LIGHTWARE

INNOVATIVE. RELIABLE. MADE IN EUROPE.



# USER MANUAL

**SCX-2x1-HC60**
**UCX-2x1-HC60**
**UCX-2x1-HC60-LCC**
**UCX-2x2-H60**
**UCX-2x2-H60-LCC**
**UCX-4x2-HC60**
**UCX-4x2-HC60-LCC**

**UCX-4x2-HC60D**
**UCX-4x2-HC60D-LCC**
**UCX-4x3-HC60**
**UCX-4x3-HC60-LCC**
**UCX-4x3-HC60-BD**
**UCX-4x3-HC60-BD-LCC**

Universal Switcher

## Bookmark Page




## Important Safety Instructions

**Class II apparatus construction.**

The equipment should be operated only from the power source indicated on the product.

To disconnect the equipment safely from power, remove the power cord from the rear of the equipment, or from the power source. The MAINS plug is used as the disconnect device, the disconnect device shall remain readily operable.

There are no user-serviceable parts inside of the unit. Removal of the cover will expose dangerous voltages. To avoid personal injury, do not remove the cover. Do not operate the unit without the cover installed.

The appliance must be safely connected to multimedia systems. Follow instructions described in this manual.

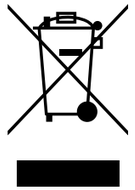
**Ventilation**

For the correct ventilation and to avoid overheating, ensure enough free space around the appliance. Do not cover the appliance, leave the ventilation holes free and never block or bypass the ventilators (if there are any).

**WARNING**

To prevent injury, the apparatus is recommended to be securely attached to the floor/wall, or mounted in accordance with the installation instructions. The apparatus shall not be exposed to dripping or splashing, and no objects filled with liquids, such as vases, shall be placed on the apparatus. No naked flame sources, such as lit candles, should be placed on the apparatus.

## Waste Electrical & Electronic Equipment (WEEE)



This marking shown on the product or its literature indicates that it should not be disposed with other household wastes at the end of its working life. To prevent possible harm to the environment or human health from uncontrolled waste disposal, please separate this from other types of wastes and recycle it responsibly to promote the sustainable reuse of material resources. Household users should contact either the retailer where they purchased this product or their local government office for details of where and how they can take this item for environmentally safe recycling. Business users should contact their supplier and check the terms and conditions of the purchase contract. This product should not be mixed with other commercial wastes for disposal.

**CAUTION**

The device contains a BR1632A button battery, which supplies power to the clock when the device is not powered on. Danger of explosion if battery is replaced incorrectly. Replace only with the same or equivalent type.

**WARNING**

Do not ingest the battery, Chemical Burn Hazard. This product contains a coin/button cell battery. If the coin/button cell battery is swallowed, it can cause severe internal burns in just 2 hours, and can lead to death. Keep new and used batteries away from children. If the battery compartment does not close securely, stop using the product and keep it away from children. If you think batteries might have been swallowed or placed inside any part of the body, seek immediate medical attention.

## Common Safety Symbols

| Symbol | Description |
|---|---|
|  | Direct current |
|  | Alternating current |
|  | Protective conductor terminal |
|  | Equipotential Connector |
|  | On (Power) |
|  | Off (Power) |
|  | Double insulation |
|  | Caution, possibility of electric shock |
|  | Caution |
|  | Laser radiation |
|  | Warning, Rotating fan |
|  | Caution: for indoor use only |

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## Applied SW/FW Environment

All presented functions refer to the indicated products. The descriptions have been made while testing these functions in accordance with the indicated Firmware/Software environment:

| Item | Version |
|---|---|
| **FW package** | v2.23.0b4 |
| **Lightware Device Controller (LDC) version** | v2.24.0b5 |
| **Lightware Device Updater V2 (LDU2) version** | v2.39.0b9 |

## Document Revision History

| Rev. | Release date | Changes | Editor |
|---|---|---|---|
| v1 | 2025-11-13 | Initial release. | Nikolett Keindl |
| ... | | | |
| v5 | 2026-05-20 | "Soft" factory reset functionality added, FIPS-140-3 chapter added, minor corrections | Nikolett Keindl |
| v6 | 2026-09-23 | SCX-2x1-HC60 model added, SNMP functionality added, minor corrections | Nikolett Keindl |

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# 1

# Introduction

**Thank you for choosing Lightware's Taurus UCX-HC60 series Universal Switcher devices. In the first chapter we would like to introduce the device by highlighting the most important features in the sections listed below:**


- Description **10**
- Box Contents **11**
- Features of the Device **12**
- Model Comparison **13**
- Typical Application **14**

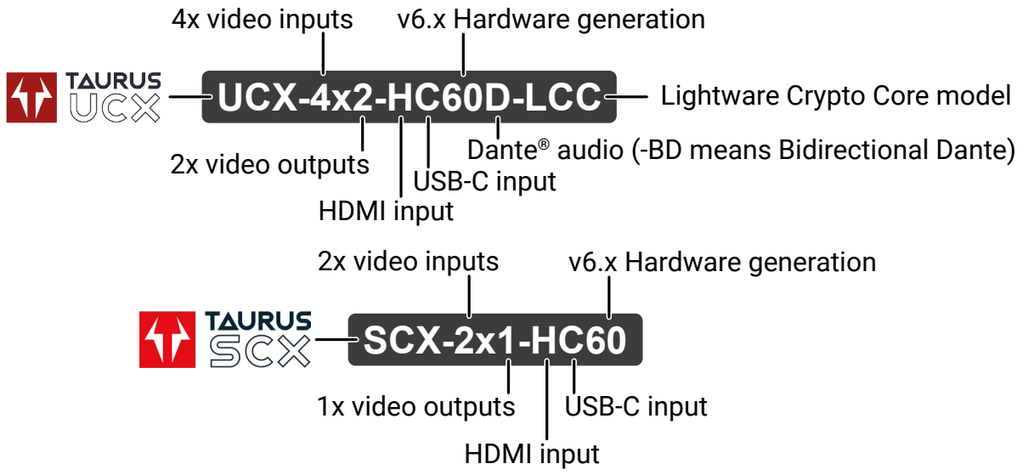
## 1.1. Description

Lightware's universal switcher enhances and extends the possibilities of a meeting room and allows meeting participants to easily use their own devices such as laptops and preferred video conference platforms, while also utilizing the available assets of the meeting space, for example HDMI displays, room cameras and other USB peripherals.

The device utilizes the USB-C connectivity for a simplified transmission of 4K video, audio, control signals and power, and allows data speeds of up to 5 Gbps under the USB 3.1 Gen1 and allowing video resolution capabilities up to 4K@60Hz at 4:4:4.

The device is designed to be a centerpiece of any collaboration space, and can be connected to USB peripherals via USB-A type connectors. The series allows the hosts to be connected to the system and also ensures quick and easy switching between these hosts, making this universal switcher a perfect fit for smaller meeting areas, involving 6-12 people.

**Model Denomination**




**About the Serial Number**

From 1st of October 2024, serial number format of Lightware devices is the following: the first two digits are of the year of manufacture, while the remaining digits make up the running sequence number.




Year of the manufacturing  6-digit running sequence number

On any UCX series device manufactured after1st of July 2025, you will find a sticker on the device with a QR code that contains all MAC addresses of the device, as well as the serial number.

For further information on expansion of the MAC address list, see the MAC Addresses section.

**Default Password**

UCX-HC60 models have a **random generated factory default password** applied to the device during the manufacturing process. This unique password is supplied on a sticker along with the device.

The sticker containing the password may either be supplied in the box alongside the device, or if it has been manufactured after 18 November 2025, it can be found on the device enclosure.

Some of the sticker designs can be seen here:

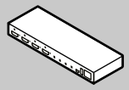
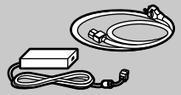
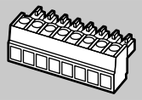



INFO: The QR code on this label shows the password.

For more information on the default password, see the Basic Authentication section.

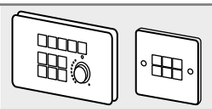
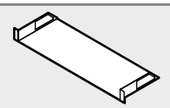
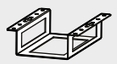
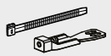
## 1.2. Box Contents

### Supplied Accessories

| |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|
| | Switcher unit | 24V Power Supply Unit with IEC power cable | Phoenix combicon® 3-pole flat connector | Phoenix combicon® 3-pole male connector | Phoenix combicon® 5-pole connector | Phoenix combicon® 8-pole connector | USB 3.1 Type C (USB-C) to Type C (USB-C) Cable, 1m | Safety & warranty info, Quick Start Guide | 2 pcs. of M3x4 flat head screw |
| UCX-2x1-HC60 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| UCX-2x2-H60 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | ✓ |
| UCX-4x2-HC60 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| UCX-4x2-HC60D | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| UCX-4x3-HC60 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| UCX-4x3-HC60-BD | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| SCX-2x1-HC60 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

INFO: The -LCC models have the same values as non-LCC models.

### Optional Accessories

| |  |  |  |  |  |
|---|---|---|---|---|---|
| | Button panels: RAP-B511 and TBP6 | Rack Shelf | UD mounting plate F100 | UD Mounting PSU F100/F110 | C-Lock |
| UCX-2x1-HC60 | ✓ | ✓ | ✓ | ✓ | ✓ |
| UCX-2x2-H60 | ✓ | ✓ | ✓ | ✓ | ✓ |
| UCX-4x2-HC60 | ✓ | ✓ | ✓ | ✓ | ✓ |
| UCX-4x2-HC60D | ✓ | ✓ | ✓ | ✓ | ✓ |
| UCX-4x3-HC60 | ✓ | ✓ | ✓ | ✓ | ✓ |
| UCX-4x3-HC60-BD | ✓ | ✓ | ✓ | ✓ | ✓ |
| SCX-2x1-HC60 | ✓ | ✓ | ✓ | ✓ | ✓ |

INFO: The -LCC models have the same values as non-LCC models.

## 1.3. Features of the Device

### Common Features




**4K and 5K Video Support**

HDMI 2.0 signal switching supporting 5K 21:9 ultrawide displays (5120x2160@30Hz, RGB 4:4:4, 12 bits) as well as 4K@60Hz, RGB 4:4:4, 18Gbit/sec bandwidth.




**Autoselect Function for Video and USB Inputs**

The Autoselect feature can sense the port status on the video input and USB Host ports and select them automatically. Priority number can be set for each input port, and the feature allows to set various modes for the automatic input selection (First detect, Last detect).




**Basic IT-security**

These entry-level network security improvements help prevent unauthorized access to the Lightware device; HTTPS/WSS support, basic network authentication.




**Bi-directional RS-232**

AV systems can also contain serial port controllers and controlled devices. Serial transmission supports any unit that works with standard RS-232.



**Dark Mode**

All illuminating elements of the front/rear panel can be switched on and off. This feature is useful in live-stage shows or other environments where flashing LEDs would be distracting.




**De-embedder Function**

The analog audio can be de-embedded from HDMI inputs and it can be routed to the analog audio output.



**Ethernet Control**

Multiple simultaneous TCP/IP connections are available with a simple ASCII-based protocol for controlling or configuring the product, or to perform a firmware update.



**Factory Default Password**

The devices come with a unique, random generated default password to ensure basic security right out of the box.



**Frame Detector and Signal Analysis**

The exact video and audio signal format can be determined such as timing, frequencies, scan mode, HDCP encryption, color range, color space and audio sample rate.




**GPIO Control Port**

Six GPIO pins operating at TTL digital signal levels that can be controlled with LW3 commands. 5V is supplied over the 7th pin constantly, up to 500 mA.




**HDCP-compliant**

The switcher fulfills the HDCP standard. HDCP capability on the digital video inputs can be disabled when non-protected content is used.




**Lightware Rest API**

The UCX switcher can be controlled through standard HTTP(S) requests to ensure the control functions from REST clients or terminal program.



**Occupancy Sensor Connector**

Occupancy sensor connection (with 24V power supply).



**Powered by LARA***

Future-proof room automation platform for system integrators so they can seamlessly and invisibly support people's collaboration to make the most out of their virtual or in-person meetings.



**SNMP Monitoring**

IT administrators can use SNMP managers to keep track of the system health and network status information.



**USB 3.1 Switch**

The USB 3.1 layer provides switching four external USB peripherals (e.g. webcamera, speakerphone, multitouch display, etc.) to four independent host computers or laptops.



**USB Type C Source Connection**

USB Type C port ensures USB-C connectivity to the source device with USB 3.1 data and Displayport Alternate mode for video. It provides power delivery of up to 100 W for the connected device (e.g. BYOD laptop or smartphone).

* SCX-2x1-HC60 does not support LARA.

**UCX-4x2-HC60D, UCX-4x3-HC60-BD**



**Dante® or AES67 Audio De-embedding**

The audio of the HDMI signal can be transmitted as a 2-channel Dante® or AES67 source from the -D model over the dedicated RJ45 connector.

**All -LCC variants (e.g. UCX-2x1-HC60-LCC)**




**FIPS 140-3 Validation**

Lightware Crypto Core delivers core cryptographic functions to the embedded systems of UCX series' hardware devices and features robust algorithm support.

## 1.4. Model Comparison

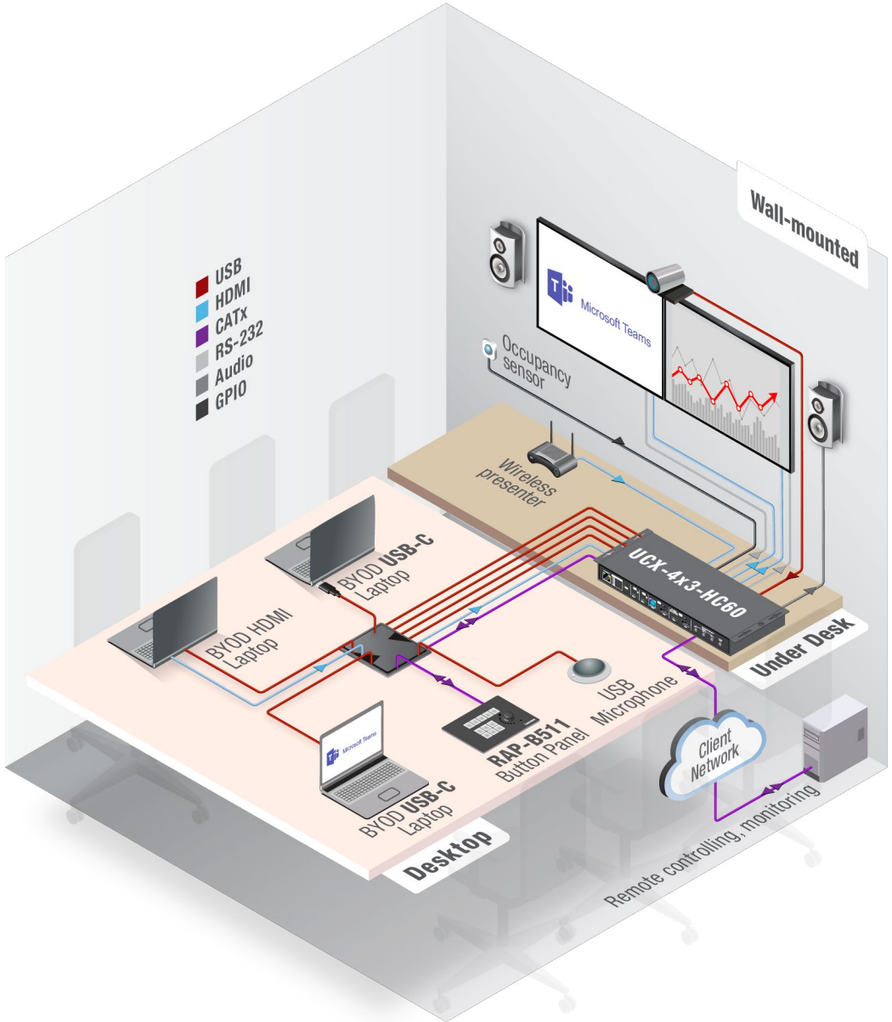
| | | AV Interface | | | | | USB Interface | | | Ethernet Interface | Serial Interface | GPIO Interface | OCS Interface |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Inputs | | | Outputs | | | | | | | | |
| | Welcome screen option | USB-C 3.1 Gen1 (5 Gbps) | HDMI | HDMI | Analog audio de-embedding | Dante DANTE/ AES67 audio | USB-A 3.1 Gen1 (5 Gbps) | USB-B 3.1 Gen1 (5 Gbps) | USB-C 3.1 Gen1 (5 Gbps) | Ethernet 1 | RS-232 | General Purpose In Out (GPIO) | Occupancy Sensor (OCS) |
| |  |  |  |  |  |  |  |  |  |  |  |  |  |
| UCX-2x1-HC60 | ✓ | 1x | 1x | 1x | ✓ | - | 2x | 1x | 3x | 3x | 1x | ✓ | ✓ |
| UCX-2x2-H60 | ✓ | - | 2x | 2x | ✓ | - | 2x | 1x | 3x | 1x | 2x | ✓ | ✓ |
| UCX-4x2-HC60 | ✓ | 2x | 2x | 2x | ✓ | - | 2x | 1x | 3x | 3x | 2x | ✓ | ✓ |
| UCX-4x2-HC60D | ✓ | 2x | 2x | 2x | ✓ | ✓ | 2x | 1x | 3x | 3x | 2x | ✓ | ✓ |
| UCX-4x3-HC60 | ✓ | 2x | 2x | 3x | ✓ | - | 2x | 1x | 3x | 3x | 2x | ✓ | ✓ |
| UCX-4x3-HC60-BD | ✓ | 2x | 2x | 3x | ✓ | ✓* | 2x | 1x | 3x | 3x | 2x | ✓ | ✓ |
| SCX-2x1-HC60 | ✓ | 1x | 1x | 1x | ✓ | - | 2x | 1x | 3x | 3x | 1x | ✓ | ✓ |

* The DANTE audio port is both an input and an output port in case of the UCX-4x3-HC60-BD model.

INFO: The -LCC models have the same values as non-LCC models.

| | LARA | Lightware Crypto Core | Default Password | Advanced Ethernet Security (VLAN Separation) | SNMP Monitoring | DANTE/AES67 audio | 802.1x Authentication | USB-C Charging |
|---|---|---|---|---|---|---|---|---|
| |  |  |  |  |  |  |  |  |
| UCX-2x1-HC60 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | ✓ |
| UCX-2x2-H60 | ✓ | ✓ | ✓ | - | ✓ | - | ✓ | - |
| UCX-4x2-HC60 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | ✓ |
| UCX-4x2-HC60D | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| UCX-4x3-HC60 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | ✓ |
| UCX-4x3-HC60-BD | ✓ | ✓ | ✓ | ✓ | ✓ | ✓* | ✓ | ✓ |
| SCX-2x1-HC60 | - | - | ✓ | ✓ | ✓ | - | ✓ | ✓ |

## 1.5. Typical Application



# 2

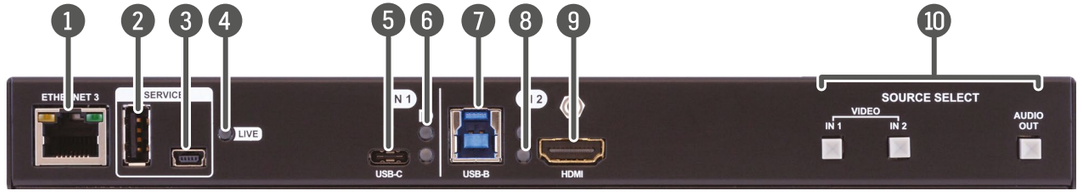
## Product Overview

**The following sections are about the physical structure of the device, input/output ports and connectors:**


- UCX-2x1-HC60 **16**
- UCX-2x2-H60 **17**
- UCX-4x2-HC60 **18**
- UCX-4x2-HC60D **19**
- UCX-4x3-HC60 **20**
- UCX-4x3-HC60-BD **21**
- SCX-2x1-HC60 **22**

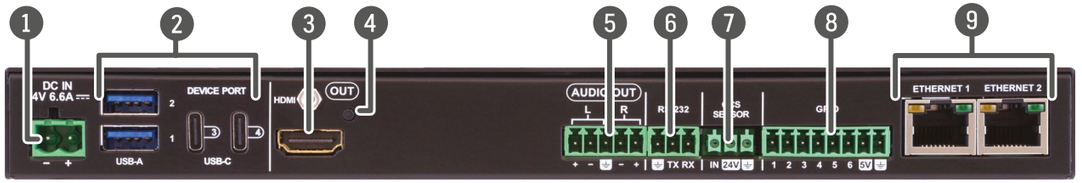
## 2.1. UCX-2x1-HC60

### 2.1.1. Front View




| | | |
|---|---|---|
| 1 | **Configurable Ethernet Port** | RJ45 connector(s) for configurable Gigabit Ethernet communication. |
| 2 | **USB-A Port** | The SERVICE-labelled USB-A connector is designed for service functions. |
| 3 | **USB mini-B Port** | The SERVICE-labelled USB mini-B port is designed for service functions. |
| 4 | **LIVE LED** | See the details in the Front Panel LEDs section. |
| 5 | **USB-C Port** | AV signal can be transferred up to a resolution of 4K@60Hz 4:4:4 and data speeds up to 5 Gbps with remote charging. Use cables certified for USB 3.1 Gen1 (5Gbps) and Displayport Alternate mode HBR2 (4x5.4Gbps) applications. |
| 6 | **Video Input Status LEDs (upper one)** | See the details in the Front Panel LEDs section. |
| 7 | **USB-B Port** | Upstream ports for connecting USB host devices (e.g. computer). |
| 8 | **USB Status LEDs (lower one)** | See the details in the Front Panel LEDs section. |
| 9 | **HDMI Input Ports** | HDMI input ports for sources. The applied cable shall not be longer than 5m. Use cables certified for HDMI 2.0 (3x6Gbps) applications. |
| 10 | **Input Select Buttons** | For more details, see the Button Functionality section. When LEDs blink green three times after pressing the button, they show that the front panel lock is enabled. |

### 2.1.2. Rear View

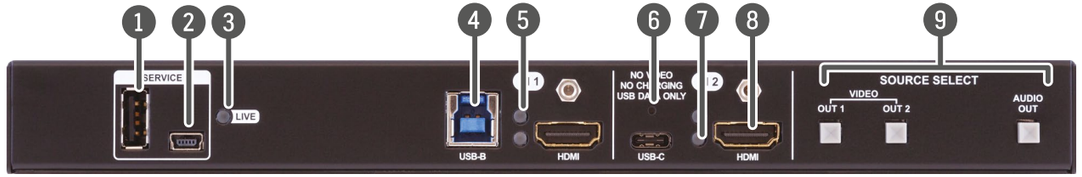



| | | |
|---|---|---|
| 1 | **DC Input** | The device can be powered by an external 160W power supply. Connect the output to the 2-pole Phoenix® connector. For more info about the powering, see the Powering Options section. |
| 2 | **USB-A and USB-C Ports** | Downstream ports for connecting USB peripherals (e.g. camera, keyboard, multitouch display) with USB 3.1 Gen1 data speed. |
| 3 | **HDMI Output Port(s)** | HDMI output port(s) for connecting sink devices (e.g. displays). |
| 4 | **Video Output Status LEDs** | See the details in the Rear Panel LEDs section. |
| 5 | **Analog Audio Port** | 5-pole Phoenix® connector for balanced analog audio output signal. The signal is de-embedded from the selected video signal. |
| 6 | **RS-232 Port** | 3-pole Phoenix® connector for bi-directional RS-232 communication. |
| 7 | **OCS Sensor Connector** | 3-pole Phoenix® connector (male) for connecting an occupancy sensor. The port provides 24V output voltage (50mA), see the details in the OCS Connector section. |
| 8 | **GPIO** | 8-pole Phoenix® connector for configurable general purpose. Max. input/output voltage is 5V, see the details in the GPIO - General Purpose Input/Output Ports section. |
| 9 | **Configurable Ethernet Port(s)** | RJ45 connector(s) for configurable Gigabit Ethernet communication. |

INFO: The -LCC models have the same values as non-LCC models.

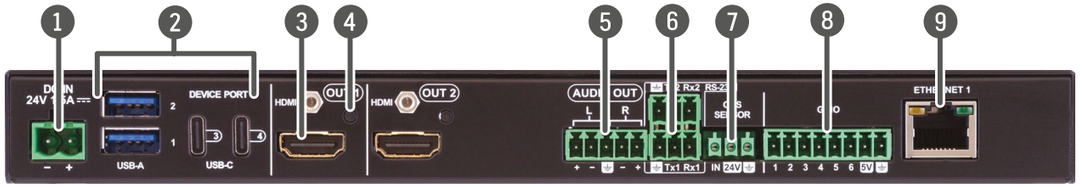
## 2.2. UCX-2x2-H60

### 2.2.1. Front View




| | | |
|---|---|---|
| 1 | **USB-A Port** | The SERVICE-labelled USB-A connector is designed for service functions. |
| 2 | **USB mini-B Port** | The SERVICE-labelled USB mini-B port is designed for service functions. |
| 3 | **LIVE LED** | See the details in the Front Panel LEDs section. |
| 4 | **USB-B Port** | Upstream ports for connecting USB host devices (e.g. computer). |
| 5 | **Video Input Status LEDs (upper one)** | See the details in the Front Panel LEDs section. |
| 6 | **USB-C Data Port** | USB-C port for USB data transmission only. |
| 7 | **USB Status LEDs (lower one)** | See the details in the Front Panel LEDs section. |
| 8 | **HDMI Input Ports** | HDMI input ports for sources. The applied cable shall not be longer than 5m. Use cables certified for HDMI 2.0 (3x6Gbps) applications. |
| 9 | **Input Select Buttons** | For more details, see the Button Functionality section. When LEDs blink green three times after pressing the button, they show that the front panel lock is enabled. |

### 2.2.2. Rear View

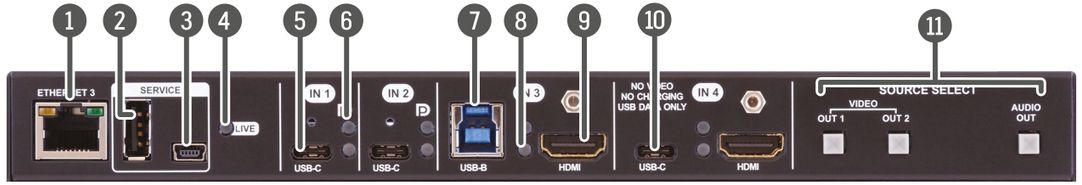



| | | |
|---|---|---|
| 1 | **DC Input** | The device can be powered by an external 120W power supply. Connect the output to the 2-pole Phoenix® connector. For more info about the powering, see the Powering Options section. |
| 2 | **USB-A and USB-C Ports** | Downstream ports for connecting USB peripherals (e.g. camera, keyboard, multitouch display) with USB 3.1 Gen1 data speed. |
| 3 | **HDMI Output Port(s)** | HDMI output port(s) for connecting sink devices (e.g. displays). |
| 4 | **Video Output Status LEDs** | See the details in the Rear Panel LEDs section. |
| 5 | **Analog Audio Port** | 5-pole Phoenix® connector for balanced analog audio output signal. The signal is de-embedded from the selected video signal. |
| 6 | **RS-232 Port** | 3-pole Phoenix® connector for bi-directional RS-232 communication. |
| 7 | **OCS Sensor Connector** | 3-pole Phoenix® connector (male) for connecting an occupancy sensor. The port provides 24V output voltage (50mA), see the details in the OCS Connector section. |
| 8 | **GPIO** | 8-pole Phoenix® connector for configurable general purpose. Max. input/output voltage is 5V, see the details in the GPIO - General Purpose Input/Output Ports section. |
| 9 | **Configurable Ethernet Port** | RJ45 connector(s) for configurable Gigabit Ethernet communication. |

INFO: The -LCC models have the same values as non-LCC models.

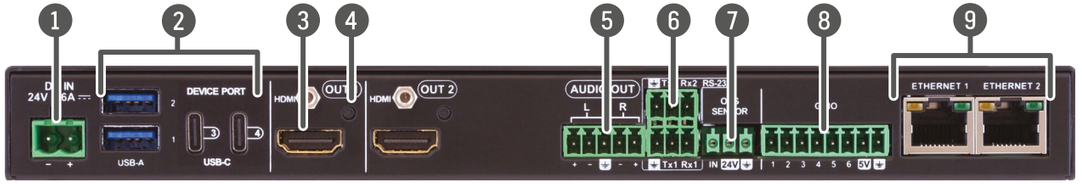
## 2.3. UCX-4x2-HC60

### 2.3.1. Front View




| | | |
|---|---|---|
| 1 | **Configurable Ethernet Port** | RJ45 connector(s) for configurable Gigabit Ethernet communication. |
| 2 | **USB-A Port** | The SERVICE-labelled USB-A connector is designed for service functions. |
| 3 | **USB mini-B Port** | The SERVICE-labelled USB mini-B port is designed for service functions. |
| 4 | **LIVE LED** | See the details in the Front Panel LEDs section. |
| 5 | **USB-C Ports** | AV signal can be transferred up to a resolution of 4K@60Hz 4:4:4 and data speeds up to 5 Gbps with remote charging. Use cables certified for USB 3.1 Gen1 (5Gbps) and Displayport Alternate mode HBR2 (4x5.4Gbps) applications. |
| 6 | **Video Input Status LEDs (upper one)** | See the details in the Front Panel LEDs section. |
| 7 | **USB-B Port** | Upstream ports for connecting USB host devices (e.g. computer). |
| 8 | **USB Status LEDs (lower one)** | See the details in the Front Panel LEDs section. |
| 9 | **HDMI Input Ports** | HDMI input ports for sources. The applied cable shall not be longer than 5m. Use cables certified for HDMI 2.0 (3x6Gbps) applications. |
| 10 | **USB-C Data Port** | USB-C port for USB data transmission only. |
| 11 | **Input Select Buttons** | For more details, see the Button Functionality section. When LEDs blink green three times after pressing the button, they show that the front panel lock is enabled. |

### 2.3.2. Rear View

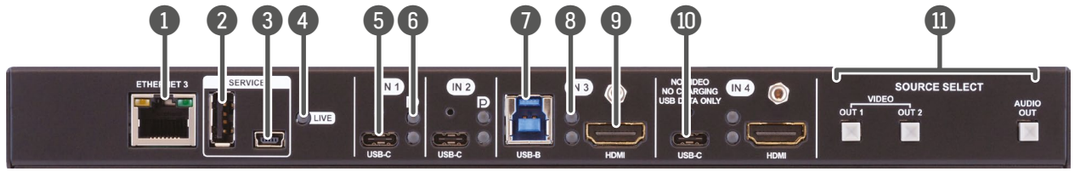



| | | |
|---|---|---|
| 1 | **DC Input** | The device can be powered by an external 160W power supply. Connect the output to the 2-pole Phoenix® connector. For more info about the powering, see the Powering Options section. |
| 2 | **USB-A and USB-C Ports** | Downstream ports for connecting USB peripherals (e.g. camera, keyboard, multitouch display) with USB 3.1 Gen1 data speed. |
| 3 | **HDMI Output Port(s)** | HDMI output port(s) for connecting sink devices (e.g. displays). |
| 4 | **Video Output Status LEDs** | See the details in the Rear Panel LEDs section. |
| 5 | **Analog Audio Port** | 5-pole Phoenix® connector for balanced analog audio output signal. The signal is de-embedded from the selected video signal. |
| 6 | **RS-232 Port** | 3-pole Phoenix® connector for bi-directional RS-232 communication. |
| 7 | **OCS Sensor Connector** | 3-pole Phoenix® connector (male) for connecting an occupancy sensor. The port provides 24V output voltage (50mA), see the details in the OCS Connector section. |
| 8 | **GPIO** | 8-pole Phoenix® connector for configurable general purpose. Max. input/output voltage is 5V, see the details in the GPIO - General Purpose Input/Output Ports section. |
| 9 | **Configurable Ethernet Port(s)** | RJ45 connector(s) for configurable Gigabit Ethernet communication. |

INFO: The -LCC models have the same values as non-LCC models.

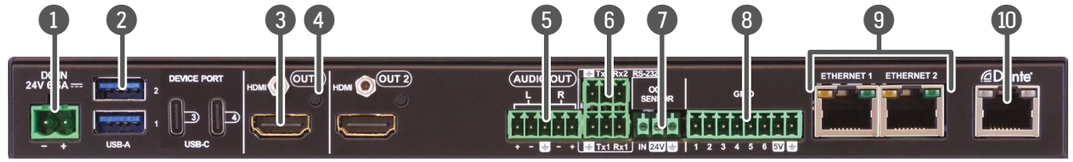
## 2.4. UCX-4x2-HC60D

### 2.4.1. Front View




| | | |
|---|---|---|
| 1 | **Configurable Ethernet Port** | RJ45 connector(s) for configurable Gigabit Ethernet communication. |
| 2 | **USB-A Port** | The SERVICE-labelled USB-A connector is designed for service functions. |
| 3 | **USB mini-B Port** | The SERVICE-labelled USB mini-B port is designed for service functions. |
| 4 | **LIVE LED** | See the details in the Front Panel LEDs section. |
| 5 | **USB-C Ports** | AV signal can be transferred up to a resolution of 4K@60Hz 4:4:4 and data speeds up to 5 Gbps with remote charging. Use cables certified for USB 3.1 Gen1 (5Gbps) and Displayport Alternate mode HBR2 (4x5.4Gbps) applications. |
| 6 | **Video Input Status LEDs (upper one)** | See the details in the Front Panel LEDs section. |
| 7 | **USB-B Port** | Upstream ports for connecting USB host devices (e.g. computer). |
| 8 | **USB Status LEDs (lower one)** | See the details in the Front Panel LEDs section. |
| 9 | **HDMI Input Ports** | HDMI input ports for sources. The applied cable shall not be longer than 5m. Use cables certified for HDMI 2.0 (3x6Gbps) applications. |
| 10 | **USB-C Data Port** | USB-C port for USB data transmission only. |
| 11 | **Input Select Buttons** | For more details, see the Button Functionality section. When LEDs blink green three times after pressing the button, they show that the front panel lock is enabled. |

### 2.4.2. Rear View

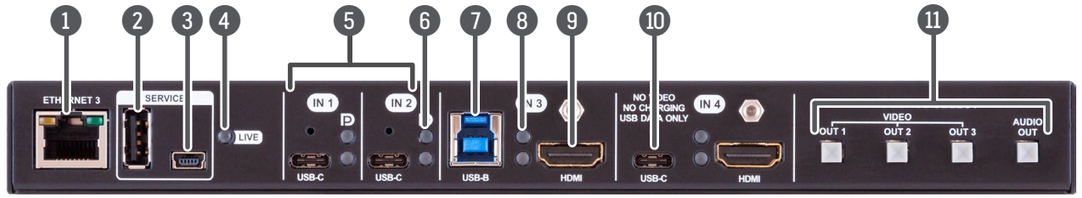



| | | |
|---|---|---|
| 1 | **DC Input** | The device can be powered by an external 160W power supply. Connect the output to the 2-pole Phoenix® connector. For more info about the powering, see the Powering Options section. |
| 2 | **USB-A and USB-C Ports** | Downstream ports for connecting USB peripherals (e.g. camera, keyboard, multitouch display) with USB 3.1 Gen1 data speed. |
| 3 | **HDMI Output Port(s)** | HDMI output port(s) for connecting sink devices (e.g. displays). |
| 4 | **Video Output Status LEDs** | See the details in the Rear Panel LEDs section. |
| 5 | **Analog Audio Port** | 5-pole Phoenix® connector for balanced analog audio output signal. The signal is de-embedded from the selected video signal. |
| 6 | **RS-232 Port** | 3-pole Phoenix® connector for bi-directional RS-232 communication. |
| 7 | **OCS Sensor Connector** | 3-pole Phoenix® connector (male) for connecting an occupancy sensor. The port provides 24V output voltage (50mA), see the details in the OCS Connector section. |
| 8 | **GPIO** | 8-pole Phoenix® connector for configurable general purpose. Max. input/output voltage is 5V, see the details in the GPIO - General Purpose Input/Output Ports section. |
| 9 | **Configurable Ethernet Port(s)** | RJ45 connector(s) for configurable Gigabit Ethernet communication. |
| 10 | **Dante® Audio port** | RJ45 connector for de-embedding the HDMI audio, which can be transmitted as a 2-channel Dante® or AES67 source. |

INFO: The -LCC models have the same values as non-LCC models.

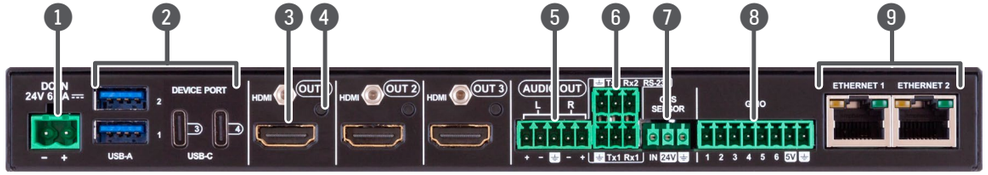
## 2.5. UCX-4x3-HC60

### 2.5.1. Front View




| | | |
|---|---|---|
| 1 | **Configurable Ethernet Port** | RJ45 connector(s) for configurable Gigabit Ethernet communication. |
| 2 | **USB-A Port** | The SERVICE-labelled USB-A connector is designed for service functions. |
| 3 | **USB mini-B Port** | The SERVICE-labelled USB mini-B port is designed for service functions. |
| 4 | **LIVE LED** | See the details in the Front Panel LEDs section. |
| 5 | **USB-C Ports** | AV signal can be transferred up to a resolution of 4K@60Hz 4:4:4 and data speeds up to 5 Gbps with remote charging. Use cables certified for USB 3.1 Gen1 (5Gbps) and Displayport Alternate mode HBR2 (4x5.4Gbps) applications. |
| 6 | **Video Input Status LEDs (upper one)** | See the details in the Front Panel LEDs section. |
| 7 | **USB-B Port** | Upstream ports for connecting USB host devices (e.g. computer). |
| 8 | **USB Status LEDs (lower one)** | See the details in the Front Panel LEDs section. |
| 9 | **HDMI Input Ports** | HDMI input ports for sources. The applied cable shall not be longer than 5m. Use cables certified for HDMI 2.0 (3x6Gbps) applications. |
| 10 | **USB-C Data Port** | USB-C port for USB data transmission only. |
| 11 | **Input Select Buttons** | For more details, see the Button Functionality section. When LEDs blink green three times after pressing the button, they show that the front panel lock is enabled. |

### 2.5.2. Rear View

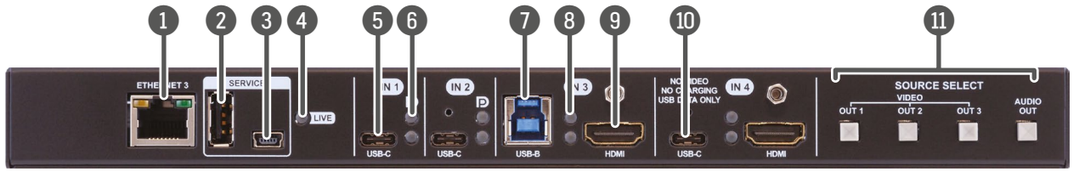



| | | |
|---|---|---|
| 1 | **DC Input** | The device can be powered by an external 160W power supply. Connect the output to the 2-pole Phoenix® connector. For more info about the powering, see the Powering Options section. |
| 2 | **USB-A and USB-C Ports** | Downstream ports for connecting USB peripherals (e.g. camera, keyboard, multitouch display) with USB 3.1 Gen1 data speed. |
| 3 | **HDMI Output Port(s)** | HDMI output port(s) for connecting sink devices (e.g. displays). |
| 4 | **Video Output Status LEDs** | See the details in the Rear Panel LEDs section. |
| 5 | **Analog Audio Port** | 5-pole Phoenix® connector for balanced analog audio output signal. The signal is de-embedded from the selected video signal. |
| 6 | **RS-232 Port** | 3-pole Phoenix® connector for bi-directional RS-232 communication. |
| 7 | **OCS Sensor Connector** | 3-pole Phoenix® connector (male) for connecting an occupancy sensor. The port provides 24V output voltage (50mA), see the details in the OCS Connector section. |
| 8 | **GPIO** | 8-pole Phoenix® connector for configurable general purpose. Max. input/output voltage is 5V, see the details in the GPIO - General Purpose Input/Output Ports section. |
| 9 | **Configurable Ethernet Port(s)** | RJ45 connector(s) for configurable Gigabit Ethernet communication. |

INFO: The -LCC models have the same values as non-LCC models.

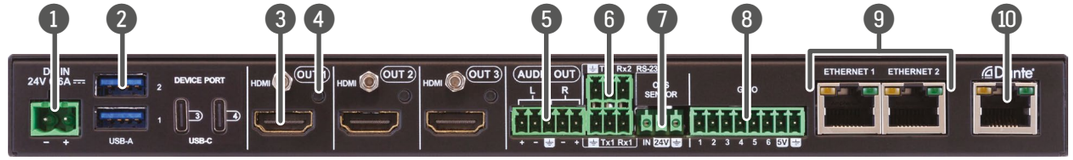
## 2.6. UCX-4x3-HC60-BD

### 2.6.1. Front View




| | | |
|---|---|---|
| 1 | **Configurable Ethernet Port** | RJ45 connector(s) for configurable Gigabit Ethernet communication. |
| 2 | **USB-A Port** | The SERVICE-labelled USB-A connector is designed for service functions. |
| 3 | **USB mini-B Port** | The SERVICE-labelled USB mini-B port is designed for service functions. |
| 4 | **LIVE LED** | See the details in the Front Panel LEDs section. |
| 5 | **USB-C Ports** | AV signal can be transferred up to a resolution of 4K@60Hz 4:4:4 and data speeds up to 5 Gbps with remote charging. Use cables certified for USB 3.1 Gen1 (5Gbps) and Displayport Alternate mode HBR2 (4x5.4Gbps) applications. |
| 6 | **Video Input Status LEDs (upper one)** | See the details in the Front Panel LEDs section. |
| 7 | **USB-B Port** | Upstream ports for connecting USB host devices (e.g. computer). |
| 8 | **USB Status LEDs (lower one)** | See the details in the Front Panel LEDs section. |
| 9 | **HDMI Input Ports** | HDMI input ports for sources. The applied cable shall not be longer than 5m. Use cables certified for HDMI 2.0 (3x6Gbps) applications. |
| 10 | **USB-C Data Port** | USB-C port for USB data transmission only. |
| 11 | **Input Select Buttons** | For more details, see the Button Functionality section. When LEDs blink green three times after pressing the button, they show that the front panel lock is enabled. |

### 2.6.2. Rear View

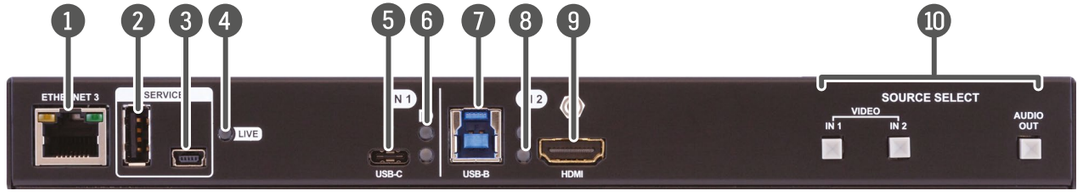



| | | |
|---|---|---|
| 1 | **DC Input** | The device can be powered by an external 160W power supply. Connect the output to the 2-pole Phoenix® connector. For more info about the powering, see the Powering Options section. |
| 2 | **USB-A and USB-C Ports** | Downstream ports for connecting USB peripherals (e.g. camera, keyboard, multitouch display) with USB 3.1 Gen1 data speed. |
| 3 | **HDMI Output Port(s)** | HDMI output port(s) for connecting sink devices (e.g. displays). |
| 4 | **Video Output Status LEDs** | See the details in the Rear Panel LEDs section. |
| 5 | **Analog Audio Port** | 5-pole Phoenix® connector for balanced analog audio output signal. The signal is de-embedded from the selected video signal. |
| 6 | **RS-232 Port** | 3-pole Phoenix® connector for bi-directional RS-232 communication. |
| 7 | **OCS Sensor Connector** | 3-pole Phoenix® connector (male) for connecting an occupancy sensor. The port provides 24V output voltage (50mA), see the details in the OCS Connector section. |
| 8 | **GPIO** | 8-pole Phoenix® connector for configurable general purpose. Max. input/output voltage is 5V, see the details in the GPIO - General Purpose Input/Output Ports section. |
| 9 | **Configurable Ethernet Port(s)** | RJ45 connector(s) for configurable Gigabit Ethernet communication. |
| 10 | **Dante® Audio port** | RJ45 connector for de-embedding the HDMI audio, which can be transmitted as a 2-channel Dante® or AES67 source. It can also handle incoming signal from a Dante source without the need for an external DSP or Dante/USB dongle. |

INFO: The -LCC models have the same values as non-LCC models.

## 2.7. SCX-2x1-HC60

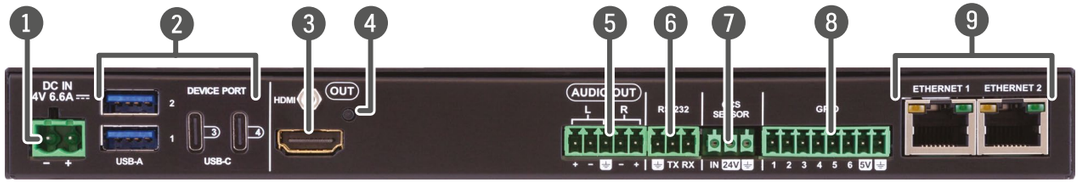
### 2.7.1. Front View




| | | |
|---|---|---|
| 1 | **Configurable Ethernet Port** | RJ45 connector(s) for configurable Gigabit Ethernet communication. |
| 2 | **USB-A Port** | The SERVICE-labelled USB-A connector is designed for service functions. |
| 3 | **USB mini-B Port** | The SERVICE-labelled USB mini-B port is designed for service functions. |
| 4 | **LIVE LED** | See the details in the Front Panel LEDs section. |
| 5 | **USB-C Port** | AV signal can be transferred up to a resolution of 4K@60Hz 4:4:4 and data speeds up to 5 Gbps with remote charging. Use cables certified for USB 3.1 Gen1 (5Gbps) and Displayport Alternate mode HBR2 (4x5.4Gbps) applications. |
| 6 | **Video Input Status LEDs (upper one)** | See the details in the Front Panel LEDs section. |
| 7 | **USB-B Port** | Upstream ports for connecting USB host devices (e.g. computer). |
| 8 | **USB Status LEDs (lower one)** | See the details in the Front Panel LEDs section. |
| 9 | **HDMI Input Ports** | HDMI input ports for sources. The applied cable shall not be longer than 5m. Use cables certified for HDMI 2.0 (3x6Gbps) applications. |
| 10 | **Input Select Buttons** | For more details, see the Button Functionality section. When LEDs blink green three times after pressing the button, they show that the front panel lock is enabled. |

*#new*

### 2.7.2. Rear View




| | | |
|---|---|---|
| 1 | **DC Input** | The device can be powered by an external 160W power supply. Connect the output to the 2-pole Phoenix® connector. For more info about the powering, see the Powering Options section. |
| 2 | **USB-A and USB-C Ports** | Downstream ports for connecting USB peripherals (e.g. camera, keyboard, multitouch display) with USB 3.1 Gen1 data speed. |
| 3 | **HDMI Output Port(s)** | HDMI output port(s) for connecting sink devices (e.g. displays). |
| 4 | **Video Output Status LEDs** | See the details in the Rear Panel LEDs section. |
| 5 | **Analog Audio Port** | 5-pole Phoenix® connector for balanced analog audio output signal. The signal is de-embedded from the selected video signal. |
| 6 | **RS-232 Port** | 3-pole Phoenix® connector for bi-directional RS-232 communication. |
| 7 | **OCS Sensor Connector** | 3-pole Phoenix® connector (male) for connecting an occupancy sensor. The port provides 24V output voltage (50mA), see the details in the OCS Connector section. |
| 8 | **GPIO** | 8-pole Phoenix® connector for configurable general purpose. Max. input/output voltage is 5V, see the details in the GPIO - General Purpose Input/Output Ports section. |
| 9 | **Configurable Ethernet Port(s)** | RJ45 connector(s) for configurable Gigabit Ethernet communication. |

# 3

## Front Panel Control

**The following sections are about front panel operation of the device and the status LEDs:**


- Button Functionality **24**
- Status LEDs **25**

## 3.1. Button Functionality

INFO: If the control lock is enabled and a button is pressed, front panel LEDs blink 3 times quickly.

INFO: The -LCC models have the same values as non-LCC models.

### 3.1.1. Video Source Selection

**UCX-2x1-HC60, SCX-2x1-HC60**

Use the **IN1** and **IN2** buttons to select the video source. **IN1** button switches the USB-C IN1 to the output, the **IN2** button switches the HDMI IN2 to the output.



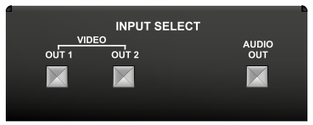

Use the **AUDIO OUT** button to set the audio source of the analog audio output.

The sequence is the following (for the audio switching):

❶ USB-C IN 1 → ❷ HDMI IN 2

**UCX-2x2-H60**

Use the **OUT1** and **OUT2** buttons to select the video source. Push **OUT1** to select the video input for the HDMI OUT1 port, the **OUT2** button switches the video input for the HDMI OUT2 port.

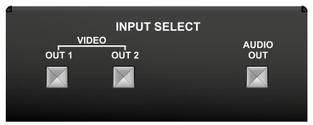



Use the **AUDIO OUT** button for selecting the audio source of the analog audio output.

The sequence is the following (both for the video and audio switching):

❶ HDMI IN 1 → ❷ HDMI IN 2

**UCX-4x2-HC60, UCX-4x2-HC60D**




Push **OUT1** to select the video input for the HDMI OUT1 port.

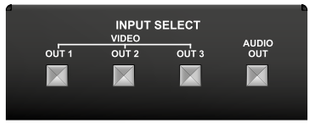
Push **OUT2** to select the video input for the HDMI OUT2 port.

Push **AUDIO OUT** to set the audio source of the analog audio output.

The sequence is the following (both for the video and audio switching): *#switch #crosspoint*

❶ USB-C IN 1 → ❷ USB-C IN 2 → ❸ HDMI IN 3 → ❹ HDMI IN 4

**UCX-4x3-HC60, UCX-4x3-HC60-BD**




Push **OUT1** to select the video input for the HDMI OUT1 port.

Push **OUT2** to select the video input for the HDMI OUT2 port.

Push **OUT3** to select the video input for the HDMI OUT3 port.

Push **AUDIO OUT** to set the audio source of the analog audio output.

The sequence is the following (both for the video and audio switching): *#switch #crosspoint*

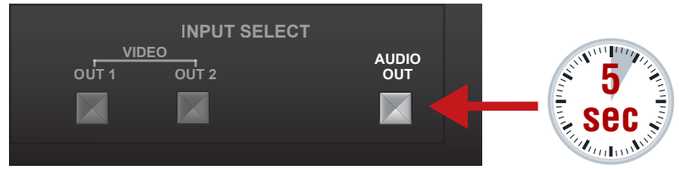
❶ USB-C IN 1 → ❷ USB-C IN 2 → ❸ HDMI IN 3 → ❹ HDMI IN 4

### 3.1.2. Enabling DHCP IP Address

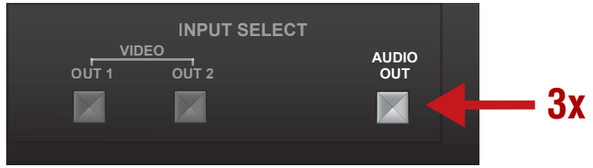
The device has a dynamic IP address as a factory default setting. If it is set to static IP address during install or usage, dynamic IP address can be enabled from the front panel:

**Step 1.** Make sure the device is powered on and operational.

**Step 2.** Press and keep pressing the **AUDIO OUT** button for 5 seconds.




**Step 3.** After 5 seconds the front panel LEDs start blinking; release the button and press it 3 times again quickly (within 3 seconds).




**Step 4.** The LEDs get dark, DHCP gets enabled. *#dhcp*

### 3.1.3. Reset to Factory Default Settings

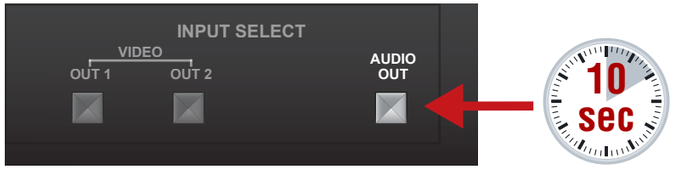
**Factory Default By Pressing AUDIO OUT button** *#factory*

To restore factory default values, do the following steps:

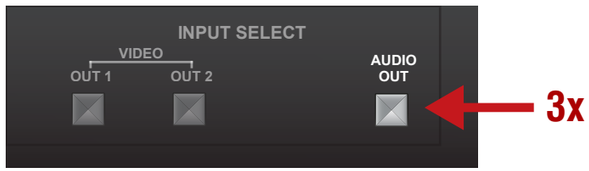
**Step 1.** Make sure the device is powered on and operational.

**Step 2.** Press and keep pressing the **AUDIO OUT** button for 10 seconds.

**Step 3.** After 5 seconds the front panel LEDs start blinking, but keep on pressing the button.




**Step 4.** After 10 seconds the LEDs start blinking faster; release the button and press it 3 times again quickly (within 3 seconds).




**Step 5.** The LEDs get dark, the device restores the factory default settings and reboots.

Factory default settings are listed in the Factory Default Settings section.

### 3.1.4. Control Lock

Press the **VIDEO OUT1 (VIDEO IN1** in **UCX-2x1-HC60 and SCX-2x1-HC60 models)** and **AUDIO OUT** buttons **together** (within 100 ms) to disable/enable front panel buttons; front panel LEDs blink 4 times when locking/unlocking. If the control lock is enabled and a button is pressed, front panel LEDs blink 3 times quickly.




## 3.2. Status LEDs

INFO: When Dark mode is enabled, no LEDs are lit, even though the device is fully functional. For more details about the dark mode, see the Status section.

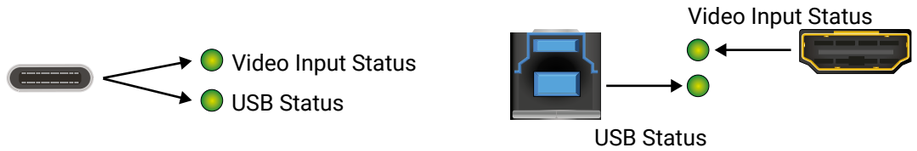
INFO: The -LCC models have the same values as non-LCC models.

### 3.2.1. Front Panel LEDs

**Live LED**

| LIVE LED | | |
|---|---|---|
| | blinking | The device is powered on and operational. |
| | off | The device is not powered or out of operation. |

**Arrangement of the status LEDs** *#status*

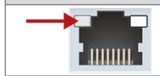
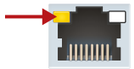
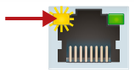
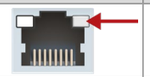
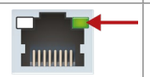
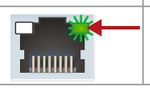



| Video Input Status LED (the upper one) | | |
|---|---|---|
| | off | There is no valid video signal on this port. |
| | on | There is a valid video signal on this port. |
| | blinks once | The port is selected by a button press. |
| **USB Status LED (the lower one)** | | |
| | off | No USB Host or deselected port. |
| | on | USB Host connected and selected. |

### 3.2.2. Rear Panel LEDs

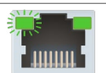
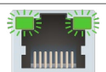
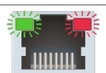
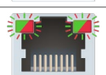
| Video Output Status | | |
|---|---|---|
| ○ | off | The signal is not present or muted. |
| ● | on | The video signal is present. |

### 3.2.3. Ethernet Status LEDs

| LED state | Left LED | Function |
|---|---|---|
|  | Off | 0 Mbit/s |
|  | On (Solid) | 1 Gbit/s |
|  | Blinking | Activity |
| **LED state** | **Right LED** | **Function** |
|  | Off | Not linked |
|  | On (Solid) | No activity |
|  | Blinking | Activity |

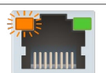
### 3.2.4. Dante® Audio Port (UCX-4x2-HC60D model)

**DIFFERENCE:** UCX-4x2-HC60D model has Dante® Audio Output.

| LED state | Left LED | Right LED | Function |
|---|---|---|---|
|  | Off | Off | No power |
|  | Solid green | Solid red | Dante is booting |
|  | Blinking green | Solid green | Slave with sync (normal operation) |
|  | Blinking green | Blinking green | Clock master (normal operation) |
|  | Blinking green | Blinking red | Acquiring clock sync (normal operation) |
|  | Alternating red/green | Alternating red/green | Identify (blinking for 6 seconds) |
|  | Blinking red | Blinking red | Dante fail safe |
|  | Blinking orange | Blinking orange | Dante is upgrading |

### 3.2.5. Dante® Audio Port (UCX-4x3-HC60-BD model)

**DIFFERENCE:** UCX-4x3-HC60-BD model has Dante® Audio port.

| LED state | Left LED | Right LED | Function |
|---|---|---|---|
|  | Off | Off | No power |
|  | Blinking orange | Solid green | Normal operation |

# 4

## Installation

**This chapter is about the installation of the device and connecting to other appliances, presenting also the mounting options and further assembly steps.**


- Mounting Options **28**
- Electrical Connections **30**
- Powering Options **32**
- Power Delivery over Type-C **33**
- USB-C Cable Recommendation **34**
- Connecting Steps **34**

## 4.1. Mounting Options

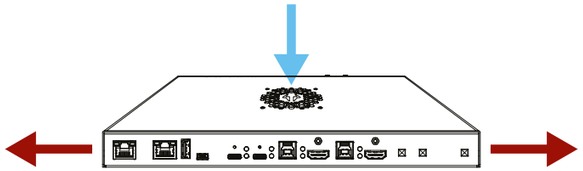
To mount the switcher, Lightware supplies optional accessories for different usage. There are two kinds of mounting kits with a similar fixing method. The switcher has two mounting holes with inner thread on the bottom side; see the bottom view in the Mechanical Drawings section. To order mounting accessories, please contact sales@lightware.com. Fasten the device with the screws enclosed to the accessory.

For further information about mounting, please see our Mounting Assembly Guide.

**WARNING! Always use the supplied screws. Using different (e.g. longer) ones may cause damage to the device.**

**Ventillation**

**WARNING! Never block the ventilation holes on any side of the switcher! Ensure proper ventilation by letting the air flow freely.**



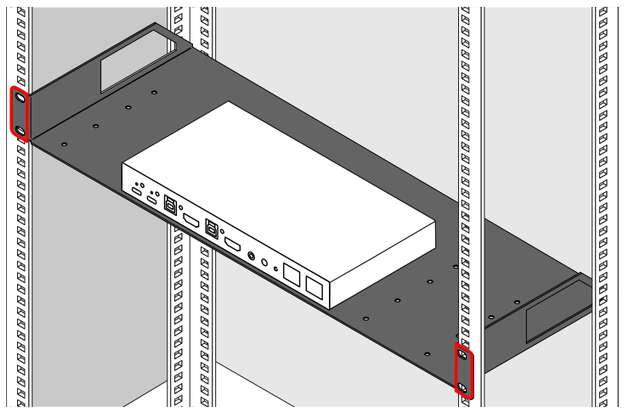
*Direction of the airflow*

### 4.1.1. 1U High Rack Shelf

Allows rack mounting for half-rack, quarter-rack and pocket sized units.



1U high rack shelf provides mounting holes for fastening two half-rack or four quarter-rack sized units. Pocket-sized devices can also be fastened to the shelf.



### 4.1.2. Mounting Plate F100 (and PSU F100/F110)

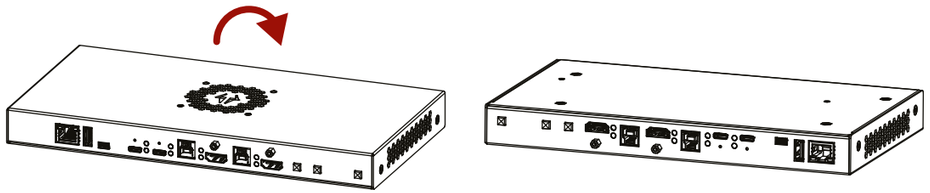
**DIFFERENCE:** The following accessories can be purchased optionally, please contact sales@lightware.com.



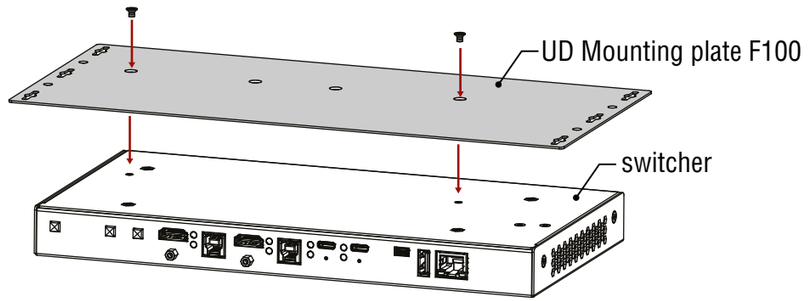
*Mounting Plate F100 and PSU F100*

The examples demonstrate the applications of the UD Kit accessories:

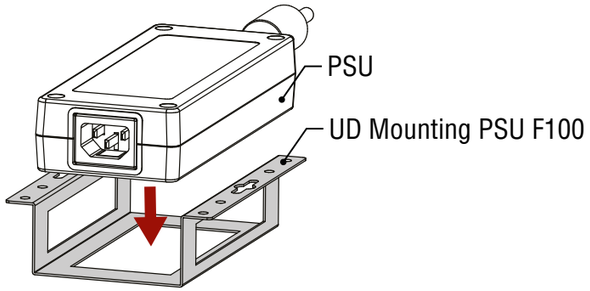
**Step 1.** Turn the switcher and the power adaptor upside down.



