical Systems

UBEX is designed to be able to operate conforming data diode network (often also referred to as a unidirectional network) requirements, where data must travel only in one direction to guarantee information safety and security. These networks are common in high security environments including defense, electric power generation facilities, nuclear power stations and similar high security installations. Typically in these configurations two or more networks are connected with changing security classifications. The hardware construction 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.

## 3D Visualizations

Visualization of data or concepts in 3D, in order to 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 concept 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. An UBEX-based medical visualization system can help examine human anatomy and reconstruct it in a real-time 3D environment for use in surgeries, medical education, simulations and trainings.

