



LIGHTWARE UBEX-PRO20-HDMI-F100 Ultra Bandwidth Extender User Guide

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visual engineering
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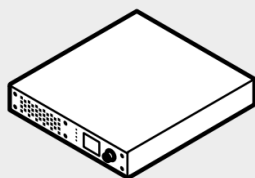
Quick Start Guide
UBEX -PRO20-HDMI-F100
UBEX -PRO20-HDMI-F110
UBEX -PRO20-HDMI-F120

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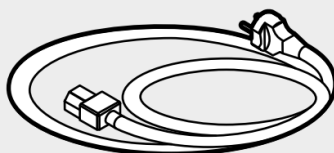
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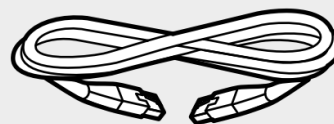
Box Contents



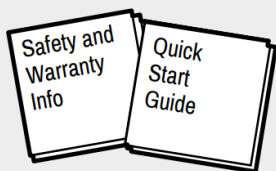
UBEX endpoint device



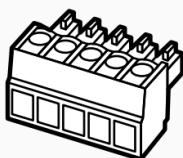
IEC power cable



UTP patch cable (3 m)



Safety and warranty info,
Quick Start Guide



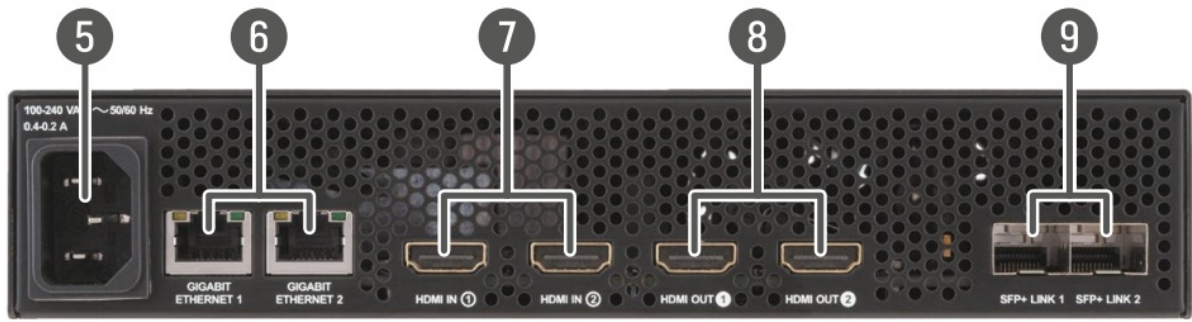
Phoenix Combicon 5-pole
connector (2x) *