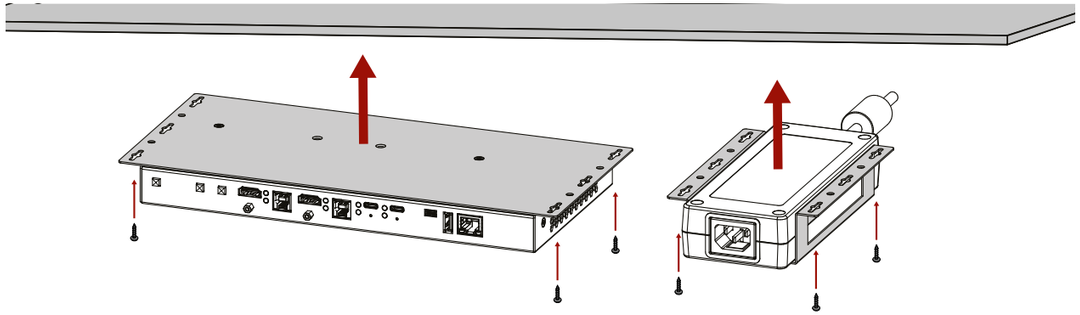
**Step 2.** Fix the **UD Mounting plate F100** to the switcher by fastening the screws (2 pcs screws are supplied with the switcher).



**Step 3.** Insert the power supply into the **UD Mounting PSU F100**.




**Step 4.** Fix the **UD Mounting plate F100** and **UD Mounting PSU F100/F110** under the desk by fastening the screws.



INFO: **UD Mounting plate F100** and **UD Mounting PSU F100/F110** do not contain the fixing screws; they can be purchased from the local hardware store. 2x4pcs M3-M5 metric or wood screws are needed, M3 size is recommended.

The **UD Mounting PSU F100** is made for mounting a **160W PSU**; for mounting a **120W PSU**, you will need the **UD Mounting PSU F110**.

**ATTENTION:** To ensure the correct ventilation and avoid overheating, insert the switcher face down to the **UD Mounting plate F100** to keep the ventilation holes free.

INFO: The fan rotates only when the device is warm, otherwise not.

### 4.1.3. C-Lock

The USB-C Cable Lock is a product designed to enhance the security and reliability of a physical connection by providing a 2-point securing option for connected USB-C cables.

**Step 1.** Plug the USB-C cable in.

**Step 2.** Fix the C-Lock with the M2 screw.

**Step 3.** Use the provided zip ties to fasten the flange to the USB-C connector.






### 4.1.4. H-Lock

The HDMI Cable Lock is a product designed to enhance the security and reliability of a physical connection by providing a 2-point securing option for connected HDMI cables.

**Step 1.** Remove the screw above the HDMI port.

**Step 2.** Plug the HDMI cable in.

**Step 3.** Fix the H-Lock with the M2 screw.

**Step 4.** Use the provided zip ties to fasten the flange to the HDMI connector.





## 4.2. Electrical Connections

### 4.2.1. HDMI Input and Output Ports



The UCX series switchers are assembled with standard 19-pole HDMI connectors with screw lock for inputs and outputs. Always use high quality HDMI cables for connecting sources and displays.

### 4.2.2. USB Connectors

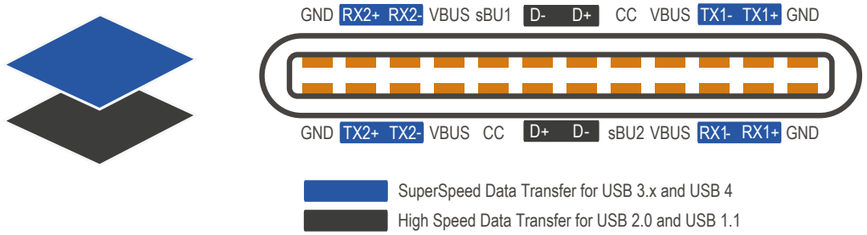
**USB Type-C**



**ATTENTION:** The USB-C ports of Taurus are developed to connect native USB-C sources. HDMI–USB-C or DP–USB-C adapters are not supported and not recommended to apply.

The switchers are supplied with USB 3.1 Gen1 (max. 5 Gbps data speed) USB C-type port for video, USB data, and Ethernet transmission. It provides power delivery for a max. of two connected devices up to 1 x 100W or 2 x 60W. Supported power profiles: 5V/3A, 9V/3A, 12V/3A, 15V/2A, 15V/3A, 20V/1,5A, 20V/3A, 20/5A. The USB-C connector has a symmetrical plug and pin layout.

**ATTENTION:** USB 2.x and 3.x data transfer happens on two independent layers simultaneously.




***The pinout of the USB-C connector***

**DIFFERENCE:** In UCX-4x2-HC60, UCX-4x3-HC60, UCX-4x2-HC60D and UCX-4x3-HC60-BD the U4 USB-C port does not transmit video, Ethernet or remote power, only USB data.The same applies to the USB-C port of the UCX-2x2-H60 model.

**ATTENTION:** USB-C functionality and speed depend on the cable and the device. Mandatory features of the USB-C - USB-C cables are: USB 2.0 (480 Mbps), min. 3A current, min. 60W power.

**USB Type-A and USB Type-C Downstream Ports**



Taurus UCX series have USB 3.1 Gen1 (max. 5 Gbps data speed) USB A-type and USB C-type ports for connecting USB peripherials.

The 5V output power capability can be turned on and off for all ports. All ports are able to supply 1000mA.

INFO: The blue color inside the USB A-type connector refers to the USB 3.0 data speed.

**USB Type-B**



The switcher is supplied with USB 3.1 Gen1 (max. 5 Gbps data speed) B-type ports for connecting USB hosts.

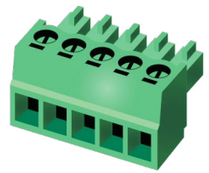
INFO: The blue color inside the connector refers to the USB 3.0 data speed.

### 4.2.3. Analog Stereo Audio

A 5-pole Phoenix® connector is used for balanced analog audio output. Unbalanced audio devices can be connected as well. See more details about the balanced and unbalanced output port wiring in the Cable Wiring Guide section.




| Pin nr. | Signal |
|---|---|
| 1 | Left+ |
| 2 | Left- |
| 3 | Ground |
| 4 | Right- |
| 5 | Right+ |



***Analog audio connector and plug pin assignments***

**Compatible Plug Type**

Phoenix® Combicon series (3.5mm pitch, 5-pole), type: MC 1.5/5-ST-3.5.

### 4.2.4. Secure Control LAN, Utility AV LAN, Configurable Ethernet Port

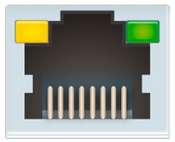
INFO: The connector type and the applied cable is the same for the Dante® audio output.

The switcher contains an RJ45 connector for 100Mbit Ethernet/LAN connection for local control functions.

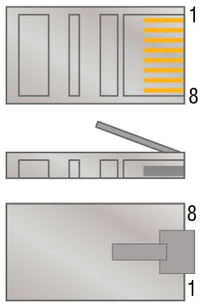
The Ethernet ports can be connected to a LAN hub, switch or router by a CATx cable. Even though both cable types (straight or cross) are supported and handled by the device, the pin assignment below is recommended.

**Wiring of LAN Cables**

Lightware recommends the termination of LAN cables on the basis of TIA/EIA T 568 A or TIA/EIA T 568 B standards.



| Pin | TIA/EIA T568A | TIA/EIA T568B |
|---|---|---|
| 1 | white/green | white/orange |
| 2 | green | orange |
| 3 | white/orange | white/green |
| 4 | blue | blue |
| 5 | white/blue | white/blue |
| 6 | orange | green |
| 7 | white/brown | white/brown |
| 8 | brown | brown |



### 4.2.5. OCS Connector

The switcher is supplied with a 3.81mm 3-pole 90° Reversed Gender Plug Phoenix® connector, which is used for connecting an occupancy sensor. The first pin is a 24V logic input. The default state is high. Different type of sensors exist: some send high level, some send low level to this input when the room is occupied. Active-high or active-low logic can be configured for this port in LDC to support them. The second pin has a constant 24V output voltage, and the third one is the ground.




| Pin nr. | Signal |
|---|---|
| 1 | 24V logic input |
| 2 | 24V |
| 3 | Ground |



***OCS connector pin assignments***

Voltage ranges for 1st pin are the following:

| | Input voltage [V] |
|---|---|
| **Logic low level** | 0 - 0.8 |
| **Logic high level** | 2V- 24V |

OCS Output Voltage Level: 24V (50mA).

**Compatible Plug Type**

WR-TBL series (3.81mm 3-pole 90° Reversed Gender Plug Phoenix), type: WR-TBL Series 3483 - 3.81 mm.

**ATTENTION:** The occupancy sensor connector and the GPIO port are not compatible with each other due to voltage level difference, please do not connect them directly.

### 4.2.6. GPIO - General Purpose Input/Output Ports

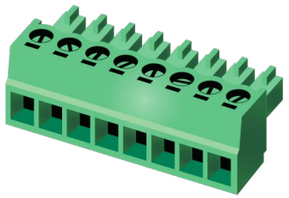
The switcher is supplied with an 8-pole Phoenix® connector with six GPIO pins that operate at TTL digital signal levels, and can be set to high or low level (Push-Pull). The direction of the pins can be input or output (adjustable). Voltage ranges for GPIO inputs are the following:

| | Input voltage [V] | Output voltage [V] | Max. output current [mA] |
|---|---|---|---|
| **Logical low level** | 0 - 0.8 | 0 - 0.5V | 30 |
| **Logical high level** | 2 - 5 | 4.5 - 5V | 18 |

The maximum total current for the six GPIO pins is 180 mA.




| Pin nr. | Signal |
|---|---|
| 1 | Configurable |
| 2 | |
| 3 | |
| 4 | |
| 5 | |
| 6 | |
| 7 | 5V |
| 8 | Ground |



***GPIO connector and plug pin assignments***

INFO: The recommended cable for the connectors is the AWG24 (0.2 mm2 diameter) or the generally used ‘alarm cable’ with 4x0.22 $mm^2$ wires.

**Compatible plug type**

Phoenix® Combicon series (3.5mm pitch 8-pole), type: MC 1.5/8-ST-3.5.

**ATTENTION:** The occupancy sensor connector and the GPIO port are not compatible with each other because of the voltage level difference, please do not connect them directly.

### 4.2.7. RS-232 Connector

The switcher contains a 3-pole Phoenix® connector, which is used for RS-232 serial connection.




| Pin nr. | Signal |
|---|---|
| 1 | Ground |
| 2 | TX data |
| 3 | RX data |



***RS-232 connector pin assignments***

**RS-232 Output Voltage Levels**

- Logic low level: 3V .. 15V
- Logic high level: -15V .. -3V

**Compatible Plug Type**

Phoenix® Combicon series (3.5mm pitch, 3-pole), type: MC 1.5/3-ST-3.5.

You can find more information about RS-232 in the Serial Interface section.

## 4.3. Powering Options

INFO: The external power supply is not isolated, 230V side is galvanically connected to the 0 output pole.

**Powering Locally**

The UCX devices are built with 2-pole Phoenix connector for DC power connection.




| Pin nr. | Signal |
|---|---|
| 1 | - |
| 2 | + |



***Power connector pin assignments***

**Remote Powering via USB-C Ports**

The UCX series devices are designed to provide power delivery for the connected device over the USB-C connectors.

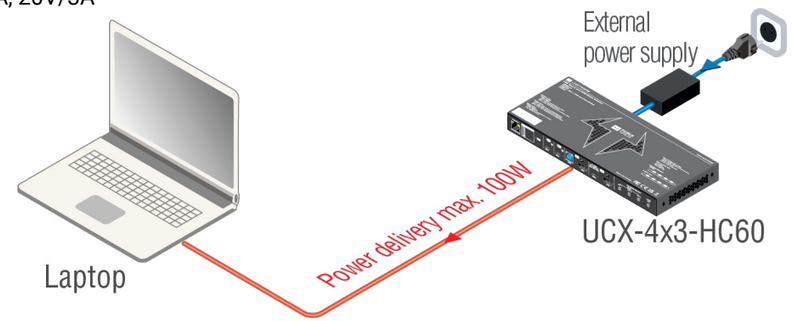
**ATTENTION:** The U4 USB-C connector of the UCX-4x2-HC60, UCX-4x2-HC60D, UCX-4x3-HC60 and UCX-4x3-HC60-BD switcher and the USB-C port of the UCX-2x2-H60 model is not capable of power delivery.

**WARNING! Always use the supplied power supply! Use of any other power supplies may lead to damage! Warranty void if damage occurs due to using a different power source.**

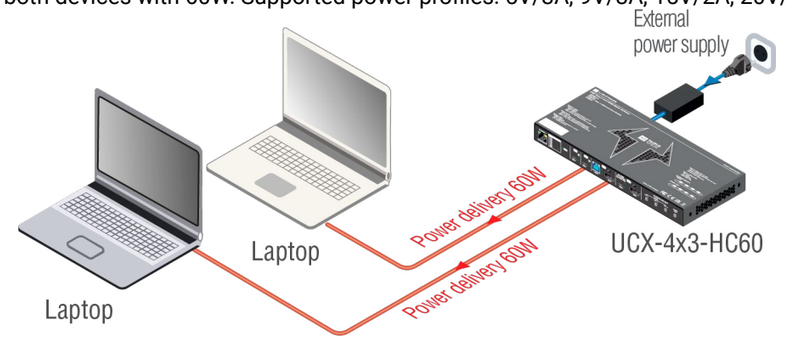
INFO: Selecting the appropriate power profile happens automatically, no manual intervention required.

The following operation modes are available:

- Charge one device with up to 100W. Supported power profiles: 5V/3A, 9V/3A, 15V/3A, 20V/3A 20V/5A.
- Charge one device on the chosen port with up to 100W. Supported power profiles: 5V/3A, 9V/3A, 15V/3A, 20V/3A




- Charge both devices with 60W. Supported power profiles: 5V/3A, 9V/3A, 15V/2A, 20V/1,5A




**ATTENTION:** It is important to note that only the first device connected is qualified for receiving 100W, even if multiple devices are connected, and all remaining charging capacity will be routed to the second connected device. Removing the device will **not** allocate charging potential to other connected devices.

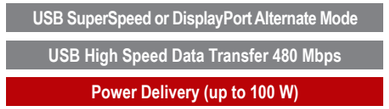
**Remote Powering via USB-A and USB-C Ports (D1-D4)**

5V output power capability can be turned on and off for all ports. Each port is able to supply 1000mA. The four ports together can supply 2A.

**Remote Powering via the Service USB-A Port**

The SERVICE-labelled USB-A port is able to supply 500mA.

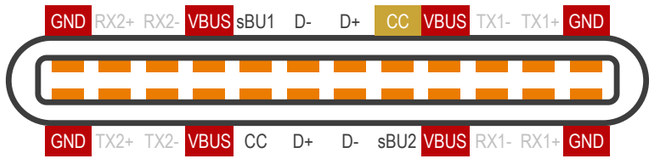
## 4.4. Power Delivery over Type-C




With Power delivery, these issues were solved:

- Allows negotiation of **up to 100 W** of power delivery to supply or charge equipment connected to a USB-C port.
- Power direction is **not fixed.**
- Intelligent and flexible system-level **management of power** (negotiation); the two connected partners exchange real-time PD protocol messages through the CC (control channel) lines.

USB PD supersedes all previous technologies and does not incorporate them. It can achieve any of the previous levels, but does so with its own methods.




***Power Pins of USB-C Connector***

- The VBUS and GND pins are power and the return paths for the signals
- The CC channel is used for power negotiation
- The other CC pin can be used for VCONN powering

**USB Chargers**

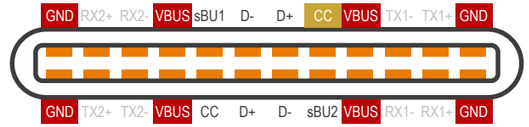
USB-C PD covers a range of different power levels, with different amperage and voltage combinations that a charger can deliver, depending on what the device asks for and the cable negotiates. These values are defined by PDO (Power Data Objects).

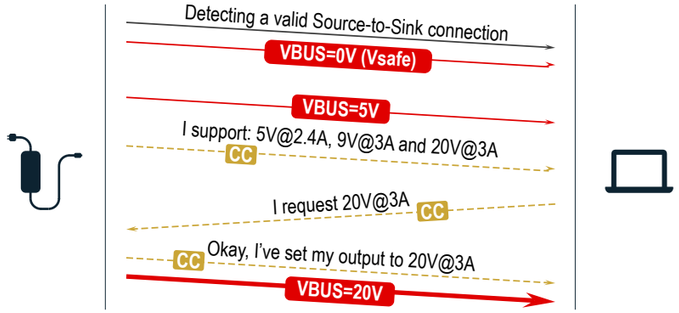
According to the specification, 12V is not a mandatory Voltage level. The reason for support in case of certain chargers is that the 12V value was on the mandatory list of a former specification.

### 4.4.1. Power Data Objects (USB-C)

Power Data Object (PDO) defines a power capability:

- Nominal voltage and maximum current
- A Source must have at least one PDO
- The Sink chooses one of the Source's PDOs via CC communication




***Powering Handshake***

**Dual-Role Power**

With USB-C, the connector is the same on all products. Laptops, certain tablets and smartphones can be both a charger and a charged device (not simultaneously). Source/Sink defines the power role the port is currently operating in.

**Source (SRC)**
supply power over VBUS

**Sink (SNK)**
consuming power from VBUS

**Dual-Role Power (DRP)**
can operate as either
a Source or a Sink

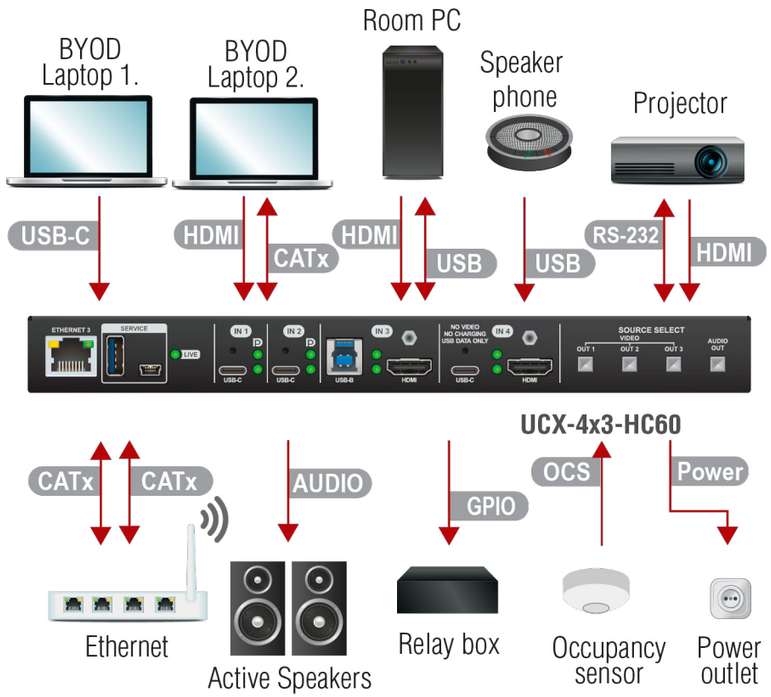
| | Source-only | Sink-only | Dual-Role Power |
|---|---|---|---|
| **Source-only** | Non-functional | Functional | DRP = Sink |
| **Sink-only** | Functional | Non-functional | DRP = Source |
| **Dual-Role Power** | DRP = Sink | DRP = Source | DRPs negotiate |

## 4.5. USB-C Cable Recommendation

Please find the recommendations for the applied cables below:

- Use Full-featured USB Type-C cables made by reliable brands.
- USB2.0 cables do not have the Superspeed channels, neither DP video, nor USB3 transmission works with them.
- Type-C cables certified for USB 3.x Gen1-Gen2 (5Gbps or 10Gbps) and Displayport Alternate mode HBR2-HBR3 (5.4Gbps or 8.1Gbps) applications are recommended.
- Thunderbolt cables are not backwards compatible with USB3.x or Displayport unless the manufacturer explicitly states so.
- Passive, 20Gbps Thunderbolt 3 cables, which are also specified for USB3.x are a good, but more expensive choice.
- 5A charging capability is not required. All USB Type-C cables should support at least 3A (up to 60W) charging.

## 4.6. Connecting Steps




**USB-C** Connect a USB-C source (e.g. BYOD laptop) to the USB-C input port.
The applied cable shall be certified for USB 3.1 Gen1 (5Gbps) and Displayport Alternate mode HBR2 (4x5.4Gbps) applications.
The USB-C port of the UCX-2x2-H60 model does **not** support this.

**HDMI** Connect an HDMI source (e.g. BYOD laptop or room PC) to the HDMI input port.

**CATx** Connect a device (e.g. BYOD laptop) to the Utility Ethernet port to access the internet or local network.

**USB** **USB Type-A:** Optionally connect the USB device (e.g. Speaker phone).
**USB Type-B:** Optionally connect the USB host (e.g. PC).
**USB Type-C (data only):**Optionally connect the USB host (e.g. PC)

**HDMI** Connect an HDMI sink (e.g projector) to the HDMI output port.

**RS-232** Optionally for RS-232 extension: connect a controller/controlled device (e.g. projector) to the RS-232 port.

**CATx** Optionally connect the Secure Control Ethernet port to a Local Network Switch to provide Ethernet connection for device configuration and BYOD internet access.

**Audio** Optionally connect an audio device (e.g. active speakers) to the analog audio output port by an audio cable.

**GPIO** Optionally connect a device (e.g. a relay) to the GPIO port.

**OCS** Optionally connect an occupancy sensor to the OCS port.

**Power** Connect the external power supply to the AC power socket and the switcher unit.
Powering the device is recommended as the final step.

**ATTENTION:** The USB-C ports of Taurus are developed to connect native USB-C sources. HDMI–USB-C or DP–USB-C adapters are not supported and not recommended to apply.

INFO: Connecting USB-B and HDMI ports to the same PC or laptop is recommended in case of IN3 and IN4 inputs.

# 5

## Device Concept

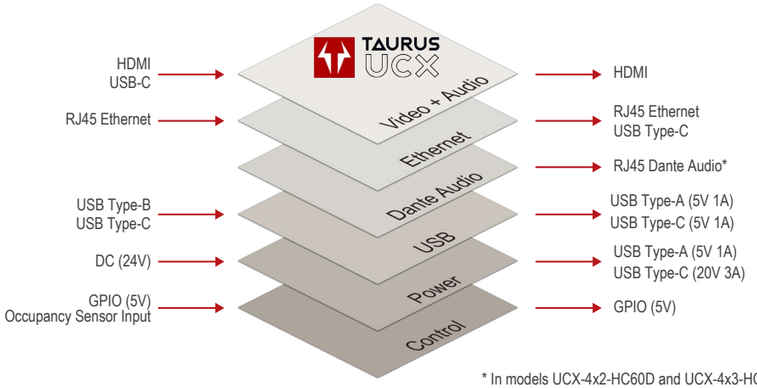
**The following chapter describes the features of the device with a few real-life examples.**


- Universal Switcher Concept 36
- USB Interface 36
- Video Interface 40
- The Autoselect Feature 44
- Audio Interface 47
- Ethernet Interface 51
- Lightware Advanced Room Automation (LARA) 52
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- 802.1x Authentication 57
- Advanced Ethernet Security 57
- Lightware Crypto Core 59
- WebSocket Service (WS, WSS) 60
- Bulk Device Management 60
- Serial Interface 61
- GPIO Interface 62
- OCS Interface 62
- Further Built-in Features 62

## 5.1. Universal Switcher Concept

### UCX-4x2-HC60

Lightware's universal switcher exploits the USB-C connectivity for a simplified transmission of 4K video, audio, control signals and power providing meeting participants with easy host switching, utilizing data speeds of up to 5 Gbps under the USB 3.1 Gen1 providing video supporting up to 4k@60Hz at 4:4:4 video resolution.




* In models UCX-4x2-HC60D and UCX-4x3-HC60-BD

## 5.2. USB Interface

### 5.2.1. USB-C Interface

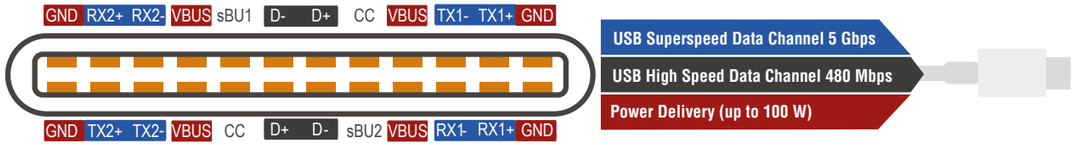
**Summary of USB-C Ports**

| | UCX-2x1-HC60 / SCX-2x1-HC60 | UCX-2x2-H60 | UCX-4x2-HC60 | UCX-4x2-HC60D | UCX-4x3-HC60 | UCX-4x3-HC60-BD |
|---|---|---|---|---|---|---|
| **USB-C 3.1 Gen1 (5 Gbps)** | 1x | 1x | - | 3x | 3x | 3x |

**DIFFERENCE:** In UCX-4x2-HC60, UCX-4x3-HC60, UCX-4x2-HC60D and UCX-4x3-HC60-BD the U4 USB-C port does not transmit video, Ethernet or remote power, only USB data.The same applies to the USB-C port of the UCX-2x2-H60 model.

INFO: The -LCC models have the same values as non-LCC models.

**USB-C Pinout and Data Channels**

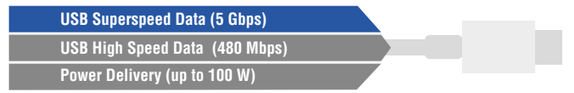



INFO: The pinout above is viewed from the PCB side.

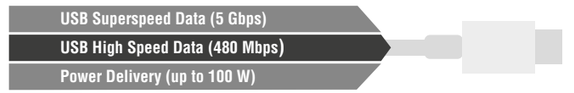
The USB-C interface consists of three main layers:

**USB Data**

- Taurus UCX series supports USB 3.1 Gen1 (max. 5 Gbps data speed) on their USB-C ports. This data is transmitted over the USB Superspeed data channels.



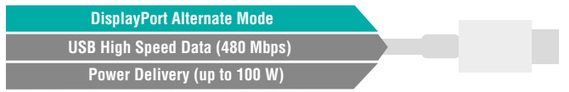

- USB 2.0 data (480 Mbps) is transferred over the High-speed data channels. The built-in USB-Ethernet bridge provides Ethernet connection over the USB-C connector. This function uses the High-speed channels. For more details, see the USB Port Diagram (UCX-2x1-HC60, SCX-2x1-HC60) and the Ethernet Interface section.



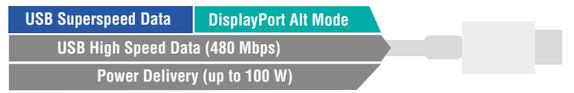

INFO: USB.2.x and 3.x data transfer happens on two independent layers simultaneously.

**Displayport Alternate Mode (Video + Embedded Audio)**

- DisplayPort Alternate Mode: Alternate mode is designed for carrying uncompressed, native Displayport video as non-USB data (All Superspeed Data lanes deliver video signals, it reserves the whole bandwidth of the SS Lines).

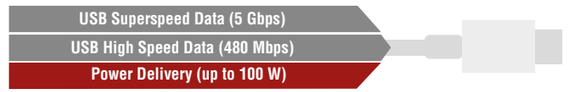



- DisplayPort Alternate mode and USB 3.1 data shared: AV signals and USB 3.1 data are transmitted at the same time, sharing the bandwidth (2 SuperSpeed lines for video + 2 SuperSpeed lines for USB 3.1).




**Power Delivery**

- Going outward to power/charge external devices.



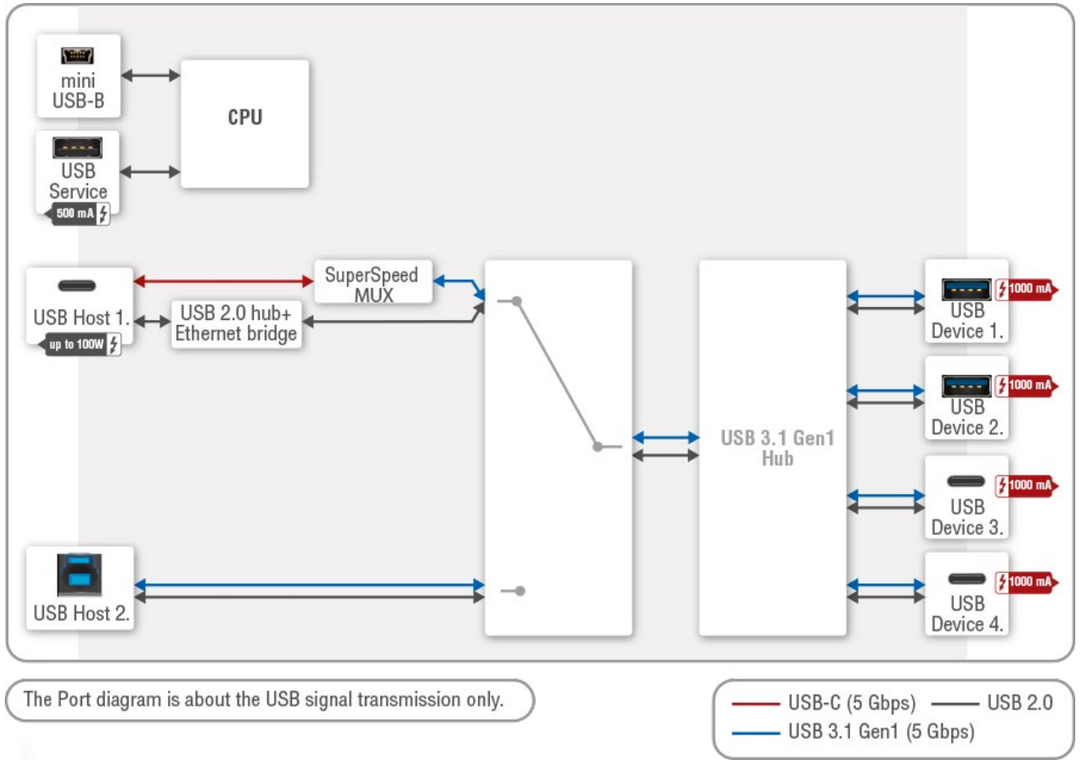
### 5.2.2. USB Data - USB 3.1 Gen1 Interface

**Summary of USB 3.1 Gen1 ports**

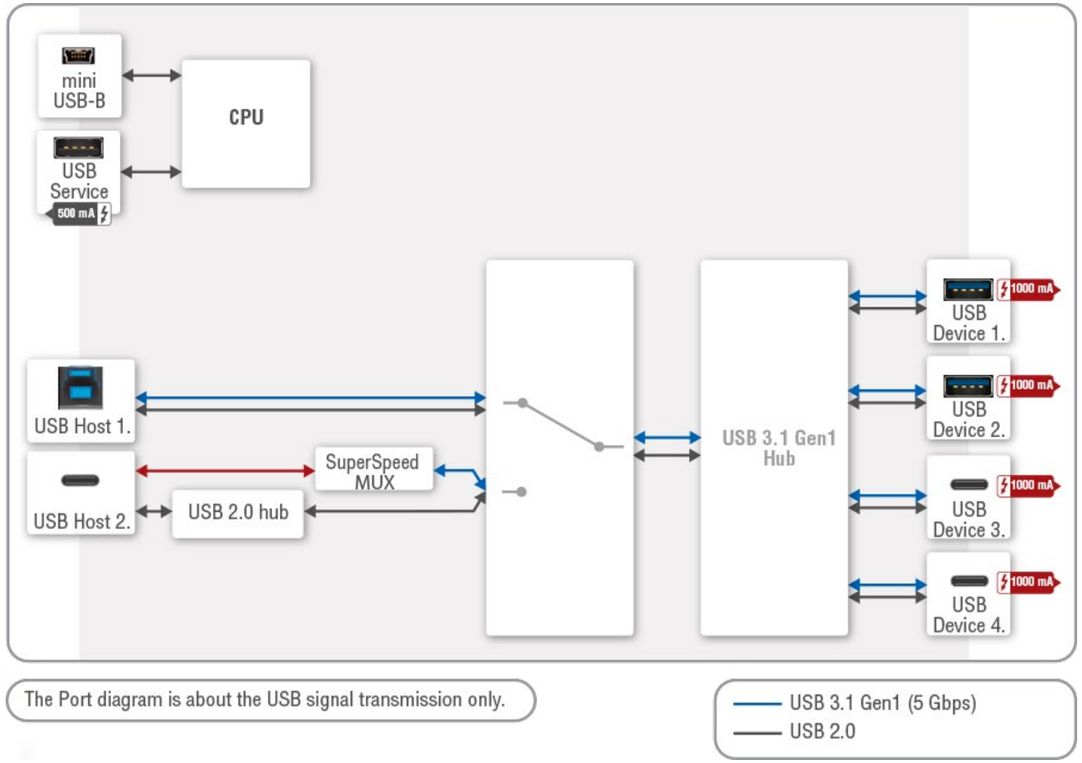
| | Upstream ports (UFP) | | Downstream ports (DFP) | |
|---|---|---|---|---|
| | USB-C 3.1 Gen1 (5 Gbps) | USB-B 3.1 Gen1 (5 Gbps) | USB-A 3.1 Gen1 (5 Gbps) | USB-C 3.1 Gen1 (5 Gbps) |
| |  |  |  |  |
| UCX-2x1-HC60 | 1x | 1x | 2x | 2x |
| UCX-2x2-H60 | 1x | 1x | 2x | 2x |
| UCX-4x2-HC60 | 3x | 1x | 2x | 2x |
| UCX-4x2-HC60D | 3x | 1x | 2x | 2x |
| UCX-4x3-HC60 | 3x | 1x | 2x | 2x |
| UCX-4x3-HC60-BD | 3x | 1x | 2x | 2x |
| SCX-2x1-HC60 | 1x | 1x | 2x | 2x |

INFO: The -LCC models have the same values as non-LCC models.

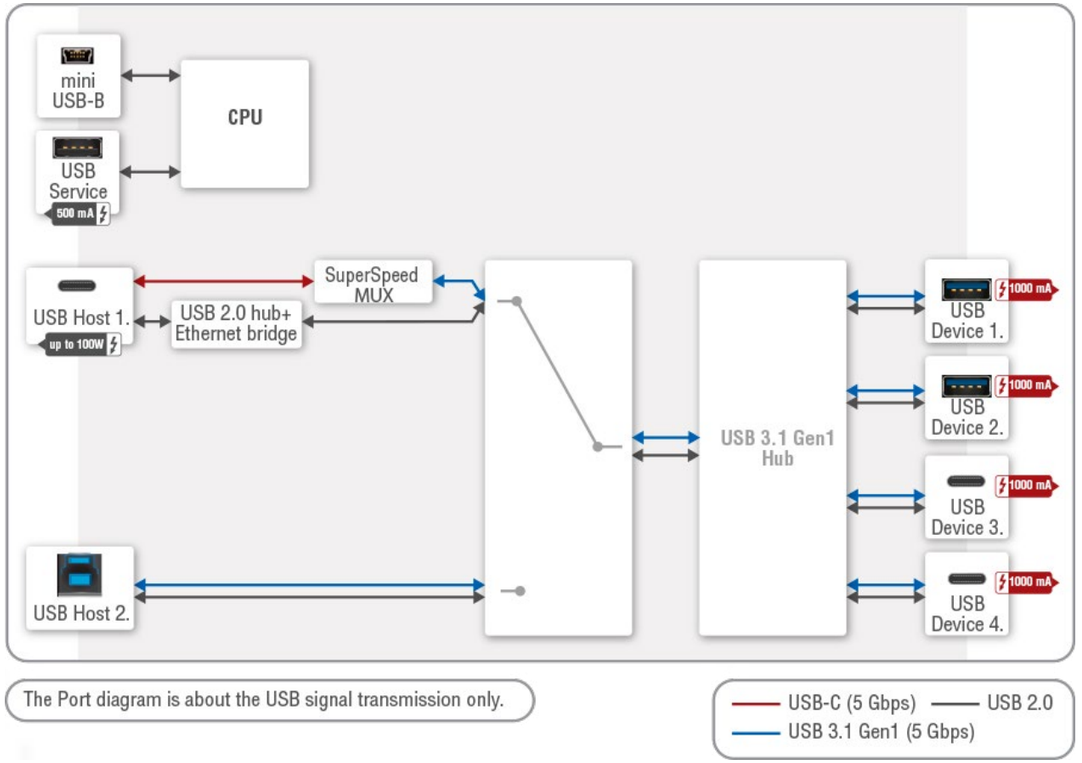
**USB Port Diagram (UCX-2x1-HC60, SCX-2x1-HC60)**



**USB Port Diagram (UCX-2x2-H60)**




**USB Port Diagram (UCX-4x2-HC60)**




INFO: UCX-4x2-HC60, UCX-4x2-HC60D, UCX-4x3-HC60 and UCX-4x3-HC60-BD models have the same USB diagram.

For more details about the power delivery of the USB-C port, see the Powering Options section.

INFO: The Taurus UCX series devices generally present 1 tier in the USB topology (a HUB). An exception is the USB2 layer on Type-C ports, which presents two tiers (two HUBs).

The USB 3.1 standard is backwards compatible. This means the High-speed channels (USB 2.0 lines) are used if the connected device or cable capability is only USB 2.0.

USB-A, USB-B and USB-C connectors also have high-speed data lines besides Superspeed.

The built-in USB-Ethernet bridge provides Ethernet for the USB-C connection. It is still available while the USB 3.1 Gen1 data channels are reserved for video or USB data transmission. For more details, see the Ethernet Port Diagram (UCX-2x1-HC60, SCX-2x1-HC60).

INFO: USB.2.x and 3.x data transfer happens on two independent layers simultaneously.

## USB Features

### DisplayPort Alternate Mode

This function is available only for USB type C connectors. See more details in the DisplayPort Alternate Mode section.

### Host detection

One host is available at once. Taurus UCX series devices give a feedback about the connected hosts.

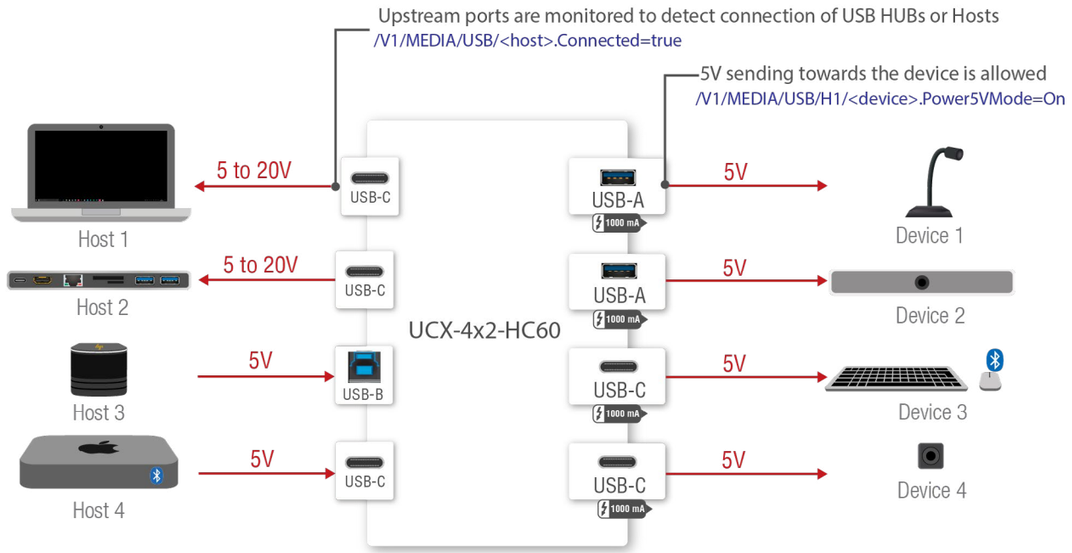
In case of USB Type-B ports: When the 5V is detected on USB Vbus, the **Connected** property becomes true.

In case of USB Type-C ports: USB Type-C introduced the port Power Roles: Sink port, Source port and Dual Role Power port. Supplying VBUS is not the privilege of the USB Host anymore.

Detecting the presence of a BYOD device on Type-C ports is done using the Power Delivery protocol over the Communication Channel.

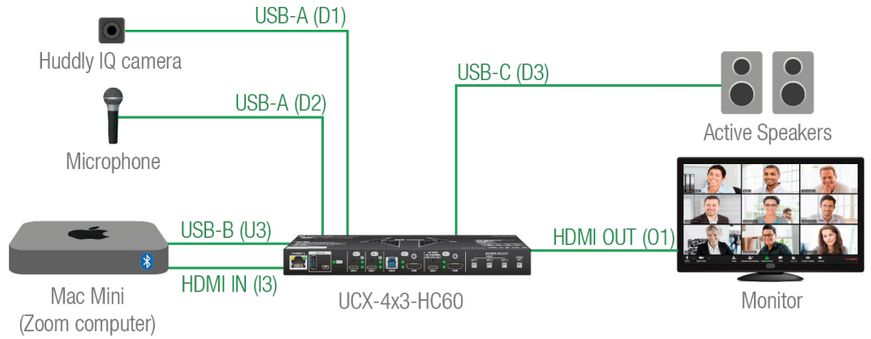
### Sending 5V Power to the Device

This function allows sending 5V power to the device (USB peripherial). Most USB devices can be powered by this 5V, so disabling and enabling this property is equal to unplugging the USB connector and plugging it back in.




***USB features in Taurus UCX series***

## Application of USB - Example




### The Concept

The Webcam and USB microphone (D2) are connected to the Mac Mini computer(U3) through a USB HUB (Taurus UCX). Zoom running on the computer sends video and embedded audio signal to the Taurus HDMI input (I3).

The switcher forwards analog audio to the active speakers and digital video to the HDMI display.

### Settings

**Step 1.** In the Crosspoint menu, USB tab, switch the Mac Mini (U3) to the USB hub (H1).

**Step 2.** Pay attention to the connected USB devices (D1 and D2) and turn on the **Power 5V Mode**.

**Step 3.** The video crosspoint is switched to I3-O1.

### 5.2.3. USB Service Ports - USB 2.0 Interface

**Summary of USB 2.0 ports**

| | Service ports | |
|---|---|---|
| | USB-A<br>USB 2.0<br>(480 Mbps) | mini USB- B<br>USB 2.0<br>(480 Mbps) |
| |  |  |
| UCX-2x1-HC60 | ✓ | ✓ |
| UCX-2x2-H60 | ✓ | ✓ |
| UCX-4x2-HC60 | ✓ | ✓ |
| UCX-4x2-HC60D | ✓ | ✓ |
| UCX-4x3-HC60 | ✓ | ✓ |
| UCX-4x3-HC60-BD | ✓ | ✓ |
| SCX-2x1-HC60 | ✓ | ✓ |

The **SERVICE**-labelled USB-A connector is designed for service function. The Mini B-type connector is reserved for future LW3 control. Both features will be added by a future firmware update.

INFO: The -LCC models have the same values as non-LCC models.

## 5.3. Video Interface

**ATTENTION:** The USB-C ports of Taurus are developed to connect native USB-C sources. HDMI–USB-C or DP–USB-C adapters are not supported and not recommended to apply.

**Summary of Video Ports** *#welcomescreen*

| | | Video Inputs | | Video Outputs |
|---|---|---|---|---|
| |  |  |  |  |
| | Welcome screen option | Displayport Alternate mode HBR2 (4x5.4Gbps) | HDMI 2.0<br>(18 Gbps) | HDMI 2.0<br>(18 Gbps) |
| UCX-2x2-H60 | ✓ | - | 2x | 2x |
| UCX-2x1-HC60 | ✓ | 1x | 1x | 1x |
| UCX-4x2-HC60 | ✓ | 2x | 2x | 2x |
| UCX-4x2-HC60D | ✓ | 2x | 2x | 2x |
| UCX-4x3-HC60 | ✓ | 2x | 2x | 3x |
| UCX-4x3-HC60-BD | ✓ | 2x | 2x | 3x |
| SCX-2x1-HC60 | ✓ | 1x | 1x | 1x |

INFO: The -LCC models have the same values as non-LCC models.

### 5.3.1. Welcome Screen

DEFINITION: The Welcome screen is an internal source, which can be customized by uploading an image file, jpg, or bmp. Besides this, custom text can be set to display on the output with or without the image.

**Rules**

- Welcome screen is an option and appears as an **additional input**.
- The image and the text can be **displayed separately or together** as well.
- If the image option is not enabled, a **light grey screen** is displayed.
- One image can be stored in the device. If a new image is uploaded, the existing one **will be overwritten**.
- The max. image size is 4MB, preferred resolution is 1280x720.
- The text length can be max. **63 characters** and the following characters are allowed: letters (a-z, A-Z), space, hyphen (-), underscore (_), numbers (0-9) and dot (.). The text color is **black**.
- If no image is uploaded, the factory default image (**Lightware logo**) can be displayed.




***The Default Welcome Screen***

**Limitations**

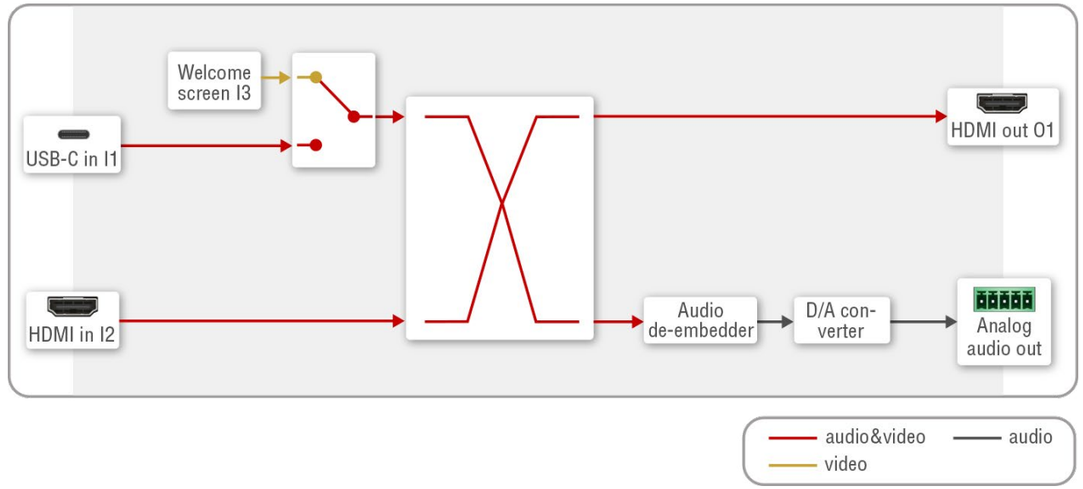
- If the I1 input port is switched to an output, the **Welcome screen is not available**.
- If the Welcome screen is switched to an output:
  - **I1 input port is not available** and I1 audio cannot be de-embedded to the analog audio output port.
  - I1 does not send hotplug signal and the **signal parameters of the I1 port are not measured**.
- If the audio of the I1 port is switched to the analog audio output and the Welcome screen is switched to the output, **the audio signal is lost**, however, the audio crosspoint is not changed.

### 5.3.2. Video Port Diagrams

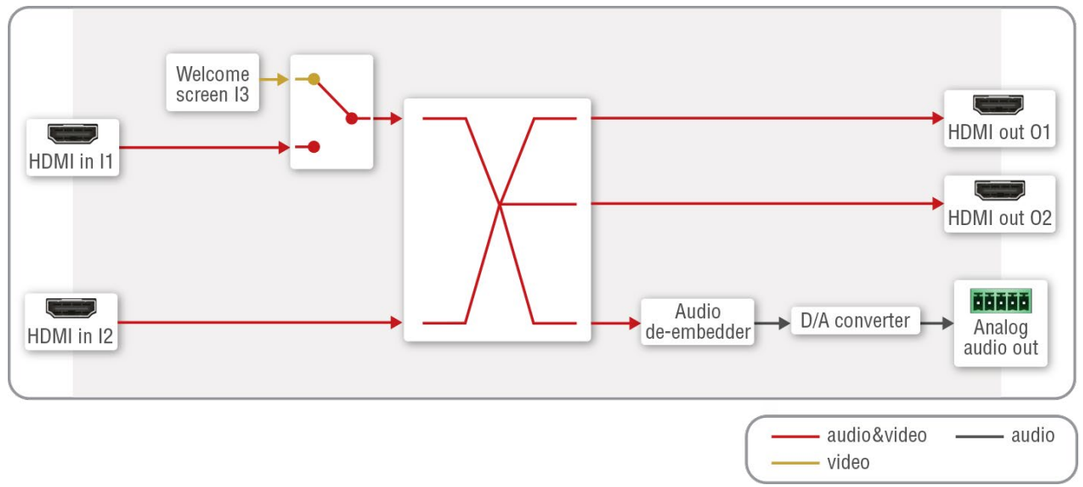
The working method of the models is the same, the difference is just the number of the video ports; for more information, see the Model Comparison section.

INFO: The source that is connected to the USB-C port sends DisplayPort video signal. This signal is converted to HDMI by the video IC internally.

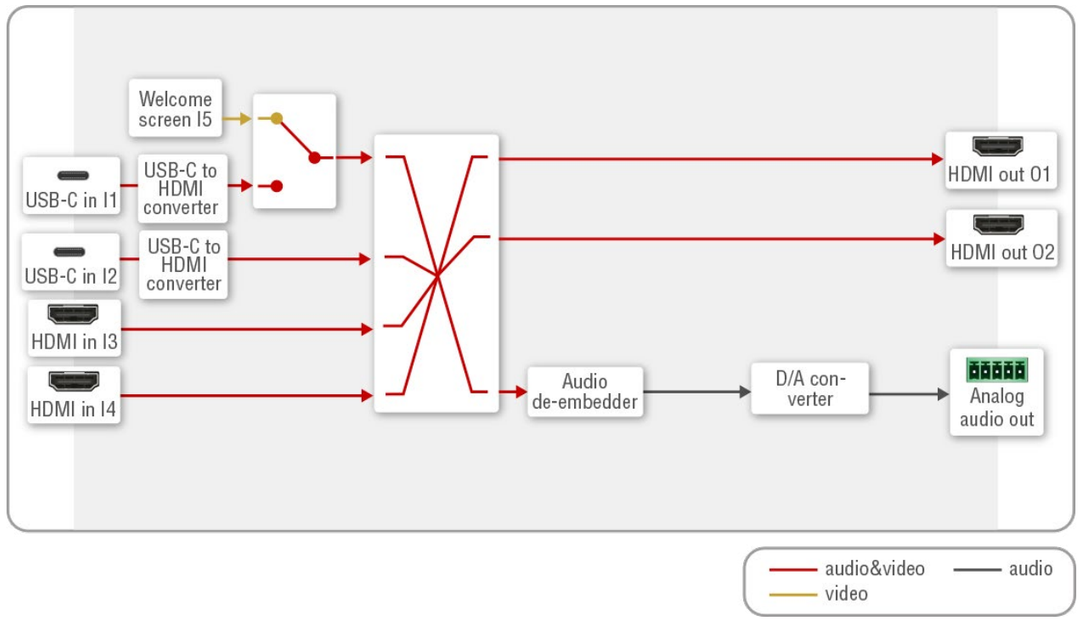
**UCX-2x1-HC60, SCX-2x1-HC60**



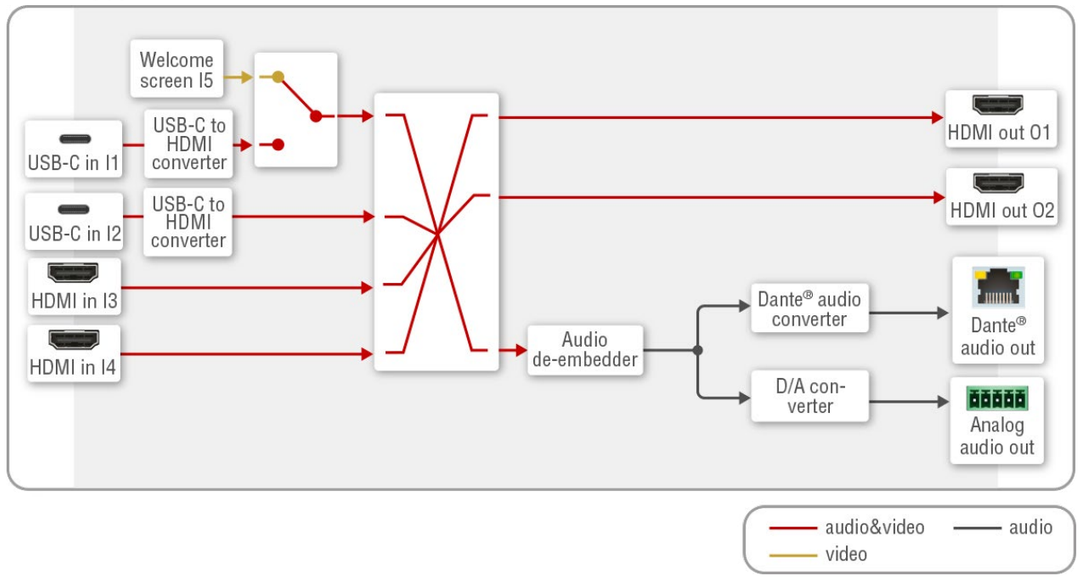

**UCX-2x2-H60**



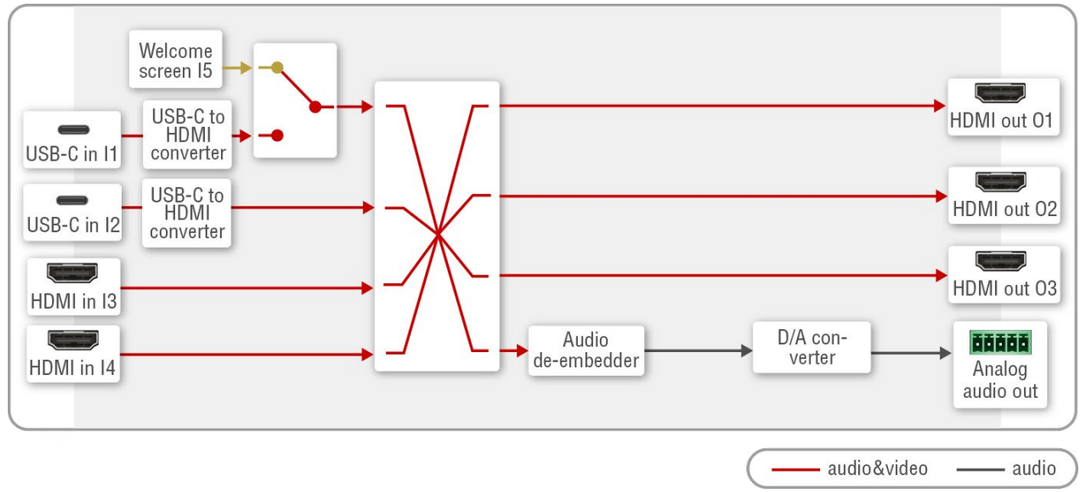
**UCX-4x2-HC60**



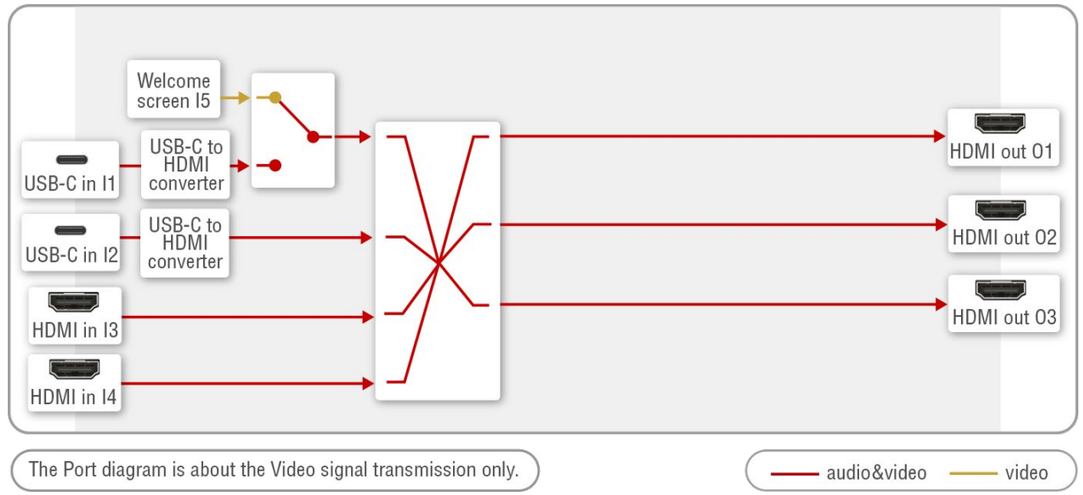

**UCX-4x2-HC60D**




**UCX-4x3-HC60**




**UCX-4x3-HC60-BD**

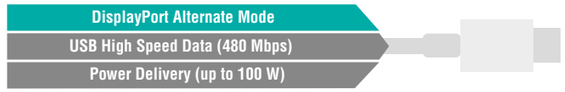



The Port diagram is about the Video signal transmission only.

### 5.3.3. DisplayPort Alternate Mode

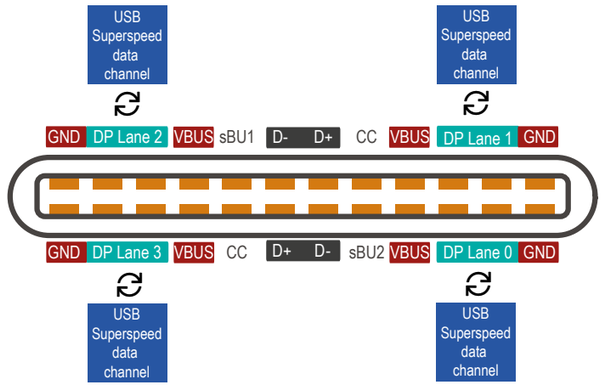
USB-C sources send Displayport signal for video transmission.

Displayport Alternate mode allows using the USB-C cable instead of DisplayPort cable for DP video signals. The standard uses the Superspeed data transfer channels for carrying the video stream.




**ATTENTION:** When the USB-C input of a UCX device is disconnected while operating in Displayport Alternate Mode, visual artifacts may appear on the downstream display.

**ATTENTION:** The bandwidth of the video is based on the capacity of the source and the sink. USB3.1 Generation (Gen1=5Gbps, Gen2=10Gbps) is not related to DP bitrate (HBR1=4x2.7Gbps, HBR2=4x5.4Gbps)




***USB-C pinout in DP Alt mode***

In Alt Mode, 2 or all 4 of the USB-C Superspeed data channels can be configured as DisplayPort lanes. A full-bandwidth DisplayPort connection is always defined as 4 lanes.

The table below shows the correlation of the video resolution and the assigned lanes:

| DisplayPort Video | | | DisplayPort Alternate Mode | | | |
|---|---|---|---|---|---|---|
| | | | 2-Lane DP | | 4-Lane DP | |
| DisplayPort Standard | Raw bandwidth (1 lane) | Display Resolutions | BW | Display Resolutions | BW | Display Resolutions |
| HBR1 (DP 1.0 / 1.1) | 2.7 Gbps | 1440p@60 Hz | 5.4 Gbps | 1 × FullHD | 10.8 Gbps | 1× 4K@30 Hz |
| HBR2 (DP 1.2) | 5.4 Gbps | 4K@60 Hz | 10.8 Gbps | 1× 4K@30 Hz | 21.6 Gbps | 1 × 4K@60 Hz |
| HBR3 (DP 1.4a)* | 8.1 Gbps | 4K@60Hz | 16.2 Gbps | 2x4K@60 Hz | 32.4 Gbps | 2x4K@60Hz |

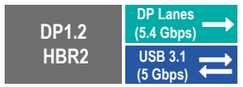
* The host computer must be able to handle forward error correction.

### 5.3.4. DisplayPort Alternate Mode and USB 3.x Mixed

The two different signals (video and USB 3.x) can be transmitted at the same time with shared bandwidth.

DP video reserves 2x Superspeed Channels for the video signal in alternate mode. 2x Superspeed Channels for USB 3.x. This setting can be configured manually via Software Control Options or via LW3 protocol commands (for more details, see the LW3 Programmers' Reference section).

#### Thunderbolt Compatibility




Thunderbolt 3 standard uses USB-C connector to transmit data. The standard is compatible backwards, so it is able to fall back to Displayport Alternate mode. In this case, the maximum bandwidth of transmitted video signal is based on the connected sink capability ( e.g. HBR2, 5.4Gbps per lane in case of UCX-4x2-HC60 switcher).

#### Display Stream Compression (DSC)

UCX-HC60 models support **Display Stream Compression (DSC)**, which is a technology that can help transmitting good quality video stream even in case of bandwidth limitations. It can transmit high quality video streams over 2 lanes, allowing the remaining 2 lanes to transmit USB 3.x data.

DSC in UCX-HC60 models uses the **VESA DSC 1.1/1.2a standard** that supports fix compression rates such as 2:1 or 3:1, as well as fractional rates (e.g. 2.5:1) with RGB and YCrCb color formats of up to 12 bit/color.

DSC decoding latency is less than 1 ms, allowing for a visually lossless transmission.

INFO: DSC is only available if the source also supports the functionality.

| Source | DSC Support | Default Behavior |
|---|---|---|
| macOS (e.g. MacBook Pro M1/M2 with Intel GPU) | Hardware support for DSC is available with DP 1.4+ standard, but there may be software issues from the Big Sur (v11.0) update and upwards | DSC is not enabled automatically; it can be adjusted manually, but operation may be unstable |
| Windows OS (Windows 10/11, with NVIDIA/AMD/ Intel GPU) | Full compatibility and support with computers supporting DP 1.4+ standard | Automatically enables DSC according to bandwith requirements; DSC is enabled by default |

Negotiation between the source (host) and the sink (UCX) happens automatically during DisplayPort Link Training. In **2-Lane DisplayPort Alternate Mode**, if the desired resolution (up to 5K@30Hz) is higher than the bandwidth allows on 2 lanes, and the source supports it, DSC is turned on.

