Introduction
Thank you for choosing Lightware UBEX F-series endpoint device. UBEX (Ultra Broadband Extender) product family offers a new optical solution allowing 4K@60Hz 4x4 uncompressed signal extension with extra low latency for the users. We use packet-based transmission instead of the conventional method.

We use standard, certified 10 Gbps SFP+ optical modules which are plug and play, so they are interchangeable by the user. There could be either duplex multimode/singlemode 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), and 10 km with short range singlemode modules, or 80 km (1 fiber for both directions per 10 Gbps link). The maximum supported cable length is 400 m with multimode modules (OM4), and 10 km with short range singlemode modules, or 80 km (1 fiber for both directions per 10 Gbps link).

The LCD Menu in Extender and Matrix Modes
The LCD menu is Extender and Matrix Modes.

Menu navigation & change parameter
Menu selection & set parameter

Menu navigation & change parameter
Menu selection & set parameter

Operation Mode Settings (only in Extender Mode)
The operation mode (TX/RX/TRX) 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 Transceiver.
2. After the confirmation the unit resets. After booting up the device operates in the desired mode.

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 System settings / Network / Static IP menu and select the Static IP
2. Navigate to the Static IP menu (TX/RX/TRX) for the device. The port is available in all operation modes (TX/RX/TRX).

USB A-type connectors
USB B-type connector

Audio input port
Audio output port

HDMI input ports
HDMI output ports

SFP+ port slots
Optical port slots for two 10 GbE SFP+ modules or DAC cables. Ports can be used for either singlemode or multimode optical connections.

Operation in Matrix Extender Mode
The operation in Extender Mode:
1. Navigate to the System settings / Factory defaults menu and press Enter. The factory default settings are restored. After the confirmation the device reboots and the factory default values are released in the device.

Further Information
The User’s manual of this appliance is available on www.lightware.com. See the Downloads section on the dedicated product page.

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UD00230
Connecting Steps

Transmitter (TX) Operation Mode

PC | Keyboard / MP3 player | Speakers | IR detector | IR emitter | 4K TV
---|----------------------|---------|-------------|------------|-------

Audio out

Connect an audio sink (e.g. audio amplifier) to the Audio out.
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.
 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.
 Connect the power adaptor to the AC input on the transmitter first, then to the AC power socket.
 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.
 Connect an audio sink (e.g. active speakers) to the audio output.
 Optionally for USB-A: connect a device (e.g. mouse) to the USB-A input connector.
 Optionally for USB HD extension: connect the USB HD devices to the transmitter (preferably mouse and keyboard).

Receiver (RX) Operation Mode

PC | Keyboard / MP3 player | Speakers | IR detector | IR emitter | Projector
---|----------------------|---------|-------------|------------|---------

Audio in

Connect an audio source (e.g. media player) to the audio input connector.
 Connect the sink devices (e.g. monitor, projector) to the HDMI output 1 and 2 ports by HDMI cables.
 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.
 Connect the power adaptor to the AC input on the receiver first, then to the AC power socket.
 Optionally for RS-232 extension: connect a controlled unit (e.g. projector) to the RS-232 port of the device with a serial cable.
 Connect an audio sink (e.g. MP3 player) to the audio input connector.
 Optionally for USB-HD extension: connect the computer by the USB-B cable.
 Optionally for USB HD extension: connect the USB HD devices to the receiver (preferably mouse and keyboard).

Transceiver (TRX) Operation Mode

PC | Keyboard / MP3 player | Speakers | IR detector | IR emitter | 4K TV
---|----------------------|---------|-------------|------------|-------

Audio out

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.
 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.
 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.
 Connect the power adaptor to the AC input on the transmitter first, then to the AC power socket.
 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.
 Connect an audio sink (e.g. active speakers) to the audio output.
 Optionally for USB-A: connect a device (e.g. mouse) to the USB-A input connector.
 Optionally for USB HD extension: connect the USB HD devices to the transmitter (preferably mouse and keyboard).

Receiver (RX) Operation Mode

PC | Keyboard / MP3 player | Speakers | IR detector | IR emitter | Projector
---|----------------------|---------|-------------|------------|---------

Audio in

Connect the UBEX receiver and the local source devices (e.g. PC, POS) using the HDMI input 1 and 2 ports by HDMI cables.
 Connect the sink devices (e.g. monitor, projector) to the HDMI output 1 and 2 ports by HDMI cables.
 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.
 Connect the power adaptor to the AC input on the receiver first, then to the AC power socket.
 Optionally for RS-232 extension: connect a controlled unit (e.g. projector) to the RS-232 port of the device with a serial cable.
 Connect an audio sink (e.g. MP3 player) to the audio input connector.
 Optionally for USB-HD extension: connect the computer by the USB-B cable.
 Optionally for USB HD extension: connect the USB HD devices to the receiver (preferably mouse and keyboard).