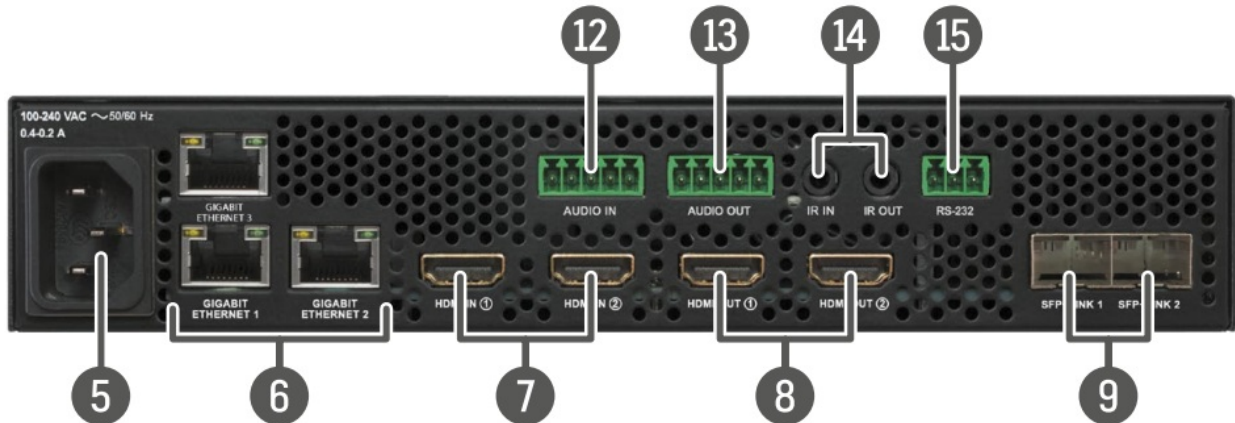
Phoenix Combicon 3-pole
connector *

Front View – All Models

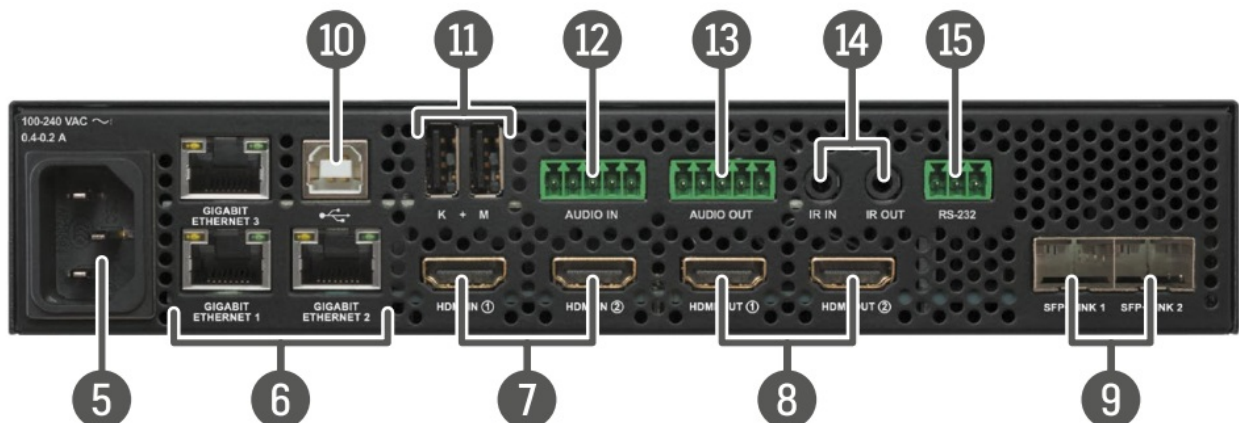




Rear View – UBEX-PRO20-HDMI-F110



Rear View – UBEX-PRO20-HDMI-F120



1. Status LEDs

The LEDs give immediate feedback about the current status of the extender.

2. LCD screen

LCD screen shows the most important settings and parameters in the front panel menu.

3. Jog dial control knob

Easy setting and menu navigation by the jog dial control. Turn and click the knob while getting feedback on the LCD.

4. Reset button

Reboots the device (the same as disconnecting from the power source and reconnecting again).

5. AC connector

Standard IEC connector accepting 100-240 V, 50 or 60 Hz.

6. Ethernet connectors

Standard locking RJ45 connectors for 1 Gbps Ethernet connections to control the device, for user Ethernet

access and firmware upgrade purpose. F100 model is built with 2x RJ45 connectors, F110 and F120 models are built with 3x RJ45 connectors.

7. **HDMI input ports**

HDMI input ports with HDMI 2.0 support for source devices.

8. **HDMI output ports**

HDMI output ports with HDMI 2.0 support for sink devices.

When the device is configured as a transmitter, the ports operate as local HDMI outputs.

9. **SFP+ port slots**

Optical port slots for two 10 GbE SFP+ modules or DAC cables.

Ports can be used for either single-mode or multimode optical connections.

10. **USB B-type connector**

USB connection to host (computer) unit via USB B-type connector.

11. **USB A-type connectors**

USB KVM ports for HID-compatible devices (preferably keyboard and mouse).

12. **Audio input port**

5-pole Phoenix connector for balanced analog audio input. The port is available in all operation modes (TX/RX/TRX).

13. **Audio output port**

5-pole Phoenix connector for balanced analog audio output.

The port is available in all operation modes (TX/RX/TRX).

14. **Infrared connectors**

2 x 3.5mm jack (TS/TRS) connectors for Infrared units (IR IN for the detector, IR OUT for the emitter).