## 5.4. The Autoselect Feature

Aside from manually selecting crosspoints, you can choose the Autoselect option in case of video and USB ports.

Video input source can be selected in the following ways:

- using the front panel buttons
- using Lightware Device Controller (LDC)
- sending LW3 protocol command or
- using the Autoselect function.

There are several Autoselect policies as follows:

- Disable autoselect
- First detect
- Last detect
- Follow video (in case of USB and audio ports)

INFO: SignalPresent cannot be sensed on I1 if I3/I5* is displayed due to the mutually exclusive operation of video input I1 and the internal Welcome screen image generator I3/I5*. Welcome screen image will disappear and the video crosspoint will be switched to I1 upon connecting a Host computer to I1, regardless of whether the computer sends Displayport image or not.

*I3 in case of UCX-2x1-HC60, UCX-2x2-H60 and SCX-2x1-HC60; I5 in case of UCX-4x2-HC60, UCX-4x2-HC60D, UCX-4x3-HC60 and UCX-4x3-HC60-BD.

**Individual input settings**

This setting defines the priority level of the ports. The priority property is valid both for first detect and last detect operation modes. It overrides the chronological order of the appearance of the active video signal. The highest priority active input is always selected to transmit (1- highest priority, 100- lowest priority).

TIPS AND TRICKS: To use the individual input settings, change the default priority settings from 1 to 5 depending on their importance (e.g. I1 priority:1; I2 priority:2; I3 priority:3; I4 priority:4; I5 priority:5 ).

**ATTENTION:** The autoselect function remains active after the manual crosspoint switching. This operation mode works in contrast to the other Lightware matrix switchers or extenders.

**Disable autoselect**

The crosspoint state change only happens manually.

**First detect**

The selected input port is kept connected to the output as long as it has an active signal. The crosspoint changes when the signal becomes inactive on the chosen input, or when the video signal appears on a higher priority port.

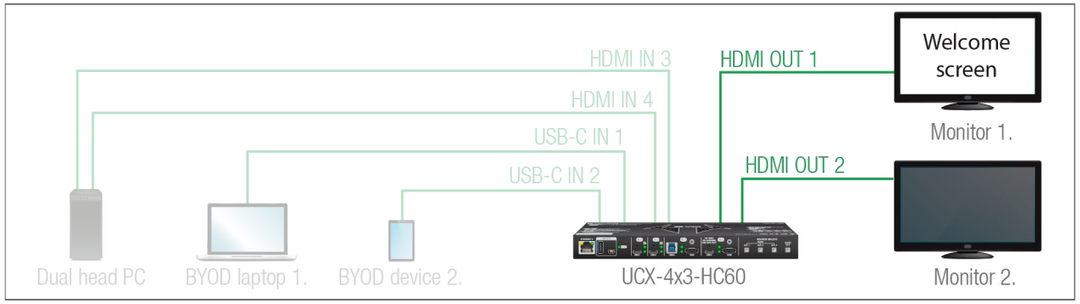
TIPS AND TRICKS: To uphold the first detect mode, default priority settings (I1 priority:50; I2 priority:50; I3 priority:50; I4 priority:50; I5 priority:100 ) are appropriate. Lower priority of the I5 port is highly recommended, because this is an internal source with constant video signal,thus this port is always the first one.

**Last detect**

It is always the last attached input that is selected to transmit. The crosspoint changes when the signal becomes inactive on the chosen input, or when the active video signal appears on a port with the same or higher priority.

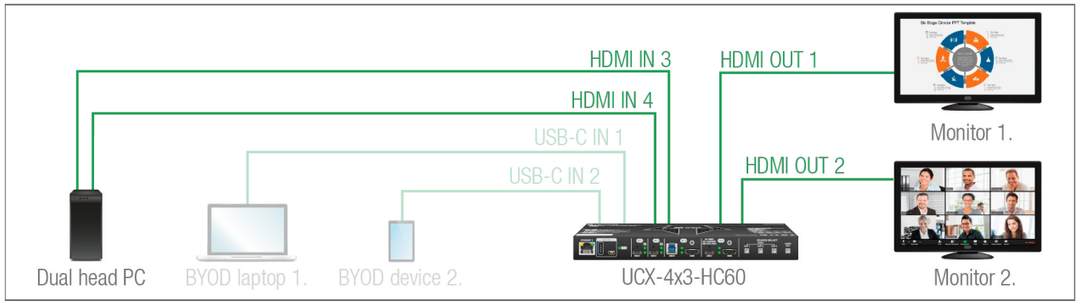
TIPS AND TRICKS: To uphold the last detect mode, default priority settings (I1 priority:50; I2 priority:50; I3 priority:50; I4 priority:50; I5 priority:100 ) are appropriate.

**Automatic Input Selection- Example 1.**

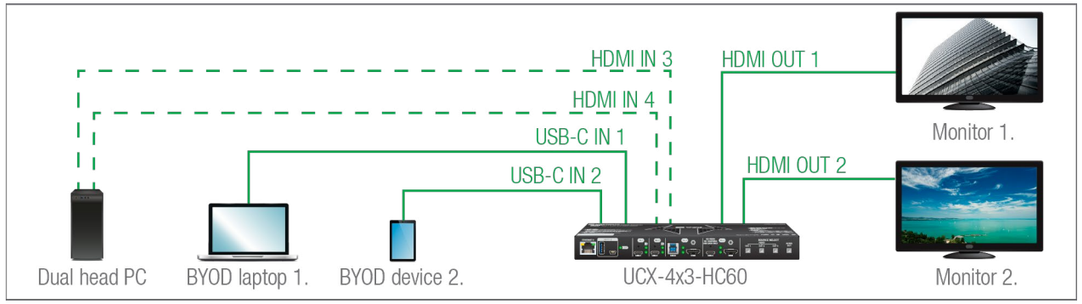



The Welcome screen appears on the Monitor 1. (O1) when no active source is connected.

The video signal of the dual-head PC (I3, I4) can be seen on Monitor 1. and Monitor 2. (O1 and O2) when it is powered on and no BYOD device is connected.



BYOD laptop 1. (I1) is displayed on Monitor 1. (O1) and BYOD device 2. (I2) can be seen on Monitor 2. when they are connected and send active video signal.The individual input settings are the following:

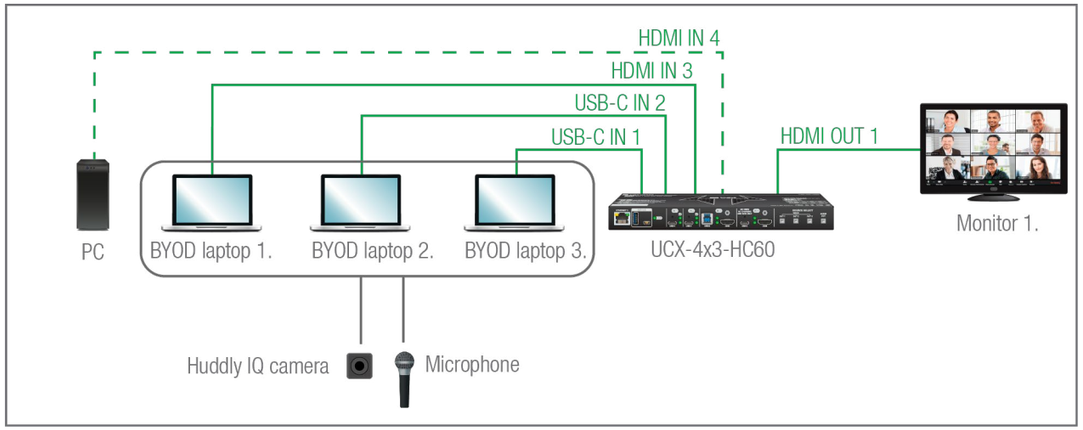



O1: I1 priority:1; I2 priority: disabled; I3 priority:2; I4 priority: disabled; I5 priority:3

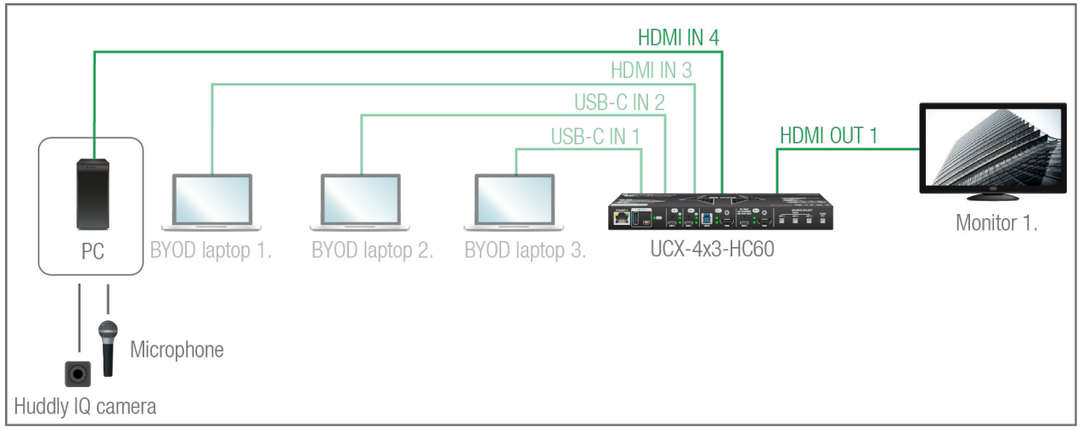
O2: I1 priority: disabled; I2 priority: 1; I3 priority: disabled; I4 priority: 2; I5 priority: disabled

**Automatic Input Selection - Example 2.**

One of the BYOD laptop is switched to Monitor 1. depending on the operation policy (Last detect/first detect) and the connection order of the BYOD laptops. The USB autoselect mode should be **Follow video,** the USB peripherials (webcam, microphone etc.) are connected to the chosen laptop. The USB Type-C provides Ethernet to the BYOD device, so the conferencing software can run there.



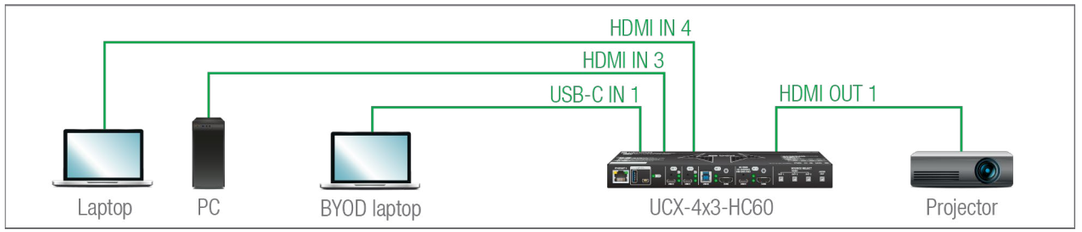

When no active BYOD device is connected and the local PC is powered on, the UCX-4x3-HC60 is switched to I4 and transmits the video to Monitor 1.




The individual input settings are the following:

O1: I1 priority:1; I2 priority: disabled; I3 priority:2; I4 priority: disabled; I5 priority:3

**Automatic Input Selection - Example 3.**



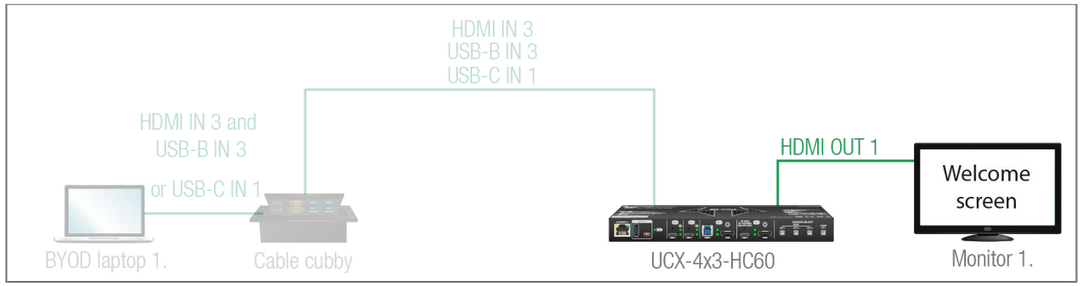

The laptop on HDMI input 4 will be automatically switched to the HDMI output if there is no other source connected to the switcher. If the PC is powered on and has active video signal, the HDMI input 3 will be switched to the HDMI output. If the BYOD Laptop is connected through the USB-C input 1, it will be switched to the HDMI output – independently of the presence of the other video signals.

Set the Autoselect mode to Last detect for HDMI out 1: The priorities are the following (the lowest number means the highest priority):

| Source device | Input port | Priority |
|---|---|---|
| Laptop | I4 (HDMI in 4) | **3** |
| PC | I3 (HDMI in 3) | **2** |
| BYOD Laptop | I1 (USB-C in 1) | **1** |

Priorities can be set in Lightware Device Controller software, see the related settings in the HDMI Video Output section.

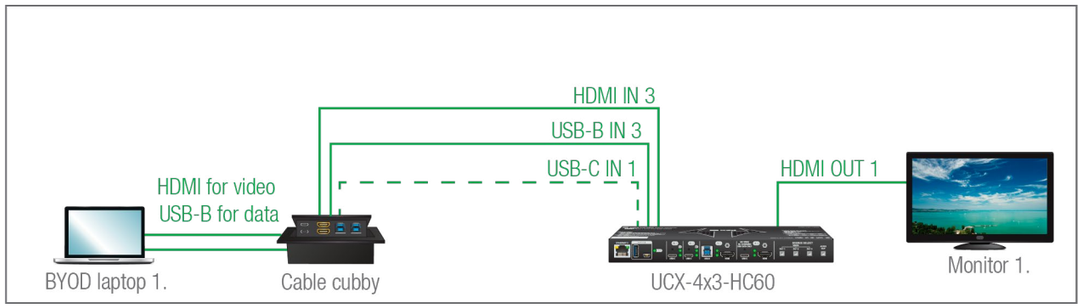
**Automatic Input Selection - Example 4.**




The Welcome screen appears on the Monitor 1. (O1) when no active source is connected. A presenter can choose what cable(s) are appropriate for their BYOD. Either a USB Type-C cable alone for both USB and Displayport, or one USB cable (USB-B or USB-C) for data and one HDMI cable for video can be used. The Taurus UCX series device will switch both USB and video layers accordingly. Cable cubby for BYOD #1 has three cables connecting to USB-C (In1), USB-B (In3), HDMI (In3).

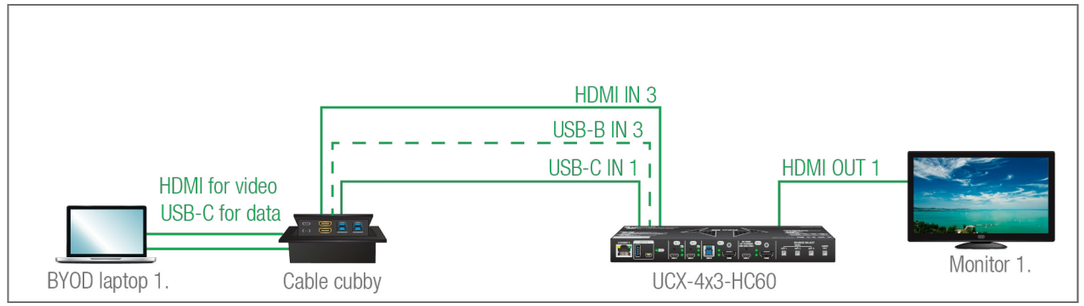
**Case 1.**

When the BYOD laptop uses HDMI for video and USB-B for data.



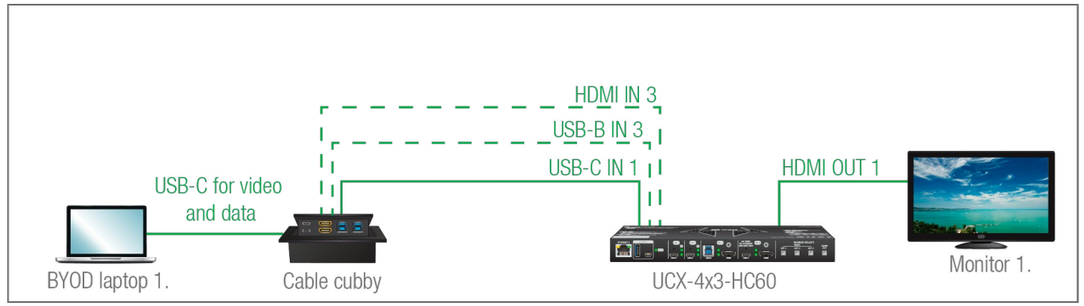

**Case 2.**

When the BYOD laptop uses HDMI for video and USB-C for data.




**Case 3.**

When the BYOD laptop uses USB-C for video and data and USB-C for data.




The individual input settings are the following:

**Video**

O1:Last detect; I1 priority:1; I2: disabled; I3 priority:1; I4: disabled; I5 priority:2

**ATTENTION:** Take care that the O2 video is not switched to I5 because of the crosspoint limitation: I1 and I5 ports are not available at the same time, only one of them can be selected to any output.

**USB**

H1: Last detect, U1 priority:1; U2 priority:1; U3 priority:1; U4 priority:1

## 5.5. Audio Interface

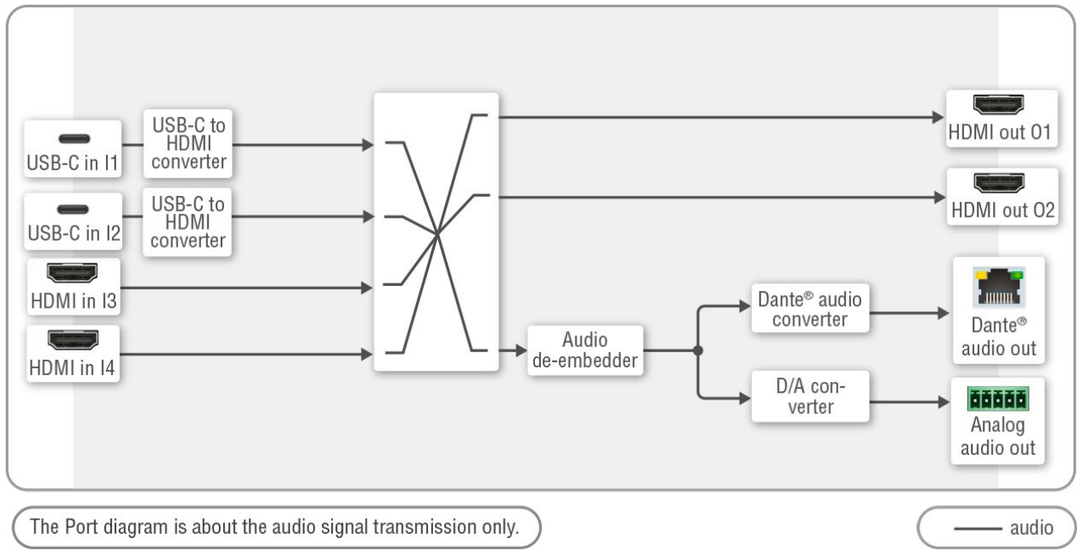
### Summary of Audio Ports

| | Audio Outputs | |
|---|---|---|
| | Analog audio de-embedding | Dante® |
| | 5-pole Phoenix Combicon | RJ45 |
| UCX-2x1-HC60 | ✓ | - |
| UCX-2x2-H60 | ✓ | - |
| UCX-4x2-HC60 | ✓ | - |
| UCX-4x2-HC60D | ✓ | ✓ |
| UCX-4x3-HC60 | ✓ | - |
| UCX-4x3-HC60-BD | ✓ | ✓* |
| SCX-2x1-HC60 | ✓ | - |

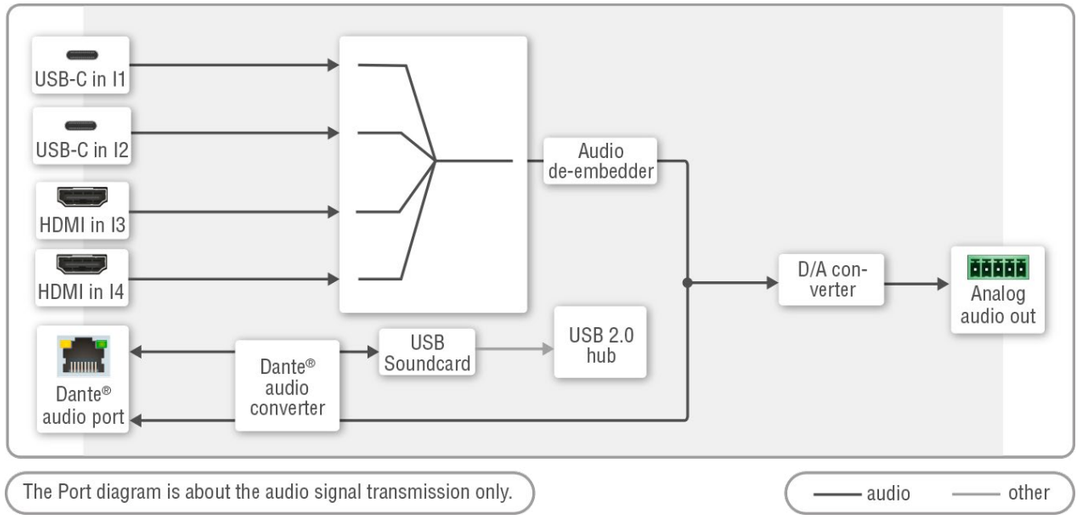
* The DANTE port is both input and output in case of the UCX-4x3-HC60-BD model.

INFO: The -LCC models have the same values as non-LCC models.

### Audio Port Diagram (UCX-4x2-HC60D)




### Audio Port Diagram (UCX-4x3-HC60-BD)




### 5.5.1. Analog Audio Interface

The device can receive embedded audio signal on the HDMI or USB-C inputs.

The switcher has a built-in audio de-embedder, which means the device is able to de-embed audio from its video ports to its analog audio output port.

**ATTENTION:** Audio can not be de-embedded from I1 to O3 as long as I3/I5* is in use. This is due to the mutually exclusive operation of I1 and I3/I5* ports. Embedded audio signal present will read false in the case described above.

*I3 in case of UCX-2x1-HC60, UCX-2x2-H60 and SCX-2x1-HC60; I5 in case of UCX-4x2-HC60, UCX-4x2-HC60D, UCX-4x3-HC60 and UCX-4x3-HC60-BD.

### 5.5.2. Dante® Audio Interface

**DIFFERENCE:** The following section refers to the UCX-4x2-HC60D and UCX-4x3-HC60-BD models.

The UCX-4x2-HC60D and UCX-4x3-HC60-BD models contain a special module that allows the de-embedding of the audio stream from the incoming HDMI signal and transmitting it as a 2-channel Dante® or AES67 source over the dedicated RJ45 connector. The chosen audio signal is mirrored to the analog audio port. *#dante #audio*

The same signal is sent to both analog and Dante® audio outputs. Both can be muted at the same time by changing the O3 port setting in the audio crosspoint: /MEDIA/AUDIO/XP/O3.Mute

The following command is exclusive to the analog port O3: /MEDIA/AUDIO/O3.Mute

INFO: In case of the UCX-4x3-HC60-BD model, the analog audio output port is O4.

**Supported Audio**

| Input audio type | Signal support |
|---|---|
| 2-ch LPCM ** | supported |
| Multichannel | not supported |
| Compressed DTS/Dolby | not supported |

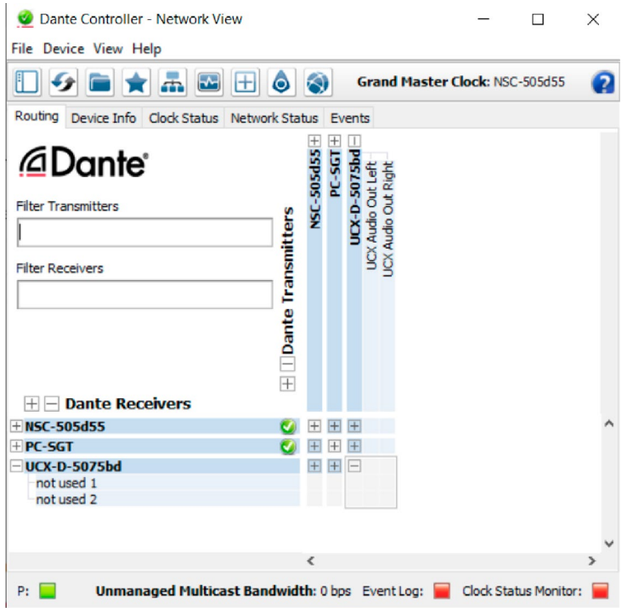
** The supported sample rates are 44.1, 48, 88.2 and 96 kHz.

Dante® is a registered trademark of Audinate Pty Ltd.

**Important Notes**

- The AES67 mode is supported by the UCX-4x2-HC60D and UCX-4x3-HC60-BD, which can be set in the Dante® Controller software.
- Multichannel or encoded audio format cannot be de-embedded. In this case, no audio is sent to the Dante® network.
- In case of UCX-4x3-HC60-BD, incoming Dante® audio is also processed without need for external DSP or Dante/USB dongle.

**Settings and Signal Routing**




All these features are available in the Dante® Controller software, which can be downloaded from the manufacturer's web page:

https://www.audinate.com/products/software

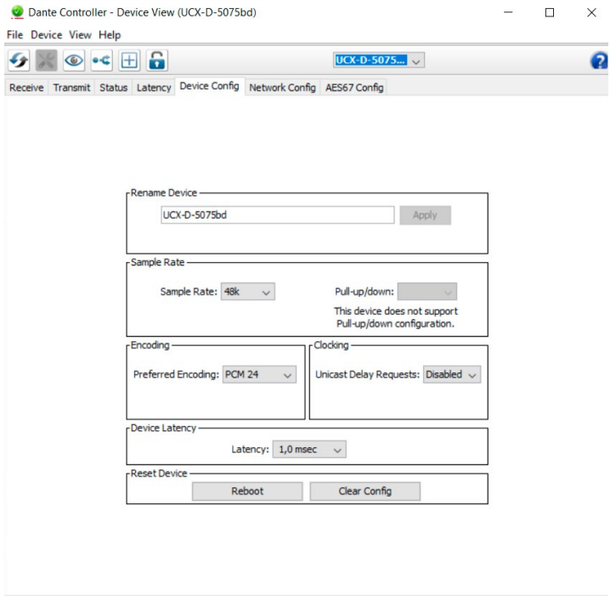
**Device Settings**

The discovered Dante®-compatible devices are displayed with middle-blue color. Double-click on the name to open the device settings.

The default device name is:

UCX-D-<Dante_MAC_address_last 6_characters>

It can be changed under the Device config tab. Similarly, the channel names can also be changed. NSC-01 is another device with Dante® audio interface.



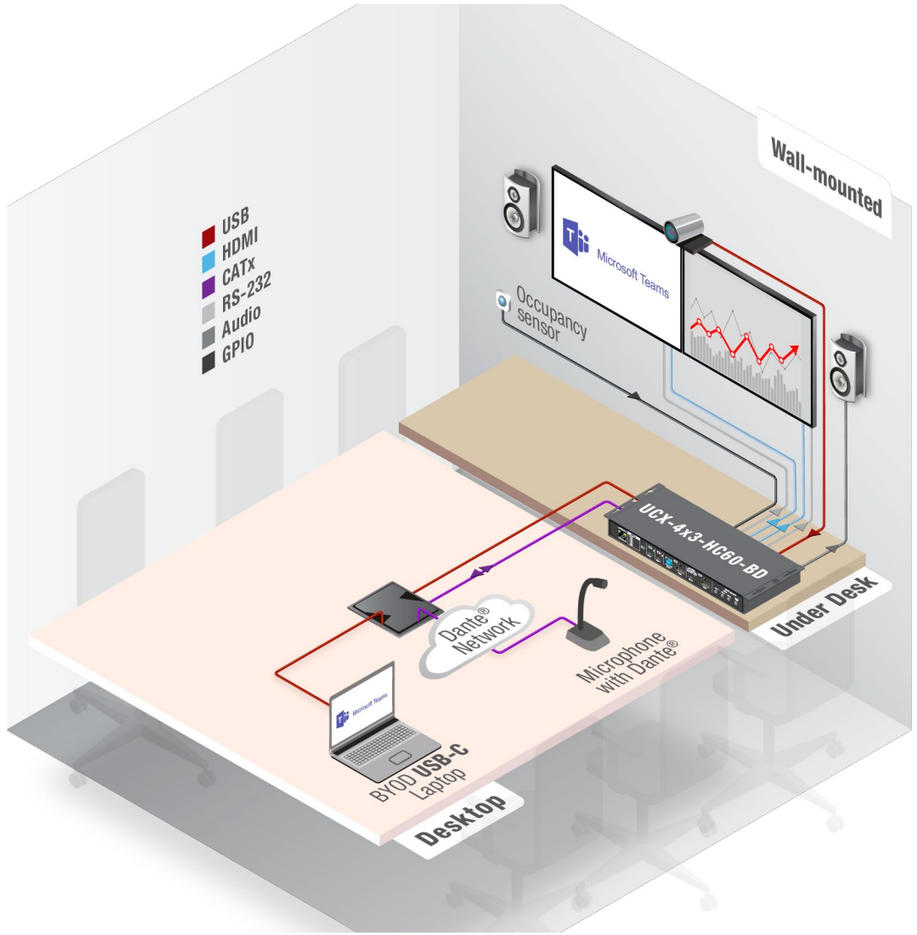

Press the 👁 button to identify the device: the LEDs of the RJ45 connector will blink six times in red.

## 5.5.3. Dante® Audio Input

**DIFFERENCE:** The following section refers to the UCX-4x3-HC60-BD model.

**USB-Audio Configuration**

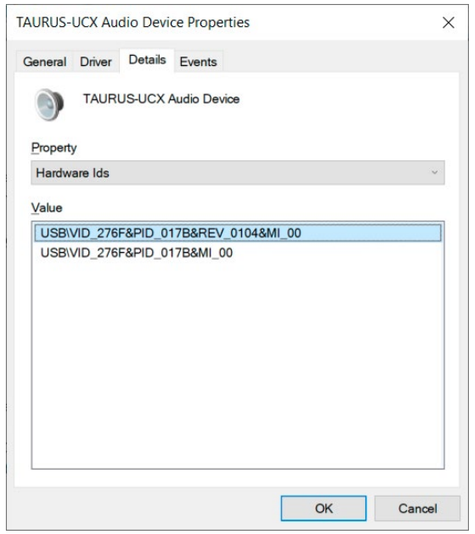
The USB crosspoint allows connecting the USB hub to one of the USB inputs (USB-C or USB-B). When a PC/laptop is connected to a USB input port, the Operating System (OS) of the computer will recognize the Dante® interface as a new Audio device (sound card). This feature allows assigning an Audio input device (e.g. microphone) to the PC/laptop connected to the USB port – over the Dante® network. A typical example is when a microphone is in the Dante® network (e.g. in the meeting room) and it can be used as an audio input device for the laptop during a meeting – see the figure below:



The module was designed to support special audio functions, too. Due to the differences between microphone types, the USB-Audio device class Terminal type can be changed. Thus, the OS will handle the microphone correctly. The desired Terminal type can be selected from the drop-dowm menu as follows:

| Audio Device Type | PID * | Description |
|---|---|---|
| Microphone (default) | 017B | A hands-free audio device designed for host-based echo cancellation. |
| Echo-suppressing microphone | 017A | A hands-free audio device with echo suppression capable of half-duplex operation. |
| Echo-canceling microphone | 0179 | A hands-free audio device with echo cancellation capable of full-duplex operation. |
| Line IO | 017C | For troubleshooting and testing purposes only. |

* The PID number is visible for the OS, see the example from Microsoft Windows 10:




This can be set in any of the following ways:

- Lightware Device Controller, see the USB-Audio Configuration section.
- REST API POST message, see the Setting the Audio Device Type for the Dante Input section.
- LW3 command, see the Setting the Audio Device Type for the Dante Input section.

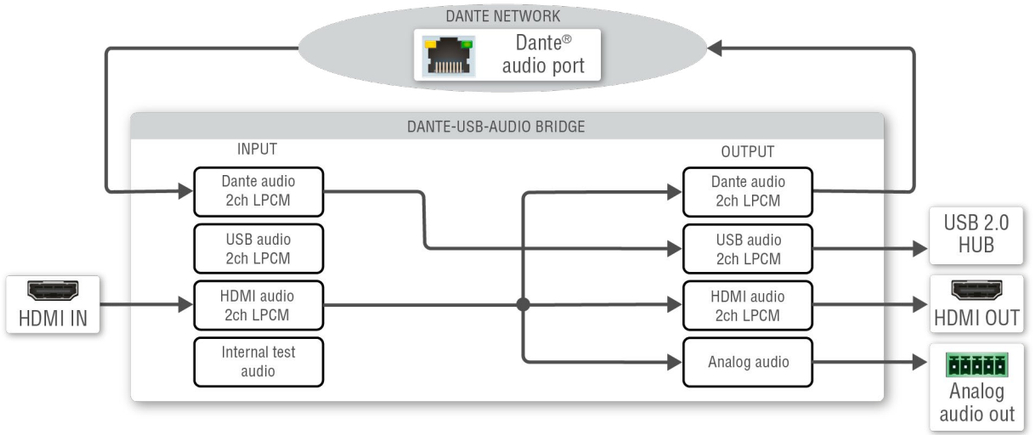
INFO: Please set the Audio Device Type according to the Microphone type.

### Signal Processing and Sampling

The Dante® USB-Audio Bridge is able to receive and send different audio formats. The following table sums up the internal working of the module:

| Input | | Internal signal processing | Output | |
|---|---|---|---|---|
| Format | Sampling Frequency (Fs) | | Sampling Frequency (Fs) | Format |
| HDMI audio 2ch LPCM | 22.5 - 192 kHz | Sampling Frequency = 48 kHz BitDepth = 32 bit/sample | 48 kHz | HDMI audio 2ch LPCM |
| SPDIF audio 2ch LPCM | 22.5 - 192 kHz | | 48 kHz | SPDIF audio 2ch LPCM |
| Dante® audio 2ch LPCM | 44.1 - 96 kHz | | Output Fs = Dante® input Fs | Dante® audio 2ch LPCM |
| USB audio (Host Playback) 2ch LPCM) | 48 kHz | | 48 kHz | USB audio (Host Playback) 2ch LPCM) |
| Internal test tone | 48 kHz | | 48 kHz | Internal test tone |

Here you can see a diagram of how the audio signals are routed within the Dante® USB-Audio bridge:




### USB Sound Card

The USB sound card in the device can be enabled or disabled, depending on the usage. If it is **enabled**, the OS will recognize it as a sound card, allowing a Dante® audio **input** device (e.g. microphone) to be assigned to the PC/laptop. If it is **disabled**, it allows for a Dante® audio **output** device (e.g. speakers) to be used.

Enabling or disabling the USB sound card is possible via the following ways:

- REST API POST message, see the Enabling/Disabling the Dante USB Sound Card section.
- LW3 command, see the Enabling/Disabling the Dante USB Sound Card section.

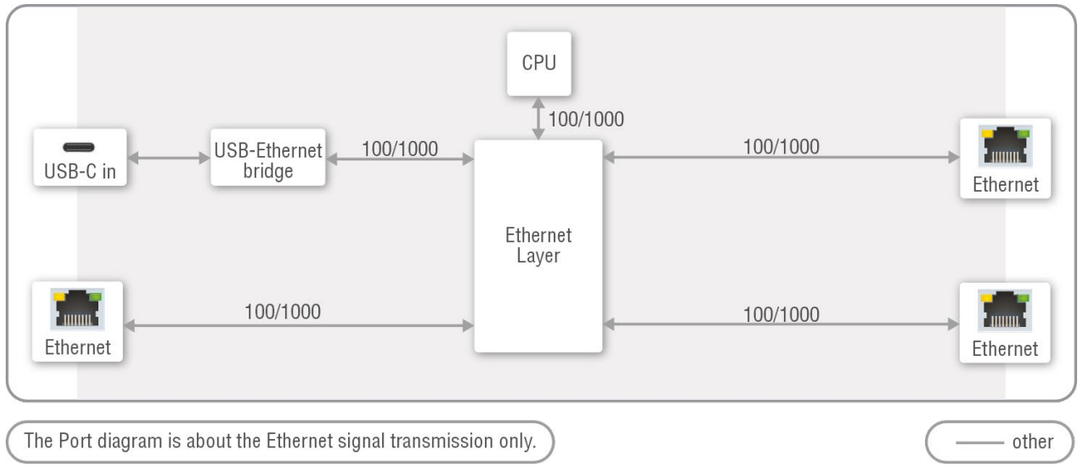
## 5.6. Ethernet Interface

**Summary of Ethernet ports**

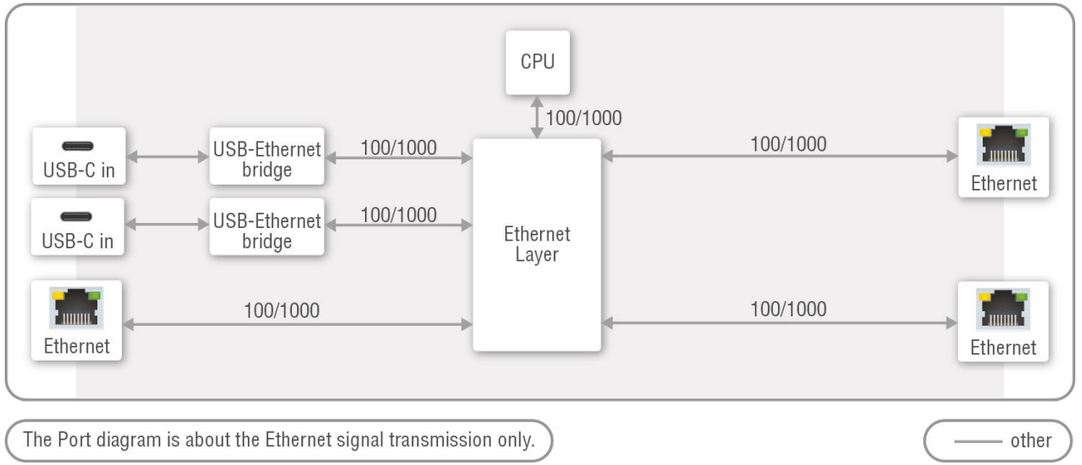
| | USB-C | Ethernet 1 | Ethernet 2 | Ethernet 3 |
|---|---|---|---|---|
| UCX-2x1-HC60 | 1x | ✓ | ✓ | ✓ |
| UCX-2x2-H60 | 1x | ✓ | - | - |
| UCX-4x2-HC60 | 2x | ✓ | ✓ | ✓ |
| UCX-4x2-HC60D | 2x | ✓ | ✓ | ✓ |
| UCX-4x3-HC60 | 2x | ✓ | ✓ | ✓ |
| UCX-4x3-HC60-BD | 2x | ✓ | ✓ | ✓ |
| SCX-2x1-HC60 | 1x | ✓ | ✓ | ✓ |

INFO: The -LCC models have the same values as non-LCC models.

**Ethernet Port Diagram (UCX-2x1-HC60, SCX-2x1-HC60)**




**Ethernet Port Diagram (UCX-4x2-HC60, UCX-4x2-HC60D, UCX-4x3-HC60, UCX-4x3-HC60-BD)**




The device can be controlled via Ethernet (standard RJ45 connector). This interface supports:

- Configuration of the device with Lightware Device Controller. For more information about the LDC, see the Software Control Options section.
- Control of the Lightware devices with LW3 command protocols. See more details about the Lightware protocol in the LW3 Programmers' Reference section.
- Establishing the connection to the Lightware Device Updater v2 software and performing Firmware Update.
- Creation of a local network, passthrough the Ethernet traffic.
- The switcher provides WS/WSS services on its 80 (for WS) and 443 (for WSS) ports to control the device with LW3 protocol commands. For more details, see the Lightware Crypto Core section.
- REST API interface is also desiged for controlling the UCX switcher. See more details in the Lightware REST API Reference section.

**USB-Ethernet Bridge**

The built-in USB-Ethernet bridge provides Ethernet for the USB-C connection. It is still available while the USB 3.1 Gen1 data channels are reserved for video or USB data transmission, as it uses the USB-2.0 layer.

**System Requirements of USB-Ethernet Bridge in -HC60 models**

The built-in USB- Ethernet bridge operates as a third-party USB Ethernet hub.

- Windows and MacOS X operation systems handle it plug and play.
- For the other operation systems, please find the driver on the following link: https://www.microchip.com/en-us/product/LAN9512

## 5.7. Lightware Advanced Room Automation (LARA)

Lightware Advanced Room Automation (LARA) is a future-proof room automation platform that enables controlling both Lightware and 3rd-party devices in a meeting room area and also accessing remote services over the network. LARA has an easy-to-use graphical interface that allows the integrators to set up and deploy their system and also helps the technicians and IT personnel to check the system status and diagnose possible errors. LARA comes with built-in touchscreen control support, where a fully customizable graphical interface can be provided to literally any modern touchscreen device.

LARA eliminates the need for an external controller unit or PC, as it is embedded into the Taurus UCX family. Because of the modular design, the integrators can build their system based on existing modules (drivers, touch screens, services and more) or create their own. Thanks to the approach of open source modules, the integrators can easily modify or extend the existing modules, or use them as a base for their new solutions.

With LARA, integrators can set up the behavior of the meeting room by creating rules and setting various parameters, there is an option to write codes. JavaScript is the most widespread language today, which has a steep learning curve and huge online community. By using the popular NodeJS engine, the integrators can rely on the public NPM repository (http://www.npmjs.org) and use the free packages available there.

We are working hard to release new functionalities regularly and make LARA more and more user-friendly.

**DIFFERENCE:** SCX-2x1-HC60 does not support LARA.

### 5.7.1. Opening the LARA interface

**ATTENTION:** When connecting to a device, you will need the 443 port for HTTPS connection, and optionally the 6107 port for raw TCP connection and the 80 port for HTTP connection.

**Step 1.** Enable LARA in your device. Navigate to the Settings/Services tab, then enable LARA via the checkbox.

INFO: As LARA is capable of running NodeJS scripts accessing your network, it is imperative to prevent open access that could be used by a malicious attacker.

**Step 2.** Open LARA in either of the following ways:
- Via the **Open LARA** button under the System tab in the LDC, or
- By typing http**s**://<ip_address>/lara into the address field of your browser. Even though any modern browser should work, we recommend using the latest Chrome or Safari versions. If you don't know the IP address of your device, please use Lightware Device Controller to discover it on your local network.

LARA does not run by default, however, once it starts, it will remain running even after resetting the device or closing the browser, until it is stopped by the user. It can be disabled in the LDC software. Please be aware that calling factory reset will erase LARA configurations.

While a graphical interface is available for most of the general functions, LARA offers the option to use it with JavaScript codes for every step and modification for both basic and more advanced task creation. Wizard and JavaScript code usage can easily be combined for maximum efficiency.

#### Help

the LARA User Manual is available by clicking on the **Help** button near the top right corner. If you have active Internet connection, the Manual is available either via the QR code or the clickable link beneath it.

### 5.7.2. Running LARA

LARA uses modules and their instances as basic building blocks of a configuration.

#### Modules

Modules are software pieces that give a base to the processes in the LARA interface. There are five module categories available as follows:

- **Driver**: a module connected to a certain device in the network
- **Logic**: a module for organizing the other modules into a system
- **Userpanel**: provides a user interface for the end user (e.g. tabletop control)
- **Service**: a module connected to a certain service in the network (e.g. calendar services)
- **Script**: any custom module for a specific purpose

LARA modules have access to the devices' every port, connection interface and the entire parameter library of the LW3 tree.

There are several pre-made modules that can be found in LARA for quick and easy system setup. These modules can be found in the **Browse Modules** menu by clicking on the **Create New** button and choosing one of the options from the **Base modules** drop-down list.

- **Taurus/MMX2 driver** module - for controlling the device
- **Taurus/MMX2 CEC driver** module - for sending CEC messages via the HDMI ports
- **Generic LW3 driver** module - for controlling another Lightware device that supports LW3 protocol
- **Generic TCP/IP driver** module - for controlling any device that is available via TCP/IP connection
- **Cisco Webex script** module - integration with Cisco Webex supporting BYOD (Bring Your Own Device) functions
- **OCS sensor serial message script** module - for sending a serial message to a device (e.g. Display) if the Occupancy Sensor detects a signal
- **Generic REST Client driver** module: universal module for controlling third-party devices over HTTP(S) REST API (PUT, POST, GET, DELETE)
- **Signal present serial message script** module - for sending a serial message to a device (e.g. Display) if a video signal is detected on a port

#### Instances

Modules can be run as instances. Different parameters may be added to different instances for the same module to include every possible process in the desired system.

Instances can communicate with each other using **Events** and **Methods**.

**ATTENTION:** It is currently only possible to run all instances together, or run none of them.

#### Events

Every instance can emit Events when something happens. An event is always momentary, it will be emitted immediately when something triggers it. An event can be used by other logic or user panel instances, or even by the same instance itself.

**Methods**

Methods are software pieces in any instance, which can be invoked (called) to initiate an activity in the associated room equipment.

**Rules**

Rules allow setting up processes according to changes in the state of the device. A status change might dispatch an **Event**, which can trigger a rule. The rule will then be able to execute an **Action** according to the triggering Event. When defining a new rule, a triggering Event must be selected. In case of Logic and Userpanel modules any instance can be chosen as the source of the Event. In other cases only the given module's own Events may be selected.

Once an Event has been dispatched that triggered a rule, an Action will be launched. An Action may have an unlimited number of steps defined.

### 5.7.3. Downloading/Uploading a Configuration

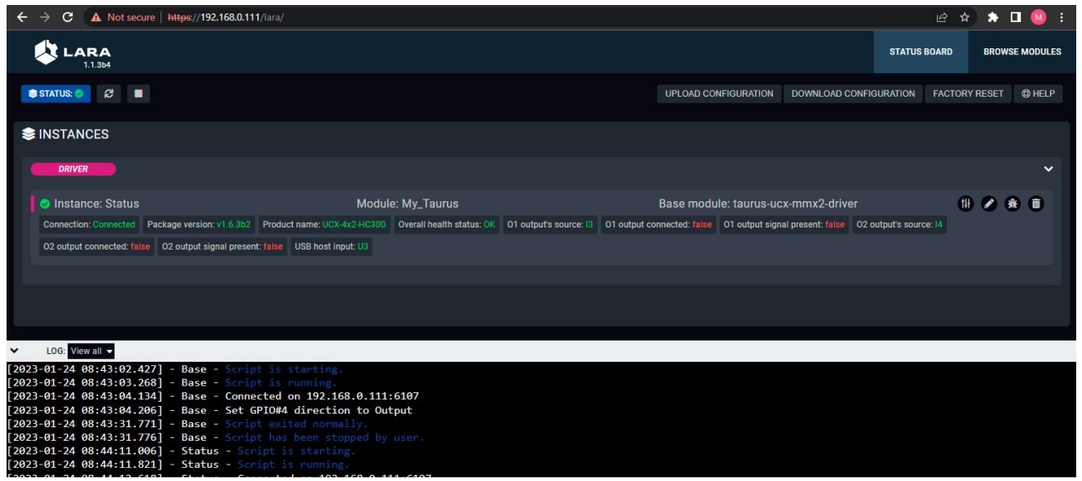
The modules, or even the entire configuration can be downloaded to the computer as a .zip file, or a previously saved configuration can be uploaded to a device.

**ATTENTION:** If the links to methods/properties are compatible with other models within the UCX/MMX2 product family, the configuration will work without a problem. However, sometimes a simple fine tune in the LW3 path of the properties/methods is necessary.

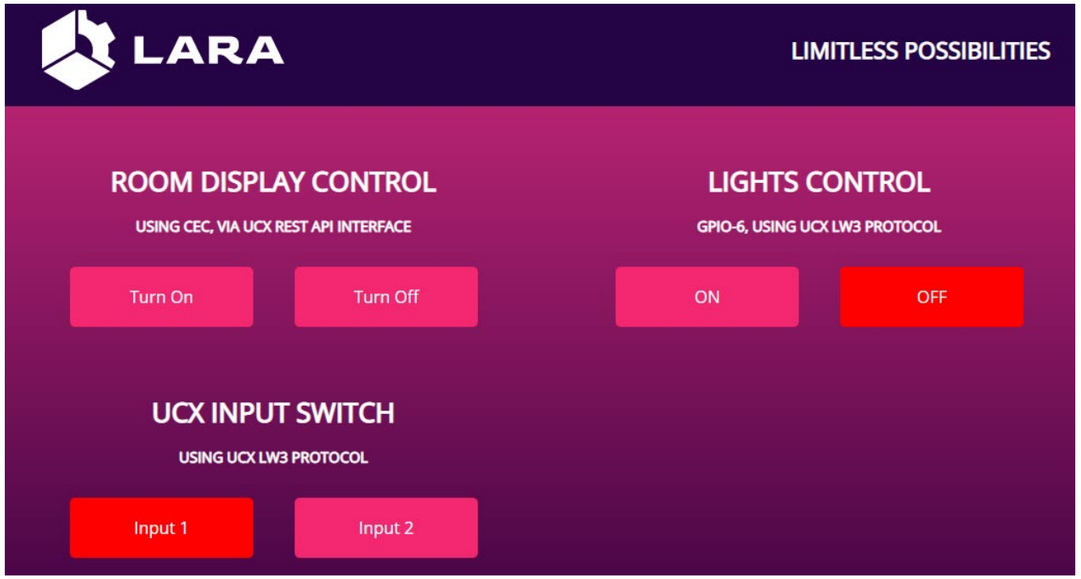
In case of downloading (and later uploading) a configuration of the module, these files are contained within the .zip file.

### 5.7.4. Status Board

The Status board offers real-time information about the connected devices through all running instances as Status Indicators. Such information might include connection status, signal presence, or even parameter status tracking. The indicators may show either static or self-refreshing information based on the current states of the device.




### 5.7.5. Touch Panel Support




LARA offers support for any touch panel device that has a browser installed on it. With the use of Userpanel modules, you can easily upload project specific HTML/CSS/JS files to your devices, and edit or change them in LARA in real time. There is a Content option under a Userpanel module for the purpose of uploading and editing these files. It is also possible to create folders and subfolders for easy organization. Uploading can be done by dragging and dropping the files into the content section.

For proper operation, in the HTML code a unique ID shall be assigned to every HTML element where LARA interaction is required.

For more information, sample configurations and training materials, please visit lightware.com/lara or take a look at the LARA User Manual.

**WARNING! Enabling LARA on your device will open TCP ports 20,000 to 30,000 for service deployment. These ports will not be protected or filtered by the device's firewall, making them accessible from the device's network interfaces. Please be aware that running services on these ports could expose potential vulnerabilities on the device. Make sure to only activate services that have undergone thorough testing and do not contain any vulnerabilities.**

## 5.8. Basic Network Security

These basic network security improvements help to prevent unauthorized access to the UCX series switchers:

- Disable Ethernet Ports
- Disable Network Services
- Basic Authentication
- Encription (HTTPS, WSS)
- Session Management (only in webLDC)
- Lightware Crypto Core

The following table summarizes the ports, protocols, features and the security options.

| Port number | Protocol | Function | Affected software | Port disable option | Encryption | Authentication | Other features |
|---|---|---|---|---|---|---|---|
| 80 | TCP | HTTP port (LW3 over WS, REST API, LARA user panels) | LDC, LDU2 | ✓ | × | ✓ | FW update, Welcome Screen image upload, Log files, Serial messaging |
| 443 | TCP | HTTPS port (LW3 over WSS, REST API, LARA management GUI) | LDC, LDU2 | ✓ | ✓ | ✓ | |
| 6107 | TCP | LW3 protocol | LDC | ✓ | × | ✓ | |
| 8001, 8002 | TCP | Serial over IP (RS-232) | - | ✓ | × | × | |
| 161 | UDP | SNMP | - | × | × | × | |
| 224.0.0.251: 5353 | UDP | mDNS / Bonjour (Device Discovery) | LDC, LDU2 | × | × | × | |
| 230.76.87.82: 37421 | UDP | Remote IP | LDC, LDU2 | × | × | × | |

INFO: The ports are necessary to be passed via a network switch/firewall for proper operation between the device and the softwares.

**ATTENTION:** Be careful when combining the security functions; improper settings may cause malfunction.

### 5.8.1. Disable Ethernet Ports

Internal Ethernet connections can be limited by enabling/disabling the Ethernet ports depending on the actual system configuration (e.g. Ethernet layer of the USB Type-C port can be disabled if necessary).

**ATTENTION:** Disabling the Ethernet layer of a USB-C port while it is in a VLAN (aside from IDs 1 and 2000) with only one Ethernet port connected to it will disable the Ethernet port as well. This happens because the Ethernet functionality of the two ports is connected as long as they are in a VLAN with only the USB-C and one selected Ethernet port in it.

### 5.8.2. HTTP/HTTPS

UCX series switcher provides HTTP/HTTPS server services on its 80 (for HTTP) and 443 (for HTTPS) ports. It makes it possible to use the following services via HTTP/HTTPS:

- LW3 over WebSocket (WS, WSS) for LW3 protocol or using LDC for device control
- REST API for device control
- Serial message sending with REST API
- Firmware update
- Uploading WelcomeScreen image
- LARA interface
- Downloading logfiles from the device

**ATTENTION:** LARA management GUI is only available through HTTPS and it is password-protected.

**DIFFERENCE:** SCX-2x1-HC60 does not support LARA.

**Basic Authentication**

Authentication is enabled by default. Password can no longer be disabled.

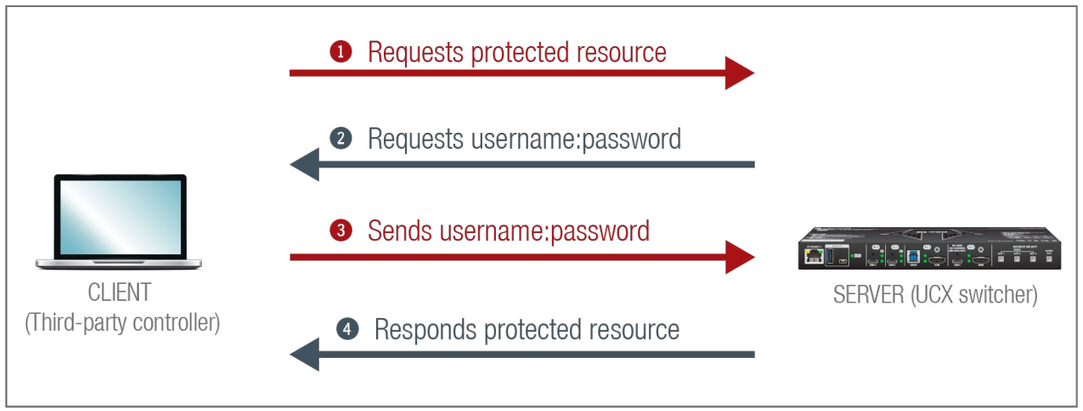
UCX-HC60 models have a **random generated factory default password** applied to the device during the manufacturing process. This unique password is supplied on a sticker along with the device.

**After a factory reset**, you will need the Username (admin) and the unique generated default password to login. After successfully logging into the device, you will be prompted to change the password.

To limit user access for HTTP/HTTPS server services, basic authentication can be turned on for the ports 80 and 443 separately.

**ATTENTION:** Authentication feature in UCX series is not equal to the Cleartext login feature in the Advanced Control Pack v3 of the TPS family extenders.

The picture below illustrates the successful authentication process:




**User**

- The switcher can manage one user (with fixed username: admin) with full access.

**Password**

- For the first time login, as well as after a factory reset, you will be able to log in using the unique generated password specific to your device. After a successful login, you will be prompted to change your password.
- The old password is required when password is changed.
- The password must be at least 10 characters long, and any UTF-8 character is allowed.
- Password history is maintained in the web authentication, not allowing for the last 10 passwords to be set again.
- If a wrong password is entered during login five times in a row, all login attempts are denied for 15 minutes.
- The device does not store the password string, so it can not be queried.
- The password can be reset to the default one by calling factory defaults (Reset to Factory Default Settings).

Follow the instructions to set the authentication:

**Step 1.** Set the password with Lightware Device Controller software (Network) or REST API command (Setting a Password for Authentication).

**Step 2.** Enable the authentication on the chosen port (HTTP: 80 or HTTPS: 443) with the Lightware Device Controller software (Network) or LW3 protocol command (Enabling the Authentication).

**Step 3.** Restart network services.

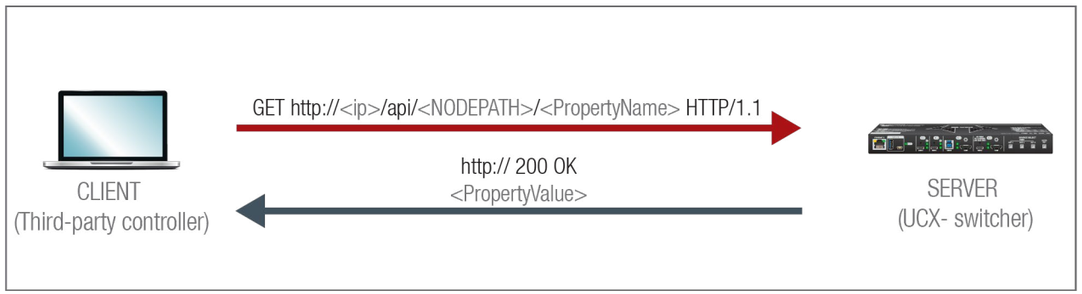
**ATTENTION:** The password will not be encrypted by this authentication mode, it remains accessible when the communication happens on HTTP.

**DIFFERENCE:** From FW version v2.22.12, it is possible to call a "soft" factory reset on the devices that restores most factory default settings, **except for example the login credentials (password)**. This is currently only available over REST API, for more information, please see the Configuration Parameters - Setting "Soft" Factory Reset section.

### 5.8.3. Encryption (HTTPS, WSS)

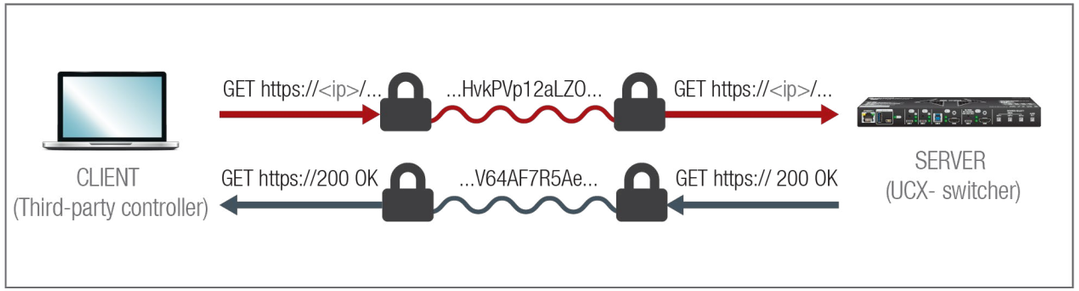
HTTP protocol uses clear text format for data transport. This method allows a third-party to listen in and eavesdrop on the transferred information.

**HTTP request-response**




To ensure the secure data transmission, the HTTP port (80) can be disabled, and the all the information can be transferred via HTTPS (443 port). HTTPS protocol encrypts the clear text, so it becomes incomprehensible for a third-party and keeps the data secure.

**HTTPS request-response**

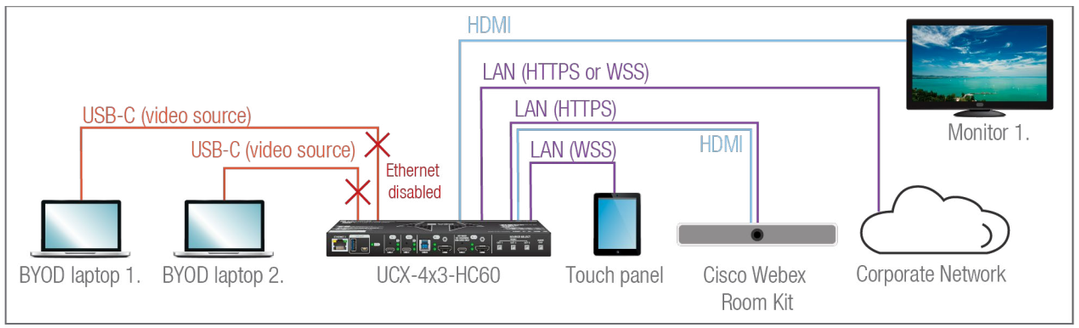



The same services are available on HTTPS as HTTP (for the detailed service list, see the HTTP/HTTPS section).

- The UCX series switcher generates a self-signed certificate, so the user does not have to deal with the configuration.
- SSL certificates can also be uploaded into the device (Certificate Management).
- A new certificate is generated after hostname changing or restoring the factory default settings.
- Please ensure proper UCX time and date setting in UCX, because it affects the self-signed certificate (SSL) generation when using WSS or HTTPS. Improper time and date setting may lead to certificate rejection.

**ATTENTION:** HTTPS does not guarantee that the communication is secure. Make sure that the client communicates with the server directly, without any third-party element in the communication route (Man-in-the-middle attack).

**Basic Security System Example**




To keep the system protected, the unsecured ports should be disabled and data traffic should be managed by secured channels.

**Step 1. Disable the Ethernet layer of the USB-C ports towards the laptops. The video and USB data transmission still work.**

The setting is available in the following ways:

- Lightware Device Controller software (see the details in the Ethernet section)
- Lightware REST API HTTP posts (see the details in the Network section)
- LW3 protocol commands (see the details in the Enabling/Disabling the Ethernet Port section)

**Step 2. Disable the HTTP port (80) and use HTTPS (443) instead.**

INFO: HTTP port is disabled by default.

The setting is available in the following ways:

- Lightware REST API HTTP posts (see the details in the Enabling/Disabling the Network Service Port section).
- LW3 protocol commands (see the details in the Enabling/Disabling the Service Port section).

**Step 3. Change the password.**

The username is always fix (admin). After a factory reset, the password reverts to the unique generated default password specific to your device. Changing the password is recommended after login.

The setting is available in the following ways:

- Lightware Device Controller software (see the details in the Network section)
- Lightware REST API HTTP posts (see the details in the Setting a Password for Authentication section).