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 on a Windows PC or a macOS and establish communication with the UBEX device.

Cabling of the BIDI SFP+ Modules

In cases 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.

Matrix Mode

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

Extender Mode

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

Factory Default Settings

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

### GENERAL SETTINGS

<table>
<thead>
<tr>
<th>Setting</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>System settings</td>
<td>Enabled</td>
</tr>
<tr>
<td>Static IP address - TX mode</td>
<td>192.168.100.1</td>
</tr>
<tr>
<td>Static IP address - RX mode</td>
<td>192.168.100.101</td>
</tr>
<tr>
<td>Static IP address - TRX mode</td>
<td>192.168.100.102</td>
</tr>
<tr>
<td>Submask</td>
<td>255.255.255.0</td>
</tr>
<tr>
<td>Default gateway</td>
<td>192.168.1.1</td>
</tr>
<tr>
<td>SNMP</td>
<td>Enabled</td>
</tr>
<tr>
<td>LW3 protocol command port</td>
<td>6027</td>
</tr>
<tr>
<td>HTTP port</td>
<td>80</td>
</tr>
</tbody>
</table>

### HDMI PORT SETTINGS – TRANSMITTER MODE

<table>
<thead>
<tr>
<th>Setting</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>HDMI input port properties</td>
<td>Enabled</td>
</tr>
<tr>
<td>Scaler mode - HDMI in 1</td>
<td>Pass-through</td>
</tr>
<tr>
<td>FRC mode - HDMI in 1</td>
<td>Pass-through</td>
</tr>
<tr>
<td>Color space converter - HDMI in 1 and 2</td>
<td>No conversion</td>
</tr>
<tr>
<td>HDCP setting - HDMI in 1 and 2</td>
<td>Enabled</td>
</tr>
</tbody>
</table>

### HDMI PORT SETTINGS – RECEIVER MODE

<table>
<thead>
<tr>
<th>Setting</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>HDMI output port properties</td>
<td>Enabled</td>
</tr>
<tr>
<td>Scaler mode - HDMI out 1</td>
<td>Pass-through</td>
</tr>
<tr>
<td>FRC mode - HDMI out 1 and 2</td>
<td>Pass-through</td>
</tr>
<tr>
<td>Color space converter - HDMI out 1 and 2</td>
<td>No conversion</td>
</tr>
<tr>
<td>Timing mode - HDMI out 1 and 2</td>
<td>Free run</td>
</tr>
<tr>
<td>HDCP mode - HDMI out 1 and 2</td>
<td>Auto</td>
</tr>
</tbody>
</table>

### HDMI PORT SETTINGS – TRANSMITTER MODE

<table>
<thead>
<tr>
<th>Setting</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>HDMI input 2 port properties</td>
<td>Enabled</td>
</tr>
<tr>
<td>Scaler mode</td>
<td>Pass-through</td>
</tr>
<tr>
<td>FRC mode</td>
<td>Pass-through</td>
</tr>
<tr>
<td>Color space converter</td>
<td>No conversion</td>
</tr>
<tr>
<td>HDCP setting</td>
<td>Enabled</td>
</tr>
</tbody>
</table>

### HDMI output 1 port properties

<table>
<thead>
<tr>
<th>Setting</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scaler mode</td>
<td>Pass-through</td>
</tr>
<tr>
<td>FRC mode</td>
<td>Pass-through</td>
</tr>
<tr>
<td>Color space converter</td>
<td>No conversion</td>
</tr>
<tr>
<td>HDCP setting</td>
<td>Enabled</td>
</tr>
</tbody>
</table>

### Extender Application Modes

<table>
<thead>
<tr>
<th>Mode</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extender Mode</td>
<td>Connect singlemode or multimode (depends on the installed SFP+ modules) fiber optical cables or DAC cables between a UBEX transmitter and a receiver, or two transceiver devices. The Extender Mode is detected and applied automatically in the device once the connection is established successfully.</td>
</tr>
</tbody>
</table>

### Matrix Mode

<table>
<thead>
<tr>
<th>Mode</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Matrix Mode</td>
<td>Connect singlemode 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 CAT5 cable to configure and control the virtual matrix. The Matrix Mode is applied automatically in the endpoint devices once the MMU claims the endpoint.</td>
</tr>
</tbody>
</table>

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1. The HDMI in 2 port cannot accept all signals when the device is configured as a transceiver.

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