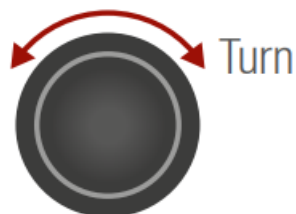
15. **RS-232 connector**

3-pole Phoenix connector for serial communication.

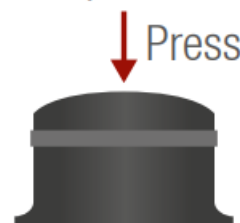
Front Panel Operation

Navigation in the LCD Menu

Menu navigation
& change parameter



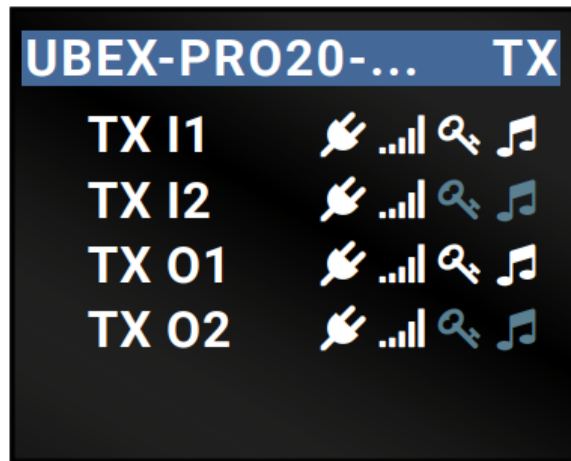
Menu selection
& set parameter



The front panel has a color LCD showing the most important settings and parameters. The jog dial control knob can be used to navigate between the menu items or change the value of a parameter (in the case of TX, RX, or TRX as well). The knob can be pressed to enter a menu or edit/set a parameter.

The LCD Menu in Extender and Matrix Modes

The menu structure is different in Extender and Matrix mode. The following settings are not available in the LCD menu of the endpoint in Matrix mode but they can be set in the Matrix Management Unit:



- Video settings – TX/RX/TRX input/output settings
- EDID operations – EDID switching and saving
- Network settings – static and DHCP (dynamic) IP address settings
- Reloading factory default values

i The Extender or Matrix mode is set automatically in the endpoint device. If the device detects a direct connection with another endpoint device at the other side of the connection, the application mode is set to Extender mode; if the device is managed by the MMU, the application mode is set to Matrix mode.

Operation Mode Settings (only in Extender Mode)

The operation mode (TXIRXITRX) of the unit can be changed from the LCD menu in a few steps.

1. Navigate to the **System settings | Operation mode | Switch mode...** submenu and select the required mode: **Transmitter**, **Receiver** or
2. After the confirmation the unit resets. After booting up the device operates in the desired

Set Static IP Address (only in Extender Mode)

The IP address of the endpoint can be set from the front panel:

1. Navigate to the **System settings | Network | DHCP** menu and check the current state of the DHCP. If the setting is Enabled change it to Disabled. After this navigate to **Save** and press Enter.
2. Navigate to the **System settings | Network | Static IP** menu and select the Static IP address, Subnet mask, Static gateway options. Set the parameters by the front panel buttons according to your network requirements.
3. Navigate to **Save** and press Enter.












Set Dynamic IP Address (DHCP) (only in Extender Mode)

1. Navigate to the **System settings | Network | DHCP** menu and check the current state of the DHCP. If the setting is Disabled change it to Enabled.
2. Navigate to the **Save** submenu (the last one of the **Network** menu) and press Enter.

Restore Factory Default Settings

Navigate to the **System settings | Factory defaults** menu and press Enter. After the confirmation, the device reboots, and the factory default values are reloaded in the device.