**Step 4. Disable 6107 port, use Lightware REST API HTTPS (443 port) or WSS for LW3 protocol to control the device.**

The setting is available in the following ways:

- Lightware REST API HTTP posts (see the details in the Enabling/Disabling the Network Service Port section).
- LW3 protocol commands (see the details in the Enabling/Disabling the Service Port section).

**Step 5. Disable the remaining unsecured Serial over IP ports (8001 and 8002).**

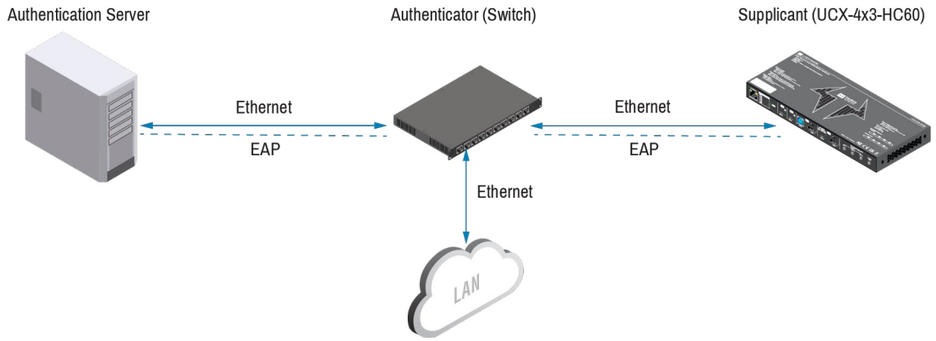
The setting is available in the following ways:

- Lightware REST API HTTP posts (see the details in the Enabling/Disabling the Network Service Port section).
- LW3 protocol commands (see the details in the Enabling/Disabling the Service Port section).

## 5.9. 802.1x Authentication

**ATTENTION:** 802.1x will only work properly if there is **exactly one** port in the Default VLAN. The authentication can still be turned on when several or none of the ports are in the Default VLAN, however, it will not operate properly.

802.1x is a server-based port authentication protocol that restricts unauthorized clients from accessing a LAN through a public port. Three parties make up the most basic setup of 802.1x: a supplicant (client device), an authenticator (Ethernet switch) and an authentication server. Before the device is permitted access to the network, port communication is restricted to Extensible Authentication Protocol over LAN (EAPOL) traffic.




After the device passes the authentication process, the authentication server notifies the switch, allowing the client to access the LAN.

The following method is available for 802.1x authentication in the UCX devices:

- **EAP-TLS**: This method utilizes Public Key Infrastructure to authenticate with an authentication server. To communicate with the server, a certification authority (CA) certificate and a client-side certificate that is signed by a known certification authority are needed.

The UCX itself can act as a supplicant, but also as a route through which a BYOD device can reach the authenticator as a supplicant.

INFO: Both the UCX and the BYOD device can be authenticated separately.

**ATTENTION:** If your device is using the **Dedicated** VLAN preset and the BYOD device is disconnected from the UCX, please be aware that the Ethernet port connected to the affected USB-C port will be blocked. You will be asked to authenticate again upon reconnecting a BYOD device. In **Transparent** mode the port blocking function is inactive.

INFO: When updating the firmware of the UCX device, sensitive information (passwords, keys etc.) on the authentication will not be downloaded into the backup file, but it will be retained in the device during the update.

## 5.10. Advanced Ethernet Security

This feature is a port-based VLAN setting, which allows the user to decide which network(s) the USB-C ports are connected to, and thus which network(s) the connected devices can use. This way the connected devices can be separated from the corporate network, increasing network security.

These application diagrams offer a simple breakdown of the different modes of the feature.

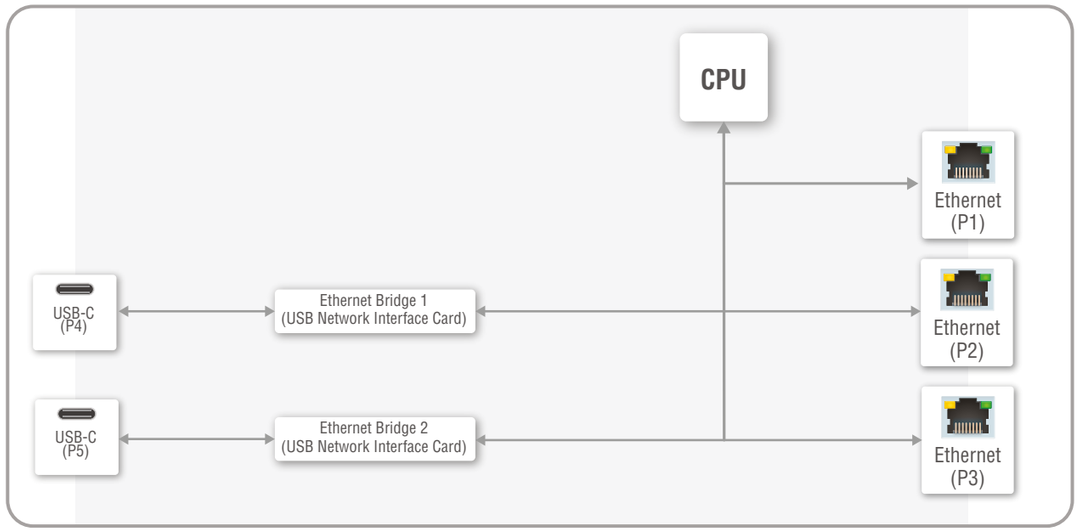
There are three options available, which are the following:

- **Transparent**: this is the default mode, with the network openly used by Taurus and the BYOD devices. If you want to authenticate the connected BYOD through 802.1x, this option is not recommended.
- **Separated BYOD**: the network provided for the BYOD devices is separated from the control network. If you want to authenticate the connected BYOD through 802.1x, then the 802.1x authenticator port must support multi-authentication.
- **Dedicated**: each connected BYOD device receives an indepentent network. If you want to authenticate the connected BYOD device(s) through 802.1x, the 802.1x authenticator port can be single-host, however make sure every BYOD is connected to the UCX via a CATx cable.
- **Custom:** the user can sort the Ethernet ports into separate groups.

INFO: Only one mode can be active at the same time.

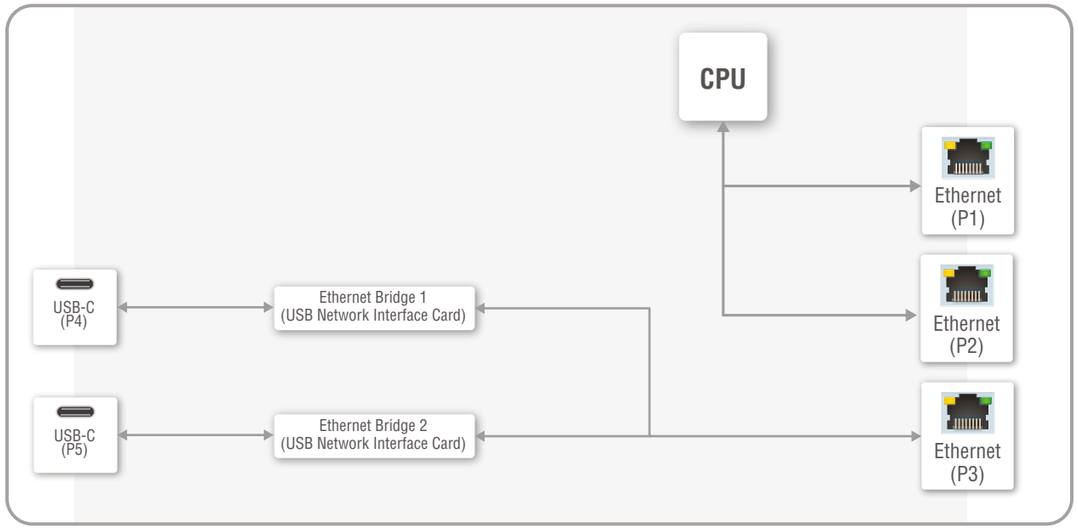
For more information about the feature, please visit our website (www.lightware.com) and download the Taurus UCX Advanced Ethernet Security Application Notes.

### 5.10.1. Transparent



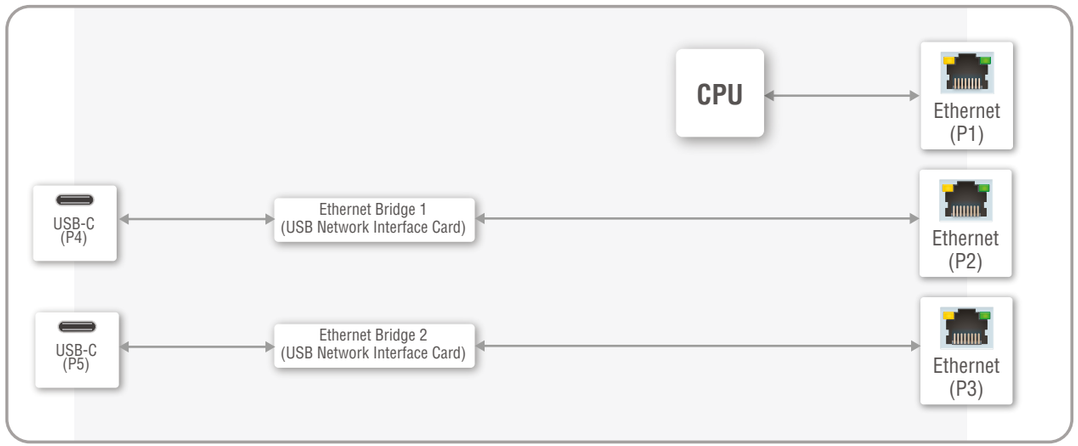

*Transparent VLAN preset in UCX-4x2-HC60(D)*

### 5.10.2. Separated BYOD




*Separated BYOD VLAN preset in UCX-4x2-HC60(D)*

### 5.10.3. Dedicated

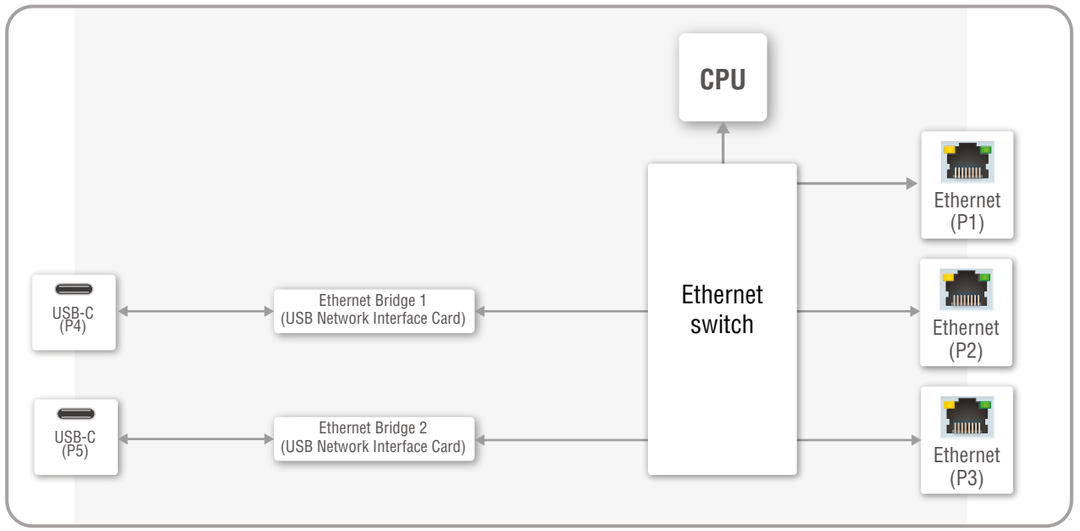



*Dedicated VLAN preset in UCX-4x2-HC60(D)*

### 5.10.4. Custom

The custom VLAN setting enables the user to set up their own Ethernet networks by putting the ports in separate groups. An Ethernet switch inside the device acts like a crosspoint for the Ethernet ports. Any VLAN setting that does not fall into the premade categories (Transparent, Separated BYOD or Dedicated) will be classified as **Custom**.

INFO: This mode cannot be directly chosen - it automatically changes to this mode when the settings are changed accordingly.




*Custom VLAN preset in UCX-4x2-HC60(D)*

#### Room LAN

**DEFINITION: Room LAN** is a VLAN Membership setting that creates an Ethernet port that is separated from the management interface while supporting controlled network behavior with separate, static MAC address and static IP allocation.

VLAN ID 2000 is reserved for Room LAN, which can be set via REST API (Enabling the Room LAN on an Ethernet Port) and LW3 (Enabling the Room LAN on an Ethernet Port) as seen below.

INFO: The CPU will appear with the **Main_3** MAC address within the Room LAN.

INFO: Internet access is not available from the Room LAN.

### Setting Up the Room LAN

Before setting up the Room LAN, you need to make sure it will have an IP address that you can reach. By default, it is set to DHCP, so if you have a DHCP server, you can skip ahead to Step 3.

However, without a DHCP server, you need to enable and set a static IP address before you enable the Room LAN (Step 1 and 2).

These settings currently can only be done via REST API or LW3 commands.

**Step 1. To enable Static IP, do the following:**

| REST API | LW3 |
|---|---|
| ➜ request-line: POST http://<ip_address>/api/EXPERIMENTAL/MANAGEMENT/NETWORKINTERFACES/ROOM/IPV4/STATIC/Enabled<br>➜ body: true | ▸ SET /EXPERIMENTAL/MANAGEMENT/NETWORKINTERFACES/ROOM/IPV4/STATIC.Enabled=true |

**Step 2. To set the static IP address and gateway, do the following:**

| REST API | LW3 |
|---|---|
| ➜ request-line: POST http://<ip_address>/api/EXPERIMENTAL/MANAGEMENT/NETWORKINTERFACES/ROOM/IPV4/STATIC/ConfiguredIpAddress<br>➜ body: <configured_ip_address> | ▸ SET /EXPERIMENTAL/MANAGEMENT/NETWORKINTERFACES/ROOM/IPV4/STATIC.ConfiguredIpAddress=<configured_ip_address> |
| ➜ request-line: POST http://<ip_address>/api/EXPERIMENTAL/MANAGEMENT/NETWORKINTERFACES/ROOM/IPV4/STATIC/ConfiguredGatewayAddress<br>➜ body: <configured_gateway> | ▸ SET /EXPERIMENTAL/MANAGEMENT/NETWORKINTERFACES/ROOM/IPV4/STATIC.ConfiguredGatewayAddress=<configured_gateway> |

**Step 3. Finally, enable the Room LAN/set the Room LAN ID on the desired port:**

| REST API | LW3 |
|---|---|
| ➜ request-line: POST http://<ip_address>/api/V1/MEDIA/ETHERNET/<ethernet_port>/VlanMembership<br>➜ body: 2000 | ▸ SET /V1/MEDIA/ETHERNET/<ethernet_port>.VlanMembership=2000 |

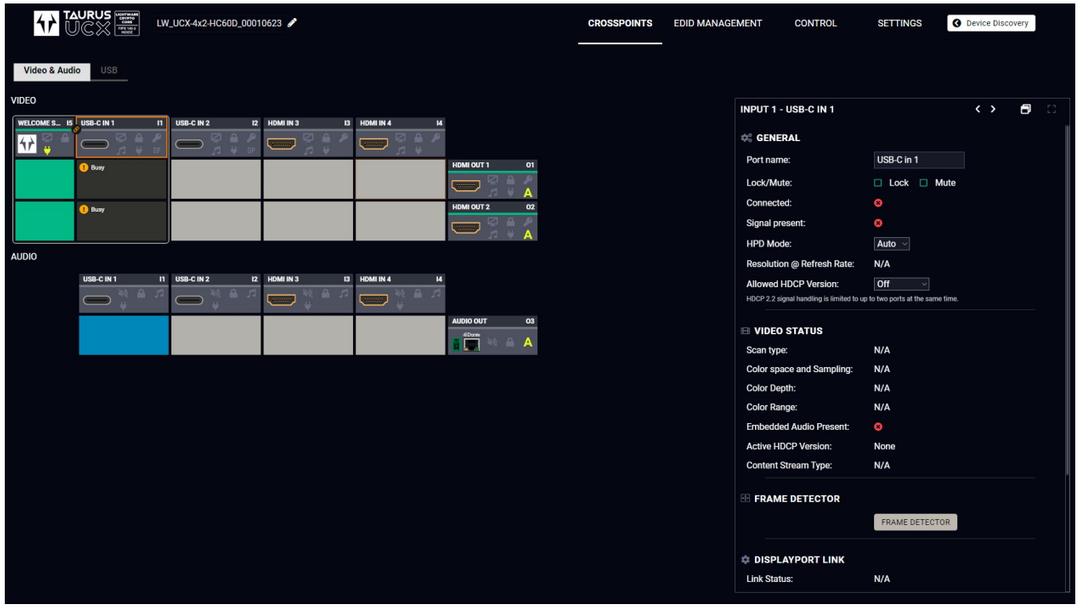
## 5.11. Lightware Crypto Core

Lightware Crypto Core (LCC) is a standards-based cryptographic engine for embedded Linux systems. The module delivers core cryptographic functions to the embedded systems of Taurus product family's hardware devices and features robust algorithm support.
*#fips*

It also offloads functions for secure key management, data integrity, data at rest encryption, and secure communications to a trusted implementation.

Lightware Crypto Core is Lightware's own FIPS 140-3-validated, Level 1-certified, cryptographic software module that is integrated into Taurus UCX products.

**DIFFERENCE:** This feature is only available in the -LCC models of the UCX family.



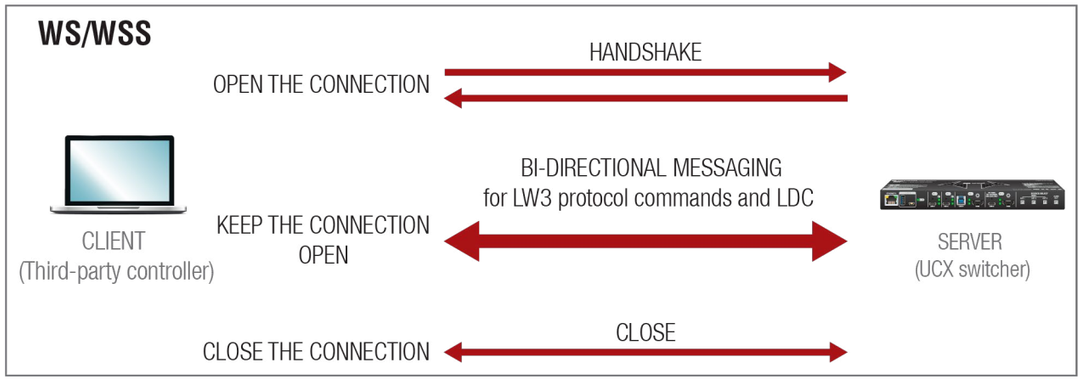

***FIPS validated devices have a visual indication in LDC next to the logo***

## 5.12. WebSocket Service (WS, WSS)

UCX series switcher provides WS/WSS services on its 80 (for WS) and 443 (for WSS) ports to control the device with LW3 protocol commands.

The UCX series switcher can manage 18 connected clients in total simultaneously for WS (80), WSS (443) and LW3 (6107) ports.

The WebSocket connection is built up by HTTP handshake. After the connection is established, communication switches to a bi-directional WebSocket protocol for LW3 communication.




The main difference between HTTP and WS communication process is that HTTP closes the connection between the client and the server after one request-response pair, while WebSocket keeps the connection open. This feature allows real-time communication such as **controlling the device with LW3 protocol commands**. The WS functions are also available via WebSocket Secure (WSS).

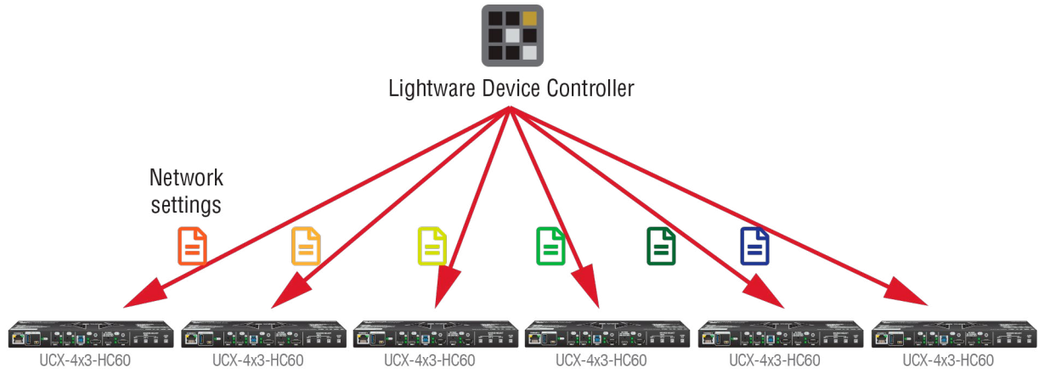
## 5.13. Bulk Device Management

It is possible to configure several devices at once with the Bulk Device Management tool. This feature can be accessed by clicking on the **Tools** button in the bottom left corner of the Device Discovery window of the LDC and choosing the Bulk Management option.

See the Bulk Device Management section for more details.

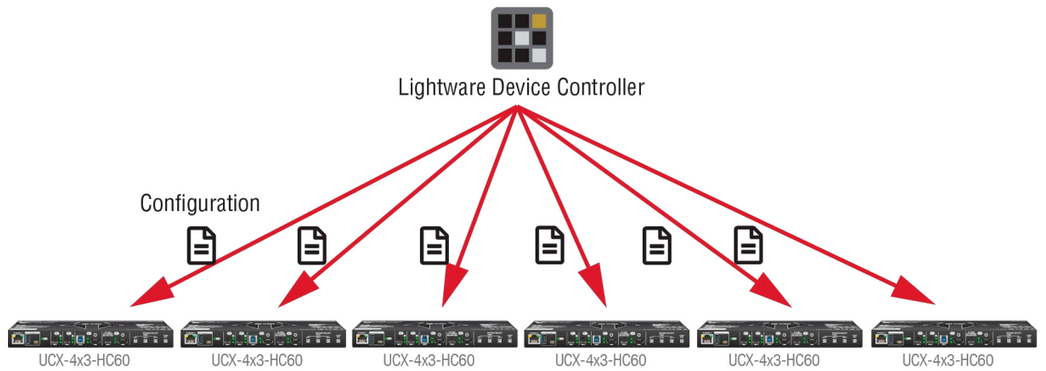
### 5.13.1. Network Settings

This function makes it possible to change and adjust the network settings of several devices at once (unique settings for each device), without having to set them at each device one by one. A .csv file can be created containing the list and desired settings of the devices and it can be uploaded into the LDC to be applied to the devices quickly.




### 5.13.2. Device Configuration

Here you can choose the devices that need to be configured, and upload a previously saved configuration to all of them at once. This is a helpful tool for quick and easy reconfiguration of the devices after a firmware update. This function allows uploading configurations to devices with the same firmware version, without changing their network settings.



## 5.14. Serial Interface

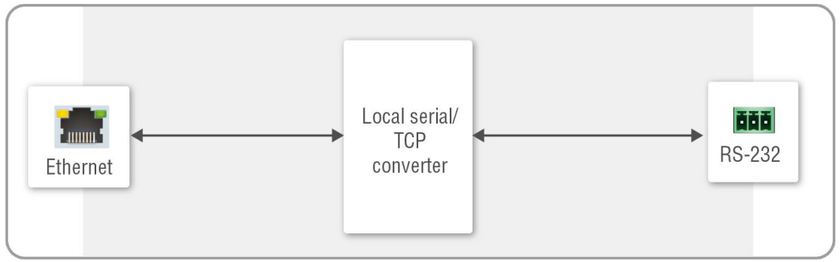
Serial data communication can be established via the local RS-232 port (Phoenix connector).

**Summary of Serial Ports**

| | UCX-2x2-H60 | UCX-2x1-HC60 | UCX-4x2-HC60 | UCX-4x2-HC60D | UCX-4x3-HC60 | UCX-4x3-HC60-BD | SCX-2x1-HC60 |
|---|---|---|---|---|---|---|---|
| RS-232 | 2x | 1x | 2x | 2x | 2x | 2x | 1x |

INFO: The -LCC models have the same values as non-LCC models.

### 5.14.1. Serial Port Diagram




The UCX switcher works as an RS-232 bi-directional converter. The TCP signal is converted to RS-232 data and vice versa. TCP/IP port numbers are defined for serial ports (8001, 8002) for this purpose. If a command is coming from the Ethernet interface that is addressed to the port no. 8001, it will be transmitted to the Tx pin of the local RS-232 port (P1). That works in the opposite direction too, and the method is the same on the serial interface of the Ethernet port as well, but the serial message will be transmitted to all opened TCP sockets (if the TCP connection closed meanwhile, the message will not be transmitted). It can handle a maximum of 20 connections at the same time.

**Disabling Serial over IP** function disconnects the Serial/TCP converter from the Ethernet layer and the serial data won't be transmitted to the Ethernet network. This setting is available in the Lightware Device Controller software (in the Settings menu, Network tab) or with LW3 protocol command (Enabling/Disabling the Service Port).

The switcher can manage a maximum of 20 connected clients at the same time for each serial port.

#### Message Sending Function

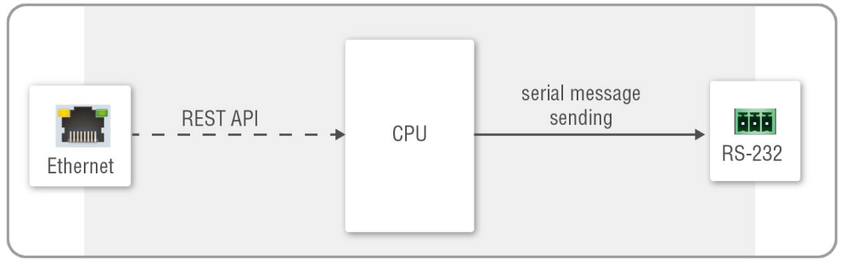
Message sending function allows RS-232 command sending to a third-party (or a Lightware) device from the Taurus UCX series. Any format is acceptable (text, binary, hexadecimal,etc.), maximum message size is 100Kb. Escaping is unnecessary.

Serial message sending is possible by using HTTP Post with Lightware REST API.

➜ header: POST·http://<ip>/api/V1/MEDIA/SERIAL/<serial_port>/send
➜ body: <message>

<serial_port> is P1 or P2.

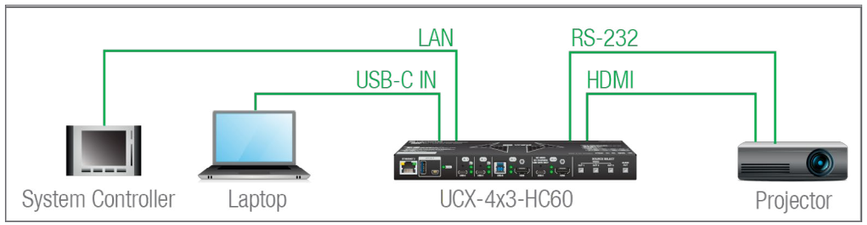
The CPU is available over REST API interface. The CPU sends the message via the serial port to a third-party (or a Lightware) device. This is a one-way communication, the response will not be interpreted by the CPU. Consider using Serial over IP function instead of listening to a serial device.




For more details about the Lightware REST API, see the Lightware REST API Reference chapter.

INFO: Taurus can receive a serial message in a special way. When a message is sent from the Taurus, the response from the connected device is accepted within 100 ms. The communication is closed after that time interval.

**Serial Options - Example**




#### External Controller Concept

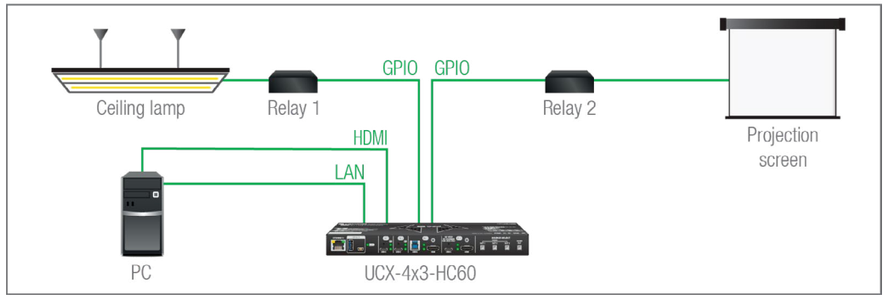
The projector is turned on and off by the external System Controller. The **System controller** has an internal REST API client, which is connected to the UCX switcher. It sends a HTTP POST to the **UCX-4x2-HC60D**. The **Switcher** sends a serial message over the P1 port to the **Projector**.

**Security:** When interpreting of the response from the projector is necessary, serial over IP port (8001 or 8002) can be enabled, in this case, the 8001 or 8002 ports are available from other devices too, and it makes the system unsecured.

## 5.15. GPIO Interface

The General Purpose Input/Output (GPIO) port is a multifunctional input/output interface to control the switcher or third-party devices and peripherals. You can establish the connection between the controller/ controllable device and the switcher via the 8-pole Phoenix connector. The direction of the six pins is configurable independently from each other.

**GPIO Options - Example**




The ceiling lamp is turned off by Relay 1 and the projection screen is rolled down by Relay 2. Both relays are controlled by the GPIO port.

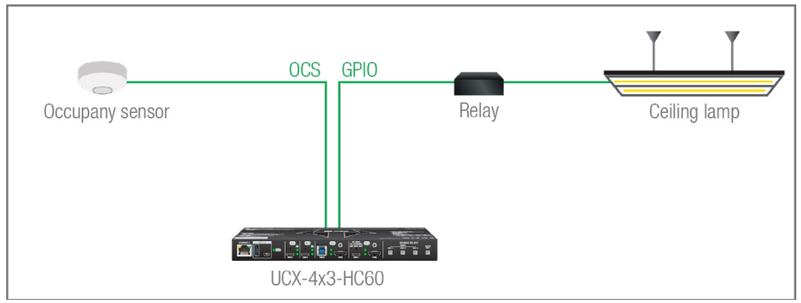
When the PC starts to play the video presentation, the signal is received over the HDMI input, so the GPIO pins send a signal to Relay 1 to open, which results in the lights being turned off. Furthermore, the GPIO pins also send a signal to Relay 2 to close and the projection screen is rolled down. When the presentation ends, signal ceases on the HDMI input, so the GPIO pins send a signal to Relay 1 to close, which results in the lights being turned on, and send a signal to Relay 2 to open, so the projection screen returns to its enclosure.

**ATTENTION:** Please always check the electrical parameters of the devices that you want to control. The maximum current of one GPIO pin is 30 mA, the maximum total current for the six pins is 180 mA.

## 5.16. OCS Interface

**OCS Application Example**

When the occupancy sensor detects people in the meeting room, the UCX switcher turns on the ceiling lamp.




## 5.17. Further Built-in Features

### 5.17.1. Device Cloning – Configuration Backup and Restore



The device (configuration) cloning of UCX series switcher is a simple method that eliminates the need to repeatedly configure certain devices to have identical (non-factory) settings. If the devices are installed in the same type of system multiple times, then it is enough to set up only one device to fit the user's needs and then copy those settings to the others, thus saving time and resources.

Cloning is possible between devices using the same firmware version. All LW3 settings, WelcomeScreen Image and LARA configurations will be saved.

Please note that the clone file can be downloaded and uploaded via HTTP or HTTPS, so 80 or 433 port has to be enabled.

See more information about the settings in the Clone configuration section.

### 5.17.2. SNMP Monitoring

**DIFFERENCE:** The SNMP monitoring functionality is available from FW version v2.23.0.

Enterprise IT teams work in SolarWinds and SNMP dashboards, not LDC and WebLDC. Prior to the feature, UCX devices were practically invisible to these systems, making monitoring them difficult and cumbersome.

This feature allows IT administrators to monitor UCX series switchers and access device and system health, as well as network interface status information without having to use specific API interfaces. SNMP managers (e.g. SolarWinds) are already used for network monitoring, and UCX devices are now compatible with such solutions.

UCX switchers are only compatible with SNMPv3 version. Requests from previous versions of the protocol are not recognized.

If the extender is in Transparent VLAN setup, the SNMP service uses the Default interface. If Management network is active, the SNMP service uses the Management interface.

SNMP monitoring is disabled by default, it can be enabled in the following ways:

- Lightware REST API HTTP messages (Enabling/Disabling SNMP Monitoring)
- LW3 command (Enabling/Disabling SNMP Monitoring)

#### Lightware SNMP API *#new*

##### Variant Independent Objects

The SNMP objects listed in this section are available on all devices.

The SNMP deamon provides metrics, status updates and other data by default. From the available default information, we are interested in **CPU** and **Memory** details:

| Service | SNMP Object | OID | Description |
|---|---|---|---|
| Memory usage | memAvailReal | 1.3.6.1.4.1.2021.4.6.0 | Free RAM memory in kilobytes |
| CPU usage | hrProcessorLoad | .1.3.6.1.2.1.25.3.3.1.2.x | CPU usage in percentage |
| Host name | sysName | 1.3.6.1.2.1.1.5.0 | Host Name |

INFO: **x** is the index of the desired CPU. It is possible that there are multiple CPUs, and that the index of the CPU starts at a seemingly random number. For this reason, it is recommended to use snmpwalk on .1.3.6.1.2.1.25.3.3.1.2 to list all available CPUs.

To provide custom information, the SNMP daemon or agent will be extended with specific LWR responses:

| Service | SNMP Object Name | OID | Description |
|---|---|---|---|
| Device Label | deviceLabel | .1.3.6.1.4.1.66014.1.1.1 | Device label |
| Serial number | serialNumber | .1.3.6.1.4.1.66014.1.1.2 | Serial number |
| Temperature | cpuTemperature | .1.3.6.1.4.1.66014.1.1.3 | CPU temperature |
| Health status | healthStatus | .1.3.6.1.4.1.66014.1.1.4 | Motherboard health status |
| Ethernet port up/down | p*LinkStatus | .1.3.6.1.4.1.66014.1.2.* | Link status of an ethernet port (i.e., V1/MEDIA/ETHERNET/p*.LinkUp) |

INFO: The asterisk (*) indicates the port index (1-based).

### 5.17.3. Remote System Logging

This feature allows system logs to be sent to an external log collector for remote analysis purposes. This makes supervising and troubleshooting the devices easier and more comfortable.

Logs may be sent using either TCP, UDP or TLS. In case of TLS only encrypted forwarding is provided, but no certificate validation is performed (anonymous TLS).

The following steps need to be taken to set up remote system logging:

**Step 1.** Set the destination hostname or IP address where the logs should be sent to

- Lightware REST API HTTP messages (Setting the Remote Server Address)
- LW3 protocol command (Setting the Remote Server Address)

**Step 2.** Set the network protocol used for forwarding

- Lightware REST API HTTP post (Setting the Protocol for the Remote System Logging)
- LW3 protocol command (Setting the Protocol for the Remote System Logging)

**Step 3.** Set the format of the logs

- Lightware REST API HTTP post (Setting the Format of the Remote System Logging)
- LW3 protocol command (Setting the Format of the Remote System Logging)

**Step 4.** Set the port number on the remote host to send log messages to

- Lightware REST API HTTP post (Setting the Port for Remote System Logging)
- LW3 protocol command (Setting the Port for Remote System Logging)

**Step 5.** Enable remote system logging

- Lightware REST API HTTP post (Enabling Remote System Logging)
- LW3 protocol command (Enabling Remote System Logging)

# 6

## Software Control Options

**Taurus device allows setting all the parameters via a user-friendly interface. Open a web browser (Google Chrome or Mozilla Firefox is highly recommended) and connect to the device to access the parameters and settings. The other option is to use the Lightware Device Controller (LDC) software and connect to the device without a web browser. The features are described in the coming sections.**


- Software Control Modes 65
- Using the Built-in Web 66
- Install and Update the LDC 66
- Running the LDC 67
- Establishing the Connection 67
- Bulk Device Management 69
- Video & Audio Crosspoint 71
- Port Properties Window 72
- CEC Tool 77
- USB Crosspoint 78
- EDID Menu 81
- Control Menu 83
- Settings Menu 86
- Advanced View Window 92

## 6.1. Software Control Modes

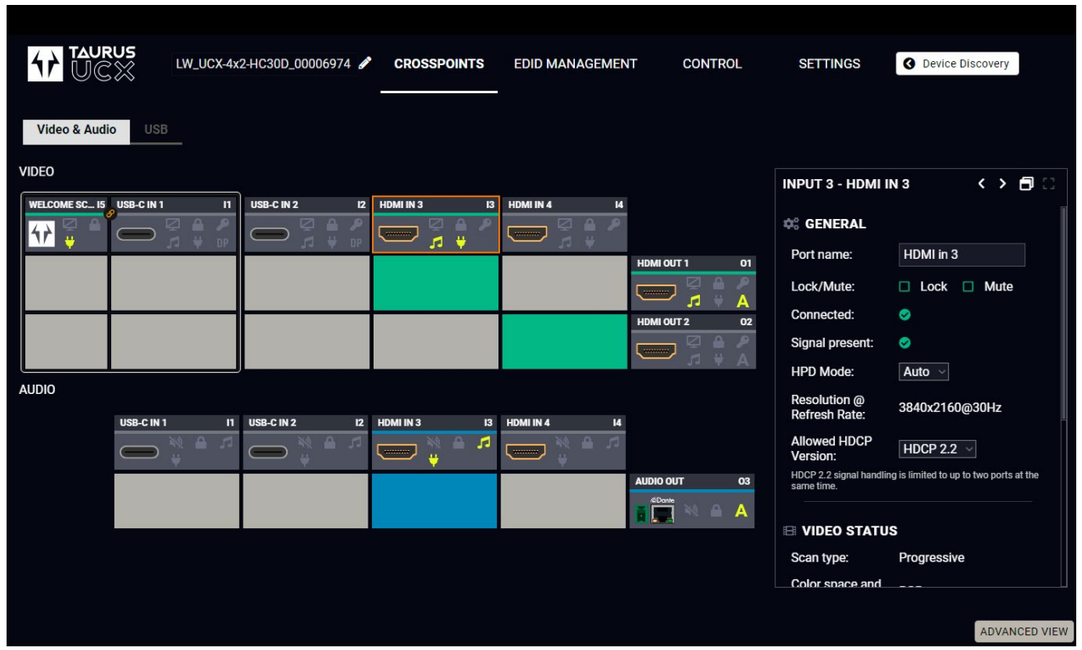
The device can be controlled in the following ways:

- Using the **built-in web page**,
- Using the **Lightware Device Controller (LDC)** software,
- Sending **REST API commands** (see the Lightware REST API Reference chapter), or
- Sending **LW3 commands** (see the LW3 Programmers' Reference chapter).

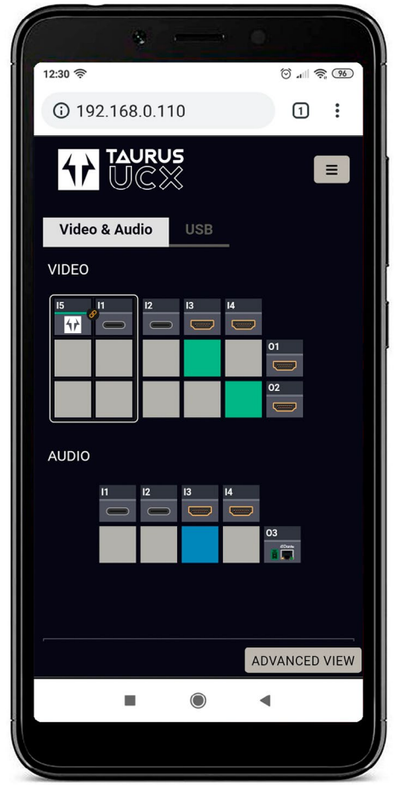
### Built-in web page vs. LDC

The LDC and the built-in web page shows the same content, but there are some minor differences:

| Function | Built-in Web | LDC |
|---|---|---|
| Platform | A Web browser running under Windows, macOS or Android | Windows, mac OS |
| Installation | Web browser needed only | Required |
| Device discovery | - | ✔ |




*The Main window – Displayed in LDC*




*The Main Window - Displayed on a Smartphone*

## 6.2. Using the Built-in Web

UCX devices can easily be controlled and configured without downloading and installing LDC, by utilizing the built-in web.

Connecting to the device is possible by typing its IP address into the URL of the browser.

**ATTENTION:** If a wrong password is entered during login five times in a row, all login attempts are denied for 15 minutes.

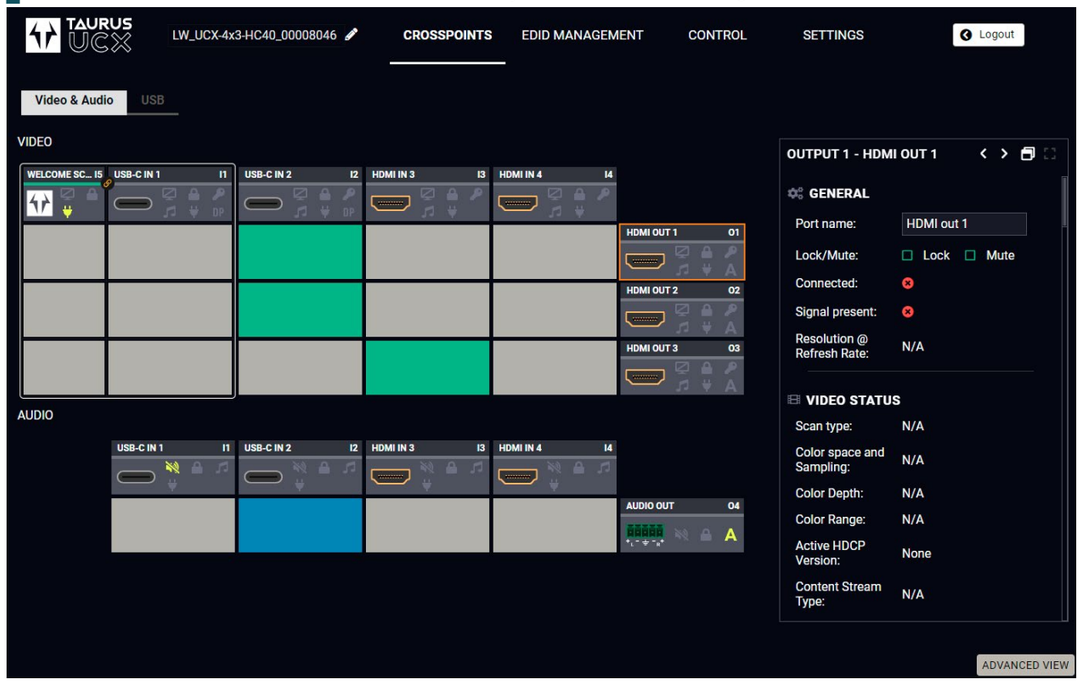
The layout of the built-in web is generally the same as the LDC, with a few differences:

- There is no **Device Discovery** button.
- There is a **Logout** button.

INFO: The **Logout** button will only appear if the device has a password and the user is logged in.

**ATTENTION:** The maximum length of a single session is **120 minutes**. If this time is up, you will be logged out, and the device will only be available upon logging in again.

**ATTENTION:** In case of **30 minutes** of inactivity the session will expire. The system will remind you in a pop-up window if the currrent session is about to expire five minutes before the time limit. If the reminder receives no answer, the session will restart and you will be forced to log out.




***The Logout button appears in the upper right corner upon login***

## 6.3. Install and Update the LDC

INFO: After the installation, the Windows and the Mac applications have the same look and functionality. This type of the installer is equal with the Normal install in case of Windows and results in an updatable version with the same attributes.

### Installation for Windows OS

Run the installer. If the User Account Control drops a pop-up message, click **Yes**.

During the installation you will be prompted to select the type of the installation: **normal** and the **snapshot** install:

| Normal install | Snapshot install |
|---|---|
| Available for Windows and macOS | Available for Windows |
| The installer can update only this instance | Cannot be updated |
| Only one updatable instance can exist for all users | More than one different version can be installed for all users |

***Comparison of installation types***

**ATTENTION:** Using the Normal install as the default choice is highly recommended.

### Installation for macOS

Mount the DMG file by double clicking on it, and drag the LDC icon over the Applications icon to copy the program into the Applications folder. If you want to copy the LDC into another location, just drag the icon over the desired folder.

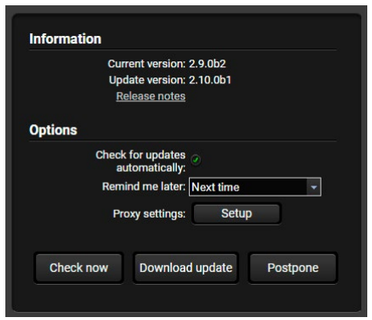
### Updating of LDC

**Step 1.** Run the application.

The **Device Discovery** window appears automatically, and the program checks the available updates on Lightware's website and opens the update window if LDC updates are found.

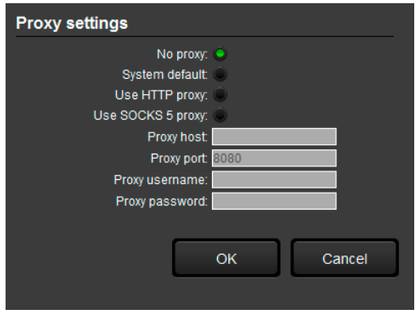
The current and the update version numbers can be seen at the top of the window and they are shown in this window even with the snapshot install.

The **Update** window can also be opened by clicking on the **About icon** and the **Update** button.



**Step 2.** Set the desired update setting in the **Options** section.

- If you do not want to check for the updates automatically, uncheck **the circle** that contains the green tick.
- If you want to postpone the update, a reminder can be set with different delays from the **drop down list**.
- If the proxy settings traverse the update process, set the proper values, then click on the **OK** button.

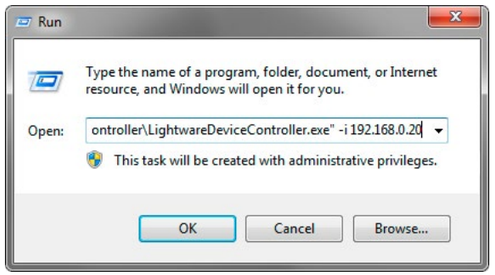



**Step 3.** Click on the **Download update** button to start the updating.

The updates can be checked manually by clicking on the **Check now** button.

## 6.4. Running the LDC

The common way to start the software is to double-click on the LDC icon. But the LDC can be run by command line parameters as follows:




### Connecting to a Device with Static IP Address

The LDC is connected to a device with the indicated static IP address directly; the Device Discovery window is not displayed. When the port number is not set, the default port is used: 6107 (LW3 protocol).

**Format:** `LightwareDeviceController -i <IP_address>:<port>`

**Example:** `LightwareDeviceController -i 192.168.0.20:6107`

### Adjusting the Zoom

The window can be zoomed to a specific value to fit to the resolution of the desktop (higher/lower). '1' is the default value (100%).

**Format:** `LightwareDeviceController -z <magnifying_value>`

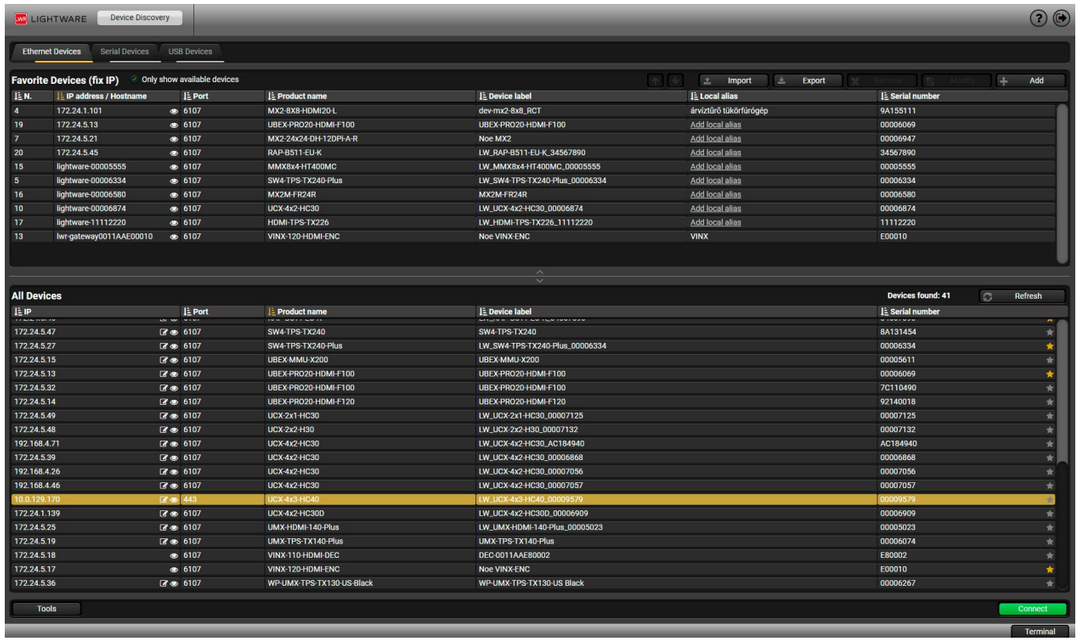
**Example:** `LightwareDeviceController -z 1.2`

**ATTENTION:** The last set value is stored and applied when LDC is started without a parameter.

## 6.5. Establishing the Connection

**Step 1.** Connect the device to a computer via Ethernet.

**Step 2.** Run the controller software; device discovery window appears automatically.




***Device discovery window in LDC***

The Ethernet tab consists of two lists. **All devices** list contains all Lightware devices that are available in the connected network. However, there is no need to browse all the available devices as you can expand the list of **Favorite devices** with any Lightware device that is connected via Ethernet in any of the following ways:

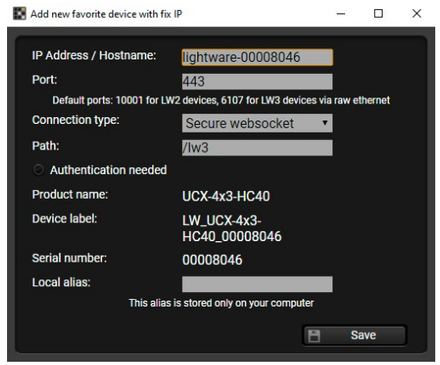
- Mark the desired device with the ★ symbol in the **All Devices** list,
- Press the **Add** button and add the device in the appearing window, or
- **Import** the list of favorite devices that was **exported** previously.

When both the 6107 and 80 ports are disabled, only the secure 443 port remains open, the UCX switcher appears in the all devices list with 443 port.

INFO: When several ports are enabled, the device will appear in the list with the most secure one available: 6107 < 80 < 443 (with 6107 as the least and 443 as the most secure).

**ATTENTION:** If a wrong password is entered during login five times in a row, all login attempts are denied for 15 minutes.

### Add New Favorite Device




Press the **Add** button; in the appearing window you can enter the **IP address**. The **hostname** of the desired device can be used instead, if it is supported. That allows setting a unique name to identify the device in a network. If the hostname is saved in this window and the IP address is changing, the device will still be available and connectible.

**ATTENTION:** The host name connection-feature does not work when the target device is accessed over VPN.

See more information about the host name property in the Setting the Host Name section.

### Import/Export the List of Favorite Devices

The list of favorite devices can be exported/imported by the dedicated buttons (saved as *.JSON file). The list can be imported later (in another computer, too), but please note that the current list will be overwritten by the imported list.

### Changing the IP Address




To modify the IP address settings quickly, it is not necessary to enter the device's settings/network menu, you can set them by clicking on the pencil icon beside the IP address.

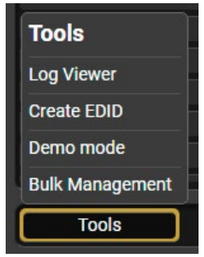
You can see the new settings only in this window. The device needs a few seconds to apply the new settings. *#ipaddress*

### Identifying the Device

Clicking on the icon results in the blinking of the status LEDs for 10 seconds. The feature helps to find the device itself physically.

## 6.6. Bulk Device Management

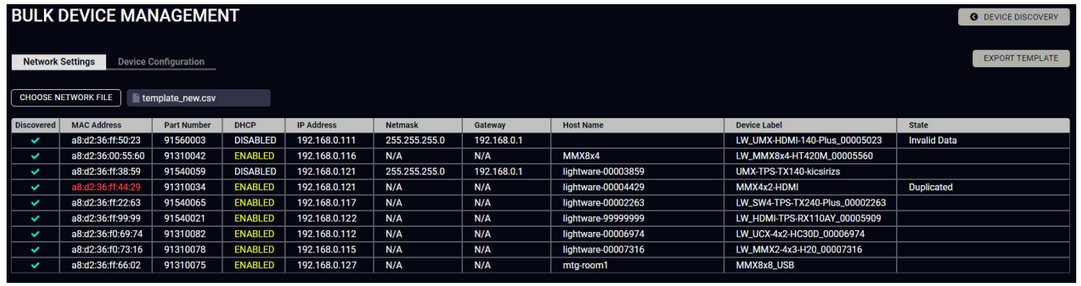
It is possible to configure several devices at once with the Bulk Device Management tool. This feature can be accessed by clicking on the Tools button in the bottom left corner of the Device Discovery window and choosing the Bulk Management option.




### 6.6.1. Network Settings

It is possible to set the network settings of several devices at once by using a .csv file that contains the list of the devices that we need to configure, then uploading it into the LDC.

Please note that if the data in the file is missing or incorrect, then the discovery of the affected device will fail and an '**Invalid data**' message will be displayed in the State column. In case of an IP or MAC address conflict, the message is '**Duplicated**'.




| MACADDRESS | PARTNUMBER | DHCP | IP | NETMASK | GATEWAY | HOSTNAME | DEVICELABEL |
|---|---|---|---|---|---|---|---|
| a8:d2:36:ff:50:23 | 91560003 | DISABLED | 192.168.0.111 | 255.255.255.0 | 192.168.0.1 | lightware-00005023 | LW_UMX-HDMI-140-Plus_00005023 |
| a8:d2:36:00:55:60 | 91310042 | ENABLED | 192.168.0.116 | 255.255.255.0 | 192.168.0.1 | MMX8x4 | LW_MMX8x4-HT420M_00005560 |
| a8:d2:36:ff:38:59 | 91540059 | DISABLED | 192.168.0.121 | 255.255.255.0 | 192.168.0.1 | lightware-00003859 | UMX-TPS-TX140-kicsirizs |
| a8:d2:36:ff:44:29 | 91310034 | ENABLED | 192.168.0.120 | 255.255.255.0 | 192.168.0.1 | lightware-00004429 | MMX4x2-HDMI |
| a8:d2:36:ff:22:63 | 91540065 | ENABLED | 192.168.0.117 | 255.255.255.0 | 192.168.0.1 | lightware-00002263 | LW_SW4-TPS-TX240-Plus_00002263 |
| a8:d2:36:ff:99:99 | 91540021 | ENABLED | 192.168.0.122 | 255.255.255.0 | 192.168.0.1 | lightware-99999999 | LW_HDMI-TPS-RX110AY_00005909 |
| a8:d2:36:f0:69:74 | 91310082 | ENABLED | 192.168.0.112 | 255.255.255.0 | 192.168.0.1 | lightware-00006974 | LW_UCX-4x2-HC30D_00006974 |
| a8:d2:36:f0:73:16 | 91310078 | ENABLED | 192.168.0.115 | 255.255.255.0 | 192.168.0.1 | lightware-00007316 | LW_MMX2-4x3-H20_00007316 |
| a8:d2:36:ff:66:02 | 91310075 | ENABLED | 192.168.0.127 | 255.255.255.0 | 192.168.0.1 | mtg-room1 | MMX8x8_USB |

Changing the network settings can be done in a few easy steps:

**Step 1.** First alter the settings you need to change in the .csv file that contains the devices. You can use a template file accessible via the **Export template** button and saving the file to your computer, then filling it out with the parameters of the devices. The file contains the MAC address, Partnumber, DHCP status, IP address, Netmask, Gateway, Hostname and Device label of each device.

**Step 2.** Upload the .csv file into the LDC by pressing the **Choose network file** button and browsing the file in the pop-up window. This will result in a list of the devices appearing on the screen.

**Step 3.** Finally, press the **Apply settings** button to execute the changes. This might take up to a minute to finish.

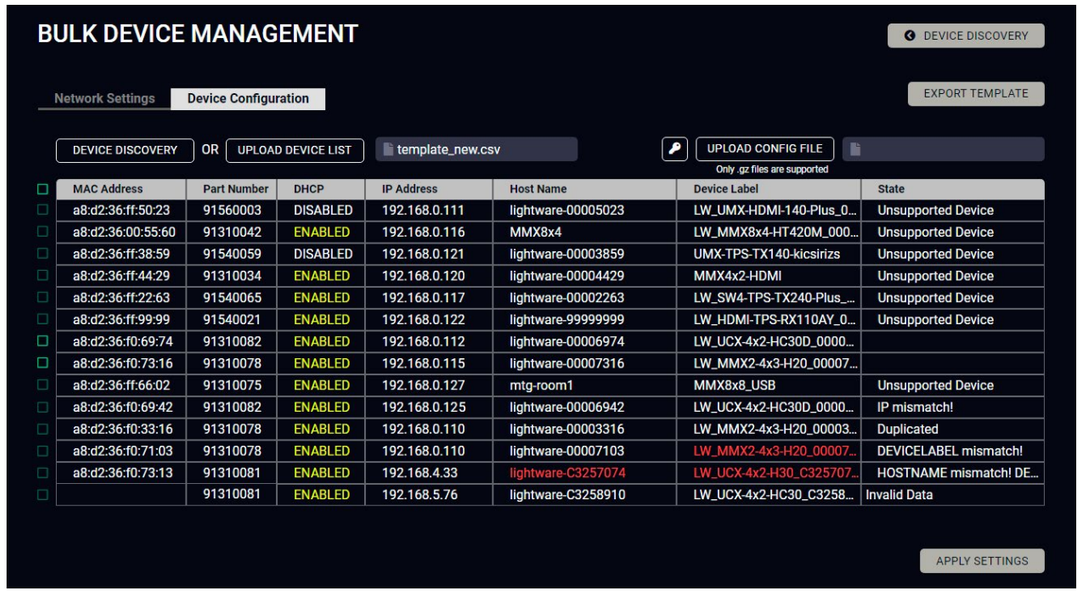



| Message | DHCP enabled | DHCP disabled | Device discovered |
|---|---|---|---|
| **All Done** | Successful procedure | | ✔ |
| **Partly Done** | Failure setting the Host name and/or the Device label | | ✘ |
| **Unavailable device** | Host name **and** Device label missing | IP address, Network, **and/or** Gateway missing | ✘ |
| **Failed** | Host name **and** Device label incorrect | IP address, Network **and** Gateway incorrect | ✔ |
| **IP mismatch** | - | Host name **and** Device label incorrect | ✘ |

**ATTENTION:** The '**Failed**' and '**IP mismatch**' status indicators are not common, they appear when the multicast and/or the port used for LMDMP connection is disabled, or if the firmware version of the device is below the recommended (see the pop-up window when opening the Bulk Management or the beginning of this chapter).

### 6.6.2. Device Configuration

Here you can choose the devices that need to be configured and upload a previously saved configuration to all of them at once. This is a helpful tool for quick and easy reconfiguration of the devices after a firmware update. This function allows uploading configurations to devices with the same firmware version, without changing their network settings.




| MAC Address | Part Number | DHCP | IP Address | Host Name | Device Label | State |
|---|---|---|---|---|---|---|
| a8:d2:36:ff:50:23 | 91560003 | DISABLED | 192.168.0.111 | lightware-00005023 | LW_UMX-HDMI-140-Plus_0... | Unsupported Device |
| a8:d2:36:00:55:60 | 91310042 | ENABLED | 192.168.0.116 | MMX8x4 | LW_MMX8x4-HT420M_000... | Unsupported Device |
| a8:d2:36:ff:38:59 | 91540059 | DISABLED | 192.168.0.121 | lightware-00003859 | UMX-TPS-TX140-kicsirizs | Unsupported Device |
| a8:d2:36:ff:44:29 | 91310034 | ENABLED | 192.168.0.120 | lightware-00004429 | MMX4x2-HDMI | Unsupported Device |
| a8:d2:36:ff:22:63 | 91540065 | ENABLED | 192.168.0.117 | lightware-00002263 | LW_SW4-TPS-TX240-Plus_... | Unsupported Device |
| a8:d2:36:ff:99:99 | 91540021 | ENABLED | 192.168.0.122 | lightware-99999999 | LW_HDMI-TPS-RX110AY_0... | Unsupported Device |
| a8:d2:36:f0:69:74 | 91310082 | ENABLED | 192.168.0.112 | lightware-00006974 | LW_UCX-4x2-HC30D_0000... | |
| a8:d2:36:f0:73:16 | 91310078 | ENABLED | 192.168.0.115 | lightware-00007316 | LW_MMX2-4x3-H20_00007... | |
| a8:d2:36:ff:66:02 | 91310075 | ENABLED | 192.168.0.127 | mtg-room1 | MMX8x8_USB | Unsupported Device |
| a8:d2:36:f0:69:42 | 91310082 | ENABLED | 192.168.0.125 | lightware-00006942 | LW_UCX-4x2-HC30D_0000... | IP mismatch! |
| a8:d2:36:f0:33:16 | 91310078 | ENABLED | 192.168.0.110 | lightware-00003316 | LW_MMX2-4x3-H20_00003... | Duplicated |
| a8:d2:36:f0:71:03 | 91310078 | ENABLED | 192.168.0.110 | lightware-00007103 | LW_MMX2-4x3-H20_00007... | DEVICELABEL mismatch! |
| a8:d2:36:f0:73:13 | 91310081 | ENABLED | 192.168.4.33 | lightware-C3257074 | LW_UCX-4x2-H30_C325707... | HOSTNAME mismatch! DE... |
| | 91310081 | ENABLED | 192.168.5.76 | lightware-C3258910 | LW_UCX-4x2-HC30_C3258... | Invalid Data |

Please note that if the data in the .csv file is missing or incorrect, then the discovery of the affected device will fail and an '**Invalid data**' message will be displayed in the State column. In case of an IP or MAC address conflict, the message is '**Duplicated**', or if the IP address is incorrect, '**IP mismatch!**'. '**Hostname mismatch!**' or '**Device label mismatch!**' appears if the respective values are incorrect.