Status LEDs

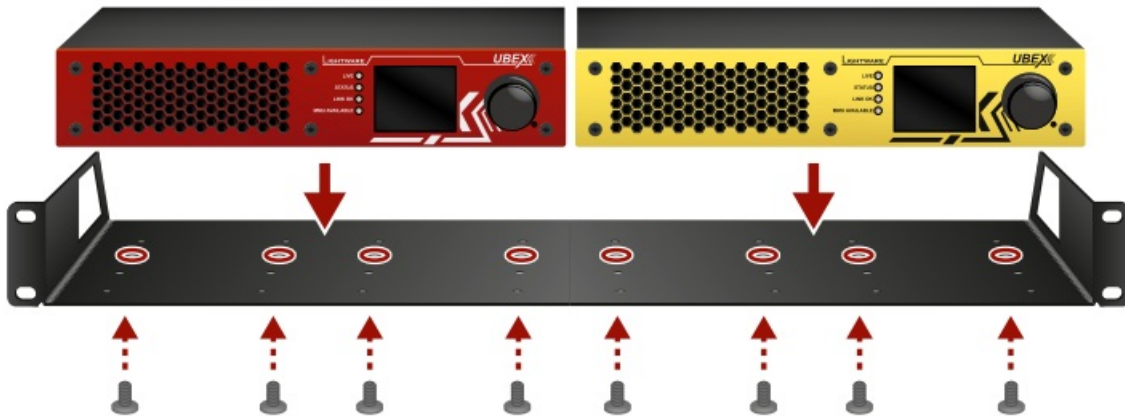
LIVE		Transmitter 1 Receiver / Transceiver
	blinking	The device is powered and ready to use.
	off	The device is not powered or out of operation.
STATUS		Transmitter 1 Receiver / Transceiver
	on	All measured temperature and voltage values are within the limits.
	blinking	Measured temperature or voltage value is out of the limits.
	off	The device is not powered or out of operation.
LINK OK		Transmitter 1 Receiver / Transceiver
	on	The connection is established on SFP+ LINK 1 and 2 and Link Aggregation is working.
	blinking	The connection is established on SFP+ LINK land 2 and the LACP detection period is active.
	off	No connection is established on one of the SFP+ links.
MMU AVAILABLE		Transmitter 1 Receiver /Transceiver
	on	Matrix mode is active; the communication is live between the endpoint and the Matrix Management Unit (MMU).
	blinking	Matrix mode is active; no communication between the endpoint and the MMU.
	off	Extender mode is active; another endpoint is connected via the optical link.

Mounting Options

The device can be mounted in several ways, depending on the application. Besides using with a rack shelf, a mounting bracket is available, which offers easy mounting on truss systems with standard clamps or using the unit built into furniture.

The 1U high rack shelf provides mounting holes for fastening two half-rack-sized units. Mounting bracket V2 allows mounting the device to any furniture surface. Fasten the bracket on the side of the unit with the provided screws and fasten it to a stand/board/furniture. To order mounting accessories please contact sales@lightware.com.