Changing the configuration of the devices can be done in a few easy steps.

**Step 1.** Set the desired configurations in one of the devices, then clone your configuration in the **Settings** menu, under the **System** tab. Click on the **Download clone file** button in the right, set the file name in the pop-up window and press **Save**. Please note that this file is not available for offline editing.

**Step 2.** Go back to the Device Discovery screen of the LDC, click on the **Tools** button in the bottom left corner and select the **Bulk Management** option.

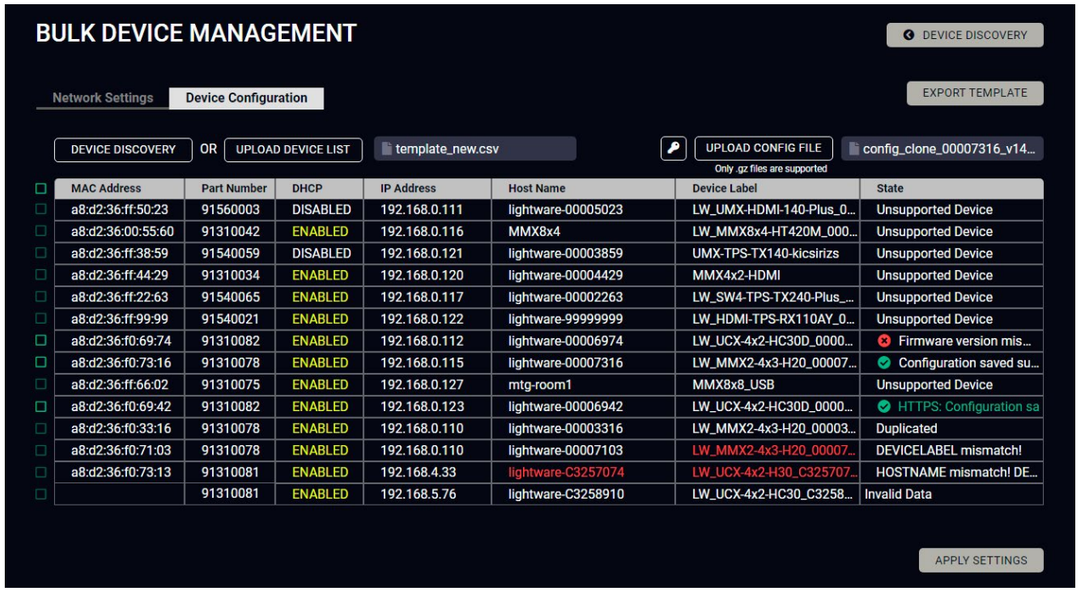
**Step 3.** Select the Device Configuration tab, then press the black **Device discovery** button for the LDC to list all compatible devices, or upload a device list that has been created beforehand. For such a file, you can use a template by clicking on the **Export template** button and saving it to your computer, see in the previous section. You can upload this file into the LDC by clicking on the **Upload device list** button, browsing the desired file and pressing the **Open** button.

**Step 4.** Once uploaded, you can further select devices from the list to be configured or you can change settings in all of them by ticking the box next to the head of the list.

**Step 5.** To change the configuration of the devices, you need to upload a configuration file previously saved from a device with the same firmware version via the **Upload config file** button. Browse the file in the pop-up window and press **Open**.

**Step 6.** In order to upload a configuration to a device that has authentication, it is necessary to fill out the credentials. This can be done via the **Credential Details** button (key icon in case of a smaller window). LDC will attempt uploading the configuration over HTTPS first, if that fails, it will attempt it over HTTP.

**Step 7.** Click on the **Apply settings** button in the lower right corner to start the reconfiguration procedure.




| MAC Address | Part Number | DHCP | IP Address | Host Name | Device Label | State |
|---|---|---|---|---|---|---|
| a8:d2:36:ff:50:23 | 91560003 | DISABLED | 192.168.0.111 | lightware-00005023 | LW_UMX-HDMI-140-Plus_0... | Unsupported Device |
| a8:d2:36:00:55:60 | 91310042 | ENABLED | 192.168.0.116 | MMX8x4 | LW_MMX8x4-HT420M_000... | Unsupported Device |
| a8:d2:36:ff:38:59 | 91540059 | DISABLED | 192.168.0.121 | lightware-00003859 | UMX-TPS-TX140-kicsirizs | Unsupported Device |
| a8:d2:36:ff:44:29 | 91310034 | ENABLED | 192.168.0.120 | lightware-00004429 | MMX4x2-HDMI | Unsupported Device |
| a8:d2:36:ff:22:63 | 91540065 | ENABLED | 192.168.0.117 | lightware-00002263 | LW_SW4-TPS-TX240-Plus_... | Unsupported Device |
| a8:d2:36:ff:99:99 | 91540021 | ENABLED | 192.168.0.122 | lightware-99999999 | LW_HDMI-TPS-RX110AY_0... | Unsupported Device |
| a8:d2:36:f0:69:74 | 91310082 | ENABLED | 192.168.0.112 | lightware-00006974 | LW_UCX-4x2-HC30D_0000... | Firmware version mis... |
| a8:d2:36:f0:73:16 | 91310078 | ENABLED | 192.168.0.115 | lightware-00007316 | LW_MMX2-4x3-H20_00007... | Configuration saved su... |
| a8:d2:36:ff:66:02 | 91310075 | ENABLED | 192.168.0.127 | mtg-room1 | MMX8x8_USB | Unsupported Device |
| a8:d2:36:f0:69:42 | 91310082 | ENABLED | 192.168.0.123 | lightware-00006942 | LW_UCX-4x2-HC30D_0000... | HTTPS: Configuration sa |
| a8:d2:36:f0:33:16 | 91310078 | ENABLED | 192.168.0.110 | lightware-00003316 | LW_MMX2-4x3-H20_00003... | Duplicated |
| a8:d2:36:f0:71:03 | 91310078 | ENABLED | 192.168.0.110 | lightware-00007103 | LW_MMX2-4x3-H20_00007... | DEVICELABEL mismatch! |
| a8:d2:36:f0:73:13 | 91310081 | ENABLED | 192.168.4.33 | lightware-C3257074 | LW_UCX-4x2-H30_C325707... | HOSTNAME mismatch! DE... |
| | 91310081 | ENABLED | 192.168.5.76 | lightware-C3258910 | LW_UCX-4x2-HC30_C3258... | Invalid Data |

The list will be updated when the configuration procedure is finished, where in case of success, the '**Configuration saved successfully**' message will be displayed in the State column.

Please note that a configuration can only be applied to a device with the same firmware version, otherwise the '**Firmware version mismatch**' error message will appear under the State column.

If the configuration is applied to a different variant, the '**Variant mismatch**' error message will appear.

If the network settings are incorrect, applying the configuration will fail, and the message '**Incorrect network settings**' will appear under the State column.

For more details about saving a configuration, see the Clone configuration section.

If a device that is in the list is not connected to the network or its IP address is incorrect, the software will fail to detect it, and will display a '**Failed to fetch**' message in the State column when applying settings.

## 6.7. Video & Audio Crosspoint

*#crosspoint #switch*




| | | |
|---|---|---|
| 1 | **Main menu** | The available menu items are displayed. The active one is shown with dark grey background color. |
| 2 | **Information ribbon** | The label shows the device label, which can be edited in the Settings menu - Status tab. |
| 3 | **Submenu selector** | The audio and video crosspoint menu and the USB crosspoint menu are available under the two tabs. |
| 4 | **Video input ports** | Each tile represents a video input port: Welcome Screen, USB-C Inputs, HDMI Video Inputs. The tile below the port shows the current crosspoint setting; if the port is switched to the output, the color of the tile is green, otherwise grey.<br>Clicking on the tile opens the input properties window. |
| 5 | **Audio input ports** | Each tile represents an audio input port. All of them are logical audio ports, they mean the de-embedded audio channel of the selected USB-C/HDMI inputs. For more details, see Embedded Audio Input. |
| 6 | **Audio output port** | Analog audio output port; clicking on the tile opens the Analog Audio Output window. The de-embedded audio is mirrored to the Dante Audio Output in case of UCX-4x2-HC60D. |
| 7 | **Video output ports** | HDMI video output ports; clicking on the tile opens the HDMI Video Output port properties window. |
| 8 | **Advanced view** | Displaying the Advanced View Window, showing the Terminal window and the LW3 protocol tree. |
| 9 | **Properties window** | Settings and status information of the selected panel are displayed in this section. Clicking on the icon opens the properties section in a new window. |
| 10 | **Navigation button** | The device discovery window can be displayed by clicking on this button. |

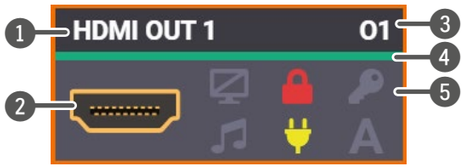
**ATTENTION:** Video crosspoint has a limitation: I1 and I3/I5* ports are not available at the same time, only one of them can be selected to any output. The **Busy** label on the crosspoint tile refers to the limitation. When I3/I5* is selected for the video source, the de-embedded audio of the I1 is not available because of the video crosspoint limitation. For more details about it, see the port diagram in the Audio Interface section.

*I3 in case of UCX-2x1-HC60, UCX-2x2-H60 and SCX-2x1-HC60; I5 in case of UCX-4x2-HC60, UCX-4x2-HC60D, UCX-4x3-HC60 and UCX-4x3-HC60-BD.

TIPS AND TRICKS: Hover the mouse cursor over the information ribbon; the **device label** and the **IP address** of the device will appear as a tooltip text.

### 6.7.1. Port Tiles

The colors of the port tiles and the displayed icons represent different states and information:




1. Port name
2. Port symbol
3. Port number
4. Signal present indicator
   **green:** present
   **grey:** not present
5. State indicators

**State Indicators** *#lock #unlock #mute #unmute*

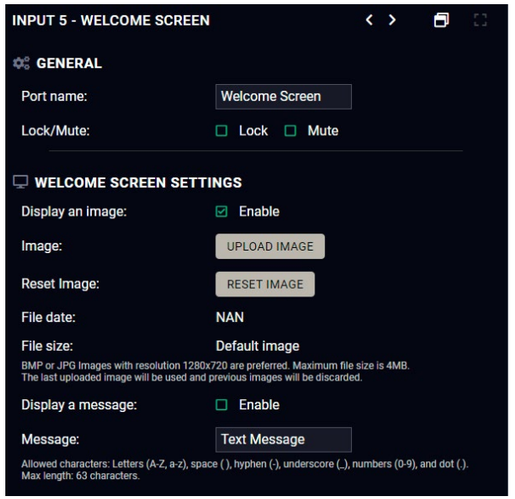
The following icons display different states of the port/signal:

| Icon is grey | Description | Icon is highlighted | Description |
|---|---|---|---|
| | Port is unmuted | | Port is muted |
| | Port is unlocked | | Port is locked |
| | Signal is not encrypted with HDCP | 2.2 | Signal is encrypted with HDCP (the HDCP version is displayed) |
| | Embedded audio is not present | | Embedded audio is present |
| | There is no connected device | | The device is connected |
| DP | No USB Host connected or DP Alt mode is not supported by USB Host | DP | DP Alternate mode successfully entered |
| | | DP | Unable to enter DP Alternate mode |
| A | Autoselect is disabled | A | Autoselect is enabled |
| | Audio is unmuted | | Audio is muted |
| | Charging function is inactive | | Charges the connected device |

## 6.8. Port Properties Window

Clicking on the port tile opens the Port properties window. This section shows the available settings and status information by port types. *#lock #unlock #mute #unmute*

### 6.8.1. Welcome Screen




Welcome screen is an internal source, which can be customized – see more information in the Welcome Screen section. *#welcomescreen*

**General**

**Port name**

The name of a port can be changed by typing the new name and clicking on the **Set** button. The following characters are allowed when naming: Letters (A-Z) and (a-z), hyphen (-), underscore (_), numbers (0-9), and dot (.). Max length: 63 characters.

**Lock** *#lock #unlock*

The port can be locked to the currently connected output ports by adding a tick. If the port is locked, the crosspoint state of this port cannot be changed.

**Mute** *#mute #unmute*

The port can be muted/unmuted by adding/removing a tick. If the port is muted, no signal is transmitted from the input port.

**Welcome Screen Settings**

**Display Welcome Screen Image**

Add a tick to **Display Welcome Screen Image** to enable the appearance of the internal image.

**Upload Image**

Click on the **Upload Image** button to browse a jpg or bmp file to customize the welcome screen picture. Recommended resolution: 1280x720 pixel, maximum file size is 4MB.

**ATTENTION:** Uploading a new image will overwrite the previous one.

**Reset Image**

Clicking on the **reset image** button restores the factory default state.

**Display Welcome Screen Message**

Add a tick to **Display Welcome Screen Message** to enable the appearance of the text message.

**Welcome Screen Message**

The following characters are allowed: Letters (A-Z) and (a-z), hyphen (-), underscore (_), numbers (0-9), space ( ) and dot (.). Max length: 63 characters.

### 6.8.2. USB-C Inputs

Clicking on the USB-C video input port icon opens the Port properties window. The most important information and settings are available from the panel.

#### HPD Mode

Hot Plug Detection function can be set here. Using Auto mode is highly recommended.

#### Status information

Connected / Signal Presence / Resolution

#### Allowed HDCP Version *#hdcp*

**ATTENTION:** HDCP 2.2 signal handling is limited to up to two input ports at the same time.

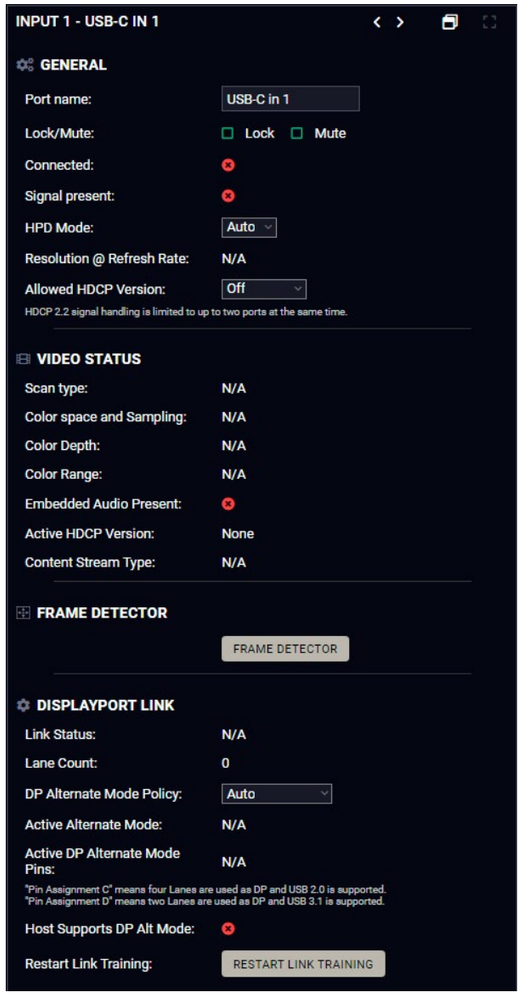
- **Off:** The connected source will detect that the switcher is not HDCP-compliant and turn off authentication if the content allows it.
- **HDCP 1.4:** The connected source will detect that the switcher is compliant with HDCP 1.4, but not compliant with HDCP 2.2.
- **HDCP 2.2:** The connected source will detect that the switcher is compliant with HDCP 2.2.

#### Video Status

This section gives a feedback about the current video stream:

#### Frame detector

For more details, see the Frame Detector section.




#### Displayport Link

##### DP Alternate Mode Policy

The following parameters can be set:

The two different signals (video and USB 3.x) can be transmitted at the same time with shared bandwidth. In this case DP video reserves 2x Superspeed Channels for the video signal in alternate mode, and there are 2x Superspeed Channels for USB 3.x.

- **Auto:** Taurus offers both operation modes described below. The BYOD device can choose between the two. Neither USB3, nor 4 lane DP Alt mode operation (4K@60) is guaranteed. BYOD devices supporting USB3.x usually choose shared mode: USB3.1 and 2 lane DP.
- **Prefer video:** Uses 4 Lanes for Displayport video, in this case USB 3.x data transmission does not operate.
- **Prefer USB 3.1:** The two different signals (DP video and USB 3.x) can be transmitted at the same time with shared bandwidth. DP video reserves 2 Lanes.

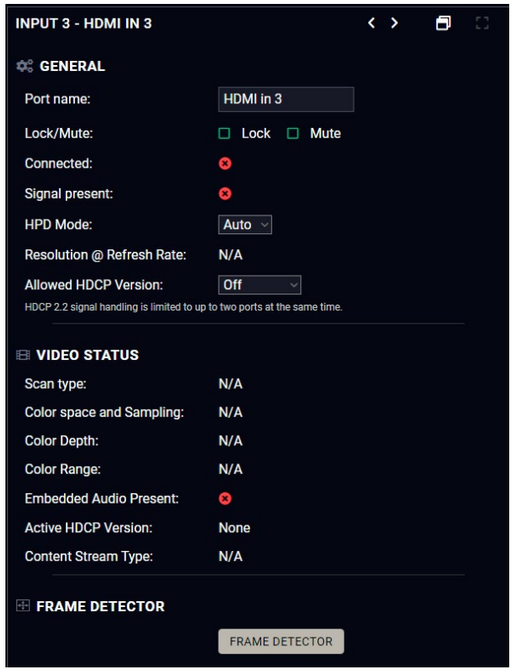
**ATTENTION:** When the USB-C input of a UCX device is disconnected while operating in Displayport Alternate Mode, visual artifacts may appear on the downstream display.

#### Restart Link Training *#linktraining*

Link training is a process where the source (PC, laptop, media server) and the sink (switcher) agree on a data rate, lane count and electrical parameters. The successful link training is a pre-requisite of the video transmission. If the quality of the USB cable is insufficient to reliably handle higher data rates, link training will result in a lower data rate, where stable connection between the source and the switcher can be maintained.

Clicking on the **Restart Link Training** button starts to build up the connection again between the switcher and the source (it happens automatically when the source is connected). It is equal to unplugging and reconnecting the Type-C connector.

### 6.8.3. HDMI Video Input




Clicking on the HDMI video input port icon opens the Port properties window. The most important information and settings are available from the panel.

**Available settings and tools**

**Port name**

The name of a port can be changed by typing the new name and clicking on the **Set** button. The following characters are allowed when naming: Letters (A-Z) and (a-z), hyphen (-), underscore (_), numbers (0-9), and dot (.). Max length: 63 characters.

**Lock** *#lock #unlock*

The port can be locked to the currently connected output ports by adding a tick. If the port is locked, the crosspoint state of this port cannot be changed.

INFO: When the locked input is switched to the output, the crosspoint state can not be changed and all inputs are locked in that line.

**Mute** *#mute #unmute*

The incoming signal can be muted/unmuted by adding/removing a tick. If the port is muted, no signal is transmitted from the input port.

**Allowed HDCP Version** *#hdcp*

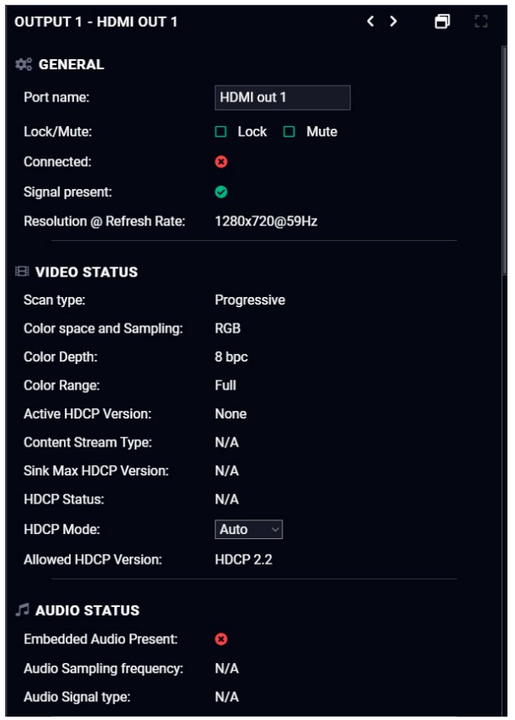
**ATTENTION:** HDCP 2.2 signal handling is limited to up to two input ports at the same time.

- **Off:** The connected source will detect that the switcher is not HDCP-compliant and turn off authentication if the content allows it.
- **HDCP 1.4:** The connected source will detect that the switcher is compliant with HDCP 1.4, but not compliant with HDCP 2.2.
- **HDCP 2.2:** The connected source will detect that the switcher is compliant with HDCP 2.2.

**Frame detector**

For more details, see the Frame Detector section.

### 6.8.4. HDMI Video Output




Clicking on the HDMI video output port icon opens the Port properties window. The most important information and settings are available from the panel.

**Available settings and tools**

**General**

**Port name**

The name of a port can be changed by typing the new name and clicking on the **Set** button. The following characters are allowed when naming: Letters (A-Z) and (a-z), hyphen (-), underscore (_), numbers (0-9), and dot (.). Max length: 63 characters.

**Lock** *#lock #unlock*

The port can be locked to the currently connected output ports by adding a tick. If the port is locked, the crosspoint state of this port cannot be changed.

**Mute** *#mute #unmute*

The incoming signal can be muted/unmuted by adding/removing a tick. If the port is muted, no signal is transmitted from the input port.

**HDCP Mode** *#hdcp*

- **HDCP mode**: Auto / Always - The transmitter forces the source to send the signal without encryption if the content allows when Auto mode is selected; *#signaltype* *#hdcp*

### Output Options

#### Output 5V Enable

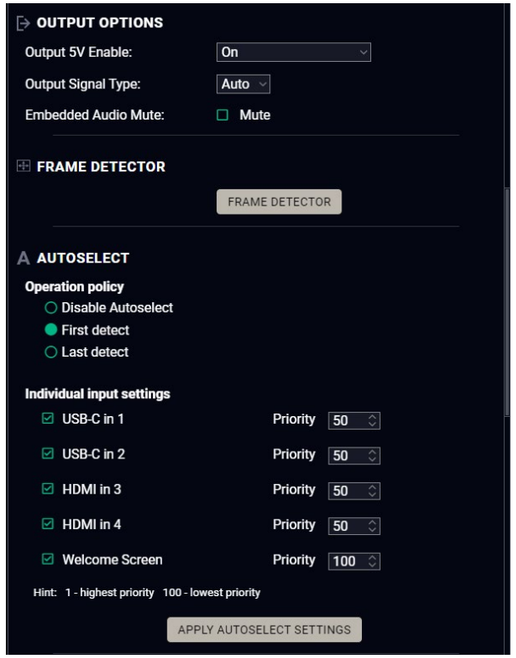
- Auto / On / Off - The setting lets the source and the sink devices be connected – independently of the transmitted signal.

#### Output Signal Type

- Auto / DVI - The outgoing signal format can be selected from a drop-down menu.

#### Embedded Audio Mute

Add a tick to turn off the embedded audio.




### Frame detector

For more details, see the Frame Detector section.

### Autoselect

Autoselect feature makes the switching of an input to an output without human intervention possible. The crosspoint state changes based on the active input signals.

Three operation policies can be set:*#autoselect # videoautoselect*

**Disable autoselect:** crosspoint state change happens manually.

**First detect:** selected input port is kept connected to the output as long as it has an active signal.

**Last detect mode**: it is always the last attached input that is selected to be transmitted.

**Individual input settings:** it is always the highest priority active input that is selected to be transmitted (1- highest priority, 100- lowest priority).

Pay attention to the following settings for the proper operation of the Autoselect function:

- Be sure that all priority values are filled in;
- Be sure that all inputs are enabled with the green tick on the right side;
- Always click on the **Apply autoselect settings** button after the changes to launch the new settings.

See more details about the feature in The Autoselect Feature section.

## 6.8.5. Embedded Audio Input




### Available settings

#### Port name

The name of a port can be changed by typing the new name and clicking on the **Set** button. The following characters are allowed when naming: Letters (A-Z) and (a-z), hyphen (-), underscore (_), numbers (0-9), and dot (.). Max length: 63 characters.

#### Lock *#lock #unlock*

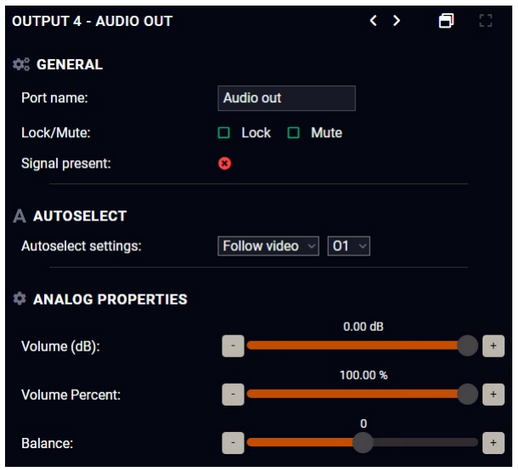
The port can be locked to the currently connected output ports by adding a tick. If the port is locked, the crosspoint state of this port cannot be changed.

#### Mute *#mute #unmute*

The incoming signal can be muted/unmuted by adding/removing a tick. If the port is muted, no audio signal is transmitted from the input port.

**ATTENTION:** Video crosspoint has a limitation: I1 and I5 ports are not available at the same time, only one of them can be selected to any output. When I5 is selected for video source, the de-embedded audio of the I1 is not available because of the video crosspoint limitation. For more details about it, see the port diagram in the Audio Interface section.

## 6.8.6. Analog Audio Output




**Available settings:** *#analogaudio #volume #balance*

- Port name
- Mute/unmute the port;
- Lock/unlock the port;
- Autoselect settings: off / follow video (O1 or O2). Follow video option means that the audio of the selected video input will be switched to the analog audio output. When the video crosspoint changes, audio crosspoint follows it.
- Volume: from 100 to 0%, in step 1% (0 dB to -95.625 dB, in step 0.375 dB (default is 0 dB));
- Balance: from -100 to +100, in step 1 (default is 0 = center).

INFO: The de-embedded audio is mirrored to the Dante Audio Output in case of UCX-4x2-HC60D.

### 6.8.7. Frame Detector

The ports can show detailed information about the signal like full size and active video resolution. This feature is a good troubleshooter if compatibility problems occur during system installation. To access this function, open the port properties window and click on the **Frame detector** button. *#framedetector*




| Hres | Vres | Act. px | Act. ln | Vbporch | Vfporch | Hbporch | Hfporch | Hsyncw | Vfreq | Hfreq | PxClk | TMDSClk |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2200 pixels | 1125 lines | 1920 pixels | 1080 lines | 36 lines | 4 lines | 148 pixels | 88 pixels | 44 pixels | 60 Hz | 67.5 kHz | 148 MHz | 148 MHz |
| 2200 pixels | 1125 lines | 1920 pixels | 1080 lines | 36 lines | 4 lines | 148 pixels | 88 pixels | 44 pixels | 60 Hz | 67.5 kHz | 148 MHz | 148 MHz |
| 2200 pixels | 1125 lines | 1920 pixels | 1080 lines | 36 lines | 4 lines | 148 pixels | 88 pixels | 44 pixels | 60 Hz | 67.5 kHz | 148 MHz | 148 MHz |
| 2200 pixels | 1125 lines | 1920 pixels | 1080 lines | 36 lines | 4 lines | 148 pixels | 88 pixels | 44 pixels | 60 Hz | 67.5 kHz | 148 MHz | 148 MHz |
| 2200 pixels | 1125 lines | 1920 pixels | 1080 lines | 36 lines | 4 lines | 148 pixels | 88 pixels | 44 pixels | 60 Hz | 67.5 kHz | 148 MHz | 148 MHz |
| 2200 pixels | 1125 lines | 1920 pixels | 1080 lines | 36 lines | 4 lines | 148 pixels | 88 pixels | 44 pixels | 60 Hz | 67.5 kHz | 148 MHz | 148 MHz |
| 2200 pixels | 1125 lines | 1920 pixels | 1080 lines | 36 lines | 4 lines | 148 pixels | 88 pixels | 44 pixels | 60 Hz | 67.5 kHz | 148 MHz | 148 MHz |

***Frame Detector Window***

Lightware's Frame Detector function works like a signal analyzer and makes it possible to determine the exact video format that is present on the port, thus helps identify many problems. E.g. actual timing parameters may differ from the expected and this may cause some displays to drop the picture.

Frame Detector measures detailed timings on the video signals just like a built-in oscilloscope, but it is much easier to use. The actual display area shows the active video size (light grey). Dark grey area of the full frame is the blanking interval, which can contain the info frames and embedded audio data for HDMI signals. Shown values are measured directly on the signal and not retrieved only from the HDMI info frames.

It is possible to download the results by clicking on the **Export Data to CSV** button.

Automatic scrolling can be toggled by clicking on the **Autoscroll** checkbox in the lower right corner. It is enabled by default.

## 6.9. CEC Tool

The device is able to send Consumer Electronics Control (CEC) commands via the HDMI outputs. This feature is to remote control the sink device. CEC is a bi-directional communication via the HDMI cable.

#cec

**ATTENTION:** Make sure that the controlled unit is CEC-capable and this function is enabled.

INFO: Taurus UCX series devices are only capable of sending CEC commands, but not of receiving them.

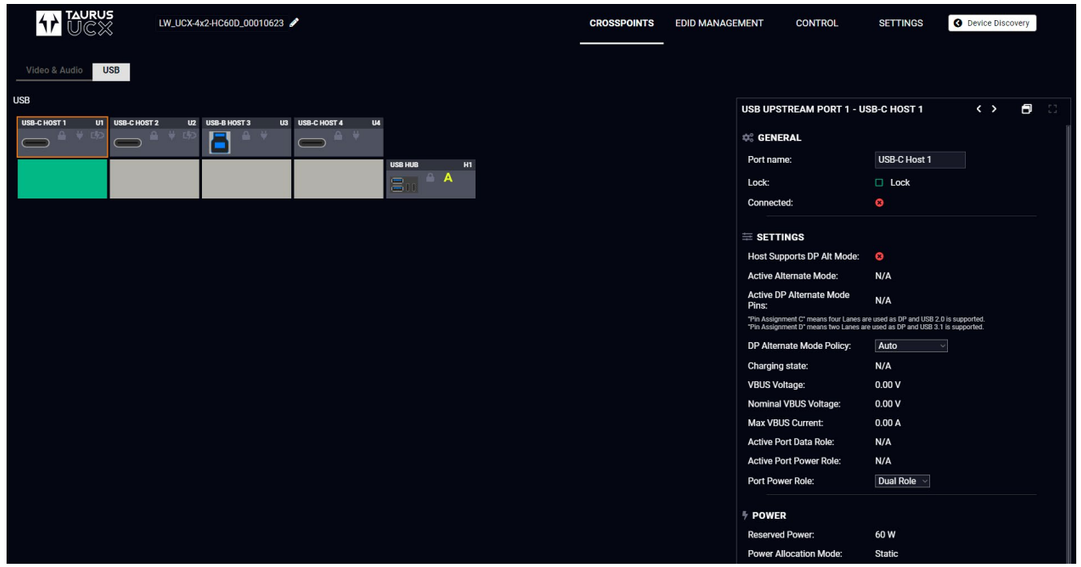



| | | |
|---|---|---|
| 1 | **Drop-down command list** | Containing the basic CEC commands, most of them are displayed on the graphical interface too (on the left side). Click on the **Send** button to send the command. |
| 2 | **Custom command textbox** | The text field is for sending hexadecimal commands in the indicated format to the source. Click on the **Send** button to send the command. |
| 3 | **Received Command box** | Displays all the sent CEC commands (in red) and the received answers (in blue) with a timestamp. |
| 4 | **Clear button** | Click on the **Clear** button to erase the content of the terminal window. |
| 5 | **CEC command button panel** | This panel provides the quick and easy management of CEC commands. These buttons are pre-programmed with basic functions and send commands towards the sink. The communication is displayed in the Received Command box. For the list of the commands, see the CEC Command Sending section. Both the layout and functionality are similar to the design of a remote control. |

It can occur that the third-party device can receive, but not execute the command, because it is not supported by the product. Check the accepted commands in the documentation of the device.

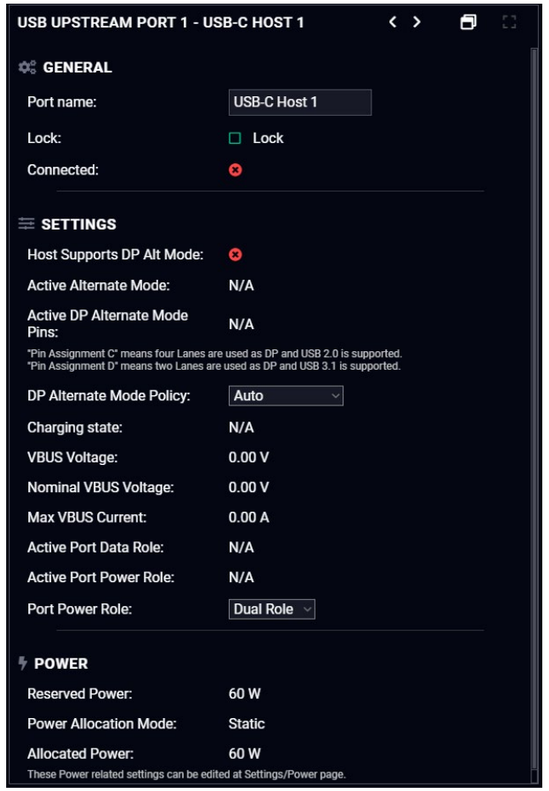
## 6.10. USB Crosspoint

In USB crosspoint tab, the connection between the of the upstream ports (USB-C and USB-B ports) and the USB hub (USB-A ports) can be set. *#usb #usbc*




### 6.10.1. USB-C Port Properties

#### Available settings and tools




#### General

##### Port name

The name of a port can be changed by typing the new name and clicking on the **Set** button. The following characters are allowed when naming: Letters (A-Z) and (a-z), hyphen (-), underscore (_), numbers (0-9), and dot (.). Max length: 63 characters.

##### Lock *#lock #unlock*

The port can be locked to the currently connected output ports by adding a tick. If the port is locked, the crosspoint state of this port cannot be changed.

#### Settings

##### DP Alternate Mode Policy

This is equal to the DP Alternate Mode Policy setting on the USB-C video port. *#dpaltmode #alternatemode #displayportalternatemode*

##### Power Role

**Dual role:** The switcher can be source (and sends power to the connected device) or sink (the switcher does not send power, real power consumption does not happen) depending on the connected device.

INFO: Using **Dual role** setting is highly recommended, the other options are mainly for troubleshooting.

**Source:** When the connected device is a sink (e.g. smart phone or a dual-role laptop), the switcher charges it via the USB-port.

**Sink:** When the power role of the connected device is source-only (e.g. PC), the switcher has to change its power role (sink or dual-role) to build up the connection. Real power consumption does not happen.

#### Power

You can see the currently set charging attributes on the port, such as **Reserved Power**, **Power Allocation Mode** and **Allocated Power**.

You can change these settings on the Power tab (Settings menu).

### 6.10.2. USB-B Port Properties

**Available settings and tools** *#usb #usbc*




#### Port name

The name of a port can be changed by typing the new name and clicking on the **Set** button. The following characters are allowed when naming: Letters (A-Z) and (a-z), hyphen (-), underscore (_), numbers (0-9), and dot (.). Max length: 63 characters.

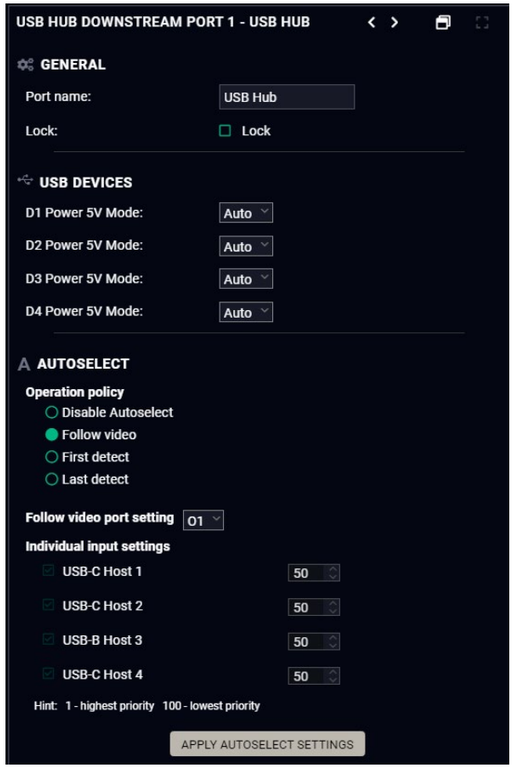
#### Lock *#lock #unlock*

The port can be locked to the currently connected output ports by adding a tick. If the port is locked, the crosspoint state of this port cannot be changed.

INFO: The port properties are the same for the following USB-C ports: the U2 port of UCX-2x1-HC60, UCX-2x2-H60 and SCX-2x1-HC60, and the U4 port of UCX-4x2-HC60, UCX-4x2-HC60D, UCX-4x3-HC60 and UCX-4x3-HC60-BD models.

### 6.10.3. USB Hub Properties

**Available settings and tools**




#### General

#### Port name

The name of a port can be changed by typing the new name and clicking on the **Set** button. The following characters are allowed when naming: Letters (A-Z) and (a-z), hyphen (-), underscore (_), numbers (0-9), and dot (.). Max length: 63 characters.

#### Lock *#lock #unlock*

The port can be locked to the currently connected output ports by adding a tick. If the port is locked, the crosspoint state of this port cannot be changed.

#### USB Devices

The power 5V Mode can be set for each port from the drop-down menu: When the option is **Off,** the switcher does not send the device 5V over the USB-A port. Using **Auto** mode is recommended.

#### Autoselect *#autoselect # usbautoselect*

For more details about this feature, see the Autoselect section.

**Autoselect settings:** Disable autoselect / Follow video / First detect / Last detect mode / Individual input settings

Follow video (O1 or O2): Follow O2 means the same computer will be the video source for O2 output and the USB Host of all USB downstream devices.

Video and USB ports either have a common USB Type-C connector for each port, or an HDMI and USB-B are clearly marked to belong together as one port.

### USB-Audio Configuration

**DIFFERENCE:** These settings are only available for the UCX-4x3-HC60-BD model.




#### Audio Device Type

Here you can choose the type of input device that you can route to the Dante interface.

The following audio device types can be chosen:

- Echo-canceling microphone
- Echo-reducing microphone
- Microphone (default)
- Line IO (for troubleshooting and debugging purposes)

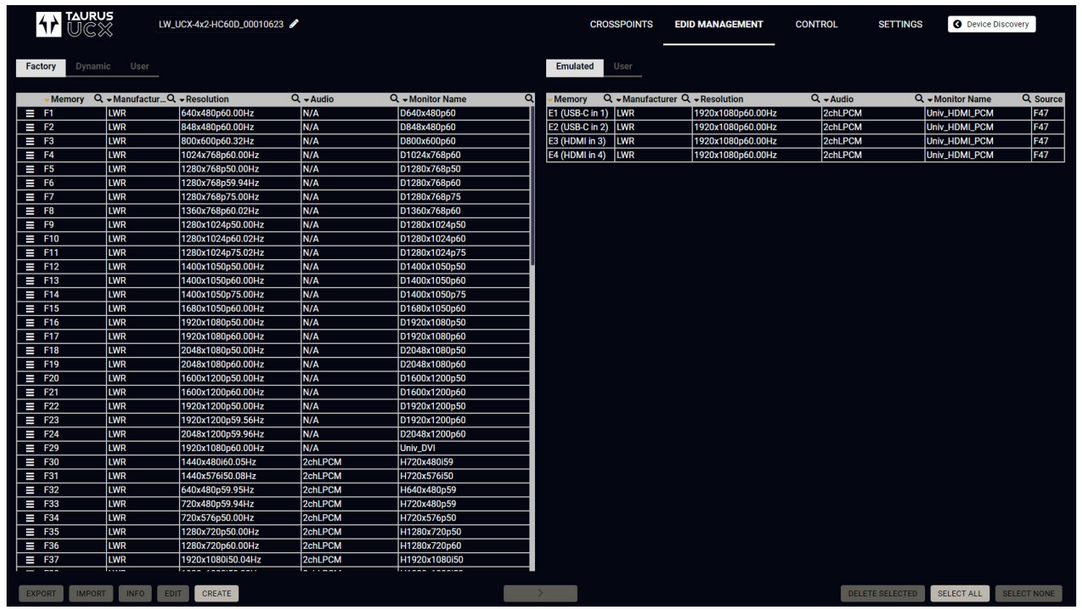
#### USB Audio Descriptor

Here you can set a unique name for the audio device connected to the Dante port.

It can be 1-25 characters long, the letters of the English alphabet (A-Z, a-z), numbers (0-9), underscore (_), hyphen (-) and space ( ) are allowed. Please be aware that space cannot be used as a first or last character.

## 6.11. EDID Menu

Advanced EDID Management can be accessed by selecting the EDID menu. There are two panels: the left one contains Source EDIDs, the right one contains Destination places where the EDIDs can be emulated or copied to.




***EDID Menu***

**Control Buttons**

| | | | |
|---|---|---|---|
| EXPORT | Exporting an EDID (save to a file) | > | Transfer button: executing EDID emulation or copying |
| IMPORT | Importing an EDID (load from a file) | DELETE SELECTED | Deleting EDID (from User memory) |
| INFO | Display EDID Summary window | SELECT ALL | Selecting all memory places in the right panel |
| EDIT | Opening Advanced EDID Editor with the selected EDID | SELECT NONE | Selecting none of the memory places in the right panel |
| CREATE | Opening Easy EDID Creator | | |

*#edid*

### 6.11.1. EDID Operations

**Changing Emulated EDID**

**Step 1.** Choose the desired **EDID list** on the source panel and select an **EDID**. >

**Step 2.** Press the **Emulated** button on the top of the Destination panel.

**Step 3.** Select the desired **port** on the right panel (one or more ports can be selected); the EDID(s) will be highlighted in yellow.

**Step 4.** Press the **Transfer** button to change the emulated EDID.

**Learning an EDID**

The process is the same as changing the emulated EDID; the only difference is the Destination panel: press the **User** button. Thus, one or more EDIDs can be copied into the user memory either from the factory memory or from a connected sink (Dynamic).

**Exporting an EDID**

A source EDID can be downloaded as a file (*.bin, *.dat or *.edid) to the computer.

**Step 1.** Select the desired **EDID** from the Source panel (line will be highlighted in yellow).

**Step 2.** Press the **Export** button to open the dialog box and save the file to the computer.

**Importing an EDID**

A previously saved EDID (*.bin, *.dat or *.edid file) can be uploaded to the user memory: IMPORT

**Step 1.** Press the **User** button on the top of the Source panel and select a **memory** slot.

**Step 2.** Press the **Import** button below the Source panel.

**Step 3.** Browse the file in the opening window then press the **Open** button. The browsed EDID is imported into the selected User memory.

**ATTENTION:** The imported EDID overwrites the selected memory place even if it is not empty.

**Deleting EDID(s)**

The EDID(s) from User memory can be deleted as follows: DELETE SELECTED

**Step 1.** Press the **User** button on the top of the Destination panel.

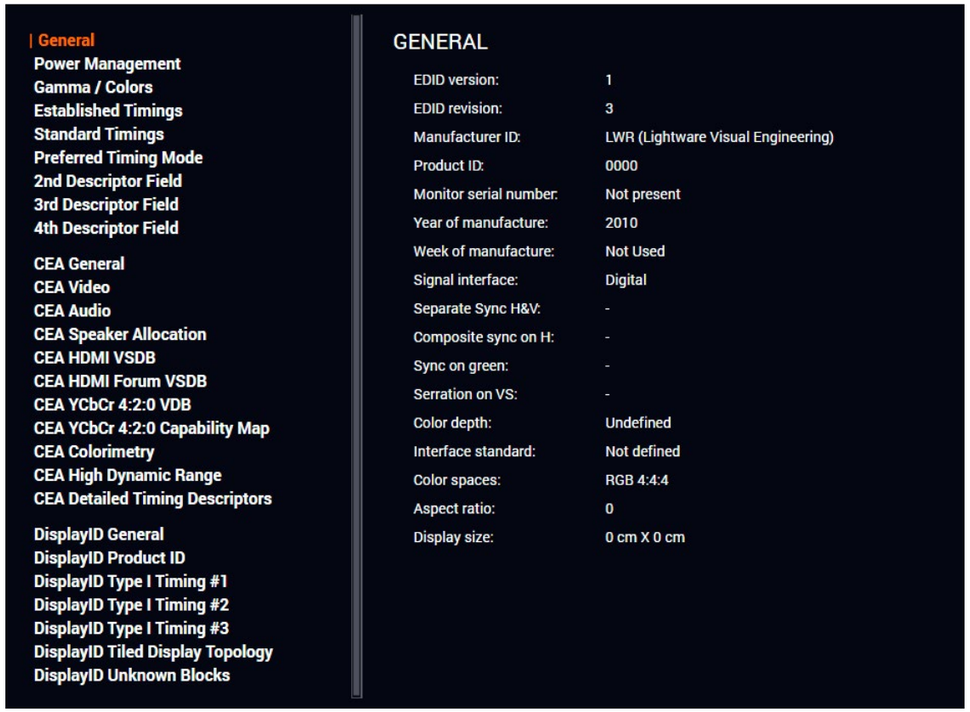
**Step 2.** Select the desired **memory** slot(s); one or more can be selected (“Select All” and “Select None” buttons can be used). The EDID(s) will be highlighted in yellow.

**Step 3.** Press the **Delete selected** button to delete the EDID(s).

### 6.11.2. EDID Summary Window

Select an EDID from the Source panel and press the **Info** button to display the EDID summary.

INFO

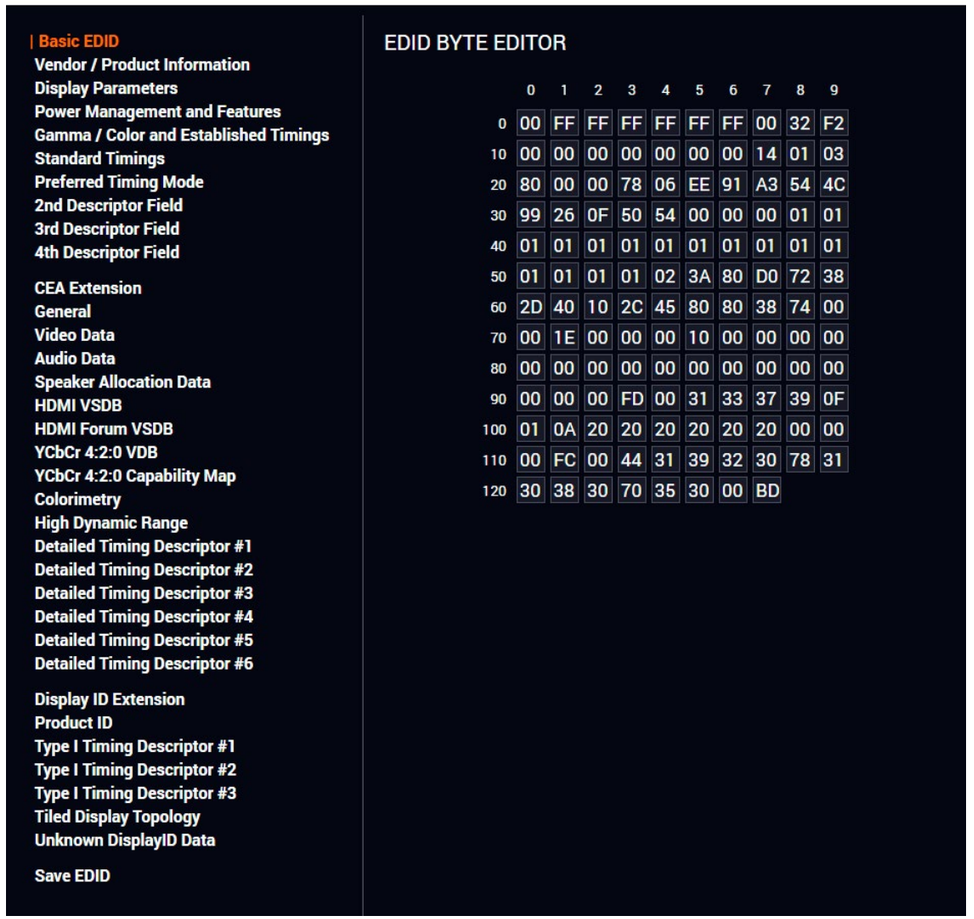



*EDID Summary Window*

### 6.11.3. Editing an EDID

Select an EDID from the Source panel and press the Edit button to display the Advanced EDID Editor window. The editor can read and write all descriptors that are defined in the standards, including the additional CEA extensions. Any EDID from the device's memory or a saved EDID file can be loaded into the editor. The software resolves the raw EDID and displays it as readable information to the user. All descriptors can be edited, saved in an EDID file, or uploaded to the User memory. For more details about EDID Editor, please visit our website (www.lightware.com) and download the EDID Editor Application note.

EDIT

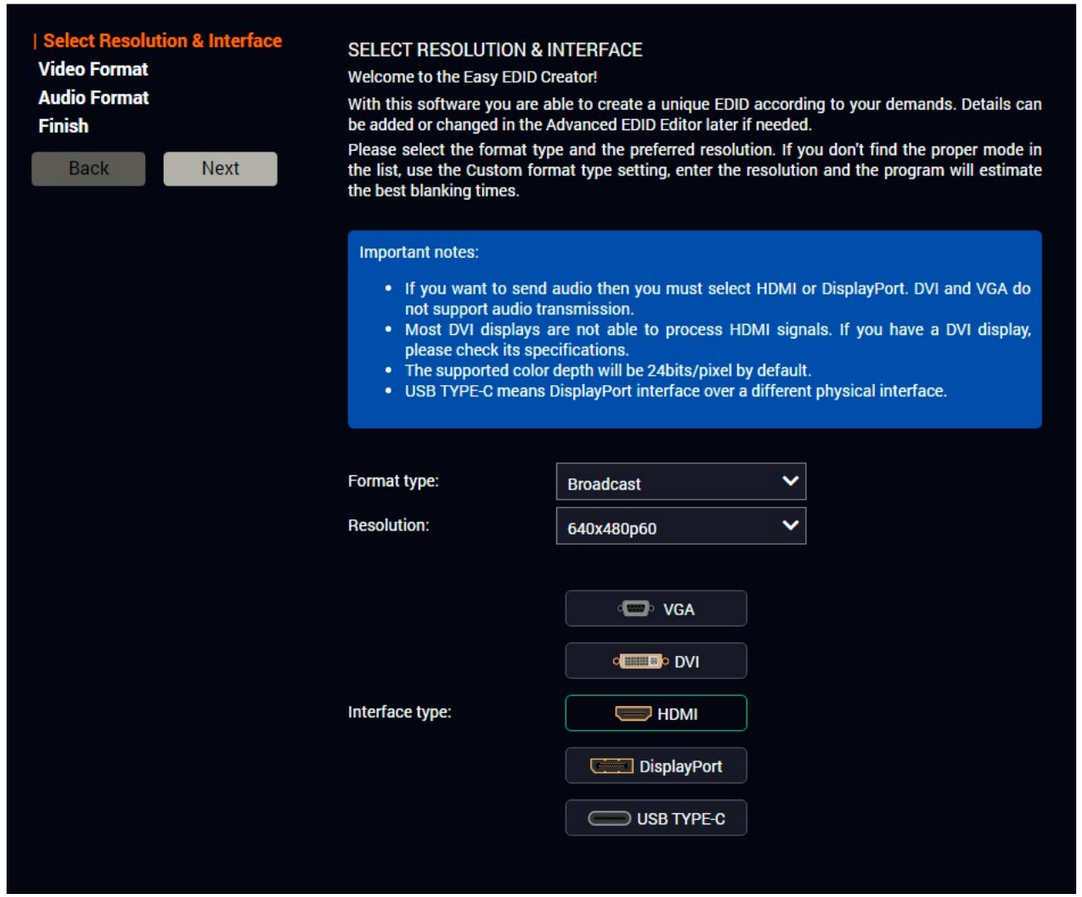



*EDID Editor Window*

### 6.11.4. Creating an EDID - Easy EDID Creator

CREATE

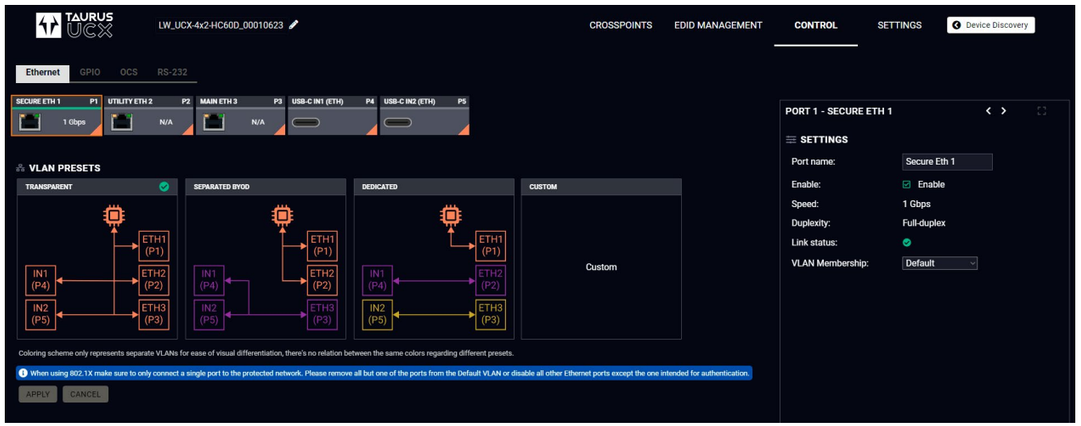
Since the Advanced EDID Creator mentioned above needs more complex knowledge about EDID, Lightware introduced a wizard-like interface for fast and easy EDID creation. With Easy EDID Creator, it is possible to create custom EDIDs in four simple steps. By clicking on the **Create** button below the Source panel, **Easy EDID Creator** is opened in a new window. For more details about the EDID Editor, please visit our website (www.lightware.com) and download the EDID Editor Application note.




***EDID Creator Window***

## 6.12. Control Menu

### 6.12.1. Ethernet




***Ethernet tab in Control menu***

Five ports are displayed in the Ethernet settings: Three of them belong to the RJ45 Ethernet connectors. You can check the status of the Ethernet line by each port: the speed and the duplexity of the connection. The remaining two are for configuring the Ethernet layer in the USB-C ports.

The following settings are available for each port:

- Rename the port,
- Enable / disable the port;
- VLAN membership,

VLAN preset setting can also be found here. For more information on VLAN presets, see the Advanced Ethernet Security section.

The following VLAN presets can be set:

- Transparent (default),
- Separated BYOD,
- Dedicated,
- Custom (this is not directly selectable - automatically selected if VLAN setting does not fit any preset)

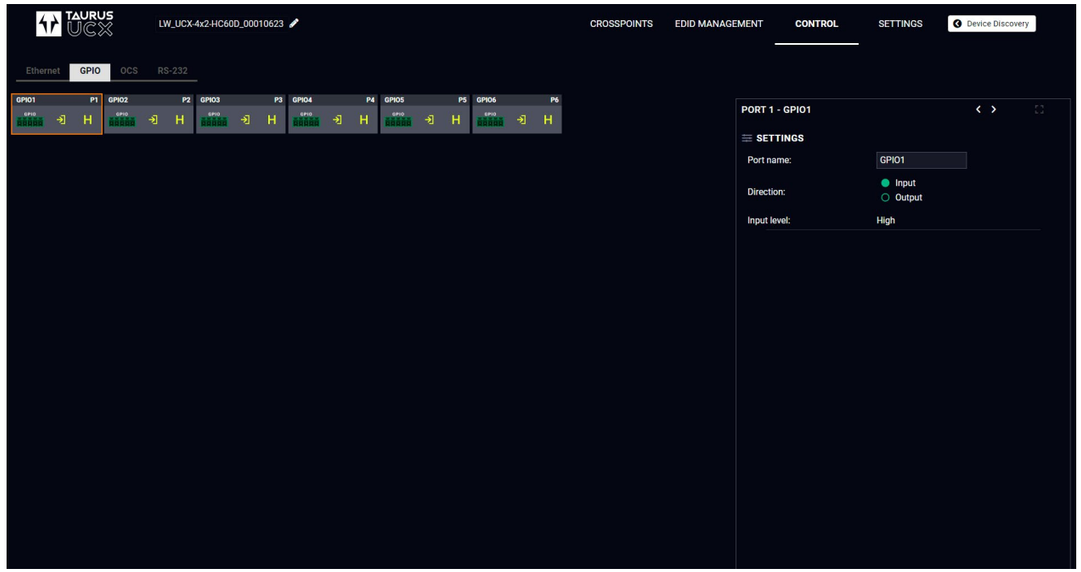
**VLAN Membership**

The VLAN membership setting offers isolated networks for the chosen ports that are independent from the management network and even each other. Further management options will be implemented in a later firmware update.

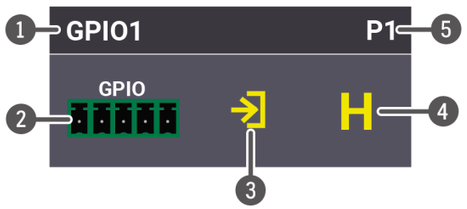
> **ATTENTION:** Disabling the Ethernet layer of a USB-C port while it is in a VLAN (aside from IDs 1 and 2000) with only one Ethernet port connected to it will disable the Ethernet port as well. This happens because the Ethernet functionality of the two ports is connected as long as they are in a VLAN with only the USB-C and one selected Ethernet port in it.

### 6.12.2. GPIO

The GPIO port has 6 pins, which operate at TTL digital signal levels and can be controlled by LDC or protocol commands. Select a GPIO pin under the Port settings section; the settings (pin direction and input level) are displayed on the port tiles as well. #gpio




INFO: Output level can be set only if the pin direction is set to Output. In case of input direction, the output level setting and the **Toggle** button is not available.



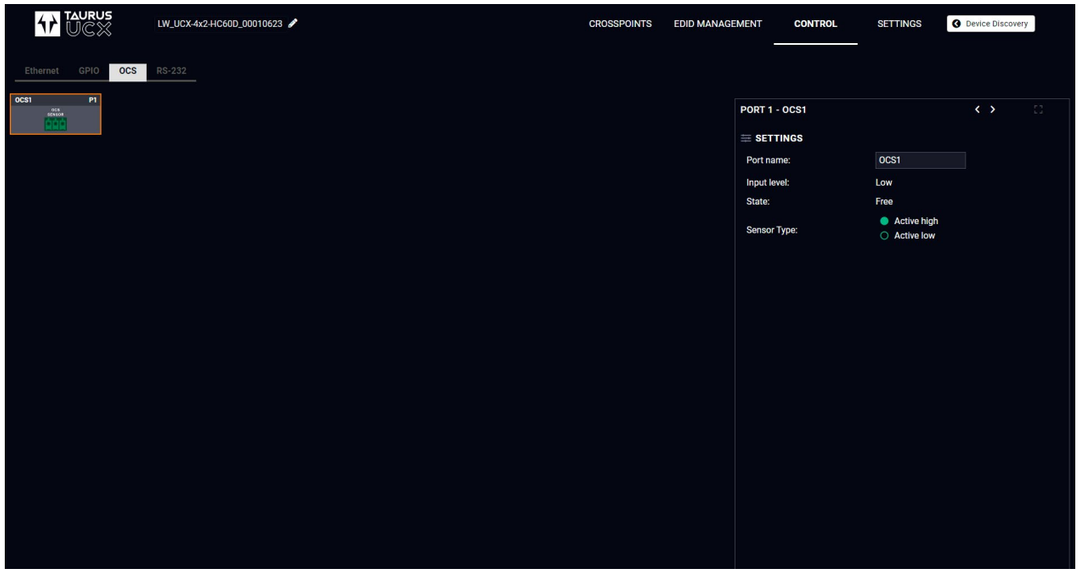

1. GPIO pin name
2. GPIO Port symbol
3. Pin direction:
   - Input
   - Output
4. Level indicator:
   - **L:** Low
   - **H:** High
5. GPIO Port number

#### Interval

Interval section is designed for setting the chosen GPIO pin to the specified level for a specified time. Configure the **Duration** time and the **Logic level** of the desired value. Confirm by clicking the **Set interval** button.

### 6.12.3. OCS - Occupancy Sensor

The OCS sensor has 3 pins, where the first pin is a 24V logic input. The default state is high. Different type of sensors exist: some send high level, some send low level to this input when the room is occupied. Active-high or active-low logic might be configured for this port in LDC to support them.




**Input level** refers to the current input signal level of the first pin.

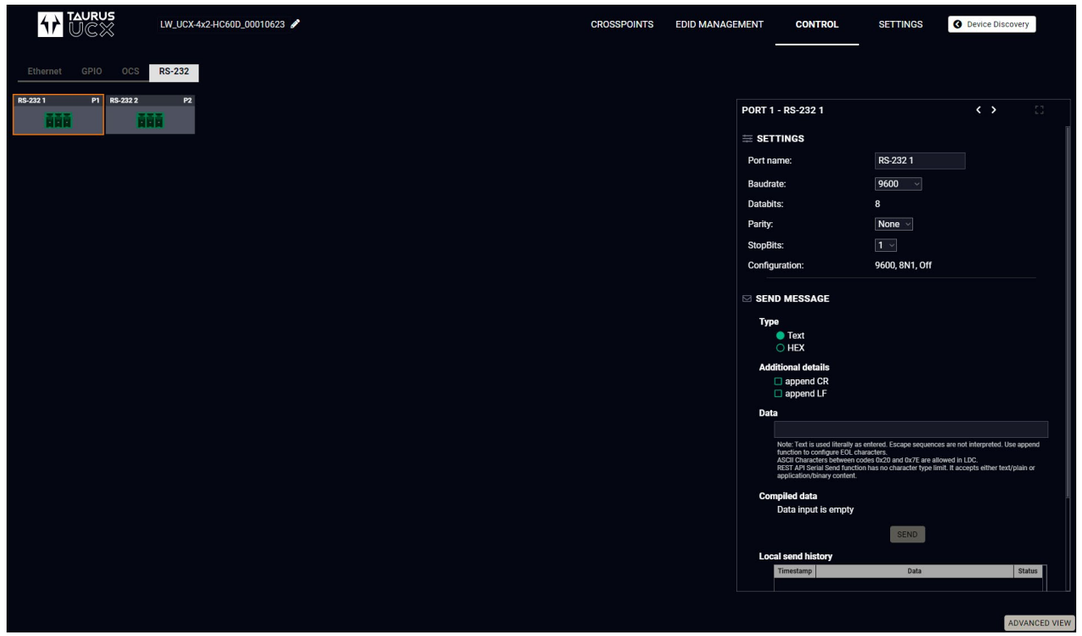
**State** value can be free or occupied, depending on the Sensor type setting and the Input level (e.g. when the sensor type is Active high and the input value is high, the state reports 'Occupied').

**Sensor type** can be active high/active low, and this defines whether the low or high input level means the occupancy.

#ocs

### 6.12.4. RS-232

**DIFFERENCE:** UCX-2x1-HC60 model is assembled with one local RS-232 port.



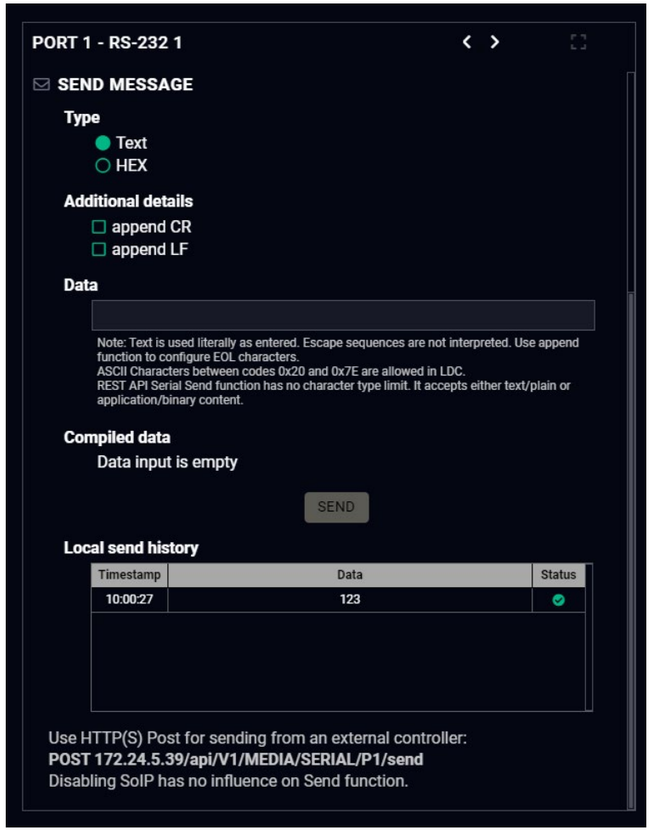

***RS-232 tab in Control menu***

The following settings and functions are available: *#rs-232* *#serial*

- **Baud rate**: 9600, 14400, 19200, 38400, 57600, 115200;
- **Data bits:** 8;
- **Parity**: None, Odd, or Even; *#rs232*

**Send Message Section**

The serial message sending is achieved by Lightware REST API, and it can be in text or hexadecimal format. The CR/LF (Carriage Return/Line Feed) can be enabled optionally.



## 6.13. Settings Menu

### 6.13.1. Status

*#devicelabel #label #producttype #firmwareversion #status #serialnumber*




***Status tab in Settings menu***

The most important hardware and software related information can be found on this tab: hardware and firmware version, serial numbers, MAC addresses, temperatures, and voltage information. Device label can be changed to a unique description by the **Set** button. *#buttonlock #lockbutton*

You can disable the functionality of the front panel buttons by marking the Lock front panel option. This is same method of the control lock enabled by the front panel buttons. See the details in the Control Lock section.

Clicking on the **Identify me** button results in the blinking of the status and crosspoint LEDs in green for 10 seconds. The feature helps to identify the device itself in the rack shelf.

**Dark mode enable:** When Dark mode is enabled, all LEDs on the unit are switched off (after 60 seconds by default) if no buttons are pressed. Pressing any button brings back the status info on the LEDs without performing the function of the button itself. *#darkmode*

**MAC Addresses**

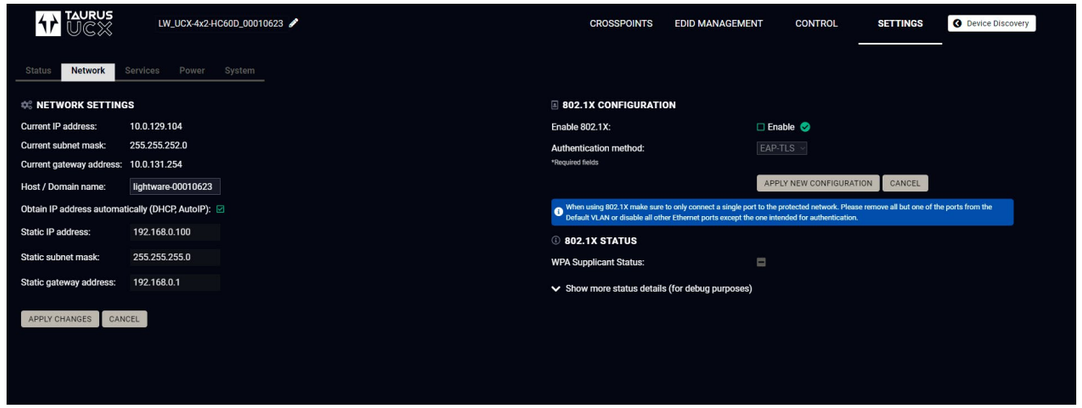
Here you can see a list of MAC addresses that are assigned to the device.

- Main: This is the MAC address of the CPU in Default network setting.
- Main_2: This is the MAC address of the CPU for future uses.
- Main_3: This is the MAC address of the CPU for future uses.
- Main_4: This is the MAC address of the CPU for future uses.
- USB Type C Port 1: This is the MAC address of the IN1 USB-C port.
- USB Type C Port 2: This is the MAC address of the IN2 USB-C port.

In case of UCX devices manufactured after this update, additional MAC addresses will be provided at the manufacturing stage and can be accessed via a QR code on the device, as well as in LDC and the LW3.

In case of UCX devices bought prior to this update, additional MAC addresses are calculated from the main MAC address automatically during firmware update.

### 6.13.2. Network




***Network tab in Settings menu***

**Network Settings**

IP address and DHCP settings can be set on this tab. Always press the **Apply settings** button to save changes.

When the host name is modified, clicking on the **Restart http(s) services** button is also needed.

INFO: A new certificate is generated after the hostname changing.

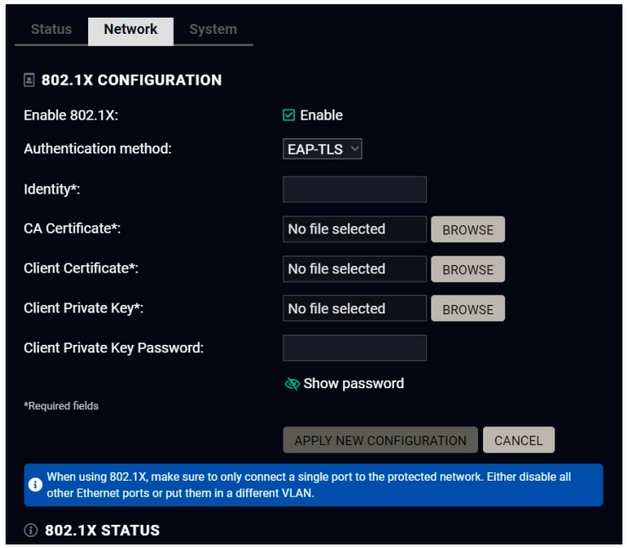
**802.1x Configuration**

**Authentication Process**

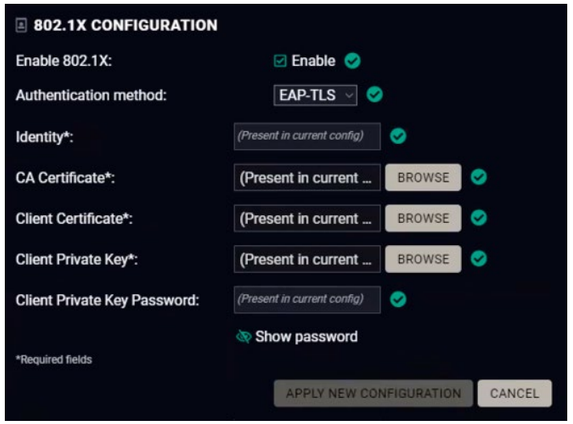
You will find the 802.1x authentication section in the right.

You can enable authentication by ticking in the Enable box. Once 802.1x authentication is enabled, you can authenticate your device with the following method: **EAP-TLS**.

With EAP-TLS, you will also need CA and Client certificates, a Client Private Key, and a password for the Key.



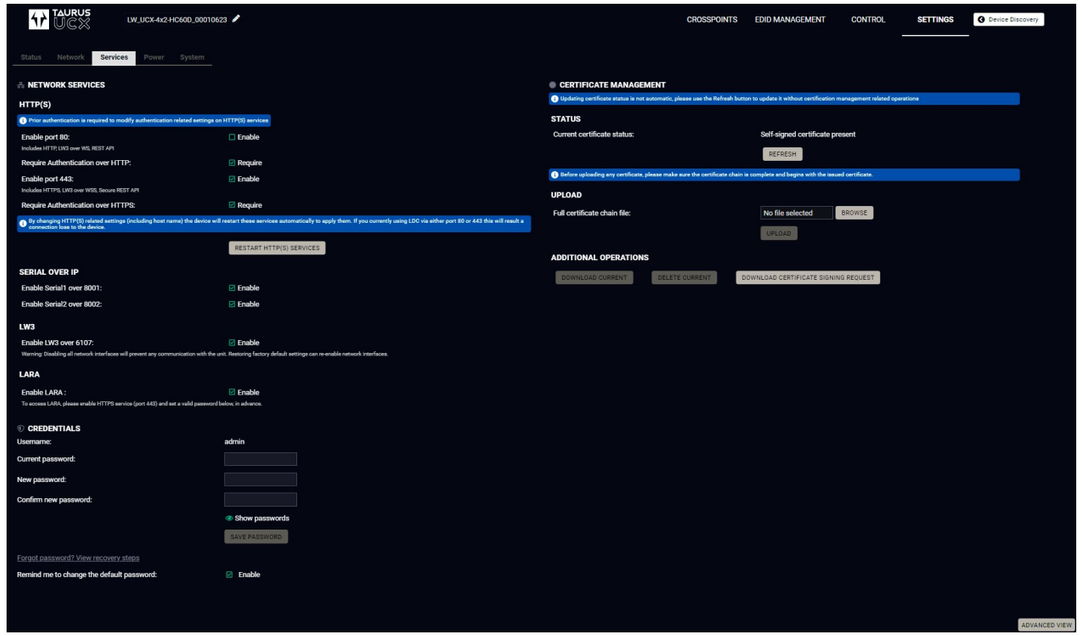

After entering every necessary information, click on the **Apply new configuration** button, and the authentication process starts.




If every component is correct, the device will gain access to the secure LAN.

**ATTENTION:** 802.1x will only work properly if there is **exactly one** port in the Default VLAN. The authentication can still be turned on when several or none of the ports are in the Default VLAN, however, it will not operate properly.

### 6.13.3. Services




***Services tab in the Settings menu***

#### Network Services

##### HTTP/HTTPS

UCX series switcher provides HTTP/HTTPS server services on its 80 and 443 ports to make it accessible over WebSocket (WS), LW3 protocol, using Lightware Device Controller and REST API for device control (see the detailed list about the additional available features in the summary table of the Lightware Advanced Room Automation (LARA) section).

INFO: HTTP port is disabled by default.

HTTPS protocol encrypts the transferred data to keep it protected. For more details about the HTTPS, see the Encryption (HTTPS, WSS) section.*#portblock #network #http #https*

- **Enable/Disable HTTP/ HTTPS port:** To ensure the secure data traffic, the HTTP port (80) can be disabled, and all the information can be transferred via HTTPS (443 port).

  80 or 443 port is necessary to upload/download WelcomeScreen image, log and clone files so one of them should be opened to reach these functions.

**ATTENTION:** Please ensure proper UCX time and date setting in UCX, because it affects the self-signed certificate (SSL) generation when using WSS or HTTPS. Improper time and date setting may lead to certificate rejection.

- **Require Authentication over HTTP/HTTPS:** authentication helps limit the access to the device by setting a username (admin) and a password. For more details, see the Basic Authentication section.
- **Restart HTTP(S) Services** is required after the authentication settings changed.

INFO: Authentication is enabled by default.

##### Serial over IP

The signal route of the serial-IP transmission can be broken by disabling the serial over 8001 or 8002 port. For more details about the RS-232, see the Serial Interface section.

##### LW3

**Enable LW3 over 6107**: LW3 protocol commands, Ligthware Device Controller software.

**WARNING! The Lightware Device Controller software operates on 6107 port, when it is disabled, the UCX series switcher can be controlled only with protocol commands via http(s). Reset to Factory Default Settings can re-enable the network interfaces.**

##### LARA

**DIFFERENCE:** SCX-2x1-HC60 does not support LARA.

LARA is enbled by default.

##### Credentials

UCX-HC60 models will have a **random generated factory default password** applied to the device during the manufacturing process. This unique password will be supplied on a sticker along with the device.

**After a factory reset**, you will need the Username (admin) and the unique generated default password to login. After successfully logging into the device, you will be prompted to change the password.

**ATTENTION:** Password history is maintained in authentication, not allowing for the last 10 passwords to be set again.

The authentication password can be set here for HTTP/HTTPS ports. UTF-8 characters are allowed. Min length: 10 characters, max length: 100 characters. The password string can not be queried. *#password*

**ATTENTION:** If a wrong password is entered during login five times in a row, all login attempts are denied for 15 minutes.

##### New Password

INFO: The old password is also required when changing the password.

**ATTENTION:** Authentication feature in UCX series is not equal to the Cleartext login feature in the Advanced Control Pack in the TPS family extenders.

### Certificate Management

You can upload certificates signed by the Certificate Authority (CA) to provide secure connection to the devices with the webLDC.

To download a Certificate Signing Request (CSR), follow these steps:

**Step 1.** Navigate to the Settings menu, Services tab and click on the **Certificate Signing Request** button.

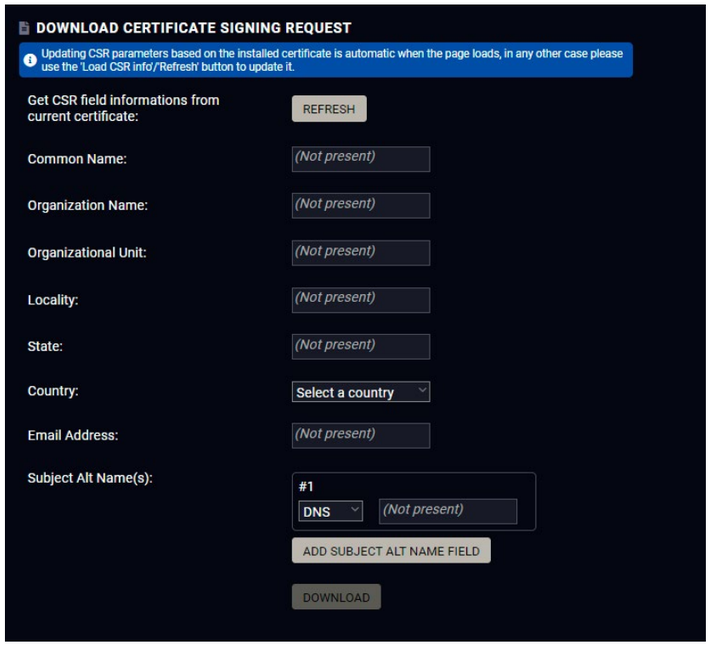
**Step 2.** Enter the data required for the authentication process. It is important to provide all information related to your organization, because it will be used to verify your identity.

**Step 3.** Once all the necessary data has been entered, the file can be downloaded via the button in the bottom, and sent for signing.

**Step 4.** When the CA signs the certificate, it will create a .pem file, which then can be uploaded onto the device.

**Step 5.** After uploading, press the **Refresh** button in the Certificate Management section and the signed certificate shall be active.

Please be aware that the certificate will use the device's own private key and will not work for any other device. Each device must have its own certification.




*The certificate signing request form*

| Information | Description | Example |
|---|---|---|
| Common Name | The domain name you wish to secure. | www.example.com |
| Organization Name | The legal name of the company or organization, any suffix included. | Lightware Visual Engineering PLC |
| Organizational Unit | The name of the internal organizational department/ division. | IT |
| Locality | The name of the city, town, village etc. of the organization. | Budapest |
| State | Province, region, county or state, not abbreviated. | Pest county |
| Country | The country of the organization can be chose from the drop-down menu. | Hungary |
| Email Address | The contact address of the certificate administrator or the IT department of the company. | example@lightware.com |

In the Subject Alt Name(s) field you can enter additional information for more hosts to be certified with one SSL. The information type can be chosen from the drop down menu. You can have several Subject Alt Name fields.

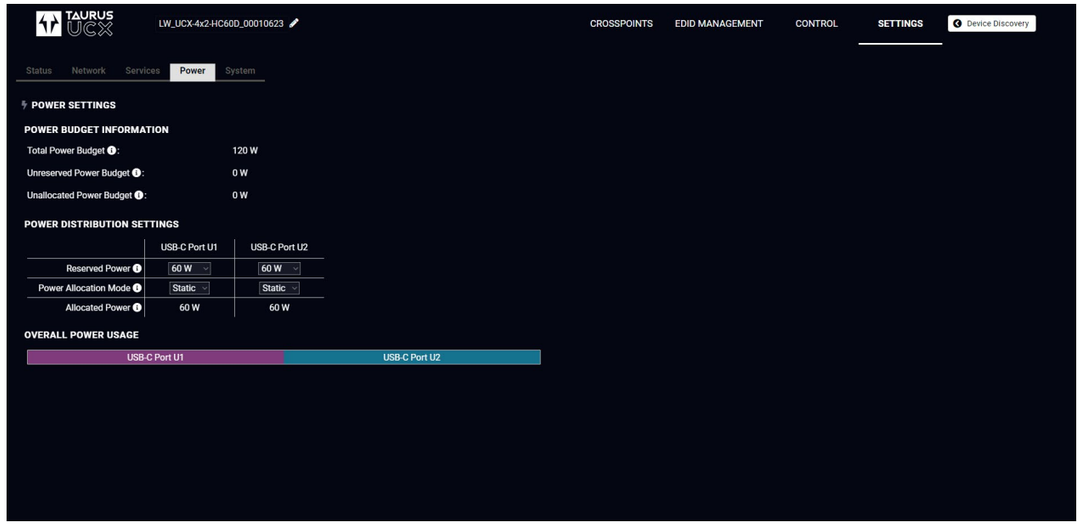



You can enter the following information in the Subject Alt Name field:

- DNS
- IP address
- E-mail address
- URI
- RID

### 6.13.4. Power

**DIFFERENCE:** This tab is only available for UCX-4x3-HC60, UCX-4x2-HC60D, and UCX-4x3-HC60-BD devices:




***Power tab in the Settings menu***

On this tab you can set the power output by each capable port.

#### Power Budget Information

- **Total Power Budget**: you can see the full amount of power available for output.
- **Unreserved Power Budget**: you can see the amount of power that remains after the amount has been set on all ports.
- **Unallocated Power Budget**: you can see the amount of power that remains available in case one of the Power Allocation Mode on a port is set to Auto. If needed, this power amount will be automatically provided for the port.

#### Power Distribution Settings

In this table you can quickly and efficiently set the power capabilities of each port.

- **Reserved Power**: You can choose a minimum amount of power to be output on the port from a drop-down menu.
- **Power Allocation Mode**: You can set whether the port shall be capable of outputting more than the minimum amount set in the line above. In case of **Static**, the port will output the set amount. In case of **Auto**, the port may use any unallocated power in addition to the given minimum to supply to the device connected to it if needed.
- **Allocated Power**: total amount of power output by the port.

#### Enabling 100W power to first connected device

In order for a USB-C port to be able to supply 100W, the amount of reserved power must be sufficient. If the user wants to allocate 100W to the first connected device, regardless of which USB-C port it is connected to, the setting must be arranged as follows:

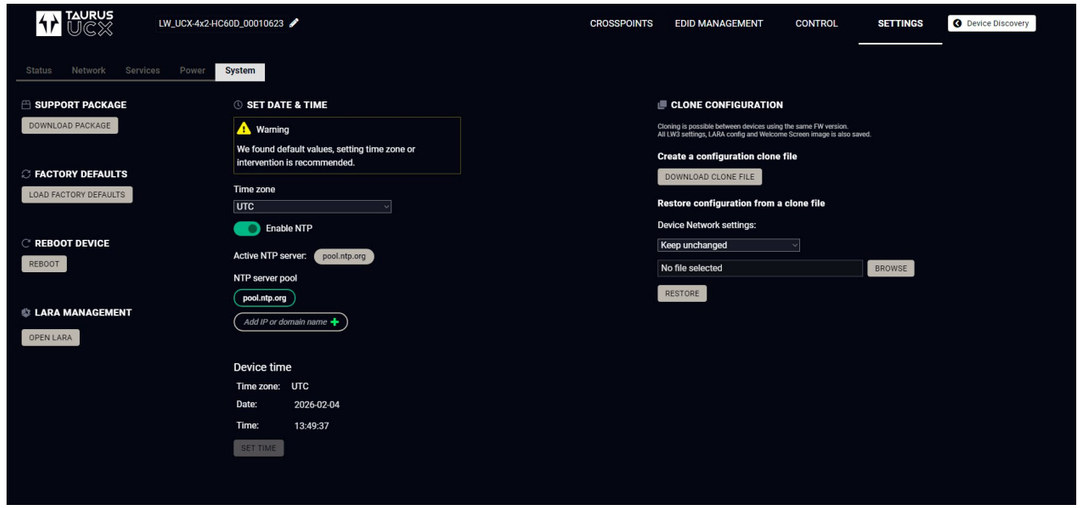
**Step 1.** Make sure that **Power Allocation Mode** for all ports is **Static**.

**Step 2.** Set the **Reserved Power** for both USB-C ports to **15W**.

**Step 3.** Turn **Power Allocation Mode** to **Auto** for the USB-C ports.

This will enable the switcher so supply the first connected device with up to 100W, while the other port will be able to supply 20W.

### 6.13.5. System




***System tab in Settings menu***

The following functions are available under the System tab:

- **Support package** - saving a log file of the device, helps during the troubleshooting process
- **Load factory defaults** - recalling factory default settings and values. All factory default settings are listed in the Factory Default Settings section.
- **Reboot** - rebooting the system.
- **LARA management** - opening the LARA
- **Set time** - (internal clock) of the switcher, which is used for logging events.
- Pressing the **Sync with Computer** button is a quick and easy way to set the time. *#factory #log #systemlog #reboot #restart*

**ATTENTION:** Please ensure proper UCX time and date setting in UCX, because it affects the self-signed certificate (SSL) generation when using WSS or HTTPS. Improper time and date setting may lead to certificate rejection.

#### LARA management

**DIFFERENCE:** SCX-2x1-HC60 does not support LARA.

The LARA interface can be opened by clicking on the **Open LARA** button.

#### Set Date & Time

To enable Network Time Protocol (NTP), the device must be able to reach an NTP server either online or a local server.

Manual time and date setting is available when NTP is disabled.

#### Clone configuration

Clone configuration makes saving all the LW3 settings, custom scripts and welcome screen image and uploading them to another device possible.

**ATTENTION:** Please note that clone configuration function operates properly when the same firmware version is installed on the devices.

##### Create a configuration clone file

Click on the **Download Clone File** button to save the setting to the computer.

##### Restore a configuration from a clone file

**Step 1.** Choose the desired network setting from the dropdown menu:

- Keep unchanged.
- Restore from clone file (hostname will change, because the hostname property is also cloned from the original device and it can affect the generated certificates of the 443 port).
- Set to DHCP mode.
- Set to custom non-DHCP mode (in this case additional settings required: IP Address, Subnet Mask, Gateway Address).

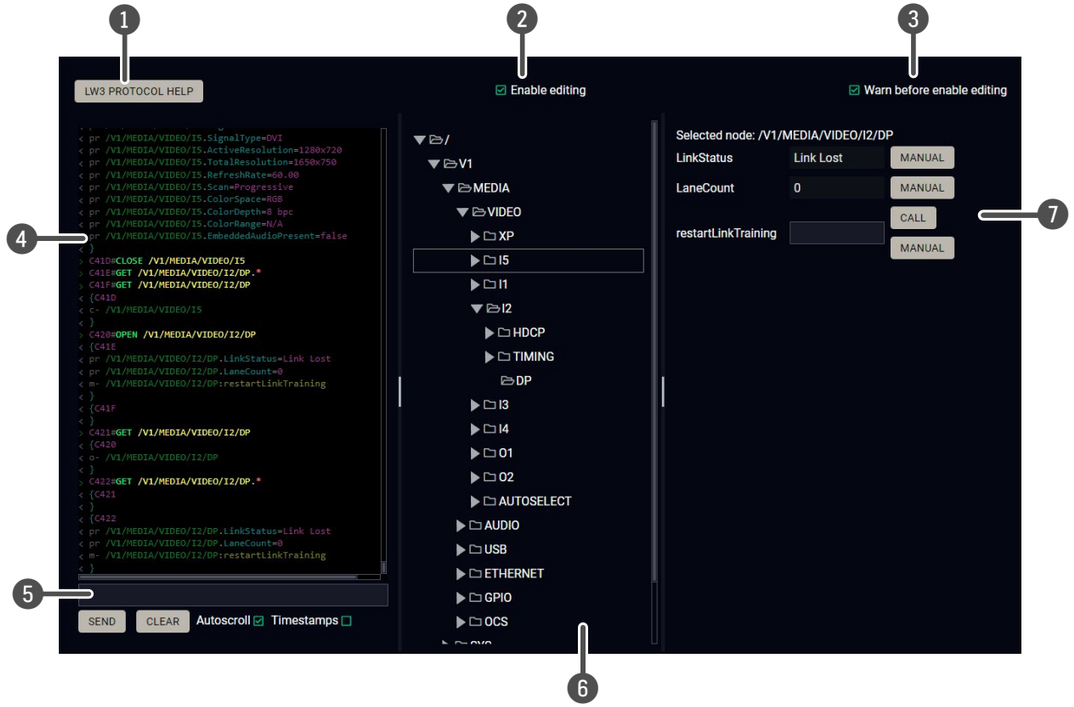
INFO: The network settings relates to Static or DHCP setting/ IP address/ Subnet mask/ Gateway address and the hostname property. Network service settings (enable http(s) ports, authentication etc.) will be always restored.

**Step 2.** Click on the **Select file** button to browse a clone file from the PC.

**Step 3.** The cloning process will start by clicking on the **Restore** button.

See the entire list of the saved data in the backup file in the Content of the Backup File section.

## 6.14. Advanced View Window




1. **LW3 protocol help** — Pushing the button results in a help window opening, which describes the most important information about LW3 protocol commands in HTML format.
2. **Edit mode** — The default appearance is the read-only mode. If you want to modify the values or parameters, tick the option. You will be prompted to confirm your selection.
3. **Warning mode** — If this is checked, a warning window pops up when you enable Edit mode.
4. **Terminal window** — Commands and responses with time and date are listed in this window. Sent command starts with '>' character, received response starts with '<' character. The color of each item depends on the type of the command and response. The content of the window can be emptied by the **Clear** button. If the **Autoscroll** option is ticked, the list is scrolled automatically when a new line is added.
5. **Command line** — Type the desired command and execute it by the **Send** button. Clear all current commands and responses in the Terminal window by the **Clear** button.
6. **Protocol tree** — LW3 protocol tree; select an item to see its content.
7. **Node list** — Correspondent parameters and nodes are shown that are connected to the selected item in the protocol tree.

*#advancedview*
*#terminal*

**Manual** button: Manual (short description) of the node can be called and displayed in the terminal window.

**Set** button: Saves the value/parameter typed in the textbox.

**Call** button: Calls the method, e.g. reloads factory default settings.

TIPS AND TRICKS: You can browse the previously entered commands by using the **Up** and **Down** arrows in the Command line.

# 7

## Lightware REST API Reference

**The device can be controlled through standard HTTP(S) requests to ensure the control functions from web browsers or terminal program. This feature is available from 1.2.0 firmware package.**


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## 7.1. Overview

The Lightware REST API is designed to provide a platform-free interface, where the UCX series switchers can be controlled by HTTP requests. REST API is a software architectural style based on HTTP protocol, so it can be used via web browser, Node.js, terminal programs.

The UCX series device provides a REST API server where most of the LW3 commands are available (for more details, see the Lightware REST API vs. LW3 Protocol section).

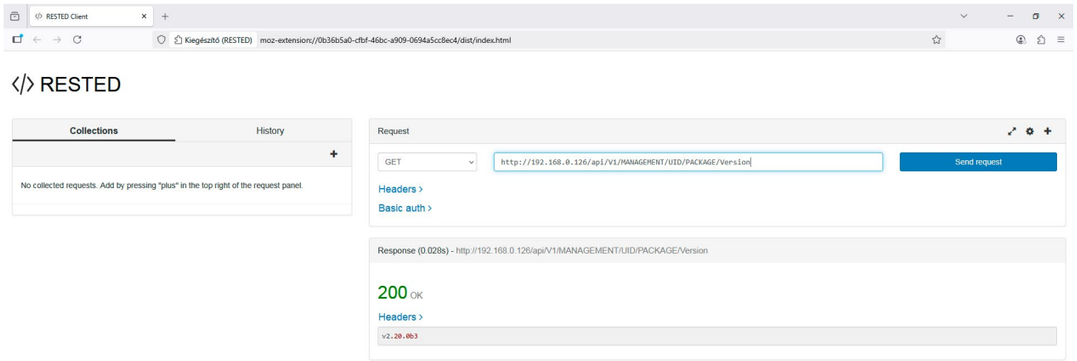
Lightware devices can be controlled with LW3 protocol commands (for more details, see LW3 Programmers' Reference). LW3 protocol consist of read-only, read-write properties and methods, which operate in the same way as REST API GET/POST methods. This is not a new protocol, the LW3 tree structure became available via HTTP(s).

## 7.2. Instructions for the Terminal Application Usage

### 7.2.1. Web Browser Plugins

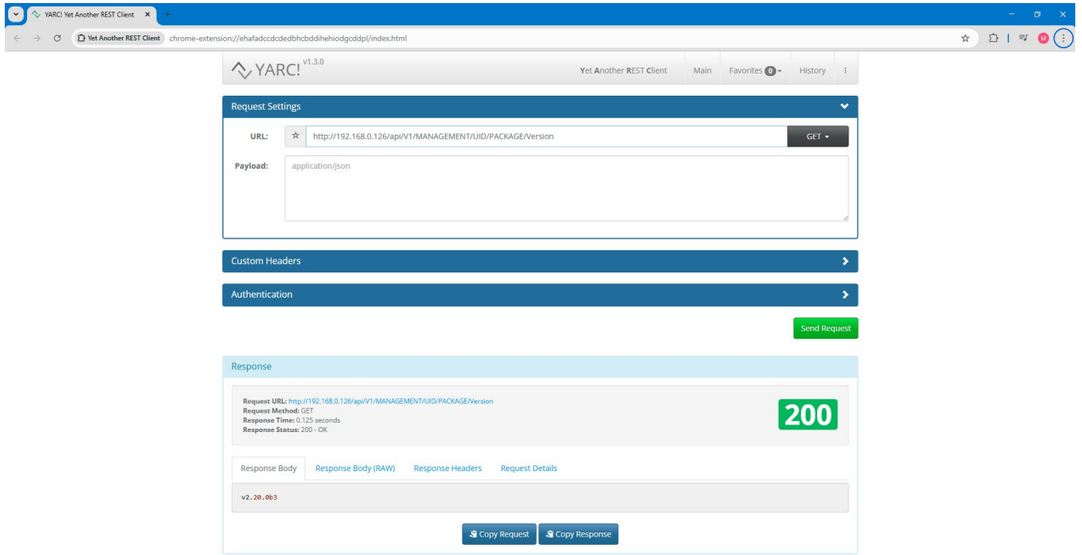
REST API interface can be easily accessed via a web browser's plugin, see the two examples below:

**Mozilla Firefox - RESTED**




*RESTED plugin for Mozilla Firefox*

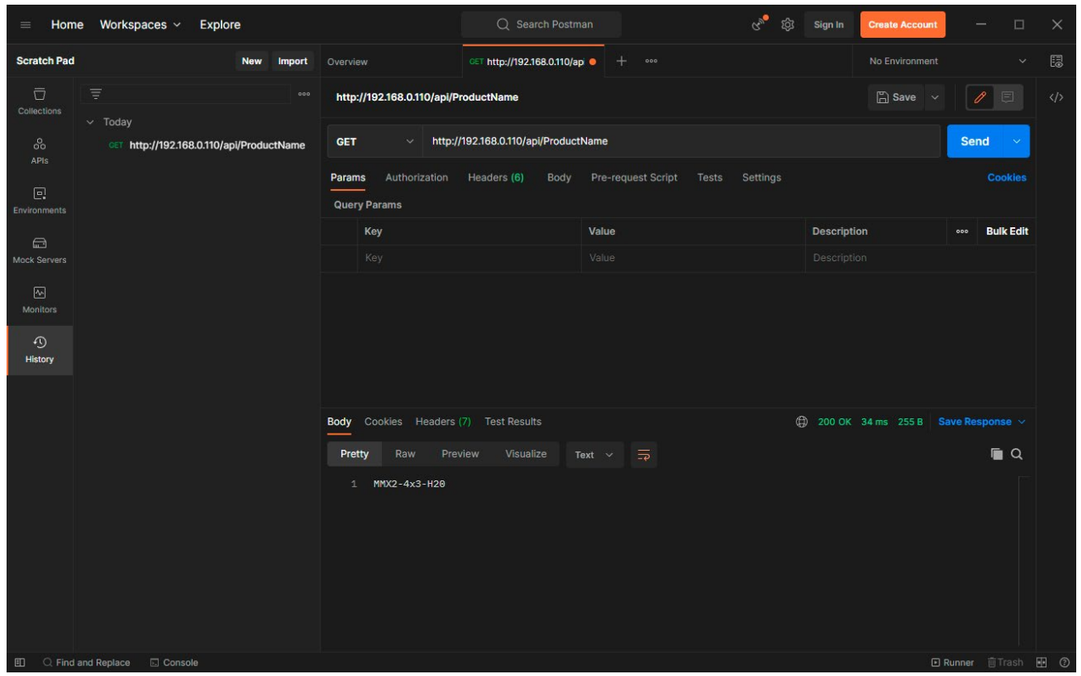
**Google Chrome - Yet Another REST Client**




*Yet Another REST Client for Google Chrome*

### 7.2.2. Third-party API Platform

Postman is one of the numerous applications that can be used for sending REST API requests.




***Postman – for REST API Usage***

### 7.2.3. Terminal Application

The REST API requests can be applied to the switcher using a terminal application. You need to install one of them on your control device, for example, Putty, CLI or Curl. *#terminal*

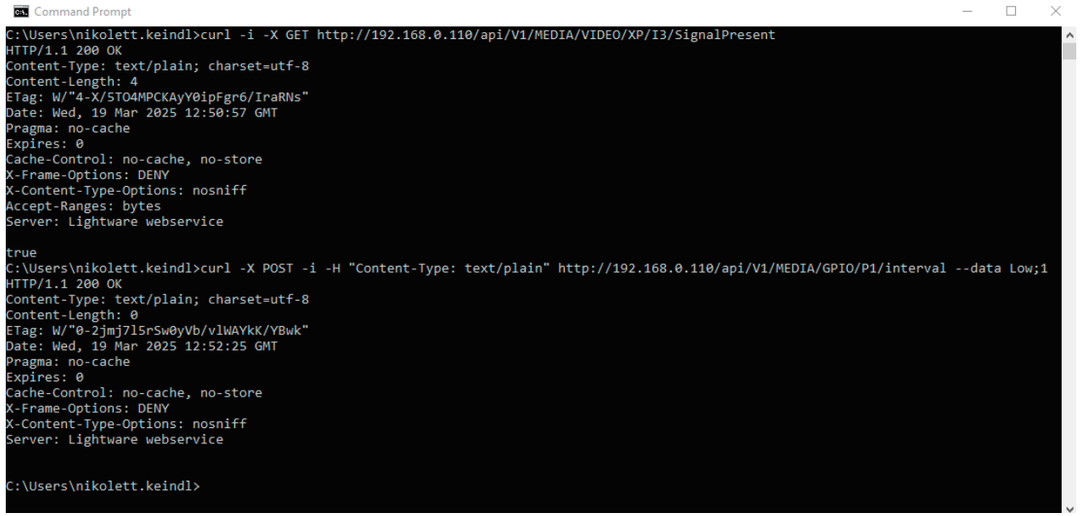
#### Curl

**Curl** is a command line tool that can also connect to the Taurus REST SERVER and display communication in a terminal window. It supports data transferring with HTTP and HTTPS standards and handles the basic authentication (username and password) in Windows® and Linux operating systems. Multi-line commands are also accepted, so a script can be stored in a .txt file for future reference.

Check if the Curl package is installed on your system. Type into your console: `curl.` When the answer is `'curl: try 'curl --help' for more information'`, curl is installed.

Some web browser plugins (e.g. REST Client) display the curl version of the sent request.

Once the terminal window is opened, you can enter the commands. Some typical examples are listed in the following section.




***REST API communication in a command line window***

**GET Command  Example**

Query the Signal Presence

curl -i -X GET <ip>/api/<NodePath>/<PropertyName>

```
C:\Users\nikolett.keindl>curl -i -X GET http://192.168.0.110/api/V1/MEDIA/VIDEO/XP/I2/SignalPresent
HTTP/1.1 200 OK
Content-Type: text/plain; charset=utf-8
Content-Length: 4
ETag: W/"4-X/5TO4MPCKAyY0ipFgr6/IraRNs"
Date: Wed, 19 March 2025 13:39:24 GMT
Pragma: no-cache
Expires: 0
Cache-control: no-cache, no-store
X-Frame-Options: DENY
X-Content-Type-Options: nosniff
Accept-Ranges: bytes
Server: Lightware webservice

true
```

**POST Command Example 1.**

Set the Mute State

curl -X POST -i -H "Content-Type: text/plain" <ip>/api/<NodePath>/<PropertyName> --data <value>

```
C:\Users\nikolett.keindl>curl -X POST -i -H "Content-Type: text/plain" http://192.168.0.110/api/V1/MEDIA/VIDEO/XP/
I2/Mute --data true
HTTP/1.1 200 OK
Content-Type: text/plain; charset=utf-8
Content-Length: 4
ETag: W/"4-X/5TO4MPCKAyY0ipFgr6/IraRNs"
Date: Wed, 19 March 2025 13:48:09 GMT
Pragma: no-cache
Expires: 0
Cache-control: no-cache, no-store
X-Frame-Options: DENY
X-Content-Type-Options: nosniff
Accept-Ranges: bytes
Server: Lightware webservice

true
```

**POST Command Example 2.**

Switch video crosspoint

curl -X POST -i -H "Content-Type: text/plain" <ip>/api/<NodePath>/<PropertyName> --data <value>

```
C:\Users\nikolett.keindl>curl -X POST -i -H "Content-Type: text/plain" http://192.168.0.110/api/V1/MEDIA/VIDEO/XP/
switch --data I2:O1
HTTP/1.1 200 OK
Content-Type: text/plain; charset=utf-8
Content-Length: 0
ETag: W/"0-2jmj7l5rSw0iVb/v1WAYkK/YBwk"
Date: Wed, 19 March 2025 14:02:01 GMT
Pragma: no-cache
Expires: 0
Cache-control: no-cache, no-store
X-Frame-Options: DENY
X-Content-Type-Options: nosniff
Server: Lightware webservice
```

**POST Command with Basic Authentication Example**

Switch video crosspoint

curl --user <username>:<password> -X POST -H "Content-Type: text/plain" <ip>/api/<NodePath>/<PropertyName> --data <value>

```
C:\Users\nikolett.keindl>curl --user admin:#password12 -X POST -H "Content-Type: text/plain" http://192.168.0.110/
api/V1/MEDIA/VIDEO/XP/switch --data I2:O1
```

**HTTPS Command Example 2.**

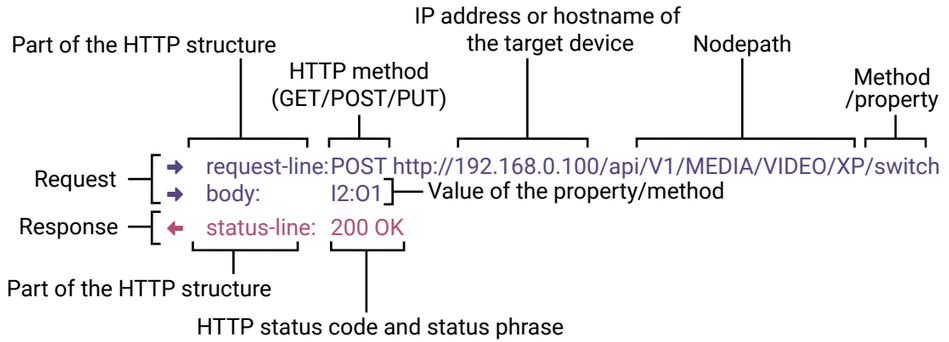
Switch video crosspoint

curl -X POST -k -i -H "Content-Type: text/plain" <ip>/api/<NodePath>/<PropertyName> --data <value>

```
C:\Users\nikolett.keindl>curl -X POST -k -i -H "Content-Type: text/plain" https://192.168.0.110/api/V1/MEDIA/VIDEO/
XP/switch --data I2:O1
HTTP/1.1 200 OK
Content-Type: text/plain; charset=utf-8
Content-Length: 0
ETag: W/"0-2jmj7l5rSw0yVb/v1WAYkK/YBwk"
Date: Wed, 19 March 2025 12:28:20 GMT
Pragma: no-cache
Expires: 0
Cache-control: no-cache, no-store
X-Frame-Options: DENY
X-Content-Type-Options: nosniff
Strict-Transport-Security: max-age=31536000; includeSubDomains
Server: Lightware webservice
```

## 7.3. Protocol Rules

### 7.3.1. Command Structure Example




The examples below show how to apply the REST API in different environments:

**Curl in Command Line Terminal**

```
➜ curl -X POST -i -H "Content-Type: text/plain" http://192.168.0.100/api/V1/MEDIA/VIDEO/XP/switch
    --data I2:O1
```

**REST API Client in Mozilla**

**Method:** POST
**URL:** http://192.168.0.100/api/V1/MEDIA/VIDEO/XP/switch
**Body content type:** text/plain
**Body:** I2:O1

### 7.3.2. General Rules

- All names and parameters are case-insensitive.
- The methods, nodes and properties are separated by a slash ('/') character.
- The node name consists of letters of the English alphabet and numbers.
- All properties and methods are available HTTP(S) below /api as an URL.
- The HTTP server is available on port 80, the HTTPS server is available on port 443.
- GET / PUT/ POST methods are supported.
- The request-line contains the IP address (or hostname) and the nodepath.
- Arguments and property values should be given in the HTTP request's body as a plain text.
- REST API - LW3 converter does escaping automatically.
- The node paths describe the exact location of the node, listing each parent node up to the root.
- The supported HTTP protocol: standard HTTP/1.1
- There is no maxiumum size or character length of the request.

### 7.3.3. Legend for the Control Commands

**Command and Response – Example**

➜ request-line: GET·<ip>/api/V1/MEDIA/VIDEO/<in>/SignalPresent

➜ body: <status code>

| Format | Description |
|---|---|
| <ip> | IP address or hostname of the target device |
| <in> | Input port number |
| <out> | Output port number |
| <port> | Input or output port number |
| <loc> | Location number |
| <parameter> | Variable defined and described in the command |
| <expression> | Batched parameters: the underline means that more expressions or parameters can be placed by using a semicolon, e.g. **I2;I4;I5** or **F27:E1;F47:E2** |
| ➜ | Sent request |
| ➜ | Received response |
| · | Space character |

Further, not listed <parameters> are defined at each command.

### 7.3.4. Lightware REST API vs. LW3 Protocol

All methods and properties of the LW3 tree structure appear below /api as a HTTP(s) URL. The separator character is always a slash ('/') character instead of point ('.') and colon (':'). The URL is case-insensitive.

**Example**

The LW3 property:
/V1/MEDIA/VIDEO/I2.ActiveResolution

Available in REST API:
192.168.0.1/api/V1/MEDIA/VIDEO/I1/ActiveResolution
192.168.0.1/API/v1/media/video/i1/activeresolution

The following features are implemented only in REST API, but not in LW3 protocol:

- Sending a Message via RS-232

The most important commands are listed in this chapter. Other commands can be inferred by the LW3 tree structure, where the read-only (eg. **pr** /V1/MEDIA/VIDEO/I5.Connected) and read-write properties (**pw** /V1/MEDIA/VIDEO/I5.Name) can be listed. For more details about the LW3 tree structure, see the LW3 Programmers' Reference section or the Advanced View Window.

### 7.3.5. Method Types

#### GET Method

GET method can be used to get the value of a property. It works the same way as the LW3 GET command.

#### PUT/ POST Method

In this case, POST and PUT are equivalent, they are for modifying read-write properties and invoking methods. They replace the LW3 SET and CALL commands.

### 7.3.6. Supported Commands

#### Querying property value (GET)

The requested value is in the body of the response.

| Protocol | Command |
|---|---|
| **REST API** | ➜ request-line: GET·<ip>/api/<NODEPATH>/<PropertyName> |
| **Example** | ➜ request-line: GET http://192.168.0.100/api/V1/MEDIA/VIDEO/XP/I2/SignalPresent |
| **LW3** | ▸ GET·/<NODEPATH>.<PropertyName> |
| **Example** | ▸ GET /V1/MEDIA/VIDEO/XP/I2.SignalPresent |

#### Setting property value (SET)

The desired property value should be given as a plain text in the body of the request. The new value is in the body of the response.

| Protocol | Command |
|---|---|
| **REST API** | ➜ request-line: POST·<ip>/api/<NODEPATH>/<PropertyName><br>➜ body: <new_value> |
| **Example** | ➜ request-line: POST http://192.168.0.100/api/V1/MEDIA/VIDEO/XP/I2/Mute<br>➜ body: false |
| **LW3** | ▸ SET·/<NODEPATH>.<PropertyName>=<new_value> |
| **Example** | ▸ SET /V1/MEDIA/VIDEO/XP/I2.Mute=false |

#### Invoking method (CALL)

The argument should be given in the body of the request.

| Protocol | Command |
|---|---|
| **REST API** | ➜ request-line: POST·<ip>/api/<NODEPATH>/<methodName><br>➜ body: <new_value> |
| **Example** | ➜ request-line: POST http://192.168.0.100/api/V1/MEDIA/VIDEO/XP/switch<br>➜ body: I5:O1 |
| **LW3** | ▸ CALL·/<NODEPATH>:<methodName>(<value>) |
| **Example** | ▸ CALL /V1/MEDIA/VIDEO/XP:switch(I5:O1) |

### 7.3.7. Not Supported Commands

#### Querying node (GET)

| Protocol | Command | Note |
|---|---|---|
| **REST API** | Not supported | 404 error code |
| **LW3** | ▸ GET·/<NODEPATH> | |
| **Example** | ▸ GET /V1/MEDIA/VIDEO | |

#### Subscribing to a node (OPEN)

| Protocol | Command | Note |
|---|---|---|
| **REST API** | Not interpreted | Not supported |
| **LW3** | ▸ OPEN·/<NODEPATH> | |
| **Example** | ▸ OPEN /V1/MEDIA/VIDEO | |

#### Unsubscribing from a Node (CLOSE)

| Protocol | Command | Note |
|---|---|---|
| **REST API** | Not interpreted | Not supported |
| **LW3** | ▸ CLOSE·/<NODEPATH> | |
| **Example** | ▸ CLOSE /V1/MEDIA/VIDEO | |

### 7.3.8. Status Codes, Error Messages

The standard HTTP response codes are defined to supply information about the response and the executed command like:

| Error code | | Description |
|---|---|---|
| 200 | OK | Standard response for successful HTTP request. |
| 401 | Unauthorized | |
| 405 | Method Not Allowed | A request method is not supported for the requested resource. This is the error code when trying to modify a read-only property. |
| 404 | Not Found | Invalid nodepath or property name. |
| 406 | Not Acceptable | LW3 server error response for POST and PUT method, equals the following LW3 error codes:<br>**pE:** an error for the property<br>**mE:** an error for a method |
| 500 | Internal Server Error | All other errors (Lw3ErrorCodes_InternalError). |

#### 7.3.9. Polling

Subscription and unsubscription features are not supported, they can be substituted with polling. It means that a custom user script sends a request for a detected property from time to time.

## 7.4. REST API Security

The REST API is designed with two security features: **Authentication** and **Encryption.** Both of them are optional and can be used independently of each other.

### 7.4.1. Authentication

Basic access authentication is designed to limit user access for the REST API server. It requires user authentication by using a password (username is fixed).

Follow the instructions below to set the password:

**Step 1.** Set the password.

➜ request-line: POST·<ip>/api/V1/MANAGEMENT/NETWORK/AUTHENTICATION/setPassword
➜ body: <new_password>

**Step 2.** Enable the basic authentication on the chosen port (HTTP: 80 or HTTPS: 443).

➜ request-line: POST·<ip>/api/V1/MANAGEMENT/NETWORK/SERVICES/HTTP/AuthenticationEnabled
➜ body: true

**Step 3.** Restart network services.

➜ request-line: POST·<ip>/api/V1/MANAGEMENT/NETWORK/SERVICES/HTTP/restart

**ATTENTION:** The password will not be encrypted by this authentication mode, it remains accessible when the communication happens on HTTP.

For more details, see the Basic Authentication section.

### 7.4.2. Encryption (HTTPS)

There is no encryption when the REST API communication happens via HTTP, because the HTTP protocol is not encrypted. The REST API server is available via HTTPS on the 443 port. To avoid the data interception (e.g. stealing the password) HTTP should be disabled and HTTPS protocol should be used instead.

**ATTENTION:** Please ensure proper UCX time and date setting in UCX, because it affects the self-signed certificate (SSL) generation when using WSS or HTTPS. Improper time and date setting may lead to certificate rejection.

HTTPS does not guarantee that the communication is secure. Make sure that the client communicates with the server directly, without any third-party element in the communication route (Man-in-the-middle attack).

For more details, see the Encryption (HTTPS, WSS) section.

## 7.5. System Commands

### 7.5.1. Setting the Device Label

INFO: The device label can be changed to a custom text in the Status tab of the LDC software.

**Request and Response** *#devicelabel #label*

➜ request-line: POST·http://<ip>/api/V1/MANAGEMENT/LABEL/DeviceLabel
➜ body: <custom_name>

➜ status-line: 200·OK
➜ body: <custom_name>

The Device Label can be 49 characters long and ASCII characters are allowed. Longer names are truncated.

**Example**

➜ request-line: POST http://192.168.0.100/api/V1/MANAGEMENT/LABEL/DeviceLabel
➜ body: UCXroom

➜ status-line: 200 OK
➜ body: UCXroom

### 7.5.2. Resetting the Device

The switcher can be restarted – the current connections will be terminated.

**Request and Response** *#reboot #restart*

➜ request-line: POST·http://<ip>/api/V1/SYS/restart

INFO: The body has to be empty, and the content type should be text/plain.

➜ status-line: 200·OK

**Example**

➜ request-line: POST http://192.168.0.100/api/V1/SYS/restart HTTP/1.1

➜ status-line: 200 OK

### 7.5.3. Restoring the Factory Default Settings

**Request and Response**

➜ request-line: POST·http://<ip>/api/V1/SYS/factoryDefaults

INFO: The body has to be empty, and the content type should be text/plain.

➜ status-line: 200·OK

**Example**

➜ request-line: POST http://192.168.0.100/api/V1/SYS/factoryDefaults
➜ status-line: 200 OK

The device is restarted, current connections are terminated, and the default settings are restored. See the complete list in the Factory Default Settings section. *#factory*

### 7.5.4. Querying the Firmware Package Version

**Request and Response** *#firmwareversion*

➡ request-line: GET·http://<ip>/api/V1/MANAGEMENT/UID/PACKAGE/Version

⬅ status-line: 200·OK
⬅ body: <firmware_version>

**Example**

➡ request-line: GET http://192.168.0.100/api/V1/MANAGEMENT/UID/PACKAGE/Version

⬅ status-line: 200 OK
⬅ body: 1.0.0b2

### 7.5.5. Control Lock

Enable/disable the operation of the front panel buttons.

**Request and Response** *#lockbutton* *#buttonlock*

➡ request-line: POST·http://<ip>/api/V1/MANAGEMENT/UI/ControlLock
➡ body: <lock_status>

⬅ status-line: 200·OK
⬅ body: <lock_status>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <lock_status> | Front panel button locking status | **None** | **None:** all functions of the front panel button are enabled. |
| | | **locked** | The front panel buttons are locked, and can be unlocked by a button combination (Control Lock). |
| | | **force locked** | The front panel buttons are locked and cannot be unlocked by a button combination, only in LDC (on the Status tab) or using the LW3 command (or REST API). |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MANAGEMENT/UI/ControlLock
➡ body: force locked

⬅ status-line: 200 OK
⬅ body: force locked

### 7.5.6. Setting the Current Time

**Request and Response** *#time*

➡ request-line: POST·http://<ip>/api/V1/MANAGEMENT/DATETIME/setTime
➡ body: <current_time>

⬅ status-line: 200·OK
⬅ body: OK

**Parameters**

<current_time>: The new router time in ISO 8601 date time format.

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MANAGEMENT/DATETIME/setTime
➡ body: 2034-05-06T14:47:25

⬅ status-line: 200 OK
⬅ body: OK

### 7.5.7. Identifying the Device

Calling the method makes the status LEDs blink for 10 seconds. The feature helps find the device physically.

**Request and Response** *#identifyme*

➡ request-line: POST·http://<ip>/api/V1/MANAGEMENT/UI/identifyMe

INFO: The body has to be empty, and the content type should be text/plain.

⬅ status-line: 200·OK

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MANAGEMENT/UI/identifyMe

⬅ status-line: 200 OK

### 7.5.8. Toggling the Dark Mode Setting

The LEDs of the device can be switched off if their light could be annoying. In Dark mode all the LEDs are switched off, except the LEDs of the RJ45 connectors (Ethernet and TPS IN). *#darkmode*

**Request and Response**

➜ request-line: POST·http://<ip>/api/V1/MANAGEMENT/UI/DARKMODE/Enable
➜ body: <mode_state>

🡐 status-line: 200·OK
🡐 body: <mode_state>

**Parameters**

If the <mode_state> parameter is **true** (or **1**), the Dark mode function is **enabled**, if the parameter is **false** (or **0**), the function is **disabled**.

**Example**

➜ request-line: POST http://192.168.0.100/api/V1/MANAGEMENT/UI/DARKMODE/Enable
➜ body: true

🡐 status-line: 200 OK
🡐 body: true

### 7.5.9. Setting the Delay of the Dark Mode

The Dark mode can be enabled right away, or after a certain time. Thus, the mode is enabled if no buttons are pressed for a while. Pressing any button brings back the status info on the LEDs without performing the function of the button itself. The delay time can be set with this command.

**Request and Response**

➜ request-line: POST·http://<ip>/api/V1/MANAGEMENT/UI/DARKMODE/Delay
➜ body: <delay_time>

🡐 status-line: 200·OK
🡐 body: <delay_time>

**Parameters**

The <delay_time> parameter means seconds, and the default value is 0. If set to 0, no delay is applied, and the Dark mode can be enabled immediately by the **DarkModeEnable** property. This delay has an effect on the **wakeFromDarkMode** method as well.

**Example**

➜ request-line: POST http://192.168.0.100/api/V1/MANAGEMENT/UI/DARKMODE/Delay
➜ body: 10

🡐 status-line: 200 OK
🡐 body: 10

### 7.5.10. Enabling Remote System Logging

**Request and Response**

➜ request-line: POST·http://<ip>/api/V1/MANAGEMENT/LOG/REMOTE/Enabled
➜ body: <status>

🡐 status-line: 200·OK
🡐 body: <status>

**Parameters**

| Parameter | Value | Value Description |
|---|---|---|
| <status> | **true** | The remote system logging is enabled. |
| | **false** | The remote system logging is disabled. |

**Example**

➜ request-line: POST http://192.168.0.100/api/V1/MANAGEMENT/LOG/REMOTE/Enabled
➜ body: true

🡐 status-line: 200 OK
🡐 body: true

### 7.5.11. Setting the Remote Server Address

**Request and Response**

➜ request-line: POST·http://<ip>/api/V1/MANAGEMENT/LOG/REMOTE/ServerAddress
➜ body: <server_address>

🡐 status-line: 200·OK
🡐 body: <server_address>

**Parameters**

| Parameter | Value | Value Description |
|---|---|---|
| <server_address> | **e.g. mycompany.com (domain)**<br>**192.168.0.1 (IPv4)** | The server domain name (RFC1035) or IP address (IPv4) where the logs should be sent to. |

**Example**

➜ request-line: POST http://192.168.0.100/api/V1/MANAGEMENT/LOG/REMOTE/ServerAddress
➜ body: 192.168.0.1

🡐 status-line: 200 OK
🡐 body: 192.168.0.1

### 7.5.12. Setting the Protocol for the Remote System Logging

**Request and Response**

➡ request-line: POST·http://<ip>/api/V1/MANAGEMENT/LOG/REMOTE/Protocol
➡ body: <protocol>

⬅ status-line: 200·OK
⬅ body: <protocol>

**Parameters**

| Parameter | Value | Value Description |
|---|---|---|
| <protocol> | **TCP** | The logs are forwarded using TCP protocol. |
| | **UDP** | The logs are forwarded using UDP protocol. |
| | **TLS** | The logs are forwarded using TLS protocol. |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MANAGEMENT/LOG/REMOTE/Protocol
➡ body: TLS

⬅ status-line: 200 OK
⬅ body: TLS

### 7.5.13. Setting the Format of the Remote System Logging

**Request and Response**

➡ request-line: POST·http://<ip>/api/V1/MANAGEMENT/LOG/REMOTE/LogFormat
➡ body: <format>

⬅ status-line: 200·OK
⬅ body: <format>

**Parameters**

| Parameter | Value | Value Description |
|---|---|---|
| <format> | **RFC3164** | This is a simplified format for human readability. |
| | **RFC5424** | This is an all-encompassing format for analitical systems. |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MANAGEMENT/LOG/REMOTE/LogFormat
➡ body: RFC3164

⬅ status-line: 200 OK
⬅ body: RFC3164

### 7.5.14. Setting the Port for Remote System Logging

**Request and Response**

➡ request-line: POST·http://<ip>/api/V1/MANAGEMENT/LOG/REMOTE/PortNumber
➡ body: <port_number>

⬅ status-line: 200·OK
⬅ body: <port_number>

**Parameters**

| Parameter | Value | Value Description |
|---|---|---|
| <port_number> | **1-65535** | The port number on the remote host to send log messages to. |

INFO: The port number cannot be set to 0.

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MANAGEMENT/LOG/REMOTE/PortNumber
➡ body: 6514

⬅ status-line: 200 OK
⬅ body: 6514

### 7.5.15. Enabling/Disabling SNMP Monitoring

**Request and Response**

➡ request-line: POST·http://<ip>/api/V1/MANAGEMENT/NETWORK/SERVICES/SNMP/Enabled
➡ body: <status>

⬅ status-line: 200 OK
⬅ body: <status>

**Parameters**

| Parameter | Value | Value Description |
|---|---|---|
| <status> | **true** | The SNMP monitoring is enabled. |
| | **false** | The SNMP monitoring is disabled. |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MANAGEMENT/NETWORK/SERVICES/SNMP/Enabled
➡ body: true

⬅ status-line: 200 OK
⬅ body: true

### 7.5.16. Setting the Device Location

**Request and Response**

➜ request-line: POST·http://<ip>/api/V1/MANAGEMENT/NETWORK/SERVICES/SNMP/SysLocation
➜ body: <location>

⬅ status-line: 200 OK
⬅ body: <location>

**Parameters**

| Parameter | Value | Value Description |
|---|---|---|
| <location> | **e.g. Room 306** | The physical or logical location of the device. The string might contain letters of the English alphabet (A-Z, a-z), numbers (0-9), space ( ), period (.), underscore (_) and hyphen (-). |

**Example**

➜ request-line: POST http://192.168.0.100/api/V1/MANAGEMENT/NETWORK/SERVICES/SNMP/SysLocation
➜ body: Room 306

⬅ status-line: 200 OK
⬅ body: Room 306

## 7.6. Video Port Settings - General

### 7.6.1. Switching the Video Input

**Request and Response**

➡ request-line: POST·http://<ip>/api/V1/MEDIA/VIDEO/XP/switch
➡ body: <in>:<out>

⬅ status-line: 200·OK

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/VIDEO/XP/switch
➡ body: I5:O1

⬅ status-line: 200 OK

INFO: When using the '0' value as an input, the input will be disconnected and no signal will appear on the output.

**ATTENTION:** Video crosspoint has a limitation: I1 and I3/I5* ports are not available at the same time, only one of them can be selected to any output. When one of the outputs is switched to I1 or I3/I5*, the other output can not be switched to I1 or I3/I5*. In this case the switch command returns an error message.

***I3** in case of **UCX-2x1-HC60**, **UCX-2x2-H60** and **SCX-2x1-HC60** models, **I5** in case of **UCX-4x2-HC60**, **UCX-4x2-HC60D**, **UCX-4x3-HC60** and **UCX-4x3-HC60-BD** models.