Mounting with the 1U High Rack Shelf



Mounting with Mounting Bracket V2

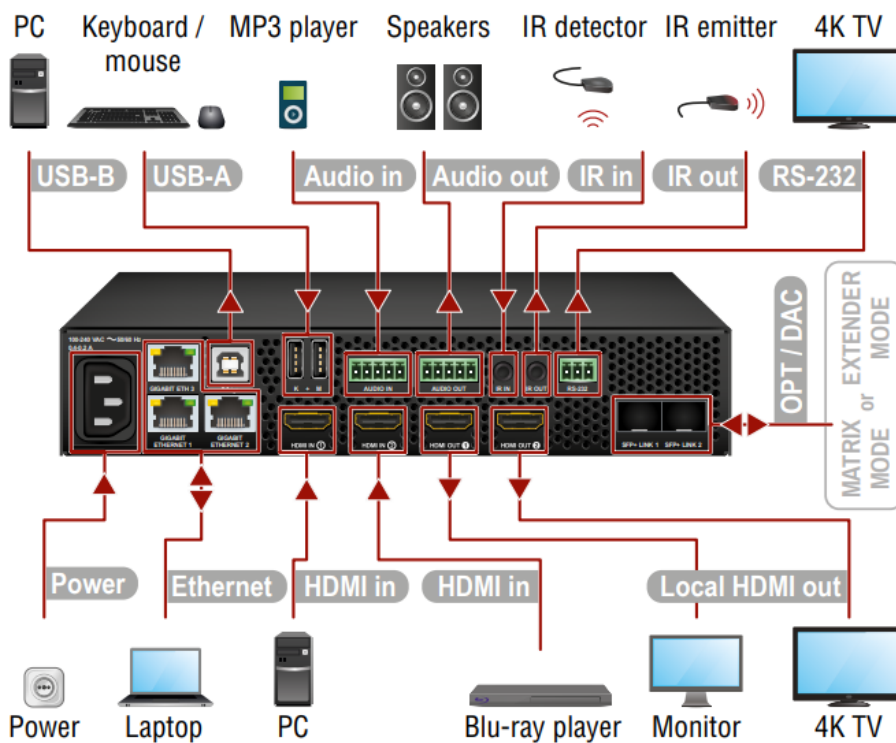


⚠ M3x6 size is the longest allowed screw for fixing the accessories to the housing.

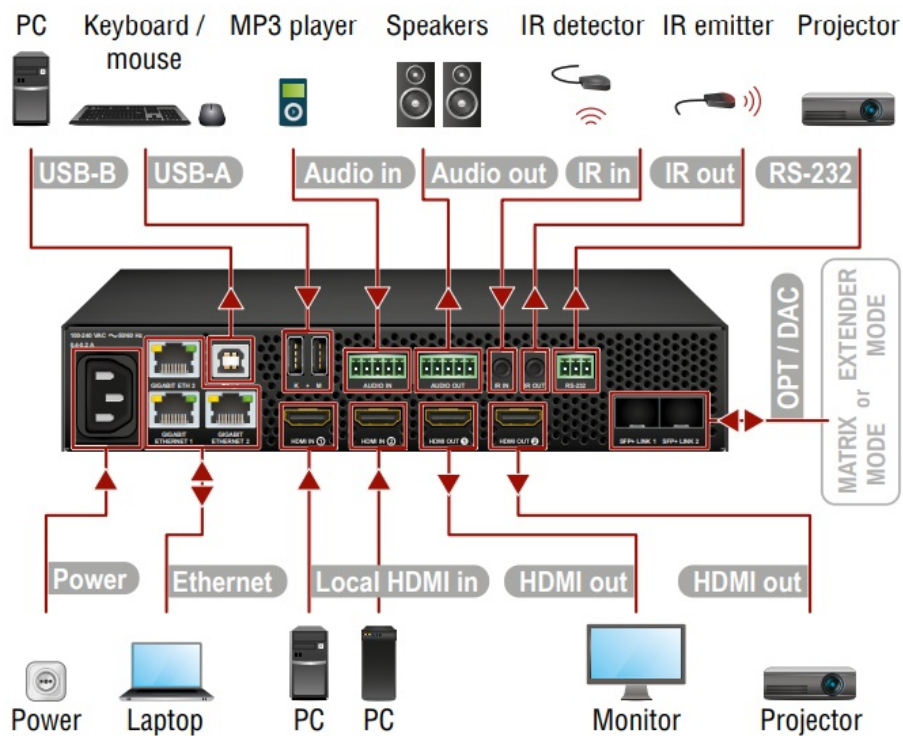
Using different (e.g. longer) screws may cause damage to the device.

Connecting Steps

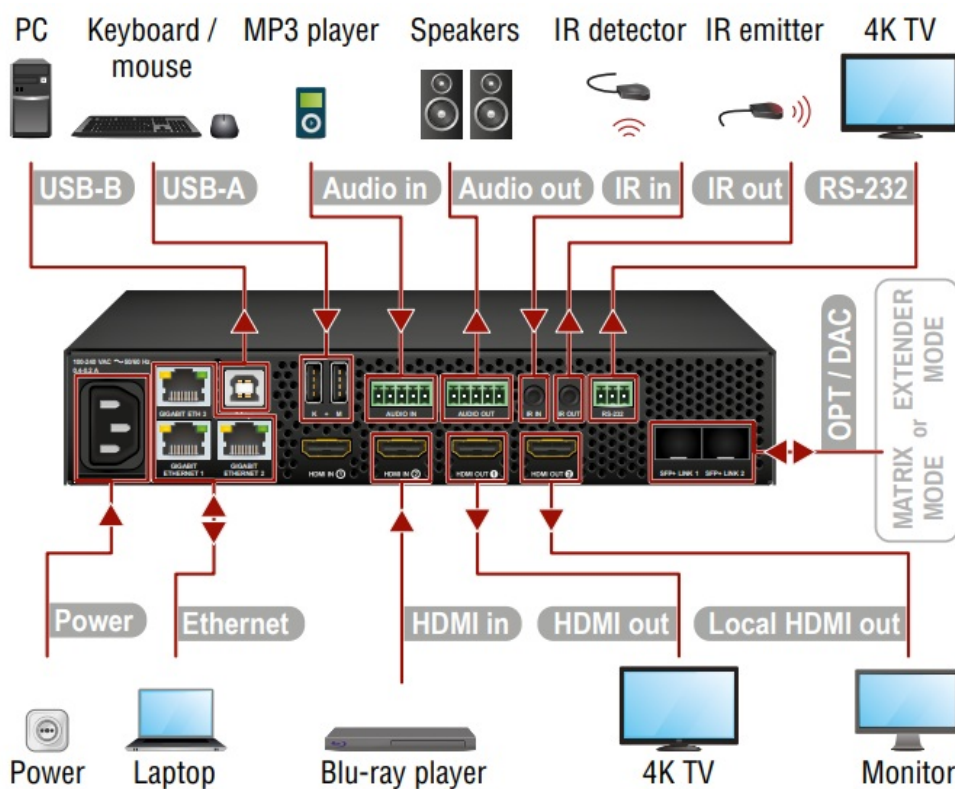
Transmitter (TX) Operation Mode



Receiver (RX) Operation Mode



Transceiver (TRX) Operation Mode



i The HDMI in 1 port cannot accept AV signal when the device is configured as a transceiver.

For all models

Transmitter (TX) Mode	
HDMI in	Connect the UBEX transmitter and the source devices (e.g. PC, Blu-ray player) using the HDMI input 1 and 2 ports by HDMI cables.
Local HDMI out	Connect the local sink devices (e.g. monitor, 4K TV) to the HDMI output 1 and 2 ports by HDMI cables. The output ports are local loopback ports in this case: the same streams received on the input ports are transmitted forward.
Ethernet	Optionally, connect the UBEX transmitter to a LAN in order to control the device. User Ethernet is also transmitted over the SFP+ interface so be sure not to create a network loop!
Power	Connect the power adaptor to the AC input on the transmitter first, then to the AC power socket.

For F110/F120 only

Audio in	Connect an audio source (e.g. media player) to the audio input connector.
Audio out	Connect an audio sink (e.g. active speakers) to the audio output.
RS-232	Optionally for RS-232 extension: connect a controlled unit (e.g. 4K TV) to the RS-232 port of the device with a serial cable.

Ford F120 only

USB-B	Optionally for USB HID extension: connect the transmitter to the computer by the USB-B cable
USB-A	Optionally for USB HID extension: connect the USB HID devices to the transmitter (preferably)

Receiver (RX) Mode	
Local HDMI in	Connect the UBEX receiver and the local source devices (e.g. PCs) using the HDMI input 1 and 2 ports by HDMI cables.
HDMI out	Connect the sink devices (e.g. monitor, projector) to the HDMI output 1 and 2 ports by HDMI cables.
Ethernet	Optionally, connect the UBEX receiver to a LAN in order to control the device. User Ethernet is also transmitted over the SFP+ interface so be sure not to create a network loop!
Power	Connect the power adaptor to the AC input on the receiver first, then to the AC power socket.

For F110/F120 only

Audio in	Connect an audio source (e.g. MP3 player) to the audio input connector.
Audio out	Connect an audio sink (e.g. audio amplifier) to the audio output.
RS-232	Optionally for RS-232 extension: connect a controlled unit (e.g. projector) to the RS-232 port of the device with a serial cable.

For F120 only


USB-B	Optionally for USB HID extension: connect the receiver to the computer by the USB-B cable.
USB-A	Optionally for USB HID extension: connect the USB HID devices to the receiver (preferably mc

First Steps of Device Configuration

Setting the Operation Mode

All endpoint devices are manufactured as transmitters (TX) by default. Set up the operation mode for the endpoints that are to be used as receivers (RX) or transceivers (TRX) with the front panel LCD menu.