**Example**

➡ request-line: GET http://192.168.0.100/api/V1/MEDIA/VIDEO/XP/O1/ConnectedSource

⬅ body: I5

➡ request-line: GET http://192.168.0.100/api/V1/MEDIA/VIDEO/XP/O2/ConnectedSource

⬅ body: I5

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/VIDEO/XP/switch
➡ body: I1:O1

⬅ header: 405 Method Not Allowed

### 7.6.2. Switching an Input to All Outputs

**Request and Response**

➡ request-line: POST·http://<ip>/api/V1/MEDIA/VIDEO/XP/switchAll
➡ body: <in>

⬅ status-line: 200·OK

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/VIDEO/XP/switchAll
➡ body: I1

⬅ status-line: 200 OK

### 7.6.3. Locking the Video Port

**Request and Response**

➡ request-line: POST·http://<ip>/api/V1/MEDIA/VIDEO/XP/<port>/Lock
➡ body: <locked_state>

⬅ status-line: 200·OK
⬅ body: <locked_state>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <locked_state> | Locked state | **true** | The port is locked |
| | | **false** | The port is unlocked |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/VIDEO/XP/I2/Lock
➡ body: false

⬅ status-line: 200 OK
⬅ body: false

### 7.6.4. Muting the Video Port

**Request and Response**

➡ request-line: POST·http://<ip>/api/V1/MEDIA/VIDEO/XP/<port>/Mute
➡ body: <muted_state>

⬅ status-line: 200·OK
⬅ body: <muted_state>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <muted_state> | Muted state | **true** | The port is muted. |
| | | **false** | The port is unmuted. |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/VIDEO/XP/I2/Mute
➡ body: false

⬅ status-line: 200 OK
⬅ body: false

### 7.6.5. Setting the Autoselect Policy

**Request and Response**

➡ request-line: POST·http://<ip>/api/V1/MEDIA/VIDEO/AUTOSELECT/<out>/Policy
➡ body: <autoselect_mode>

⬅ status-line: 200·OK
⬅ body: <autoselect_mode>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <autoselect_mode> | The autoselect policy | **Off** | The autoselect function is disabled. |
| | | **Last Detect** | It is always the last attached input that is automatically switched to the output. |
| | | **First Detect** | The first active video input is selected. |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/VIDEO/AUTOSELECT/O2/Policy
➡ body: First detect

⬅ status-line: 200 OK
⬅ body: First detect

### 7.6.6. Changing the Autoselect-Included Input Ports

**Request and Response**

➡ request-line: POST·http://<ip>/api/V1/MEDIA/VIDEO/AUTOSELECT/<out>/<in>/Included
➡ body: <state>

⬅ status-line: 200·OK
⬅ body: <state>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <state> | The chosen input is ignored in the autoselect process or not. | **true** | The port is included in autoselect. |
| | | **false** | The autoselect function ignores that port. |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/VIDEO/AUTOSELECT/O2/I1/Included
➡ body: false

⬅ status-line: 200 OK
⬅ body: false

### 7.6.7. Changing the Input Port Priority

**Request and Response**

➡ request-line: POST·http://<ip>/api/V1/MEDIA/VIDEO/AUTOSELECT/<out>/<in>/Priority
➡ body: <prio_num>

⬅ status-line: 200·OK
⬅ body: <prio_num>

**Parameters**

The <prio> parameter means the priority number from 1 to 100, equal numbers are allowed. Inputs can have different priorities in relation with two or more outputs. Therefore the output port number is part of the node path of input port priorities.

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/VIDEO/AUTOSELECT/O2/I2/Priority
➡ body: 51

⬅ status-line: 200 OK
⬅ body: 51

### 7.6.8. Querying the Connected Source

**Request and Response**

➡ request-line: GET·http://<ip>/api/V1/MEDIA/VIDEO/XP/<out>/ConnectedSource

⬅ status-line: 200·OK
⬅ body: <in>

**Example**

➡ request-line: GET http://192.168.0.100/api/V1/MEDIA/VIDEO/XP/O2/ConnectedSource

⬅ status-line: 200 OK
⬅ body: I1

### 7.6.9. Querying the Connected Destinations

**Request and Response**

➡ request-line: GET·http://<ip>/api/V1/MEDIA/VIDEO/XP/<in>/ConnectedDestinations

⬅ status-line: 200·OK
⬅ body: ["<out1>";"<out1>"]

**Example**

➡ request-line: GET http://192.168.0.100/api/V1/MEDIA/VIDEO/XP/I3/ConnectedDestinations

⬅ status-line: 200 OK
⬅ body: ["O1","O2"]

### 7.6.10. Querying the Input Switching Capability

Video crosspoint has a limitation: I1 or I3/I5 ports can not be selected to any output at the same time. **Busy** value of the switchable property refers to the limitation.

***I3** in case of **UCX-2x1-HC60**, **UCX-2x2-H60** and **SCX-2x1-HC60** models, **I5** in case of **UCX-4x2-HC60**, **UCX-4x2-HC60D**, **UCX-4x3-HC60** and **UCX-4x3-HC60-BD** models.

**Request and Response**

➡ request-line: GET·http://<ip>/api/V1/MEDIA/VIDEO/XP/<out>/SWITCHABLE/<in>

⬅ status-line: 200·OK
⬅ body: <switchable_state>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <switchable_state> | The chosen input is can be switched to the output or not. | **OK** | The connection of the chosen input and output is allowed. |
| | | **Busy** | The chosen input can not be switched to the output. |
| | | **Locked** | The chosen input can not be switched to the output, because the input is locked. |

**Example**

➡ request-line: GET http://192.168.0.100/api/V1/MEDIA/VIDEO/XP/O2/SWITCHABLE/I1

⬅ status-line: 200 OK
⬅ body: Busy

### 7.6.11. Query the Video Signal Presence

**Request and Response**

➡ request-line: GET·http://<ip>/api/V1/MEDIA/VIDEO/<port>/SignalPresent

⬅ status-line: 200·OK
⬅ body: <state>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <state> | This property gives a feedback about the current signal presence of the port. | **true** | The video signal is present. |
| | | **false** | The video signal is not present. |

**Example**

➡ request-line: GET http://192.168.0.100/api/V1/MEDIA/VIDEO/I1/SignalPresent

⬅ status-line: 200 OK
⬅ body: true

### 7.6.12. HDCP Setting (Input Port)

HDCP capability can be set on the input ports, thus non-encrypted content can be seen on a non-HDCP compliant display. See more information in the HDCP Management section.

**ATTENTION:** HDCP 2.2 signal handling is limited to up to two input ports at the same time.

**Request and Response** *#hdcp*

➡ request-line: POST·http://<ip>/api/V1/MEDIA/VIDEO/<in>/HDCP/AllowedHdcpVersion
➡ body: <allowed_hdcp>

⬅ status-line: 200·OK
⬅ body: <allowed_hdcp>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <allowed_hdcp> | The input port reports the HDCP capability. | **HDCP 1.4** | The input port reports HDCP 1.4 capability. |
| | | **HDCP 2.2** | The input port reports HDCP 2.2 capability. |
| | | **Off** | The input port reports non-HDCP compliance. |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/VIDEO/I1/HDCP/AllowedHdcpVersion
➡ body: HDCP 1.4

⬅ status-line: 200 OK
⬅ body: HDCP 1.4

### 7.6.13. HdcpMode

HDCP capability can be set to Auto/Always on the output ports, thus non-encrypted content can be transmitted to a non-HDCP compliant display. See more information in the HDCP Management section.

**Request and Response** *#hdcp*

➡ request-line: POST·http://<ip>/api/V1/MEDIA/VIDEO/<out>/HdcpMode
➡ body: <hdcp_mode>

⬅ status-line: 200·OK
⬅ body: <hdcp_mode>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <hdcp_mode> | HDCP encryption setting on the output port | **Auto** | The encryption is enabled on the output port if the signal on the input port is encrypted. |
| | | **Always** | The outgoing signal is HDCP-encrypted. |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/VIDEO/O1/HDCP/HdcpMode
➡ body: Auto

⬅ status-line: 200 OK
⬅ body: Auto

### 7.6.14. Querying the Embedded Audio Presence

**Request and Response**

➡ request-line: GET·http://<ip>/api/V1/MEDIA/VIDEO/<port>/EmbeddedAudioPresent

⬅ status-line: 200·OK
⬅ body: <embedded_state>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <embedded_state> | It shows if the video contains audio or not. | **true** | There is embedded audio in the video signal. |
| | | **false** | There is no embedded audio in the video signal. |

**Example**

➡ request-line: GET http://192.168.0.100/api/V1/MEDIA/VIDEO/I2/EmbeddedAudioPresent

⬅ status-line: 200 OK
⬅ body: true

### 7.6.15. Muting the Embedded Audio

**Request and Response**

➡ request-line: POST·http://<ip>/api/V1/MEDIA/VIDEO/<port>/EmbeddedAudioMute
➡ body: <mute_state>

⬅ status-line: 200·OK
⬅ body: <mute_state>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <mute_state> | It shows if the embedded audio is muted or not. | **true** | The embedded audio is muted. |
| | | **false** | The embedded audio is unmuted. |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/VIDEO/O1/EmbeddedAudioMute
➡ body: false

⬅ status-line: 200 OK
⬅ body: false

### 7.6.16. Setting the Output Signal Type

**Request and Response** *#signaltype*

➡ request-line: POST·http://<ip>/api/V1/MEDIA/VIDEO/<out>/OutputSignalType
➡ body: <signal_type>

⬅ status-line: 200·OK
⬅ body: <signal_type>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <signal_type> | Signal type setting | **Auto** | The outgoing signal type is HDMI. |
| | | **DVI** | The outgoing signal type is DVI. |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/VIDEO/O1/OutputSignalType
➡ body: Auto

⬅ status-line: 200 OK
⬅ body: Auto

### 7.6.17. Turning on Output 5V

The 5V power towards the sink can be enabled or disabled as follows:

**Request and Response**

➡ request-line: POST·http://<ip>/api/V1/MEDIA/VIDEO/<out>/Output5VMode
➡ body: <5V_pwr>

⬅ status-line: 200·OK
⬅ body: <5V_pwr>

**Parameters**

| Parameter | Parameter description | Value | Value description |
|---|---|---|---|
| <5V_pwr> | 5V power towards the sink | **Auto** | 5V power is enabled when a sink is connected to the port |
| | | **On** | Enable 5V power on HDMI port |
| | | **Off** | Disable 5V power on HDMI port |
| | | **Follow signal present** | 5V power is only enabled if there is active video signal on the port |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/VIDEO/O1/Output5VMode
➡ body: On

⬅ status-line: 200 OK
⬅ body: On

## 7.7. Welcome Screen Settings

For details about the Welcome screen feature, please see the Welcome Screen section.

### 7.7.1. Displaying the Welcome Screen Image

**Request and Response** *#welcomescreen*

➡ request-line: POST·http://<ip>/api/V1/MEDIA/VIDEO/<w_scr>/WELCOMESCREEN/ImageEnabled
➡ body: <image_state>

⬅ status: 200·OK
⬅ body: <image_state>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <w_scr> | Port number of the welcome screen depending on the model | **I3** | UCX-2x1-HC60, UCX-2x2-H60, SCX-2x1-HC60 models |
| | | **I5** | UCX-4x2-HC60, UCX-4x2-HC60D, UCX-4x3-HC60, UCX-4x3-HC60-BD models |
| <image_state> | | **true** | The welcome screen image is displayed. |
| | | **false** | The welcome screen image is not displayed. |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/VIDEO/I5/WELCOMESCREEN/ImageEnabled
➡ body: true

⬅ status-line: 200 OK
⬅ body: true

### 7.7.2. Displaying the Welcome Screen Text

**Request and Response**

➡ request-line: POST·http://<ip>/api/V1/MEDIA/VIDEO/<w_scr>/WELCOMESCREEN/MessageEnabled
➡ body: <text_state>

⬅ status-line: 200·OK
⬅ body: <text_state>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <w_scr> | Port number of the welcome screen depending on the model | **I3** | UCX-2x1-HC60, UCX-2x2-H60, SCX-2x1-HC60 models |
| | | **I5** | UCX-4x2-HC60, UCX-4x2-HC60D, UCX-4x3-HC60, UCX-4x3-HC60-BD models |
| <text_state> | | **true** | The welcome screen text is displayed. |
| | | **false** | The welcome screen text is not displayed. |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/VIDEO/I5/WELCOMESCREEN/MessageEnabled
➡ body: false

⬅ status-line: 200 OK
⬅ body: false

### 7.7.3. Setting the Welcome Screen Text

**Request and Response**

➡ request-line: POST·http://<ip>/api/V1/MEDIA/VIDEO/<w_scr>/WELCOMESCREEN/MessageText
➡ body: <text>

⬅ status-line: 200·OK
⬅ body: <text>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <w_scr> | Port number of the welcome screen depending on the model | **I3** | UCX-2x1-HC60, UCX-2x2-H60, SCX-2x1-HC60 models |
| | | **I5** | UCX-4x2-HC60, UCX-4x2-HC60D, UCX-4x3-HC60, UCX-4x3-HC60-BD models |
| <text> | Text to appear on the welcome screen | | It may consist of letters (A-Z) and (a-z), hyphen (-), underscore (_), numbers (0-9), space ( ) and dot (.). Max length: 63 characters. Longer text is truncated. |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/VIDEO/I5/WELCOMESCREEN/MessageText
➡ body: helloworld

⬅ status-line: 200 OK
⬅ body: helloworld

### 7.7.4. Resetting the Welcome Screen Image

This command restores the original welcome screen image.

**Request and Response**

➜ request-line: POST·http://<ip>/api/V1/MEDIA/VIDEO/<w_scr>/WELCOMESCREEN/resetImage

INFO: The body has to be empty, and the content type should be text/plain.

➜ status-line: 200·OK

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <w_scr> | Port number of the welcome screen depending on the model | **I3** | UCX-2x1-HC60, UCX-2x2-H60, SCX-2x1-HC60 models |
| | | **I5** | UCX-4x2-HC60, UCX-4x2-HC60D, UCX-4x3-HC60, UCX-4x3-HC60-BD models |

**Example**

➜ request-line: POST http://192.168.0.100/api/V1/MEDIA/VIDEO/I5/WELCOMESCREEN/resetImage
➜ status-line: 200 OK

## 7.8. Video Port Settings - USB-C Related Commands

### 7.8.1. Restarting the Link Training

This method is equal to pulling the USB-C connector out and plugging it in again.

**Request and Response** *#linktraining*

➜ request-line: POST·http://<ip>/api/V1/MEDIA/VIDEO/<in>/DP/restartLinkTraining

INFO: The body has to be empty, and the content type should be text/plain.

➜ status-line: 200·OK

**Example**

➜ request-line: POST http://192.168.0.100/api/V1/MEDIA/VIDEO/I1/DP/restartLinkTraining
➜ status-line: 200 OK

## 7.9. CEC Command Sending

The device is able to send Consumer Electronics Control (CEC) commands. This feature is for remote controlling the source or sink device. CEC is a bi-directional communication via the HDMI cable.

**ATTENTION:** To have a successful CEC command processing, the connected HDMI device must support CEC. *#cec*

### 7.9.1. Simple CEC Code Sending

This command is for sending simple CEC commands to the connected sink device. In this case the <command> is sent in a CEC frame without any opcode. The command also allows sending many commands at once.

The commands can be sent by the following two formats – defined in the header:

- **text/plain**: hexa strings (as seen in the example)
- **application/octet-stream**: binary data that allows sending a file with the desired codes

**Request and Response**

➜ request-line: POST·http://<ip>/api/V1/MEDIA/VIDEO/<port>/CEC/send
➜ body: <command>·

➜ status-line: 200·OK
➜ body: <response>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <port> | Video output port | **O1-O3*** | Video output port number |
| <command> ** | Two-digit-long hexa code to control the sink device | **04** | Power on |
| | | **0D** | Power off |
| | | **36** | Standby |
| | | **821000** | Select input 1 |
| | | **822000** | Select input 2 |
| | | **823000** | Select input 3 |

* It depends on the capabilities of the UCX device.

** The supported list of <commands> depends on the connected sink device.

The <response> can be:

| <response> | HTTP code | Result |
|---|---|---|
| ACK | 200 | The transmission is successful |
| NACK | 444 | The command is not accepted |
| Timeout | 408 | Timeout |
| Internal Error | 500 | Other error |

**Example**

➡ request-line: POST·http://192.168.0.100/api/V1/MEDIA/VIDEO/O1/CEC/send
➡ body: 04

⬅ status-line: 200 OK
⬅ body: ACK

### 7.9.2. Remote Control Code Sending

This command is for sending the so-called 'push-button-commands'. There is a range within the CEC commands for this purpose, e.g. volume up/down. With this method one <command> is put between the 0x44 and 0x45 opcodes in the background.

**Request and Response**

➡ request-line: POST·http://<ip>/api/V1/MEDIA/VIDEO/<port>/CEC/sendUserControlClick
➡ body: <command>·

⬅ status-line: 200·OK
⬅ body: <response>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <port> | Video output port | **O1-O3*** | Video output port number |
| <command> ** | Two-digit-long hexa code to control the sink device | **6D** | Power on |
| | | **6C** | Power off |

* It depends on the capabilities of the UCX device.

** The supported list of <commands> depends on the connected sink device.

The <response> can be the same as written at the previous command.

**Example**

➡ request-line: POST·http://192.168.01.100/api/V1/MEDIA/VIDEO/O1/CEC/sendUserControlClick
➡ body: 6D

⬅ status-line: 200 OK
⬅ body: ACK

## 7.10. Audio Port Settings

INFO: Audio port numbers may differ depending on the model. For more information, see the Port Numbering section.

### 7.10.1. Switching the Audio Input

**Request and Response**

➡ request-line: POST·http://<ip>/api/V1/MEDIA/AUDIO/XP/switch
➡ body: <audio_in>:<analog_audio_out>·

⬅ status-line: 200·OK
⬅ body: <audio_in>:<analog_audio_out>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <audio_in> | Audio input port | **I1-I4** | Audio input port number |
| <analog_audio_out> | Analog audio output port | **O2-O4** | Analog audio output port number |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/AUDIO/XP/switch
➡ body: I2:O3

⬅ status-line: 200 OK
⬅ body: I2:O3

INFO: When using the '0' value as an input, the input will be disconnected and no signal will appear on the output.

**ATTENTION:** When I3/I5* is selected for video source, the de-embedded audio of the I1 is not available, because the video crosspoint has a limitation: I1 and I3/I5* ports are not available at the same time, only one of them can be selected to any output. For more details about it, see the port diagrams in the Audio Interface section.

***I3** in case of **UCX-2x1-HC60**, **UCX-2x2-H60** and **SCX-2x1-HC60** models, **I5** in case of **UCX-4x2-HC60**, **UCX-4x2-HC60D**, **UCX-4x3-HC60** and **UCX-4x3-HC60-BD** models.

### 7.10.2. Querying the Connected Source

**Request and Response**

➡ request-line: GET·http://<ip>/api/V1/MEDIA/AUDIO/XP/<analog_audio_out>/ConnectedSource

⬅ status-line: 200·OK
⬅ body: <audio_in>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <analog_audio_out> | Analog audio output port | **O2-O4** | Analog audio output port number |
| <audio_in> | Audio input port | **I1-I4** | Audio input port number |

**Example**

➡ request-line: GET http://192.168.0.100/api/V1/MEDIA/AUDIO/XP/O3/ConnectedSource

⬅ status-line: 200 OK
⬅ body: I2

### 7.10.3. Querying the Connected Destinations

**Request and Response**

➡ request-line: GET·http://<ip>/api/V1/MEDIA/AUDIO/XP/<audio_in>/ConnectedDestinations

⬅ status-line: 200·OK
⬅ body: <analog_audio_out>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <audio_in> | Audio input port | **I1-I4** | Audio input port number |
| <analog_audio_out> | Analog audio output port | **O2-O4** | Analog audio output port number |

**Example**

➡ request-line: GET http://192.168.0.100/api/V1/MEDIA/AUDIO/XP/I3/ConnectedDestinations

⬅ status-line: 200 OK
⬅ body: O3

### 7.10.4. Setting the Autoselect Operation Mode

**Request and Response**

➡ request-line: POST·http://<ip>/api/V1/MEDIA/AUDIO/AUTOSELECT/<analog_audio_out>/Policy
➡ body: <op_mode>

⬅ status-line: 200·OK
⬅ body: <op_mode>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <analog_audio_out> | Analog audio output port | **O2-O4** | Analog audio output port number |
| <op_mode> | Operation mode | **Follow video** | Follows the video crosspoint state automatically. |
| | | **Off** | Autoselect function is disabled. |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/AUDIO/AUTOSELECT/O3/Policy
➡ body: Follow video

⬅ status-line: 200 OK
⬅ body: Follow video

### 7.10.5. Setting the Followed Video Port to Autoselect

**Request and Response**

➡ request-line: POST·http://<ip>/api/V1/MEDIA/AUDIO/AUTOSELECT/<analog_audio_out>/VideoFollowPort
➡ body: <out>

⬅ status-line: 200 OK
⬅ body: <out>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <analog_audio_out> | Analog audio output port | **O2-O4** | Analog audio output port number |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/AUDIO/AUTOSELECT/O3/VideoFollowPort
➡ body: O1

⬅ status-line: 200 OK
⬅ body: O1

### 7.10.6. Enabling/Disabling the Dante USB Sound Card

**DIFFERENCE:** This command is only available for the UCX-4x3-HC60-BD model.

This command enables or disables the Dante USB Sound Card, toggling the Dante input functionality. When enabled, the Dante audio input devices will appear as USB audio inputs on the host computer.

INFO: Dante input devices can only be detected by the computer when the USB sound card is enabled.

**Request and Response**

➡ request-line: POST·http://<ip>/api/V1/SYS/BD_DANTE_ADDON/Enabled
➡ body: <status>

⬅ status-line: 200·OK
⬅ body: <status>

**Parameters**

| Parameter | Parameter description | Values |
|---|---|---|
| <status> | Enables or disables the USB sound card. Default value is **true**. | **true** |
| | | **false** |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/SYS/BD_DANTE_ADDON/Enabled
➡ body: true

⬅ request-line: 200 OK
⬅ body: true

### 7.10.7. Setting the Audio Device Type for the Dante Input

**DIFFERENCE:** This command is only available for the UCX-4x3-HC60-BD model.

This command allows setting the type of audio input device through the Dante channel.

**Request and Response**

➡ request-line: POST·http://<ip>/api/V1/MEDIA/AUDIO/DANTE_IN/AudioDeviceType
➡ body: <device_type>

⬅ request-line: 200·OK
⬅ body: <device_type>

**Parameters**

| Parameter | Parameter description | Values |
|---|---|---|
| <device_type> | Sets the type of the audio input device | **Speakerphone** |
| | | **Echo-canceling speakerphone** |
| | | **Echo-suppressing speakerphone** |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/AUDIO/DANTE_IN/AudioDeviceType
➡ body: Echo-canceling speakerphone

⬅ request-line: 200 OK
⬅ body: Echo-canceling speakerphone

### 7.10.8. Setting the Name of the Dante Input

With this command you can set the descriptor of the device connected to the Dante input connector, making it easier to manage your system as it will appear with this custom name in other applications.

It can be 1-25 characters long, the letters of the English alphabet (A-Z, a-z), numbers (0-9), underscore (_), hyphen (-) and space ( ) are allowed. Please be aware that space cannot be used as a first or last character.

**Request and Response**

➡ request-line: POST·http://<ip>/api/V1/MEDIA/AUDIO/DANTE_IN/DeviceDescriptor
➡ body: <custom_name>

⬅ status-line: 200·OK
⬅ body: <custom_name>

**Example**

➡ request-line: POST http://192.168.0.100/api/MEDIA/AUDIO/DANTE_IN/DeviceDescriptor
➡ body Dante mic - M_Room 12

⬅ status-line: 200 OK
⬅ body: Dante mic - M_Room 12

### 7.10.9. Locking the Audio Port

**Request and Response**

➡ request-line: POST·http://<ip>/api/V1/MEDIA/AUDIO/XP/<audio_port>/Lock
➡ body: <locked_state>

⬅ status-line: 200·OK
⬅ body: <locked_state>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <audio_port> | Audio port | **I1-I4**<br>**O2-O4** | Audio input port number<br>Analog audio output port number |
| <locked_state> | Locked state | **true**<br>**false** | The port is locked<br>The port is unlocked |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/AUDIO/XP/I2/Lock
➡ body: false

⬅ status-line: 200 OK
⬅ body: false

### 7.10.10. Muting the Audio Port 1.

INFO: Suspends the connection of the chosen port (no signal is forwarded).

**Request and Response**

➡ request-line: POST·http://<ip>/api/V1/MEDIA/AUDIO/XP/<audio_port>/Mute
➡ body: <muted_state>

⬅ status-line: 200·OK
⬅ body: <muted_state>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <audio_port> | Audio port | **I1-I4**<br>**O2-O4** | Audio input port number<br>Analog audio output port number |
| <muted_state> | Muted state | **true**<br>**false** | The port is muted.<br>The port is unmuted. |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/AUDIO/XP/I2/Mute
➡ body: false

⬅ status-line: 200 OK
⬅ body: false

INFO: All inputs and analog output ports have a mute property in the audio XP (e.g. http://<ip>/api/V1/MEDIA/AUDIO/XP/I1.Mute). Outputs have a separate mute function within the port node as well:

- http://<ip>/api/V1/MEDIA/VIDEO/XP/O1.EmbeddedAudioMute
- http://<ip>/api/V1/MEDIA/VIDEO/XP/O2.EmbeddedAudioMute
- http://<ip>/api/V1/MEDIA/AUDIO/O3.Mute

### 7.10.11. Muting the Audio Port 2.

INFO: The volume of the analog audio output is set to low.

**Request and Response**

➡ request-line: POST·http://<ip>/api/V1/MEDIA/AUDIO/<analog_audio_out>/Mute
➡ body: <muted_state>

⬅ status-line: 200·OK
⬅ body: <muted_state>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <analog_audio_out> | Analog audio output port | **O2-O4** | Analog audio output port number |
| <muted_state> | Muted state | **true**<br>**false** | The port is muted.<br>The port is unmuted. |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/AUDIO/O3/Mute
➡ body: false

⬅ status-line: 200 OK
⬅ body: false

### 7.10.12. Querying the Audio Signal Presence

**Request and Response**

➡ request-line: GET·http://<ip>/api/V1/MEDIA/AUDIO/<audio_port>/SignalPresent

⬅ status-line: 200·OK
⬅ body: <signal_state>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <audio_port> | Audio port | **I1-I4**<br>**O2-O4** | Audio input port number<br>Analog audio output port number |
| <signal_state> | Signal presence | **true**<br>**false** | The audio signal is present.<br>No audio signal is present. |

**Example**

➡ request-line: GET http://192.168.0.100/api/V1/MEDIA/AUDIO/I1/SignalPresent

⬅ status-line: 200 OK
⬅ body: false

### 7.10.13. Analog Audio Output Volume (dB) Setting

**Request and Response** *#analogaudio #volume*

➡ request-line: POST·http://<ip>/api/V1/MEDIA/AUDIO/<analog_audio_out>/VolumedB
➡ body: <level>

⬅ status-line: 200·OK
⬅ body: <level>

**Parameter**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <analog_audio_out> | Analog audio output port | **O2-O4** | Analog audio output port number |
| <level> | Sets the output volume (attenuation) in step of -0.375 dB. | **-95.62 dB-0 dB** | The value is rounded up if necessary, to match with the step value. |

The <level> parameter sets the output volume (attenuation) between -95.62 dB and 0 dB in step of -0.375 dB. The value is rounded up if necessary, to match with the step value.

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/AUDIO/O3/VolumedB
➡ body: -15

⬅ status-line: 200 OK
⬅ body: -15

### 7.10.14. Analog Audio Output Volume Percent Setting

**Request and Response**

➡ request-line: POST·http://<ip>/api/V1/MEDIA/AUDIO/<analog_audio_out>/VolumePercent
➡ body: <percent>

⬅ status-line: 200·OK
⬅ body: <percent>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <analog_audio_out> | Analog audio output port | **O2-O4** | Analog audio output port number |
| <percent> | Sets the output volume (attenuation) in step of 1%. | **100%-0%** | The value is rounded up if necessary, to match with the step value. |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/AUDIO/O3/VolumePercent
➡ body: 50

⬅ status-line: 200 OK
⬅ body: 50

### 7.10.15. Setting the Balance

**Request and Response** *#balance*

➡ request-line: POST·http://<ip>/api/V1/MEDIA/AUDIO/<analog_audio_out>/Balance
➡ body: <level>

⬅ status-line: 200·OK
⬅ body: <level>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <analog_audio_out> | Analog audio output port | **O2-O4** | Analog audio output port number |
| <level> | Sets the output volume (attenuation) in step of 1. | **-100-100** | -100 means left balance, 100 means right balance, center is 0 (default). |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/AUDIO/O3/Balance
➡ body: 0

⬅ status-line: 200 OK
⬅ body: 0

### 7.10.16. Analog Audio Output Level Setting by Steps (dB)

**Request and Response** *#analogaudio #volume*

➡ request-line: POST·http://<ip>/api/V1/MEDIA/AUDIO/<analog_audio_out>/stepVolumedB
➡ body: <step>

⬅ status-line: 200·OK
⬅ body: <step>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <analog_audio_out> | Analog audio output port | **O2-O4** | Analog audio output port number |
| <step> | The volume is increased or decreased with the given value in dB. | | Increase the dB with +<number><br>Decrease the dB with -<number> |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/AUDIO/O3/stepVolumedB
➡ body: -1

⬅ status-line: 200 OK
⬅ body: OK

The volume is decreased with 1 dB, the current volume is -1.95 dB, which means 77.84% in percent.

### 7.10.17. Analog Audio Output Level Setting by Steps in Percent

**Request and Response**

➡ request-line: POST·http://<ip>/api/V1/MEDIA/AUDIO/<analog_audio_out>/stepVolumePercent
➡ body: <step>

⬅ status-line: 200·OK
⬅ body: <step>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <analog_audio_out> | Analog audio output port | **O2-O4** | Analog audio output port number |
| <step> | The volume is increased or decreased with the given value in percent. | **0-100** | |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/AUDIO/O3/stepVolumePercent
➡ body: 5

⬅ status-line: 200 OK
⬅ body: OK

### 7.10.18. Analog Audio Output Balance Setting by Steps

**Request and Response**

➡ request-line: POST·http://<ip>/api/V1/MEDIA/AUDIO/<analog_audio_out>/stepBalance
➡ body: <step>

⬅ status-line: 200·OK
⬅ body: <step>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <analog_audio_out> | Analog audio output port | **O2-O4** | Analog audio output port number |
| <step> | The volume is increased or decreased with the given value. | | Increase the volume with <number><br>Decrease the volume with -<number> |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/AUDIO/O3/stepBalance
➡ body: 5

⬅ status-line: 200 OK
⬅ body: OK

## 7.11. USB Port Settings

INFO: USB port numbers may differ depending on the model. For more information, see the Port Numbering section.

### 7.11.1. Switching the USB Input

**Request and Response** *#usb*

➡ request-line: POST·http://<ip>/api/V1/MEDIA/USB/XP/switch
➡ body: <host>:H1

⬅ status-line: 200·OK
⬅ body: <host>:H1

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <host> | USB Host | **0**<br>**U1-U4** | Disconnected<br>USB-C and USB-B port number |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/USB/XP/switch
➡ body: U1:H1

⬅ status-line: 200 OK
⬅ body: OK

INFO: When using the '0' value as an input, the input will be disconnected and no signal will appear on the output.

### 7.11.2. Querying the Connected Source

**Request and Response**

➡ request-line: GET·http://<ip>/api/V1/MEDIA/USB/XP/H1/ConnectedSource

⬅ status-line: 200·OK
⬅ body: <host>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <host> | USB Host | **U1-U4** | USB-C and USB-B port number |

**Example**

➡ request-line: GET http://192.168.0.100/api/V1/MEDIA/USB/XP/H1/ConnectedSource

⬅ status-line: 200 OK
⬅ body: U4

### 7.11.3. Querying the Connected Destinations

**Request and Response** *#autoselect*

➡ request-line: GET·http://<ip>/api/V1/MEDIA/USB/XP/<host>/ConnectedDestinations

⬅ status-line: 200·OK
⬅ body: <host>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <host> | USB Host | **U1-U4** | USB-C and USB-B port number |

**Example**

➡ request-line: GET http://192.168.0.100/api/V1/MEDIA/USB/XP/U3/ConnectedDestinations

⬅ status-line: 200 OK
⬅ body: H1

### 7.11.4. Locking the USB Port

**Request and Response** *#lock*

➡ request-line: POST·http://<ip>/api/V1/MEDIA/USB/XP/<usb_port>/Lock
➡ body: <locked_state>

⬅ status-line: 200·OK
⬅ body: <locked_state>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <usb_port> | USB port | **U1-U4**<br>**H1** | USB-C and USB-B port number<br>USB hub |
| <locked_state> | Locked state | **true**<br>**false** | The port is locked<br>The port is unlocked |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/USB/XP/U2/Lock
➡ body: false

⬅ status-line: 200 OK
⬅ body: false

### 7.11.5. Setting the 5V Sending to the USB Peripherals

The 5V power towards the USB A-type ports can be enabled or disabled as follows:

**Request and Response**

➡ request-line: POST·http://<ip>/api/V1/MEDIA/USB/H1/<device_id>/Power5VMode
➡ body: <device_pwr>

⬅ status-line: 200·OK
⬅ body: <device_pwr>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <device_id> | USB A-type port | **D1-D4** | Downstream port number |
| <device_pwr> | 5V power sending | **Auto** | The host controls the 5V power sending. |
| | | **Off** | Disable 5V power on USB downstream port |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/USB/H1/D1/Power5VMode
➡ body: Auto

⬅ status-line: 200 OK
⬅ body: Auto

### 7.11.6. Setting the USB Autoselect Policy

**Request and Response**

➡ request-line: POST·http://<ip>/api/V1/MEDIA/USB/AUTOSELECT/H1/Policy
➡ body: <op_mode>

⬅ status-line: 200·OK
⬅ body: <op_mode>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <op_mode> | Operation mode | **Off** | The autoselect function is disabled. |
| | | **Last Detect** | It is always the last attached input that is automatically switched to the output. |
| | | **First Detect** | The first active USB input is selected. |
| | | **Follow video** | Follows the video crosspoint state automatically. |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/USB/AUTOSELECT/H1/Policy
➡ body: Follow video

⬅ status-line: 200 OK
⬅ body: Follow video

### 7.11.7. Setting the Followed Video Port to Autoselect

**Request and Response:**

➡ request-line: POST·http://<ip>/api/V1/MEDIA/USB/AUTOSELECT/H1/VideoFollowPort
➡ body: <out>

⬅ status-line: 200·OK
⬅ body: <out>

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/USB/AUTOSELECT/H1/VideoFollowPort
➡ body: O1

⬅ status-line: 200 OK
⬅ body: O1

### 7.11.8. Changing the Autoselect Included USB Ports

**Request and Response**

➡ request-line: POST·http://<ip>/api/V1/MEDIA/USB/AUTOSELECT/H1/<host>/Included
➡ body: <state>

⬅ status-line: 200·OK
⬅ body: <state>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <host> | USB Host | **U1-U4** | USB-C and USB-B port number |
| <state> | The chosen input is ignored in the autoselect process or not. | **true** | The port is included in autoselect. |
| | | **false** | The autoselect function ignores that port. |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/USB/AUTOSELECT/H1/U1/Included
➡ body: false

⬅ status-line: 200 OK
⬅ body: false

### 7.11.9. Changing the USB Port Priority

**Request and Response**

➡ request-line: POST·http://<ip>/api/V1/MEDIA/USB/AUTOSELECT/H1/<host>/Priority
➡ body: <prio_num>

⬅ status-line: 200·OK
⬅ body: <prio_num>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <host> | USB Host | **U1-U4** | USB-C and USB-B port number |
| <prio_num> | Priority number from 1 to 100, equal numbers are allowed. | **1-100** | 1: the highest priority<br>100: the lowest priority |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/USB/AUTOSELECT/H1/U1/Priority
➡ body: 51

⬅ status-line: 200 OK
⬅ body: 51

## 7.12. USB Port Settings - USB-C Related Commands

INFO: USB-C port numbers may differ depending on the model. For more information, see the Port Numbering section.

### 7.12.1. Setting the USB-C Power

Allows setting the supplied power over the USB-C ports. Default is 100W.

**Request and Response** *#power*

➡ request-line: POST·http://<ip>/api/V1/MEDIA/USB/<usb-c_port>/POWER/Reserved
➡ body: <power>

⬅ status-line: 200·OK
⬅ body: <power>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <power> | Reserved power to the USB-C port | **15W** | Minimum supplied power if **AllocationMode** is **Auto**. If **AllocationMode** is **Static**, this is the maximum supplied power. |
| | | **30W** | Minimum supplied power if **AllocationMode** is **Auto**. If **AllocationMode** is **Static**, this is the maximum supplied power. |
| | | **60W** | Minimum supplied power if **AllocationMode** is **Auto**. If **AllocationMode** is **Static**, this is the maximum supplied power. |
| | | **100W** | Minimum supplied power if **AllocationMode** is **Auto**. If **AllocationMode** is **Static**, this is the maximum supplied power. |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/USB/U1/POWER/Reserved
➡ body: 100W

⬅ status-line: 200 OK
⬅ body: 100W

### 7.12.2. Setting the Displayport Alternate Mode Policy

**Request and Response**

➡ request-line: POST·http://<ip>/api/V1/MEDIA/USB/<usb-c_port>/DpAltModePolicy
➡ body: <dp_policy>

⬅ status-line: 200·OK
⬅ body: <dp_policy>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <usb-c_port> | USB-C port number | **U1-U2** | USB-C port number |
| <dp_policy> | The preferred video or USB data transmission | **Auto** | **Auto:** Taurus offers both operation modes described below. A BYOD device can choose between the two. Neither USB3, nor 4 lane DP Alt mode operation (4K@60) is guaranteed. BYOD devices supporting USB3.x usually choose shared mode: USB3.1 and 2 lane DP. |
| | | **Force C** | **Prefer video**: all four lanes are reserved for video transmission, USB 3.1 data transmission does not operate. |
| | | **Force D** | **Prefer USB 3.1:** 2 lanes are reserved for USB 3.1, 2 lanes for video. |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/USB/U2/DpAltModePolicy
➡ body: Auto

⬅ status-line: 200 OK
⬅ body: Auto

**ATTENTION:** Changing DpAltModePolicy is recommended before connecting a computer to the input.

**ATTENTION:** When the USB-C input of a UCX device is disconnected while operating in Displayport Alternate Mode, visual artifacts may appear on the downstream display.

### 7.12.3. Querying the Host Alternate Mode Support

**Request and Response**

➡ request-line: GET·http://<ip>/api/V1/MEDIA/USB/<usb-c_port>/HostSupportsDpAltMode

⬅ status-line: 200·OK
⬅ body: <altmode_support>

**Parameters**

| Parameter | Parameter description | Value | Value description |
|---|---|---|---|
| <usb-c_port> | USB-C port number | **U1-U2** | USB-C port number |
| <altmode_support> | | **False** | The host does not support the alternate mode. |
| | | **True** | The host supports the alternate mode. |

**Example**

➡ request-line: GET http://192.168.0.100/api/V1/MEDIA/USB/U1/HostSupportsDpAltMode

⬅ status-line: 200 OK
⬅ body: true

### 7.12.4. Querying the Status of the Alternate Mode

**Request and Response** *#dpaltmode #alternatemode #displayportalternatemode*

➡ request-line: GET·http://<ip>/api/V1/MEDIA/USB/<usb-c_port>/ActiveAltMode

⬅ status-line: 200·OK
⬅ body: <altmode_state>

**Parameters**

| Parameter | Parameter description | Value | Value description |
|---|---|---|---|
| <usb-c_port> | USB-C port number | **U1-U2** | USB-C port number |
| <altmode_state> | | **N/A** | The host is not connected |
| | | **None** | DP Alt mode is not active |
| | | **DP** | DP Alt mode is active. |

**Example**

➡ request-line: GET http://192.168.0.100/api/V1/MEDIA/USB/U2/ActiveAltMode

⬅ status-line: 200 OK
⬅ body: DP

### 7.12.5. Querying the Port Data Role

**Request and Response**

➡ request-line: GET·http://<ip>/api/V1/MEDIA/USB/<usb-c_port>/ActivePortDataRole

⬅ status-line: 200·OK
⬅ body: <data_role>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <usb-c_port> | USB-C port number | **U1-U2** | USB-C port number |
| <data_role> | | **N/A** | No information about the data role. |
| | | **DFP** | Downstream Facing Port (usually a Host / HUB ports) The port data role is configured as USB Host. This is for building up the connection (USB data transmission operates after the data role swap) |
| | | **UFP** | Upstream Facing Port (usually a device) |

**Example**

➡ request-line: GET http://192.168.0.100/api/V1/MEDIA/USB/U2/ActivePortDataRole

⬅ status-line: 200 OK
⬅ body: UFP

### 7.12.6. Querying the Port Power Role

**Request and Response** *#power*

➡ request-line: GET·http://<ip>/api/V1/MEDIA/USB/<usb-c_port>/ActivePortPowerRole

⬅ status-line: 200·OK
⬅ body: <power_role>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <usb-c_port> | USB-C port number | **U1-U2** | USB-C port number |
| <power_role> | | **N/A** | No information about the power role. |
| | | **Sink** | The port is configured as a sink. |
| | | **Source** | The port is configured as a source |

**Example**

➡ request-line: GET http://192.168.0.100/api/V1/MEDIA/USB/U2/ActivePortPowerRole

⬅ status-line: 200 OK
⬅ body: Source

### 7.12.7. Setting the Port Power Role

**Request and Response**

➡ request-line: POST·http://<ip>/api/V1/MEDIA/USB/<usb-c_port>/PortPowerRoleSetting
➡ body: <power_role>

⬅ status-line: 200·OK
⬅ body: <power_role>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <usb-c_port> | USB-C port number | **U1-U2** | USB-C port number |
| <power_role> | | **Sink** | The port is configured as a sink. |
| | | **Source** | The port is configured as a source. |
| | | **Dual Role** | The port is configured to be in Dual Power Role mode. |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/USB/U1/PortPowerRoleSetting
➡ body: Dual Role

⬅ status-line: 200 OK
⬅ body: Dual Role

## 7.13. EDID Management

### 7.13.1. Querying the Emulated EDIDs

**Request and Response** *#edid*

➡ request-line: GET·http://<ip>/api/V1/EDID/EdidStatus

⬅ status-line: 200·OK
⬅ body: ["<source>:E1";"<source>:E2";" <source>:E3;""<source>:E4"]

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <source> | Source EDID memory place | **F1-F159** | Factory EDIDs |
| | | **U1-U100** | User EDIDs |
| | | **D1-D3** | Dynamic EDIDs |

**Example**

➡ request-line: GET http://192.168.0.100/api/V1/EDID/EdidStatus

⬅ status-line: 200 OK
⬅ body: ["F47:E1","F47:E2","F47:E3","F47:E4"]

Emulated EDID memory for input port is listed with the EDID number that is currently emulated on the input.

### 7.13.2. Querying the Validity of a Dynamic EDID

**Request and Response**

➡ request-line: GET·http://<ip>/api/V1/EDID/D/<dynamic_edid>/Validity

⬅ status-line: 200·OK
⬅ body: <validity>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <dynamic_edid> | The Dynamic EDID to be queried | **D1-D3** | Dynamic EDIDs |
| <validity> | Validity of a Dynamic EDID | **true** | The Dynamic EDID is valid. |
| | | **false** | The Dynamic EDID is invalid. |

**Example**

➡ request-line: GET http://192.168.0.100/api/V1/EDID/D/D1/Validity

⬅ status-line: 200 OK
⬅ body: true

The 'Validity' property is true, valid EDID is stored in D1 memory place.

### 7.13.3. Querying the Preferred Resolution of a User EDID

**Request and Response**

➡ request-line: GET·http://<ip>/api/V1/EDID/U/<user_edid>/PreferredResolution

⬅ status-line: 200·OK
⬅ body: <preferred_resolution>

**Example**

➡ request-line: GET http://192.168.0.100/api/V1/EDID/U/U2/PreferredResolution

⬅ status-line: 200 OK
⬅ body: 1920x1080p60.00Hz

INFO: Use the **Manufacturer** and **MonitorName** properties to query further information.

### 7.13.4. Emulating an EDID to an Input Port

**Request and Response**

➡ request-line: POST·http://<ip>/api/V1/EDID/switch
➡ body: <source>:<destination>

⬅ status-line: 200·OK
⬅ body: <source>:<destination>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <source> | Source EDID memory place | **F1-F159** | Factory EDIDs |
| | | **U1-U100** | User EDIDs |
| | | **D1-D3** | Dynamic EDIDs |
| <destination> | The emulated EDID memory of the desired input port | **E1-E4** | Emulated EDIDs |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/EDID/switch
➡ body: F49:E2

⬅ status-line: 200 OK
⬅ body: OK

### 7.13.5. Emulating an EDID to All Input Ports

**Request and Response**

➡ request-line: POST·http://<ip>/api/V1/EDID/switchAll
➡ body: <source>

⬅ status-line: 200·OK
⬅ body: OK

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <source> | Source EDID memory place | **F1-F159** | Factory EDIDs |
| | | **U1-U100** | User EDIDs |
| | | **D1-D3** | Dynamic EDIDs |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/EDID/switchAll
➡ body: F47

⬅ status-line: 200 OK
⬅ body: OK

### 7.13.6. Copying an EDID to User Memory

**Request and Response**

➡ request-line: POST·http://<ip>/api/V1/EDID/copy
➡ body: <source>:<destination>

⬅ status-line: 200·OK
⬅ body: OK

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <source> | Source EDID memory place | **F1-F159** | Factory EDIDs |
| | | **U1-U100** | User EDIDs |
| | | **D1-D3** | Dynamic EDIDs |
| <destination> | The User EDID spot you wish to copy the EDID to | **U1-U100** | User EDIDs |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/EDID/copy
➡ body: F1:U2

⬅ status-line: 200 OK
⬅ body: OK

### 7.13.7. Deleting an EDID from User Memory

**Request and Response**

➡ request-line: POST·http://<ip>/api/V1/EDID/delete
➡ body: <user_edid>

⬅ status-line: 200·OK
⬅ body: OK

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <user_edid> | The User EDID spot you wish to delete an EDID from | **U1-U100** | User EDIDs |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/EDID/delete
➡ body: U2

⬅ status-line: 200 OK
⬅ body: OK

### 7.13.8. Resetting the Emulated EDIDs

**Request and Response**

➡ request-line: POST·http://<ip>/api/V1/EDID/reset

INFO: The body has to be empty, and the content type should be text/plain.

⬅ status-line: 200·OK
⬅ body: OK

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/EDID/reset

⬅ status-line: 200 OK
⬅ body: OK

Calling this method switches all emulated EDIDs to a factory default one. See the table in the Factory EDID List section.

## 7.14. Ethernet Port Configuration

### 7.14.1. Setting the DHCP State

**ATTENTION:** When you change a network property, the new value is stored, but the **applySettings** method must always be called to apply the new settings. When two or more network parameters are changed, the **applySettings** method is enough to be called once as a final step.

**Request and Response** *#dhcp #network #ipaddress*

➜ request-line: POST·http://<ip>/api/V1/MANAGEMENT/NETWORK/DhcpEnabled
➜ body: <dhcp_status>

🡐 status-line: 200·OK
🡐 body: <dhcp_status>

**Parameters**

If the <dhcp_status> parameter is **true**, the current IP address setting is DHCP, if the parameter is **false,** the current IP address is static.

**Example**

➜ request-line: POST http://192.168.0.100/api/V1/MANAGEMENT/NETWORK/DhcpEnabled
➜ body: true

🡐 status-line: 200 OK
🡐 body: true

➜ request-line: POST http://192.168.0.100/api/V1/MANAGEMENT/NETWORK/applySettings

🡐 status-line: 200 OK
🡐 body: OK

INFO: The **applySettings** method will save and apply the new value and it will reboot the device.

INFO: The current setting can be queried by using the GET Method.

### 7.14.2. Changing the IP Address (Static)

**Request and Response**

➜ request-line: POST·http://<ip>/api/V1/MANAGEMENT/NETWORK/StaticIpAddress
➜ body: <IP_address>

🡐 status-line: 200·OK
🡐 body: <IP_address>

**Example**

➜ request-line: POST http://192.168.0.100/api/V1/MANAGEMENT/NETWORK/StaticIpAddress
➜ body: 192.168.0.105

🡐 status-line: 200 OK
🡐 body: 192.168.0.105

➜ request-line: POST http://192.168.0.100/api/V1/MANAGEMENT/NETWORK/applySettings

🡐 status-line: 200 OK
🡐 body: OK

INFO: The **applySettings** method saves and applies the new value and it will reboot the device.

INFO: The current setting can be queried by using the GET Method.

### 7.14.3. Changing the Subnet Mask (Static)

**Request and Response** *#ipaddress*

➜ request-line: POST·http://<ip>/api/V1/MANAGEMENT/NETWORK/StaticNetworkMask
➜ body: <netmask>

⬅ status-line: 200·OK
⬅ body: <netmask>

**Example**

➜ request-line: POST http://192.168.0.100/api/V1/MANAGEMENT/NETWORK/StaticNetworkMask
➜ body: 255.255.255.0

⬅ status-line: 200 OK
⬅ body: 255.255.255.0

➜ request-line: POST http://192.168.0.100/api/V1/MANAGEMENT/NETWORK/applySettings

⬅ status-line: 200 OK
⬅ body: OK

INFO: The **applySettings** method will save and apply the new value and it will reboot the device.

INFO: The current setting can be queried by using the GET Method.

### 7.14.4. Changing the Gateway Address (Static)

**Request and Response**

➜ request-line: POST·http://<ip>/api/V1/MANAGEMENT/NETWORK/StaticGatewayAddress
➜ body: <gw_address>

⬅ status-line: 200·OK
⬅ body: <gw_address>

**Example**

➜ request-line: POST http://192.168.0.100/api/V1/MANAGEMENT/NETWORK/StaticGatewayAddress
➜ body: 192.168.0.1

⬅ status-line: 200 OK
⬅ body: 192.168.0.1

➜ request-line: POST http://192.168.0.100/api/V1/MANAGEMENT/NETWORK/applySettings

⬅ status-line: 200 OK
⬅ body: OK

INFO: The **applySettings** method will save and apply the new value and it will reboot the device.

INFO: The current setting can be queried by using the GET Method.

### 7.14.5. Applying the Network Settings

**Request and Response**

➜ request-line: POST·http://<ip>/api/V1/MANAGEMENT/NETWORK/applySettings

INFO: The body has to be empty, and the content type should be text/plain.

⬅ status-line: 200·OK
⬅ body: OK

**Example**

➜ request-line: POST http://192.168.0.100/api/V1/MANAGEMENT/NETWORK/applySettings

⬅ status-line: 200 OK
⬅ body: OK

All network settings that were changed are applied and network interface restarts.

### 7.14.6. Setting the Hostname

The host name is a property that can be used instead of the IP address when connecting to the device. It is also suitable for finding the device in the Device Discovery window of the LDC, see more details in the Add New Favorite Device section. Furthermore, it can be used to open the The Built-in Miniweb. If the IP address of the device is changing, the host name can be used as a fixed property.

After hostname changing, restarting the network services is required. New SSL certificate will be generated.

**Request and Response**

➜ request-line: POST·http://<ip>/api/V1/MANAGEMENT/NETWORK/HostName
➜ body: <unique_name>

⬅ status-line: 200·OK
⬅ body: <unique_name>

**Parameters**

The <unique_name> can be 1-64 character(s) long and the following are allowed for naming: the elements of the English alphabet and numbers. Hyphen (-) and dot (.) are also accepted, except as last character.

**Example**

➜ request-line: POST http://192.168.0.100/api/V1/MANAGEMENT/NETWORK/HostName
➜ body: room-switcher

⬅ status-line: 200 OK
⬅ body: room-switcher

## 7.15. Network Security

### 7.15.1. Enabling/Disabling the Ethernet Port

**ATTENTION:** Disabling the Ethernet layer of a USB-C port while it is in a VLAN (aside from IDs 1 and 2000) with only one Ethernet port connected to it will disable the Ethernet port as well. This happens because the Ethernet functionality of the two ports is connected as long as they are in a VLAN with only the USB-C and one selected Ethernet port in it.

**Request and Response**

➡ request-line: POST·http://<ip>/api/V1/MEDIA/ETHERNET/<ethernet_port>/Enabled
➡ body: <status>

⬅ status-line: 200·OK
⬅ body: <status>

**Parameters**

| Identifier | Parameter description | Parameter values |
|---|---|---|
| <ethernet_port> | Ethernet port number | **P1-P5*** |
| <status> | The port is disabled. | **false** |
| | The port is enabled. | **true** |

*UCX-2x1-HC60 model has three Ethernet ports (P1-P3).

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/ETHERNET/P4/Enabled
➡ body: false

⬅ status-line: 200 OK
⬅ body: false

### 7.15.2. Querying the Network Service Port Number

**Request and Response** *#http #https*

➡ request-line: GET·http://<ip>/api/V1/MANAGEMENT/NETWORK/SERVICES/<port>/Port

⬅ status-line: 200·OK
⬅ body: <port_num>

**Parameters**

| Identifier | Parameter description | Parameter values |
|---|---|---|
| <port> | Port type | **HTTP / HTTPS / LW3 / SERIAL1 / SERIAL2** |
| <port_num> | Port number | **80 / 443 / 6107 / 8001 / 8002** |

**Example**

➡ request-line: GET http://192.168.0.100/api/V1/MANAGEMENT/NETWORK/SERVICES/HTTP/Port

⬅ status-line: 200 OK
⬅ body: 80

### 7.15.3. Enabling/Disabling the Network Service Port

INFO: HTTP port is disabled by default.

**Request and Response**

➡ request-line: GET·http://<ip>/api/V1/MANAGEMENT/NETWORK/SERVICES/<port>/Enabled
➡ body: <status>

⬅ status-line: 200·OK
⬅ body: <status>

**Parameters**

| Identifier | Parameter description | Parameter values |
|---|---|---|
| <port> | Port type | **HTTP / HTTPS** |
| <status> | The port is enabled. | **true** |
| | The port is disabled. | **false** |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MANAGEMENT/NETWORK/SERVICES/HTTP/Enabled
➡ body: false

⬅ status-line: 200 OK
⬅ body: false

### 7.15.4. Querying the Username for Authentication

INFO: UCX series deal with one user for authentication and the username (admin) can not be changed.

**Request and Response**

➡ request-line: GET·http://<ip>/api/V1/MANAGEMENT/NETWORK/AUTH/USER1/Name

⬅ status-line: 200·OK
⬅ body: admin

**Example**

➡ request-line: GET http://192.168.0.100/api/V1/MANAGEMENT/NETWORK/AUTH/USER1/Name

⬅ status-line: 200 OK
⬅ body: admin

### 7.15.5. Setting a Password for Authentication

**ATTENTION:** The minimum character requirement for the password is 10 characters, and it can contain any UTF-8 character.

INFO: Due to security reasons, the password is not stored in any property, so it can not be queried.

**Request and Response** *#password*

➡ request-line: POST·http://<ip>/api/V1/MANAGEMENT/NETWORK/AUTH/USER1/setPassword
➡ body: <password>

⬅ status-line: 200·OK
⬅ body: <password>

**Parameters**

| Identifier | Parameter description | Value description |
|---|---|---|
| <password> | User defined password for authentication. | min. character length: 10<br>max. character length: 100<br>accepted characters: UTF-8 characters |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MANAGEMENT/NETWORK/AUTH/USER1/setPassword
➡ body: #password12

⬅ status-line: 200 OK
⬅ body: #password12

### 7.15.6. Enabling the Authentication

INFO: Authentication is enabled by default.

INFO: Restarting the HTTP(S) services is required to apply the authentication settings.

**Request and Response**

➡ request-line: POST·http://<ip>/api/V1/MANAGEMENT/NETWORK/SERVICES/<port>/AuthenticationEnabled
➡ body: <status>

⬅ status-line: 200·OK
⬅ body: <status>

**Parameters**

| Identifier | Parameter description | Parameter values |
|---|---|---|
| <port> | Port type | **HTTP / HTTPS** |
| <status> | Authentication enabled | **true** |
| | Authentication disabled | **false** |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MANAGEMENT/NETWORK/SERVICES/HTTP/AuthenticationEnabled
➡ body: false

⬅ status-line: 200 OK
⬅ body: false

# 7.16. Advanced Ethernet Security

## 7.16.1. Setting the VLAN Preset

### Request and Response

➡ request-line: POST·http://<ip>/api/V1/MEDIA/ETHERNET.VlanPreset
➡ body: <vlan_preset>

⬅ status-line: 200·OK
⬅ body: <vlan_preset>

### Parameters

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <vlan_preset> | VLAN preset mode | **Transparent** | The same open network is used by the Taurus and the BYOD devices. |
| | | **SeparatedByod** | The BYOD devices use a network that is separated from the main line. |
| | | **Dedicated** | Every BYOD device uses a separate network. |

### Example

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/ETHERNET.VlanPreset
➡ body: SeparatedByod

⬅ status-line: 200 OK
⬅ body: SeparatedByod

## 7.16.2. Setting the VLAN Membership

**ATTENTION:** Changing the VLAN membership of the Control Ethernet port will cause loss of the connection to the device. Please make sure you are changing the correct settings.

With this command the Ethernet ports can be arranged into separate networks in any setup desired.

### Request and Response

➡ request-line: POST·http://<ip>/api/V1/MEDIA/ETHERNET/<port_number>.VlanMembership
➡ body: <vlan_membership>

⬅ status-line: 200·OK
⬅ body: <vlan_mebership>

### Parameters

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <vlan_membership> | VLAN membership number | **1-8** | The ports with the same membership number are part of the same network. |

### Example

➡ request-line: POST http://192.168.0.100/api/V1/MEDI/ETHERNET/P3.VlanMembership
➡ body: 3

⬅ status-line: OK
⬅ body: 3

### 7.16.3. Setting the VLAN ID

You can create separate networks by setting different VLAN IDs for the Ethernet ports. You can create any number of setups for limiting access to the corporate or management network or providing separate networks for each user. Default VLAN ID is 1 for all of the ports.

**ATTENTION:** VLAN ID 2000 is reserved for the Room LAN.

**Request and Response**

➡ request-line: POST·http://<ip>/api/V1/MEDIA/ETHERNET/<port>/VlanMembership
➡ body: <vlan_id>
⬅ status-line: 200·OK
⬅ body: <vlan_id>

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/ETHERNET/P1/VlanMembership
➡ body: 2
⬅ status-line: 200 OK
⬅ body: 2

**Enabling the Room LAN on an Ethernet Port**

**Request and Response**

➡ request-line: POST·http://<ip>/api/V1/MEDIA/ETHERNET/<port>/VlanMembership
➡ body: 2000
⬅ status-line: 200·OK
⬅ body: 2000

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/ETHERNET/P1/VlanMembership
➡ body: 2000
⬅ status-line: 200 OK
⬅ body: 2000

### 7.16.4. Setting the Static IP Address for the Room LAN

In case there is no DHCP server on the Room LAN, a static IP address is needed to be set before enabling the function, so that it remains available.

**Request and Response**

➡ request-line: POST·http://<ip>/api/EXPERIMENTAL/MANAGEMENT/NETWORKINTERFACES/ROOM/IPV4/STATIC/ConfiguredIpAddress
➡ body: <static_management_ip>
⬅ status-line: 200·OK
⬅ body: <static_management_ip>

**Example**

➡ request-line: POST http://192.168.0.100/api/EXPERIMENTAL/MANAGEMENT/NETWORKINTERFACES/ROOM/IPV4/STATIC/ConfiguredIpAddress
➡ body: 10.10.128.34
⬅ status-line: 200 OK
⬅ body: 10.10.128.34

### 7.16.5. Setting the Gateway for Static IP on the Room LAN

**Request and Response**

➡ request-line: POST·http://<ip>/api/EXPERIMENTAL/MANAGEMENT/NETWORKINTERFACES/ROOM/IPV4/STATIC/ConfiguredGatewayAddress
➡ body: <static_management_gateway>
⬅ status-line: 200·OK
⬅ body: <static_management_gateway>

**Example**

➡ request-line: POST http://192.168.0.100/api/EXPERIMENTAL/MANAGEMENT/NETWORKINTERFACES/ROOM/IPV4/STATIC/ConfiguredGatewayAddress
➡ body: 10.10.128.1
⬅ status-line: 200 OK
⬅ body: 10.10.128.1

## 7.17. 802.1X Security Feature

This feature can be set via REST API by the following methods. All the parameters can be set and stored at the following URL:

http://<ip_or_host>/api/V1/MANAGEMENT/SECURITY/IEEE8021X/Configuration

### Parameters

The following keys are in the Configuration structure:

| Parameter | Parameter description | Values |
|---|---|---|
| <ip_or_host> | The IP address or the host name of the device. | e.g.: 192.168.0.110, myDevice |
| <enabled> | (de)activating the security feature | **true**<br>**false** |
| <eap> | EAP method | **MD5**<br>**TLS** |
| <identity> | User name (identity string for EAP) | |
| <password> | If the EAP method is MD5, this parameter must be set. **PROTECTED INFO**. | |
| <caCert> | Plain/text in PEM format containing one or more trusted CA certificates. If the EAP method is TLS, this parameter must be set. | |
| <clientCert> | Plain/text in PEM format containing the certificate of the client. If the EAP method is TLS, this parameter must be set. | |
| <privateKey> | Plain/text in PEM format containing the private key of the client. If the EAP method is TLS, this parameter must be set. **PROTECTED INFO**. | |
| <privateKeyPasswd> | The password for the private key. Optional, it can be used if the EAP method is TLS. **PROTECTED INFO**. | |

**PROTECTED INFO**: the information is protected: it can be set (POST) as a JSON object but cannot be queried (GET).

### Way of Working

#### The Successful Request

If the POSTed JSON structure is valid and consistent, the setting is applied immediately and stored in case of a reboot as well. HTTP status response is **'200 OK'**. The response is in plain/text format containing '**OK**'.