Connecting to the Devices over LAN

 Connecting the devices to the network using the factory default network settings might cause IP address conflict.

Please follow the steps before connecting the endpoint devices to the network:

1. Set different static IP addresses or set DHCP (dynamic IP address) on the front panel LCD menu or via the Lightware Device Controller (LDC) software.
2. Establish a connection between the endpoint devices over the SFP+ interface.

For all models

Transceiver (TRX) Mode	
HDMI in	Connect the UBEX transceiver and source devices (e.g. PC) using the HDMI input 2 port by an HDMI cable.
HDMI out	Connect a sink device (e.g. 4K TV) to the HDMI output 1 port by an HDMI cable.
Local HDMI out	Connect a local sink (e.g. monitor) to the HDMI output 2 by an HDMI cable. The output port is a local loopback port in this case: the same stream received on the HDMI input 2 port is transmitted forward.
Ethernet	Optionally, connect the UBEX transceiver to a LAN in order to control the device. User Ethernet is also transmitted over the SFP+ interface so be sure not to create a network loop!
Power	Connect the power adaptor to the AC input on the transceiver first, then to the AC power socket.

For F110/F120 only

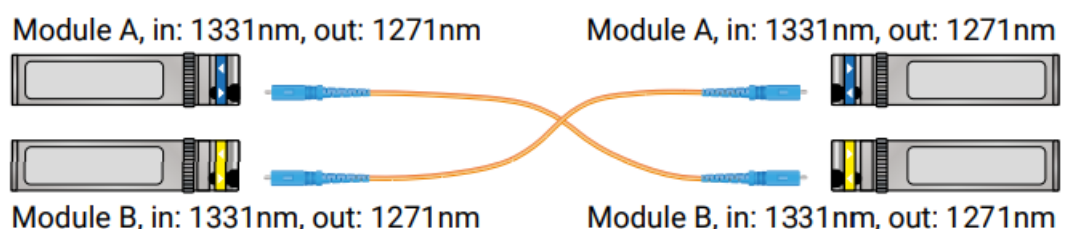
Audio in	Connect an audio source (e.g. media player) to the audio input connector.
Audio out	Connect an audio sink (e.g. audio amplifier) to the audio output.
RS-232	HDCEP Optionally for RS-232 extension: connect a controlled unit (e.g. 4K TV) to the RS-232 port of the device with a serial cable.

Ford F120 only

USB-B	Optionally for USB HID extension: connect the transceiver to the computer by the USB-B cable
USB-A	Optionally for USB HID extension: connect the USB HID devices to the transceiver (preferably i

Cabling of the BiDi SFP+ Modules

In the case of using bidirectional (BiDi) SFP+ modules in the UBEX endpoint devices, please check the wavelength of the INPUT and OUTPUT modules. If the wavelengths are different, the cabling might be also different and the modules shall be connected across.



Software Control – Using Lightware Device Controller (LDC)



The device can be controlled from a computer through the Ethernet ports using Lightware Device Controller. Please download the application from www.lightware.com, install it on a Windows PC or a macOS, and establish a connection to the device.

Factory Default Settings

The following settings are applied in the device once the factory default settings are recalled:

GENERAL SETTINGS		
System settings		
Application mode (Extender I Matrix)		Auto (the endpoint detects automatically the actual application mode)
Network settings		
Static IP address – TX mode		192.168.0.101
Static IP address – RX mode		192.168.0.102
Static IP address – TRX mode		192.168.0.101
Subnet mask		255.255.255.0
Default gateway		192.168.0.1
DHCP		Disabled
LW3 protocol command port		6107
HTTP port		80

HDMI PORT SETTINGS – TRANSMITTER MODE	
HDMI input port properties	
Scaler mode – HDMI in 1	Pass-through
FRC mode – HDMI in 2	Pass-through
Color space converter – HDMI in 1 and 2	No conversion
HDCP setting – HDMI in 1 and 2	Enabled

HDMI PORT SETTINGS – RECEIVER MODE	
HDMI output port properties	
Scaler mode – HDMI out 1	Pass-through
FRC mode – HDMI out 1 and 2	Pass-through
Color space converter – HDMI out 1 and 2	No conversion
Timing mode – HDMI out 1 and 2	Free run
HDCP mode – HDMI out 1 and 2	Auto

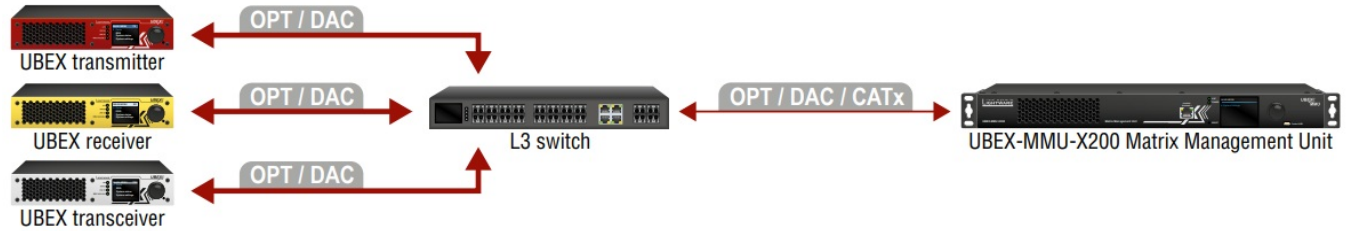
HDMI PORT SETTINGS – TRANSCEIVER MODE	
HDMI input 2 port properties	
FRC mode	Pass-through
Color space converter	No conversion
HDCP setting	Enabled
HDMI output 1 port properties	
Scaler mode	Pass-through
FRC mode	Pass-through
Color space converter	No conversion
Timing mode	Free run
HDCP mode	Auto

Extender Mode



OPT to Connect single-mode or multimode (depends on the installed SFP+ modules) fiber optical cables or DAC cables between a UBEX transmitter and a receiver, or two transceiver **DAC** devices. The Extender Mode is detected and applied automatically in the device once the connection is established successfully.

Matrix Mode



OPT to Connect single-mode or multimode (depends on the installed SFP+ modules) fiber optical cables or DAC cables between the UBEX transmitter/receiver/transceiver devices and the Layer 3 (L3) network switch. Also, connect the Matrix Management Unit (MMU) to the switch by fiber optical or CATx cable to configure and control the virtual matrix. **DAC** The Matrix Mode is applied automatically in the endpoint devices once the MMU claims the endpoint.

Important Safety Instructions

Please read the supplied safety instruction document before using the product and keep it available for future reference.
The extender is a Class 1 laser product.

Introduction



Thank you for choosing the Lightware UBEX F-series endpoint device. UBEX (Ultra Bandwidth Extender) product family offers a new optical solution allowing 4K@60Hz 4:4:4 uncompressed signal extension with extra-low latency for the users. We use packet-based transmission instead of the conventional method.

We use standard, certificated 10 Gbps SFP+ optical modules which are plug and play, so they are interchangeable by the user. There could be either duplex multimode/single-mode modules (1–1 fiber for each direction per 10 Gbps link) or bidirectional Singlemode modules (1 fiber for both directions per 10 Gbps link). The maximum supported cable length is 400 m with multimode modules (OM4), 10 km with short-range Singlemode modules, or 80 km with long-range single-mode modules. In a typical application with a standard, non-blocking 10 Gbps Ethernet switch it is necessary to use both directions of the link. Therefore the number of necessary fibers depends on the link speed and the optical module: for 10 Gbps 1 or 2 fibers, for 20 Gbps 2 or 4 fibers are needed. One of the primary advantages of the new architecture is scalability.

Further Information

The document is valid with the following firmware version: 2.2.0

The User's manual of this appliance is available on www.lightware.com.

See the Downloads section on the dedicated product page.

Contact Us

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support@lightware.com

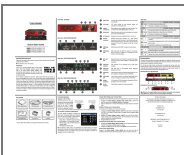
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Doc. ver.: 1.4

192000192

Documents / Resources



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UBEX-PRO20-HDMI-F100, UBEX-PRO20-HDMI-F120, UBEX-PRO20-HDMI-F110, Ultra
Bandwidth Extender