#### The Unsuccessful Request

If the structure fails (e.g. **EAP** method is **TLS** and the **clientCert** parameter is missing or in unaccepted format), the response is **'406 Not Acceptable'**. The response format is text/plain in this case, with a reference to the nature of the failure (e.g. Client certificate required in TLS mode.).

### 7.17.1. Querying the Security Status

#### Request and Response

➡ request: GET·http://<ip_or_host>/api/V1/MANAGEMENT/SECURITY/IEEE8021X/Configuration/

⬅ response: <standard_response>
⬅ body: <enabled>

#### Parameters

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <enabled> | The current status of the security feature as a JSON object. | **true**<br>**false** | |
| <standard_response> | Standard HTTP response | **200 OK** | <message>: <Product_name><br>The request has succeeded; the product name of the device is sent as text/plain content. |

#### Example

➡ request: http://192.168.0.100/api/V1/MANAGEMENT/SECURITY/IEEE8021X/Configuration/

⬅ response: 200 OK
⬅ body: {
⬅ "enabled": false
⬅ }

### 7.17.2. Example – Applying the TLS Method

➡ request: POST http://192.168.0.100/api/V1/MANAGEMENT/SECURITY/IEEE8021X/Configuration/
➡ body: {
"enabled": true,
"eap": "TLS",
"identity": "John",
"caCert": "-----BEGIN CERTIFICATE-----\n
***<CA certificate in PEM format>***
-----END CERTIFICATE-----\n",
"clientCert": ***<client certificate in PEM format>***,
"privateKey": ***<encrypted private key of the client in PEM format>***,
"privateKeyPasswd": "myPassword"
}

⬅ response: 200 OK
⬅ body: OK

## 7.18. Serial Port Configuration

INFO: Port numbering can be found in the Port Numbering section.

### 7.18.1. BAUD Rate Setting

**Request and Response** *#rs-232 #rs232*

➡ request-line: POST·http://<ip>/api/V1/MEDIA/SERIAL/<serial_port>/Baudrate
➡ body: <baudrate>

⬅ status-line: 200·OK
⬅ body: <baudrate>

**Parameters**

| Identifier | Parameter description | Parameter values |
|---|---|---|
| <serial_port> | Serial port number | **P1-P2** |
| <baudrate> | Baud rate value | **9600**<br>**19200**<br>**38400**<br>**57600**<br>**115200** |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/SERIAL/P1/Baudrate
➡ body: 19200

⬅ status-line: 200 OK
⬅ body: 19200

### 7.18.2. Stop Bits Setting

**Request and Response** *#rs232 #rs-232 #serial*

➡ request-line: POST·http://<ip>/api/V1/MEDIA/SERIAL/<serial_port>/StopBits
➡ body: <stopbits>

⬅ status-line: 200·OK
⬅ body: <stopbits>

**Parameters**

| Identifier | Parameter description | Parameter values |
|---|---|---|
| <serial_port> | Serial port number | **P1-P2** |
| <stopbits> | Stop bit value | **1**<br>**2** |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/SERIAL/P1/StopBits
➡ body: 1

⬅ status-line: 200 OK
⬅ body: 1

### 7.18.3. Querying the Data Bits

**Request and Response**

➡ request-line: GET·http://<ip>/api/V1/MEDIA/SERIAL/<serial_port>/DataBits

⬅ status-line: 200·OK
⬅ body: <databits>

**Parameters**

| Identifier | Parameter description | Parameter values |
|---|---|---|
| <serial_port> | Serial port number | **P1-P2** |
| <databits> | DataBits value | **8**<br>**9** |

**Example**

➡ request-line: GET http://192.168.0.100/api/V1/MEDIA/SERIAL/P1/DataBits

⬅ status-line: 200 OK
⬅ body: 8

### 7.18.4. Parity Setting

**Request and Response**

➡ request-line: POST·http://<ip>/api/V1/MEDIA/SERIAL/<serial_port>/Parity
➡ body: <parity>

⬅ status-line: 200·OK
⬅ body: <parity>

**Parameters**

| Identifier | Parameter description | Parameter values |
|---|---|---|
| <serial_port> | Serial port number | **P1-P2** |
| <parity> | Parity value | **None**<br>**Odd**<br>**Even** |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/SERIAL/P1/Parity
➡ body: None

⬅ status-line: 200 OK
⬅ body: None

### 7.18.5. Querying the Serial over IP Port Number

**Request and Response**

➡ request-line: GET·http://<ip>/api/V1/MEDIA/SERIAL/<serial_port>/SERIALOVERIP/Port

⬅ status-line: 200·OK
⬅ body: <port_nr>

**Parameters**

| Identifier | Parameter description | Parameter values |
|---|---|---|
| <serial_port> | Serial port number | **P1-P2** |
| <port_nr> | Serial over IP port number | **8001**<br>**8002** |

**Example**

➡ request-line: GET http://192.168.0.100/api/V1/MEDIA/SERIAL/P1/SERIALOVERIP/Port

⬅ status-line: 200 OK
⬅ body: 8001

### 7.18.6. Enabling the Serial over IP Port

**Request and Response** *#rs232 #rs-232 #serial*

➡ request-line: POST·http://<ip>/api/V1/MEDIA/SERIAL/<serial_port>/SERIALOVERIP/Enabled
➡ body: <state>

⬅ status-line: 200·OK
⬅ body: <state>

**Parameters**

| Identifier | Parameter description | Parameter values |
|---|---|---|
| <serial_port> | Serial port number | **P1-P2** |
| <state> | | **true**<br>**false** |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/SERIAL/P1/SERIALOVERIP/Enabled
➡ body: false

⬅ status-line: 200 OK
⬅ body: false

## 7.19. Serial Port Messaging

### 7.19.1. Sending a Message via RS-232

**ATTENTION:** Serial message sending is implemented only via Lightware REST API. This function is not available with LW3 protocol command. *#message*

**Request and Response**

➡ request-line: POST·http://<ip>/api/V1/MEDIA/SERIAL/<serial_port>/send
➡ body: <message>

⬅ status-line: 200·OK

**Parameters**

| Identifier | Parameter description | Parameter values |
|---|---|---|
| <serial_port> | Serial port number | **P1-P2** |
| <message> | Serial message | Any format is acceptable (text, binary, hexadecimal etc.), maximum message size is 100K. Escaping is unnecessary. |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/SERIAL/P1/send
➡ body: PWR0

⬅ status-line: 200 OK

The 'PWR0' message is sent out via the P1 serial port.

INFO: Taurus can receive a serial message in a special way. When a message is sent from the Taurus, the response from the connected device is accepted within 100 ms. The communication is closed after that time interval.

# 7.20. GPIO Port Configuration

## 7.20.1. Setting the Direction of a GPIO Pin

**Request and Response**

➡ request-line: POST·http://<ip>/api/V1/MEDIA/GPIO/<port>/Direction
➡ body: <dir>

⬅ status-line: 200·OK
⬅ body: <dir>

**Parameters**

| Parameter | Parameter description | Value | Value description |
|---|---|---|---|
| <dir> | The direction of the GPIO pin. | **Input** | input |
| | | **Output** | output |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/GPIO/P1/Direction
➡ body: Input

⬅ status-line: 200 OK
⬅ body: Input

## 7.20.2. Setting the Output Level of a GPIO Pin

**Request and Response**

➡ request-line: POST·http://<ip>/api/V1/MEDIA/GPIO/<port>/Output
➡ body: <state>

⬅ status-line: 200·OK
⬅ body: <state>

**Parameters**

| Parameter | Parameter description | Value | Value description |
|---|---|---|---|
| <value> | The output value of the GPIO pin. | **High** | high level |
| | | **Low** | low level |

**Example**

➡ request-line:POST http://192.168.0.100/api/V1/MEDIA/GPIO/P1/Output
➡ body: High

⬅ status-line: 200 OK
⬅ body: High

## 7.20.3. Setting the Output Level for a Specified Time

**Request and Response**

➡ request-line: POST·http://<ip>/api/V1/MEDIA/GPIO/<port>/interval
➡ body: <value>;<time>

⬅ status-line: 200·OK
⬅ body: <value>;<time>

**Parameters**

| Parameter | Parameter description | Value | Value description |
|---|---|---|---|
| <value> | The output value of the GPIO pin. | **High** | high level |
| | | **Low** | low level |
| <time> | Duration of the desired value in seconds. | **1-120** | second(s) |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/GPIO/P1/interval
➡ body: Low;1

⬅ status-line: 200 OK
⬅ body: OK

## 7.20.4. Toggling the Level of a GPIO Pin

The output level can be changed from high to low and from low to high with the command below.

**Request and Response**

➡ request-line: POST·http://<ip>/api/V1/MEDIA/GPIO/<port>/toggle

INFO: The body has to be empty, and the content type should be text/plain.

⬅ status-line: 200·OK
⬅ body: OK

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/GPIO/P1/toggle

⬅ status-line: 200 OK
⬅ body: OK

## 7.21. OCS Port Configuration

### 7.21.1. Querying the Input Level of an OCS Pin

**Request and Response** *#ocs*

➡ request-line: GET·http://<ip>/api/V1/MEDIA/OCS/P1/InputLevel

⬅ status-line: 200·OK
⬅ body: <value>

**Parameters**

| Parameter | Parameter description | Value | Value description |
|---|---|---|---|
| <value> | The input value of the OCS pin. | **High** | high level |
| | | **Low** | low level |

**Example**

➡ request-line: GET http://192.168.0.100/api/V1/MEDIA/OCS/P1/InputLevel

⬅ status-line: 200 OK
⬅ body: Low

### 7.21.2. Setting the Sensor Type

**Request and Response**

➡ request-line: POST·http://<ip>/api/V1/MEDIA/OCS/P1/SensorType·
➡ body: <sensor_type>

⬅ status-line: 200·OK
⬅ body: <sensor_type>

**Parameters**

| Parameter | Parameter description | Value | Value description |
|---|---|---|---|
| <sensor_type> | It defines whether the low or high input level means the occupancy. | **Active low** | Occupancy status is 'Occupied' when the input level is low. |
| | | **Active high** | Occupancy status is 'Occupied' when the input level is high (default value). |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MEDIA/OCS/P1/SensorType
➡ body: Active low

⬅ status-line: 200 OK
⬅ body: Active low

### 7.21.3. Querying the Reported OCS State

**Request and Response**

➡ request-line: GET·http://<ip>/api/V1/MEDIA/OCS/P1/State

⬅ status-line: 200·OK
⬅ body: <status>

**Parameters**

| Parameter | Parameter description | Value | Value description |
|---|---|---|---|
| <status> | It reports the occupancy state of the room depending on the sensor type. | **Free** | When the SensorType=Active high and the Inputlevel=Low or when SensorType=Active low and Inputlevel=High |
| | | **Occupied** | When the SensorType=Active high and the Inputlevel=High or when SensorType=Active low and Inputlevel=Low |

**Example**

➡ request-line: GET http://192.168.0.100/api/V1/MEDIA/OCS/P1/State

⬅ status-line: 200 OK
⬅ body: Free

# 7.22. Updating the Device via REST API

## 7.22.1. Querying the Update REST API Version

### Request and Response

➡ request-line: GET·http://<ip>/api/V1/MANAGEMENT/UPDATE/Version

⬅ status-line: <standard_response>
⬅ body: <major>.<minor>

### Parameters

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <ip> | The IP address of the device separated with dots. | | e.g.: 192.168.0.100 |
| <standard_response> | Standard HTTP response | **200 OK** | The request has succeeded. |
| | | **400 Bad request** | The request cannot be processed. |
| <major> | REST API major version number | | |
| <minor> | REST API minor version number | | |

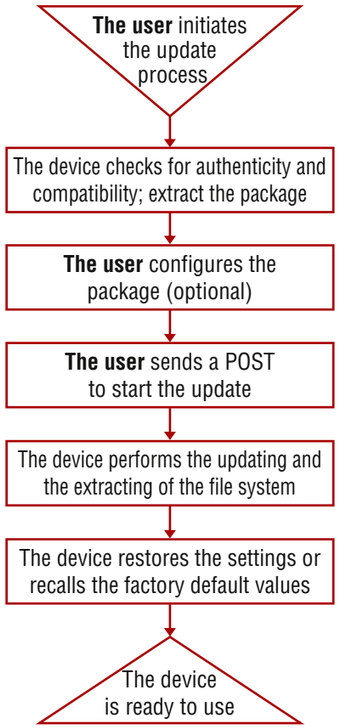
### Example

➡ request-line: GET http://192.168.0.100/api/V1/MANAGEMENT/UPDATE/Version

⬅ status-line: 200 OK
⬅ body: 1.1

## 7.22.2. The Updating Process

The API allows the device to update itself with an **LFP2** FW package. This new approach means there is no need to run a software on the connected PC (in case of LDU2) for updating the Lightware device.




***The Updating Process***

### The Updating Steps

1. The **User uploads the package** to a dedicated URL.
   – The package is being unpacked during the uploading process.
   – The package is checked by the device to see if they are compatible with each other.
2. The **User can set the uploaded package**.
   – The factory default settings can be recalled (this is the default setting of the package) or the current settings of the device can be restored (optional).
3. The **User starts the self-updating process** by sending a POST method.
   – The device performs the operations in connection with the update (e.g. file system replacement).
   – The device restores the previous settings to the new system, if it was set to.
4. The device is ready to use.

### 7.22.3. Uploading the Package

This step may take up to one or two minutes to finish as the size of the LFP2 package is approx. 100-150 MB (depends on the device and FW version).

**Request and Response**

➡ request-line: POST·http://<ip/host>/api/V1/MANAGEMENT/UPDATE/Package
➡ body: <LFP2 file>
➡ content-type: application/octet-stream

⬅ status-line: <standard_response>
⬅ body: <message>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <ip/host> | The IP address or the host name of the device. | | e.g.: 192.168.0.100, myDevice |
| <standard_response> | Standard HTTP response | **200 OK** | <message>: **OK** The request has succeeded; the whole package is extracted and the basic checks are done. |
| | | **400 Bad request** | <message>: **Package incompatible: Incompatible partnumber: [...]** The request cannot be processed; error during the uploading/checking. e.g. the package is not compatible with the device. The <message> is in text/plain format. |
| | | **500 Internal Server Error** | <message>: **Socket timeout** The package uploading was not successful. Please try it again. |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MANAGEMENT/UPDATE/Package
➡ body: (the LFP2 file)

⬅ status-line: 200 OK
⬅ body: OK

### 7.22.4. Configuration Parameters – Keep the Current Settings

**ATTENTION:** Restoring the device settings is not allowed if the firmware is **downgraded** to a previous version. In those cases, recalling the factory default settings is a must.

This is an **optional step** that allows keeping the current settings of the device. The **default setting** of an update is to **recall the factory default** values. If you want to keep the current settings of the device, delete the **'dofactoryreset'** file from the uploaded package as follows:

**Request and Response**

➡ request-line: DELETE·http://<ip/host>/api/V1/MANAGEMENT/UPDATE/CONFIG/dofactoryreset

⬅ status-line: <standard_response>
⬅ body: <message>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <ip/host> | The IP address or the host name of the device. | | e.g.: 192.168.0.100, myDevice |
| <standard_response> | Standard HTTP response | **200 OK** | "Deleted" |
| | | **405 Method not allowed** | LFP2 package was not uploaded to the device. |
| | | **500 Internal Server Error** | The file does not exist in the uploaded package (e.g. it was deleted previously). Continue the update process. |

**Example**

➡ request-line: DELETE http://192.168.0.100/api/V1/MANAGEMENT/UPDATE/CONFIG/dofactoryreset

⬅ status-line: 200 OK
⬅ body: Deleted

### 7.22.5. Configuration Parameters - Setting "Soft" Factory Reset

**DIFFERENCE:** From FW version v2.22.12, it is possible to call a soft factory reset on a device, which will restore most factory default settings, **except for example the login credentials (password)**.

INFO: "Soft" factory reset and factory reset settings are mutually exclusive. Only one of them can be active at a time. Calling one command will cancel the other one.

This node only appears when an LFP2 package is already uploaded to the device. To upload a package, see the Uploading the Package section.

INFO: This setting is only active until the update is performed. If needed, it must be set again during the following updates.

**Request and Response**

➡ request-line: POST·http://<ip/host>/api/V1/MANAGEMENT/UPDATE/CONFIG/dosoftreset
➡ body: <softreset_specifier>
➡ content-type: application/json

⬅ status-line: <standard_response>
⬅ body: <message>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <ip/host> | The IP address or the host name of the device. | | e.g.: 192.168.0.100, myDevice |
| <softreset_specifier> | The configuration to enable soft reset | { "preserve": [ "userConfig" ] } | |
| <standard_response> | Standard HTTP response | **201 Created** | Soft factory reset is enabled |
| | | **500 Internal Server Error** | Uploading the configuration was not successful. |

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MANAGEMENT/UPDATE/CONFIG/dosoftreset
➡ body:
```
{
  "preserve": [
    "userConfig"
  ]
}
```
➡ content-type: application/json

⬅ status-line: 201 Created
⬅ body: <message>

### 7.22.6. Configuration Parameters - Querying the Factory Reset Setting

This command shows the configuration set for the next update.

**Request and Response**

➡ request-line: GET·http://<ip/host>/api/V1/MANAGEMENT/UPDATE/CONFIG/dosoftreset

⬅ status-line: <standard_response>
⬅ body: <softreset_specifier>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <ip/host> | The IP address or the host name of the device. | | e.g.: 192.168.0.100, myDevice |
| <softreset_specifier> | The configuration to enable soft reset | { "preserve": [ "userConfig" ] } | |
| <standard_response> | Standard HTTP response | **200 OK** | Soft factory reset configuration is set |
| | | **404 Not Found** | No soft reset was configured |
| | | **500 Internal Server Error** | The file does not exist in the uploaded package (e.g. it was deleted previously). Continue the update process. |
| | | **503 Service Unavailable** | No update package has been uploaded. |

**Example**

➡ request-line: GET http://192.168.0.100/api/V1/MANAGEMENT/UPDATE/CONFIG/dosoftreset

⬅ status-line: 200 OK
⬅ body:
```
{
  "preserve": [
    "userConfig"
  ]
}
```

### 7.22.7. Configuration Parameters - Deleting "Soft" Factory Reset Configuration

This commands deletes the soft factory reset configuration if it has been set.

**Request and Response**

➡ request-line: DELETE·http://<ip/host>/api/V1/MANAGEMENT/UPDATE/CONFIG/dosoftreset

⬅ status-line: <standard_response>
⬅ body: <message>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <ip/host> | The IP address or the host name of the device. | | e.g.: 192.168.0.100, myDevice |
| <standard_response> | Standard HTTP response | **200 OK** | "Deleted" |
| | | **500 Internal Server Error** | Error happened. |

**Example**

➡ request-line: DELETE http://192.168.0.100/api/V1/MANAGEMENT/UPDATE/CONFIG/dofactoryreset

⬅ status-line: 200 OK
⬅ body: Deleted

### 7.22.8. Executing the Update

The command is for installing the uploaded package in place of the current system. This step may take up to 7 minutes.

**Request and Response**

➡ request-line: POST·http://<ip/host>/api/V1/MANAGEMENT/UPDATE/update
➡ body: <payload>
➡ content-type: text/plain

⬅ status-line: <standard_response>
⬅ body: <message>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <ip/host> | The IP address or the host name of the device. | | e.g.: 192.168.0.100, myDevice |
| <payload> | optional | **force** | The update can be forced to run in **Package incompatible** error state, but the security check cannot be bypassed (**Package untrusted** state). |
| <standard_response> | Standard HTTP response | **200 OK** | The request has succeeded; the update process finished successfully. |
| | | **400 Bad request** | The request cannot be processed. it may happen that the uploaded package is not compatible with the device (**Package incompatible** error state) and the **force** payload was **not** used. |

**ATTENTION:** Please note that running a **forced update** can make the device inoperable.

**Example**

➡ request-line: POST http://192.168.0.100/api/V1/MANAGEMENT/UPDATE/update

⬅ status-line: 200 OK
⬅ body: OK

When the *'force'* payload is used:

➡ request-line: POST http://192.168.0.100/api/V1/MANAGEMENT/UPDATE/update
➡ body: force
➡ content-type: RAW (JSON)

⬅ status-line: 200 OK
⬅ body: OK

### 7.22.9. Querying the State of the Updating Process

This command is for querying the current state of the updating process.

**Request and Response**

➡ request-line: GET·http://<ip/host>/api/V1/MANAGEMENT/UPDATE/Status

⬅ status-line: <standard_response>
⬅ body: <message>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <ip/host> | The IP address or the host name of the device. | | e.g.: 192.168.0.100, myDevice |
| <standard_response> | Standard HTTP response | **200 OK** | The request has succeeded.<br><message> states:<br>**Idle**: not active, update has not started yet.<br>**Package uploading**: updating and checking is in progress.<br>**Package ready**: uploading is done, checking is successful. |
| | | **400 Bad Request** | The request cannot be processed.<br><message> states:<br>**Package incompatible**: the uploaded package is not compatible with the device.<br>**Package untrusted**: the uploaded package is not secure.<br>**Failed**: the update is not successful. |

INFO: Please note that while the new firmware is being programmed in the device, it cannot send a response for a request. Thus the current state cannot be requested either.

After the firmware update is finished successfully, the device would send the 'Idle' response when requesting its status with this command.

**Example**

➡ request-line: GET http://192.168.0.100/api/V1/MANAGEMENT/UPDATE/Status

⬅ status-line: 200 OK
⬅ body: Package uploading

## 7.23. Lightware REST API Quick Summary

**System Commands**

Setting the Device Label

➜ request-line: POST·http://<ip>/api/V1/MANAGEMENT/LABEL/DeviceLabel
➜ body: <custom_name>

Resetting the Device

➜ request-line: POST·http://<ip>/api/V1/SYS/restart

Restoring the Factory Default Settings

➜ request-line: POST·http://<ip>/api/V1/SYS/factoryDefaults

Querying the Firmware Package Version

➜ request-line: GET·http://<ip>/api/V1/MANAGEMENT/UID/PACKAGE/Version

Control Lock

➜ request-line: POST·http://<ip>/api/V1/MANAGEMENT/UI/ControlLock
➜ body: <lock_status>

Setting the Current Time

➜ request-line: POST·http://<ip>/api/V1/MANAGEMENT/DATETIME/setTime
➜ body: <current_time>

Identifying the Device

➜ request-line: POST·http://<ip>/api/V1/MANAGEMENT/UI/identifyMe

Toggling the Dark Mode Setting

➜ request-line: POST·http://<ip>/api/V1/MANAGEMENT/UI/DARKMODE/Enable
➜ body: <mode_state>

Setting the Delay of the Dark Mode

➜ request-line: POST·http://<ip>/api/V1/MANAGEMENT/UI/DARKMODE/Delay
➜ body: <delay_time>

Enabling Remote System Logging

➜ request-line: POST·http://<ip>/api/V1/MANAGEMENT/LOG/REMOTE/Enabled
➜ body: <status>

Setting the Remote Server Address

➜ request-line: POST·http://<ip>/api/V1/MANAGEMENT/LOG/REMOTE/ServerAddress
➜ body: <server_address>

Setting the Protocol for the Remote System Logging

➜ request-line: POST·http://<ip>/api/V1/MANAGEMENT/LOG/REMOTE/Protocol
➜ body: <protocol>

Setting the Format of the Remote System Logging

➜ request-line: POST·http://<ip>/api/V1/MANAGEMENT/LOG/REMOTE/LogFormat
➜ body: <format>

Setting the Port for Remote System Logging

➜ request-line: POST·http://<ip>/api/V1/MANAGEMENT/LOG/REMOTE/PortNumber
➜ body: <port_number>

Enabling/Disabling SNMP Monitoring

➜ request-line: POST·http://<ip>/api/V1/MANAGEMENT/NETWORK/SERVICES/SNMP/Enabled
➜ body: <status>

Setting the Device Location

➜ request-line: POST·http://<ip>/api/V1/MANAGEMENT/NETWORK/SERVICES/SNMP/SysLocation
➜ body: <location>

**Video Port Settings - General**

Switching the Video Input

➜ request-line: POST·http://<ip>/api/V1/MEDIA/VIDEO/XP/switch
➜ body: <in>:<out>

Switching an Input to All Outputs

➜ request-line: POST·http://<ip>/api/V1/MEDIA/VIDEO/XP/switchAll
➜ body: <in>

Locking the Video Port

➜ request-line: POST·http://<ip>/api/V1/MEDIA/VIDEO/XP/<port>/Lock
➜ body: <locked_state>

Muting the Video Port

➜ request-line: POST·http://<ip>/api/V1/MEDIA/VIDEO/XP/<port>/Mute
➜ body: <muted_state>

Setting the Autoselect Policy

➜ request-line: POST·http://<ip>/api/V1/MEDIA/VIDEO/AUTOSELECT/<out>/Policy
➜ body: <autoselect_mode>

Changing the Autoselect-Included Input Ports

➜ request-line: POST·http://<ip>/api/V1/MEDIA/VIDEO/AUTOSELECT/<out>/<in>/Included
➜ body: <state>

Changing the Input Port Priority

➜ request-line: POST·http://<ip>/api/V1/MEDIA/VIDEO/AUTOSELECT/<out>/<in>/Priority
➜ body: <prio_num>

Querying the Connected Source

➜ request-line: GET·http://<ip>/api/V1/MEDIA/VIDEO/XP/<out>/ConnectedSource

#### Querying the Connected Destinations

➡ request-line: GET·http://<ip>/api/V1/MEDIA/VIDEO/XP/<in>/ConnectedDestinations

#### Querying the Input Switching Capability

➡ request-line: GET·http://<ip>/api/V1/MEDIA/VIDEO/XP/<out>/SWITCHABLE/<in>

#### Query the Video Signal Presence

➡ request-line: GET·http://<ip>/api/V1/MEDIA/VIDEO/<port>/SignalPresent

#### HDCP Setting (Input Port)

➡ request-line: POST·http://<ip>/api/V1/MEDIA/VIDEO/<in>/HDCP/AllowedHdcpVersion
➡ body: <allowed_hdcp>

#### HdcpMode

➡ request-line: POST·http://<ip>/api/V1/MEDIA/VIDEO/<out>/HdcpMode
➡ body: <hdcp_mode>

#### Querying the Embedded Audio Presence

➡ request-line: GET·http://<ip>/api/V1/MEDIA/VIDEO/<port>/EmbeddedAudioPresent

#### Muting the Embedded Audio

➡ request-line: POST·http://<ip>/api/V1/MEDIA/VIDEO/<port>/EmbeddedAudioMute
➡ body: <mute_state>

#### Setting the Output Signal Type

➡ request-line: POST·http://<ip>/api/V1/MEDIA/VIDEO/<out>/OutputSignalType
➡ body: <signal_type>

#### Turning on Output 5V

➡ request-line: POST·http://<ip>/api/V1/MEDIA/VIDEO/<out>/Output5VMode
➡ body: <5V_pwr>

### Welcome Screen Settings

#### Displaying the Welcome Screen Image

➡ request-line: POST·http://<ip>/api/V1/MEDIA/VIDEO/<w_scr>/WELCOMESCREEN/ImageEnabled
➡ body: <image_state>

#### Displaying the Welcome Screen Text

➡ request-line: POST·http://<ip>/api/V1/MEDIA/VIDEO/<w_scr>/WELCOMESCREEN/MessageEnabled
➡ body: <text_state>

#### Setting the Welcome Screen Text

➡ request-line: POST·http://<ip>/api/V1/MEDIA/VIDEO/<w_scr>/WELCOMESCREEN/MessageText
➡ body: <text>

#### Resetting the Welcome Screen Image

➡ request-line: POST·http://<ip>/api/V1/MEDIA/VIDEO/<w_scr>/WELCOMESCREEN/resetImage

### Video Port Settings - USB-C Related Commands

#### Restarting the Link Training

➡ request-line: POST·http://<ip>/api/V1/MEDIA/VIDEO/<in>/DP/restartLinkTraining

### CEC Command Sending

#### Simple CEC Code Sending

➡ request-line: POST·http://<ip>/api/V1/MEDIA/VIDEO/<port>/CEC/send
➡ body: <command>·

#### Remote Control Code Sending

➡ request-line: POST·http://<ip>/api/V1/MEDIA/VIDEO/<port>/CEC/sendUserControlClick
➡ body: <command>·

### Audio Port Settings

#### Switching the Audio Input

➡ request-line: POST·http://<ip>/api/V1/MEDIA/AUDIO/XP/switch
➡ body: <audio_in>:<analog_audio_out>·

#### Querying the Connected Source

➡ request-line: GET·http://<ip>/api/V1/MEDIA/AUDIO/XP/<analog_audio_out>/ConnectedSource

#### Querying the Connected Destinations

➡ request-line: GET·http://<ip>/api/V1/MEDIA/AUDIO/XP/<audio_in>/ConnectedDestinations

#### Setting the Autoselect Operation Mode

➡ request-line: POST·http://<ip>/api/V1/MEDIA/AUDIO/AUTOSELECT/<analog_audio_out>/Policy
➡ body: <op_mode>

#### Setting the Followed Video Port to Autoselect

➡ request-line: POST·http://<ip>/api/V1/MEDIA/AUDIO/AUTOSELECT/<analog_audio_out>/VideoFollowPort
➡ body: <out>

#### Enabling/Disabling the Dante USB Sound Card

➡ request-line: POST·http://<ip>/api/V1/SYS/BD_DANTE_ADDON/Enabled
➡ body: <status>

#### Setting the Audio Device Type for the Dante Input

➡ request-line: POST·http://<ip>/api/V1/MEDIA/AUDIO/DANTE_IN/AudioDeviceType
➡ body: <device_type>

#### Setting the Name of the Dante Input

➡ request-line: POST·http://<ip>/api/V1/MEDIA/AUDIO/DANTE_IN/DeviceDescriptor
➡ body: <custom_name>

### Locking the Audio Port

➜ request-line: POST·http://<ip>/api/V1/MEDIA/AUDIO/XP/<audio_port>/Lock
➜ body: <locked_state>

### Muting the Audio Port 1.

➜ request-line: POST·http://<ip>/api/V1/MEDIA/AUDIO/XP/<audio_port>/Mute
➜ body: <muted_state>

### Muting the Audio Port 2.

➜ request-line: POST·http://<ip>/api/V1/MEDIA/AUDIO/<analog_audio_out>/Mute
➜ body: <muted_state>

### Querying the Audio Signal Presence

➜ request-line: GET·http://<ip>/api/V1/MEDIA/AUDIO/<audio_port>/SignalPresent

### Analog Audio Output Volume (dB) Setting

➜ request-line: POST·http://<ip>/api/V1/MEDIA/AUDIO/<analog_audio_out>/VolumedB
➜ body: <level>

### Analog Audio Output Volume Percent Setting

➜ request-line: POST·http://<ip>/api/V1/MEDIA/AUDIO/<analog_audio_out>/VolumePercent
➜ body: <percent>

### Setting the Balance

➜ request-line: POST·http://<ip>/api/V1/MEDIA/AUDIO/<analog_audio_out>/Balance
➜ body: <level>

### Analog Audio Output Level Setting by Steps (dB)

➜ request-line: POST·http://<ip>/api/V1/MEDIA/AUDIO/<analog_audio_out>/stepVolumedB
➜ body: <step>

### Analog Audio Output Level Setting by Steps in Percent

➜ request-line: POST·http://<ip>/api/V1/MEDIA/AUDIO/<analog_audio_out>/stepVolumePercent
➜ body: <step>

### Analog Audio Output Balance Setting by Steps

➜ request-line: POST·http://<ip>/api/V1/MEDIA/AUDIO/<analog_audio_out>/stepBalance
➜ body: <step>

## USB Port Settings

### Switching the USB Input

➜ request-line: POST·http://<ip>/api/V1/MEDIA/USB/XP/switch
➜ body: <host>:H1

### Querying the Connected Source

➜ request-line: GET·http://<ip>/api/V1/MEDIA/USB/XP/H1/ConnectedSource

### Querying the Connected Destinations

➜ request-line: GET·http://<ip>/api/V1/MEDIA/USB/XP/<host>/ConnectedDestinations

### Locking the USB Port

➜ request-line: POST·http://<ip>/api/V1/MEDIA/USB/XP/<usb_port>/Lock
➜ body: <locked_state>

### Setting the 5V Sending to the USB Peripherals

➜ request-line: POST·http://<ip>/api/V1/MEDIA/USB/H1/<device_id>/Power5VMode
➜ body: <device_pwr>

### Setting the USB Autoselect Policy

➜ request-line: POST·http://<ip>/api/V1/MEDIA/USB/AUTOSELECT/H1/Policy
➜ body: <op_mode>

### Setting the Followed Video Port to Autoselect

➜ request-line: POST·http://<ip>/api/V1/MEDIA/USB/AUTOSELECT/H1/VideoFollowPort
➜ body: <out>

### Changing the Autoselect Included USB Ports

➜ request-line: POST·http://<ip>/api/V1/MEDIA/USB/AUTOSELECT/H1/<host>/Included
➜ body: <state>

### Changing the USB Port Priority

➜ request-line: POST·http://<ip>/api/V1/MEDIA/USB/AUTOSELECT/H1/<host>/Priority
➜ body: <prio_num>

## USB Port Settings - USB-C Related Commands

### Setting the USB-C Power

➜ request-line: POST·http://<ip>/api/V1/MEDIA/USB/<usb-c_port>/POWER/Reserved
➜ body: <power>

### Setting the Displayport Alternate Mode Policy

➜ request-line: POST·http://<ip>/api/V1/MEDIA/USB/<usb-c_port>/DpAltModePolicy
➜ body: <dp_policy>

### Querying the Host Alternate Mode Support

➜ request-line: GET·http://<ip>/api/V1/MEDIA/USB/<usb-c_port>/HostSupportsDpAltMode

### Querying the Status of the Alternate Mode

➜ request-line: GET·http://<ip>/api/V1/MEDIA/USB/<usb-c_port>/ActiveAltMode

### Querying the Port Data Role

➜ request-line: GET·http://<ip>/api/V1/MEDIA/USB/<usb-c_port>/ActivePortDataRole

#### Querying the Port Power Role

➜ request-line: GET·http://<ip>/api/V1/MEDIA/USB/<usb-c_port>/ActivePortPowerRole

#### Setting the Port Power Role

➜ request-line: POST·http://<ip>/api/V1/MEDIA/USB/<usb-c_port>/PortPowerRoleSetting
➜ body: <power_role>

### EDID Management

#### Querying the Emulated EDIDs

➜ request-line: GET·http://<ip>/api/V1/EDID/EdidStatus

#### Querying the Validity of a Dynamic EDID

➜ request-line: GET·http://<ip>/api/V1/EDID/D/<dynamic_edid>/Validity

#### Querying the Preferred Resolution of a User EDID

➜ request-line: GET·http://<ip>/api/V1/EDID/U/<user_edid>/PreferredResolution

#### Emulating an EDID to an Input Port

➜ request-line: POST·http://<ip>/api/V1/EDID/switch
➜ body: <source>:<destination>

#### Emulating an EDID to All Input Ports

➜ request-line: POST·http://<ip>/api/V1/EDID/switchAll
➜ body: <source>

#### Copying an EDID to User Memory

➜ request-line: POST·http://<ip>/api/V1/EDID/copy
➜ body: <source>:<destination>

#### Deleting an EDID from User Memory

➜ request-line: POST·http://<ip>/api/V1/EDID/delete
➜ body: <user_edid>

#### Resetting the Emulated EDIDs

➜ request-line: POST·http://<ip>/api/V1/EDID/reset

### Ethernet Port Configuration

#### Setting the DHCP State

➜ request-line: POST·http://<ip>/api/V1/MANAGEMENT/NETWORK/DhcpEnabled
➜ body: <dhcp_status>

#### Changing the IP Address (Static)

➜ request-line: POST·http://<ip>/api/V1/MANAGEMENT/NETWORK/StaticIpAddress
➜ body: <IP_address>

#### Changing the Subnet Mask (Static)

➜ request-line: POST·http://<ip>/api/V1/MANAGEMENT/NETWORK/StaticNetworkMask
➜ body: <netmask>

#### Changing the Gateway Address (Static)

➜ request-line: POST·http://<ip>/api/V1/MANAGEMENT/NETWORK/StaticGatewayAddress
➜ body: <gw_address>

#### Applying the Network Settings

➜ request-line: POST·http://<ip>/api/V1/MANAGEMENT/NETWORK/applySettings

#### Setting the Hostname

➜ request-line: POST·http://<ip>/api/V1/MANAGEMENT/NETWORK/HostName
➜ body: <unique_name>

### Network Security

#### Enabling/Disabling the Ethernet Port

➜ request-line: POST·http://<ip>/api/V1/MEDIA/ETHERNET/<ethernet_port>/Enabled
➜ body: <status>

#### Querying the Network Service Port Number

➜ request-line: GET·http://<ip>/api/V1/MANAGEMENT/NETWORK/SERVICES/<port>/Port

#### Enabling/Disabling the Network Service Port

➜ request-line: GET·http://<ip>/api/V1/MANAGEMENT/NETWORK/SERVICES/<port>/Enabled
➜ body: <status>

#### Querying the Username for Authentication

➜ request-line: GET·http://<ip>/api/V1/MANAGEMENT/NETWORK/AUTH/USER1/Name

#### Setting a Password for Authentication

➜ request-line: POST·http://<ip>/api/V1/MANAGEMENT/NETWORK/AUTH/USER1/setPassword
➜ body: <password>

#### Enabling the Authentication

➜ request-line: POST·http://<ip>/api/V1/MANAGEMENT/NETWORK/SERVICES/<port>/AuthenticationEnabled
➜ body: <status>

### Advanced Ethernet Security

#### Setting the VLAN Preset

➜ request-line: POST·http://<ip>/api/V1/MEDIA/ETHERNET.VlanPreset
➜ body: <vlan_preset>

#### Setting the VLAN Membership

➜ request-line: POST http://<ip>/api/V1/MEDIA/ETHERNET/<port_number>.VlanMembership
➜ body: <vlan_membership>

#### Setting the VLAN ID

➜ request-line: POST http://<ip>/api/V1/MEDIA/ETHERNET/<port>/VlanMembership
➜ body: <vlan_id>
➜ request-line: POST http://<ip>/api/V1/MEDIA/ETHERNET/<port>/VlanMembership
➜ body: 2000

#### Setting the Static IP Address for the Room LAN

➜ request-line: POST http://<ip>/api/EXPERIMENTAL/MANAGEMENT/NETWORKINTERFACES/ROOM/IPV4/STATIC/ConfiguredIpAddress
➜ body: <static_management_ip>

#### Setting the Gateway for Static IP on the Room LAN

➜ request-line: POST http://<ip>/api/EXPERIMENTAL/MANAGEMENT/NETWORKINTERFACES/ROOM/IPV4/STATIC/ConfiguredGatewayAddress
➜ body: <static_management_gateway>

### 802.1X Security Feature

#### Querying the Security Status

➜ request: GET http://<ip_or_host>/api/V1/MANAGEMENT/SECURITY/IEEE8021X/Configuration/

### Serial Port Configuration

#### BAUD Rate Setting

➜ request-line: POST http://<ip>/api/V1/MEDIA/SERIAL/<serial_port>/Baudrate
➜ body: <baudrate>

#### Stop Bits Setting

➜ request-line: POST http://<ip>/api/V1/MEDIA/SERIAL/<serial_port>/StopBits
➜ body: <stopbits>

#### Querying the Data Bits

➜ request-line: GET http://<ip>/api/V1/MEDIA/SERIAL/<serial_port>/DataBits

#### Parity Setting

➜ request-line: POST http://<ip>/api/V1/MEDIA/SERIAL/<serial_port>/Parity
➜ body: <parity>

#### Querying the Serial over IP Port Number

➜ request-line: GET http://<ip>/api/V1/MEDIA/SERIAL/<serial_port>/SERIALOVERIP/Port

#### Enabling the Serial over IP Port

➜ request-line: POST http://<ip>/api/V1/MEDIA/SERIAL/<serial_port>/SERIALOVERIP/Enabled
➜ body: <state>

### Serial Port Messaging

#### Sending a Message via RS-232

➜ request-line: POST http://<ip>/api/V1/MEDIA/SERIAL/<serial_port>/send
➜ body: <message>

### GPIO Port Configuration

#### Setting the Direction of a GPIO Pin

➜ request-line: POST http://<ip>/api/V1/MEDIA/GPIO/<port>/Direction
➜ body: <dir>

#### Setting the Output Level of a GPIO Pin

➜ request-line: POST http://<ip>/api/V1/MEDIA/GPIO/<port>/Output
➜ body: <state>

#### Setting the Output Level for a Specified Time

➜ request-line: POST http://<ip>/api/V1/MEDIA/GPIO/<port>/interval
➜ body: <value>;<time>

#### Toggling the Level of a GPIO Pin

➜ request-line: POST http://<ip>/api/V1/MEDIA/GPIO/<port>/toggle

### OCS Port Configuration

#### Querying the Input Level of an OCS Pin

➜ request-line: GET http://<ip>/api/V1/MEDIA/OCS/P1/InputLevel

#### Setting the Sensor Type

➜ request-line: POST http://<ip>/api/V1/MEDIA/OCS/P1/SensorType
➜ body: <sensor_type>

#### Querying the Reported OCS State

➜ request-line: GET http://<ip>/api/V1/MEDIA/OCS/P1/State

### Updating the Device via REST API

#### Querying the Update REST API Version

➜ request-line: GET http://<ip>/api/V1/MANAGEMENT/UPDATE/Version

#### Uploading the Package

➜ request-line: POST http://<ip/host>/api/V1/MANAGEMENT/UPDATE/Package
➜ body: <LFP2 file>
➜ content-type: application/octet-stream

#### Configuration Parameters – Keep the Current Settings

➜ request-line: DELETE http://<ip/host>/api/V1/MANAGEMENT/UPDATE/CONFIG/dofactoryreset

### Configuration Parameters - Setting "Soft" Factory Reset

➜ request-line: POST·http://<ip/host>/api/V1/MANAGEMENT/UPDATE/CONFIG/dosoftreset
➜ body: <softreset_specifier>
➜ content-type: application/json

### Configuration Parameters - Querying the Factory Reset Setting

➜ request-line: GET·http://<ip/host>/api/V1/MANAGEMENT/UPDATE/CONFIG/dosoftreset

### Configuration Parameters - Deleting "Soft" Factory Reset Configuration

➜ request-line: DELETE·http://<ip/host>/api/V1/MANAGEMENT/UPDATE/CONFIG/dosoftreset

### Executing the Update

➜ request-line: POST·http://<ip/host>/api/V1/MANAGEMENT/UPDATE/update
➜ body: <payload>
➜ content-type: text/plain

### Querying the State of the Updating Process

➜ request-line: GET·http://<ip/host>/api/V1/MANAGEMENT/UPDATE/Status

# 8

## LW3 Programmers' Reference

**The device can be controlled through Lightware 3 (LW3) protocol commands to ensure the compatibility with other Lightware products. The supported LW3 commands are described in this chapter.**


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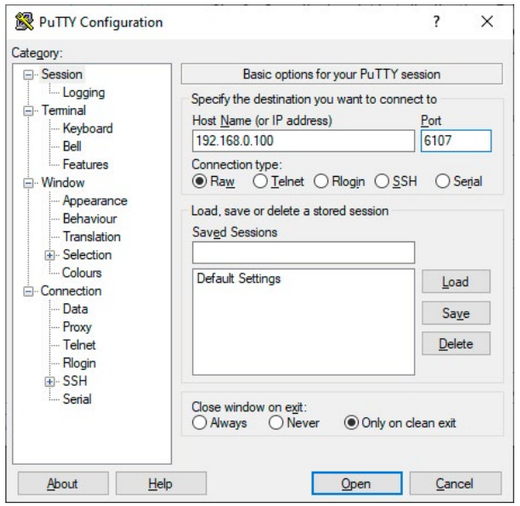
## 8.1. Overview

The Lightware Protocol #3 (LW3) is implemented in almost all new Lightware devices (matrix switchers, signal extenders and distribution amplifiers) since 2012. The protocol is ASCII-based and all commands are terminated with a carriage return (Cr, '\r') and line feed (Lf, '\n') pair. It is organized as a tree structure that provides outstanding flexibility and user-friendly handling with 'nodes', 'properties' and 'methods'. The **Advanced View** of the Lightware Device Controller software is the perfect tool for browsing and learning how the LW3 protocol can be used in practice.

## 8.2. Instructions for the Terminal Application Usage

### Terminal Application

The LW3 protocol commands can be applied to the switcher using a terminal application. You need to install one of them on your control device, for example **Putty** or **CLI**. *#terminal*




### Establishing Connection

Follow the steps to establish connection to the switcher:

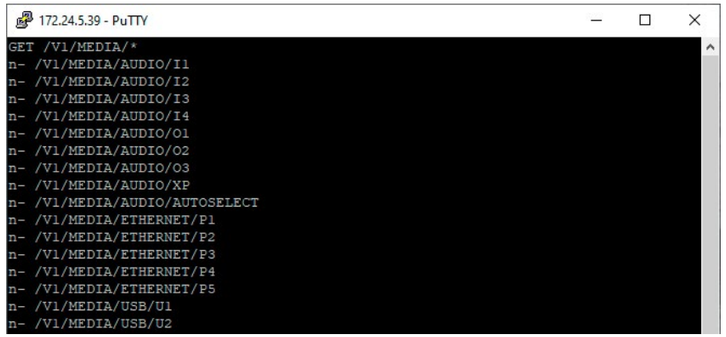
**Step 1.** Connect the device to a LAN over Ethernet.

**Step 2.** Open the terminal application (e.g. Putty).

**Step 3.** Add the **IP address** of the device (default: DHCP) and the **port number (6107)**.

**Step 4.** Select the **Raw** connection type, and open the connection.

Once the terminal window is opened, you can enter the LW3 protocol commands, which are listed in the following sections.




***LW3 protocol command communication in a terminal window***

## 8.3. Websocket (WS) or Secured Websocket (WSS) Usage

UCX series switcher provides WS/WSS services on its 80 (for WS) and 443 (for WSS) ports to control the device with LW3 protocol commands. For more details about the websocket, see the Lightware Crypto Core section.

The LW3 node tree is available after opening a session with the device on the following path:

- ws://<ip>/lw3
- wss://<ip>/lw3

### WebSocket Client Application

#### Establishing Connection

Follow the steps to establish connection to the switcher:

**Step 1.** Connect the receiver to a LAN over Ethernet.

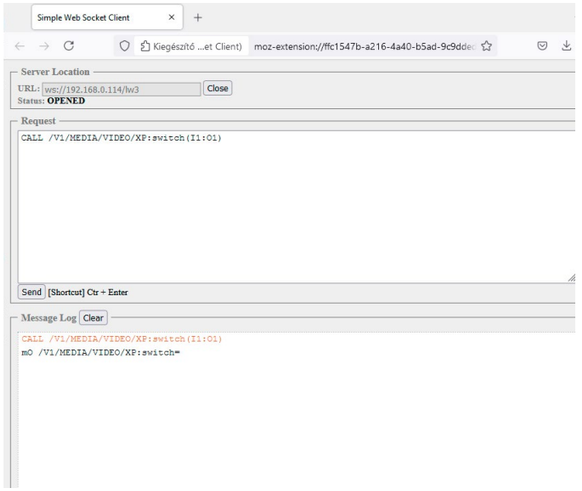
**Step 2.** Open the websocket client (e.g. Simple websocket Client).

**Step 3.** Add the **IP address** of the device (default: DHCP): ws://<ip>/lw3 or wss://<ip>/lw3

**Step 4.** Press the **Open/Connect** button.

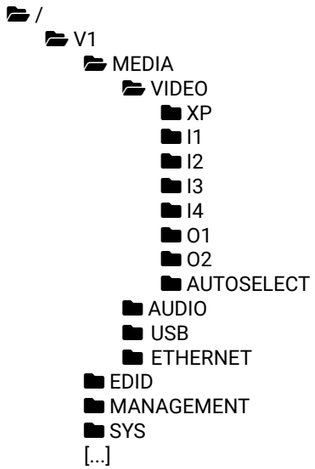
**Step 5.** Once connected, enter a message, hit **Enter** and press the **Send** button.

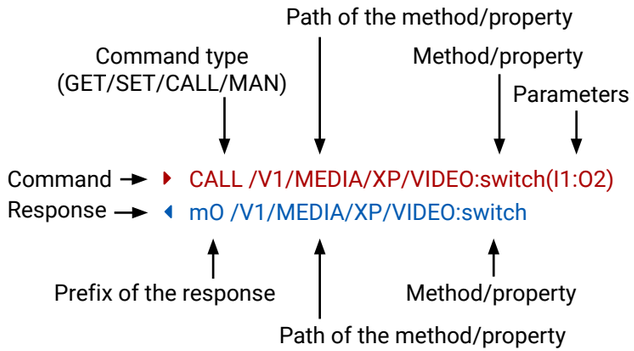
**Step 6.** Press the **Close/Disconnect** button to end the session.



## 8.4. Protocol Rules

### 8.4.1. LW3 Tree Structure and Command Structure (examples)




### 8.4.2. General Rules

- All names and parameters are **case-insensitive**.
- The nodes are separated by a slash ('/') character.
- The node name can contain the elements of the English alphabet and numbers.
- Use the **TCP port no. 6107** when using LW3 protocol over Ethernet.
- The 80 port can be used for WS (instead of HTTP)
- The 443 port can be used for WSS (instead of HTTPS)
- When a command is issued by the device, the received response cannot be processed by the CPU.
- The node paths describe the exact location of the node, listing each parent node up to the root.
- The **length of a line** (command/response, command type / prefix, path, method/property and parameters together) can be **max. 800 bytes**.
- The command lines have to be closed by **Carriage Return and Line Feed** (CrLf)
- It can manage 18 connected clients in total simultaneously for WS (80), WSS (443) and LW3 (6107) ports.

### 8.4.3. Legend for the Control Commands

**Command and Response – Example**

- GET·/V1/MEDIA/VIDEO/I2.SignalPresent
- pr·/V1/MEDIA/VIDEO/I2.SignalPresent=<signal_present>

| Format | Description |
|---|---|
| <in> | Input port number |
| <out> | Output port number |
| <port> | Input or output port number |
| <loc> | Location number |
| <parameter> | Variable defined and described in the command |
| <expression> | Batched parameters: the underline means that more expressions or parameters can be placed by using a semicolon, e.g. **I2;I4;I5** or **F27:E1;F47:E2** |
| ▸ | Sent command |
| ◂ | Received response |
| · | Space character |

Further not listed <parameters> are defined at each command.

### 8.4.4. Command Types

#### GET Command

The **GET** command can be used to get the child nodes, properties and methods of a specific node. It can also be used to get the value of a property. Use the dot character (.) when addressing a property:

- GET /.SerialNumber
- pr /.SerialNumber=87654321

#### GETALL Command

The **GETALL** command can be used to get all child nodes, properties and methods of a node with one command.

- GETALL /V1/MEDIA/ETHERNET
- n- /V1/MEDIA/ETHERNET/P1
- n- /V1/MEDIA/ETHERNET/P2
- n- /V1/MEDIA/ETHERNET/P3
- n- /V1/MEDIA/ETHERNET/P4
- n- /V1/MEDIA/ETHERNET/P5

#### SET Command

The **SET** command can be used to modify the value of a property. Use the dot character (.) when addressing the property:

- SET /V1/MEDIA/VIDEO/I2/HDCP.AllowedHdcpVersion=Off
- pw /V1/MEDIA/VIDEO/I2/HDCP.AllowedHdcpVersion=Off

#### CALL Command

A method can be invoked by the **CALL** command. Use the colon character (:) when addressing the method:

- CALL /V1/EDID:switchAll(F49)
- mO /V1/EDID:switchAll

#### MAN Command

The manual is a human readable text that describes the syntax and provides a hint on how to use the primitives. For every node, property and method in the tree there is a manual; type the MAN command to get the manual:

- MAN /V1/MEDIA/VIDEO/O1.Output5VMode
- pm /V1/MEDIA/VIDEO/O1.Output5VMode ["On" | "Auto" | "Off"] Enables/disables power 5V output

### 8.4.5. Prefix Summary

DEFINITION: The prefix is a 2-character-long code that describes the type of the response.

The following prefixes are defined in the LW3 protocol:

| Prefix | Description |
|---|---|
| n- | a node |
| nE | an error for a node |
| nm | a manual for a node |
| ns | a child node of a node |
| pr | a read-only property |
| pw | read-write property |
| pE | an error for the property |

| Prefix | Description |
|---|---|
| pm | a manual for the property |
| m- | a method |
| mO | a response after a successful method execution |
| mF | a response after a failed method execution |
| mE | an error for a method |
| mm | a manual for a method |

### 8.4.6. Error Messages

There are several error messages defined in the LW3 protocol, all of them have a unique error number.

- CALL /MEDIA/VIDEO/XP:lock(IA)
- mE /MEDIA/VIDEO/XP:lock %E002:Not exist

### 8.4.7. Escaping

DEFINITION: An escape sequence is a sequence of characters that does not represent itself when used inside a character or string literally, but is translated into another character or a sequence of characters.

Property values and method parameters can contain characters that are used as control characters in the protocol. They must be escaped. The escape character is the backslash ('\') and escaping means injecting a backslash before the character that should be escaped (like in C language).

Control characters are the following: \ { } # % ( ) \r \n \t

### 8.4.8. Signature

DEFINITION: The signature is a 4-digit-long hexadecimal value that can be optionally placed before every command to keep a command and the corresponding responses together as a group.

Each line is terminated with Carriage Return (Cr, '\r') and Line Feed (Lf, '\n') characters. In several cases the number of the lines in the response cannot be determined in advance, e.g. the client intends to receive the whole response and also wants to be sure that the received lines belong together and to the same command. In these cases, a special feature, the 'signature' can be used. The response to that particular command will also be preceded by the signature, and the corresponding lines will be between brackets:

```
1700#GET /V1/EDID.*
{1700
pr /V1/EDID.EdidStatus=F49:E1;F49:E2;F49:E3;F49:E4
m- /V1/EDID:copy
m- /V1/EDID:delete
m- /V1/EDID:reset
m- /V1/EDID:switch
m- /V1/EDID:switchAll
}
```

INFO: The lines of the signature are also Cr and Lf terminated.

### 8.4.9. Subscription

DEFINITION: Subscription to a node means that the user will get a notification if a property of the node changes.

A user can subscribe to any node. These notifications are asynchronous messages and are useful to keep the client application up to date, without having to periodically poll the node to detect a changed property. When the user does not want to be informed about the changes anymore, he can simply unsubscribe from the node.

INFO: Subscription to a nonexistent path is possible, and thus there will be no error message upon mistyping a path.

**ATTENTION:** The subscriptions are handled separately for connections. Hence, if the connection is terminated, all registered subscriptions are deleted. After reopening a connection all subscribe commands have to be sent in order to get the notifications of the changes on that connection.

**Subscribe to a Node**

```
OPEN /V1/MEDIA/VIDEO
o- /V1/MEDIA/VIDEO
```

**Get the Active Subscriptions**

```
OPEN
o- /V1/MANAGEMENT/LABEL
o- /V1/MEDIA/VIDEO/XP/O1/SWITCHABLE
o- /V1/MEDIA/VIDEO/XP/O2/SWITCHABLE
o- /V1/MEDIA/VIDEO/XP/I5
```

**Subscribe to Multiple Nodes**

```
OPEN /V1/MEDIA/VIDEO/*
o- /V1/MEDIA/VIDEO/*
```

**Unsubscribe from a Node**

```
CLOSE /V1/MEDIA/VIDEO
c- /V1/MEDIA/VIDEO
```

**Unsubscribe from Multiple Nodes**

```
CLOSE /V1/MEDIA/VIDEO/*
c- /V1/MEDIA/VIDEO/*
```

### 8.4.10. Notifications about the Changes of the Properties

When the value of a property is changed, and the user is subscribed to the node that the property belongs to, an asynchronous notification is generated. This notification is called the 'change message'. The format of such a message is very similar to the response for the **GET** command:

```
CHG /EDID.EdidStatus=F48:E1
```

**A Short Example of How to Use the Subscription**

There are two independent users controlling the device through two independent connections (**Connection #1** and **Connection #2**). The events in the rows occur after each other.

| | |
|---|---|
| OPEN /V1/MEDIA/AUDIO/O3<br>o- /V1/MEDIA/AUDIO/O3<br>GET /V1/MEDIA/AUDIO/O3.VolumePercent<br>pm /V1/MEDIA/AUDIO/O3.VolumePercent=100.00 | **connection #1** |
| GET /V1/MEDIA/AUDIO/O3.VolumePercent<br>pw /V1/MEDIA/AUDIO/O3.VolumePercent=100.00<br>SET /V1/MEDIA/AUDIO/O3.VolumePercent=50.00<br>pw /V1/MEDIA/AUDIO/O3.VolumePercent=50.00 | **connection #2** |
| CHG /V1/MEDIA/AUDIO/O3.VolumePercent=50.00 | **connection #1** |

The first user (**Connection #1**) set a subscription to a node. Later the other user (**Connection #2**) made a change, and thanks to the subscription, the first user got a notification about the change.

## 8.5. System Commands

### 8.5.1. Setting the Device Label

INFO: The device label can be changed to a custom text in the Status tab of the LDC software.

**Command and Response** *#devicelabel #label*

- SET·/V1/MANAGEMENT/LABEL.DeviceLabel=<custom_name>
- pw·/V1/MANAGEMENT/LABEL.DeviceLabel=<custom_name>

The Device Label can be 49 characters long and ASCII characters are allowed. Longer names are truncated.

**Example**

- SET /V1/MANAGEMENT/LABEL.DeviceLabel=UCX_Conference_room1
- pw /V1/MANAGEMENT/LABEL.DeviceLabel=UCX_Conference_room1

### 8.5.2. Resetting the Device

The switcher can be restarted – the current connections will be terminated.

**Command and Response** *#reboot #restart*

- CALL·/V1/SYS:restart()
- mO·/V1/SYS:restart=

**Example**

- CALL /V1/SYS:restart()
- mO /V1/SYS:restart=

### 8.5.3. Restoring the Factory Default Settings

**Command and Response**

- CALL·/V1/SYS:factoryDefaults()
- mO·/V1/SYS:factoryDefaults=

**Example**

- CALL /V1/SYS:factoryDefaults()
- mO /V1/SYS:factoryDefaults=

The device is restarted, current connections are terminated, and the default settings are restored. See the complete list in the Factory Default Settings section.

*#factory*

### 8.5.4. Querying the Firmware Package Version

**Command and Response** *#firmwareversion*

- GET·/V1/MANAGEMENT/UID/PACKAGE.Version
- pr·/V1/MANAGEMENT/UID/PACKAGE.Version=<firmware_version>

**Example**

- GET /V1/MANAGEMENT/UID/PACKAGE.Version
- pr /V1/MANAGEMENT/UID/PACKAGE.Version=1.0.0b2

### 8.5.5. Control Lock

Enable/disable the operation of the front panel buttons.

**Command and Response** *#lockbutton #buttonlock*

- SET·/V1/MANAGEMENT/UI.ControlLock=<lock_status>
- pw·/V1/MANAGEMENT/UI.ControlLock=<lock_status>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <lock_status> | Front panel button locking status | **None** | All functions of the front panel button are enabled. |
| | | **Locked** | The front panel buttons are locked and can be unlocked by button combination (Control Lock). |
| | | **Force locked** | The front panel buttons are locked and cannot be unlocked by button combination, only in LDC (on the Status tab) or using the LW3 command. |

**Example**

- SET /V1/MANAGEMENT/UI.ControlLock=force locked
- pw /V1/MANAGEMENT/UI.ControlLock=force locked

### 8.5.6. Setting the Current Time

**Command and Response** *#time*

- CALL·/V1/MANAGEMENT/DATETIME:setTime(<current_time>)
- mO·/V1/MANAGEMENT/DATETIME:setTime=

**Parameters**

| Parameter | Value | Value Description |
|---|---|---|
| <current_time> | **e.g. 2025-10-22T10:20:34 000Z** | The new router time in ISO 8601 date time format. |

**Example**

- CALL /V1/MANAGEMENT/DATETIME:setTime(2020-11-01T04:39:54.000Z)
- mO /V1/MANAGEMENT/DATETIME:setTime=

### 8.5.7. Identifying the Device

Calling the method makes the status LEDs blink for 10 seconds. The feature helps find the device physically.

**Command and Response** *#identifyme*

- CALL /V1/MANAGEMENT/UI:identifyMe()
- mO /V1/MANAGEMENT/UI:identifyMe=

**Example**

- CALL /V1/MANAGEMENT/UI:identifyMe()
- mO /V1/MANAGEMENT/UI:identifyMe=

### 8.5.8. Toggling the Dark Mode Setting

The LEDs of the device can be switched off if their light could be annoying. In Dark mode, all LEDs are switched off, except for the LEDs of the RJ45 connectors. *#darkmode*

**Command and Response**

- SET·/V1/MANAGEMENT/UI/DARKMODE.Enable=<mode_state>
- pw·/V1/MANAGEMENT/UI/DARKMODE.Enable=<mode_state>

**Parameters**

If the <mode_state> parameter is **true** (or **1**), the Dark mode function is **enabled**, if the parameter is **false** (or **0**), the function is **disabled**.

**Example**

- SET /V1/MANAGEMENT/UI/DARKMODE.Enable=true
- pw /V1/MANAGEMENT/UI/DARKMODE.Enable=true

### 8.5.9. Setting the Delay of the Dark Mode Setting

The Dark mode can be enabled right away, or after a certain time. Thus, the mode is enabled if no buttons are pressed for a while. Pressing any button brings back the status info on the LEDs without performing the function of the button itself. The delay time can be set by this command.

**Command and Response**

- SET·/V1/MANAGEMENT/UI/DARKMODE.Delay=<delay_time>
- pw·/V1/MANAGEMENT/UI/DARKMODE.Delay=<delay_time>

**Parameters**

The <delay_time> parameter means seconds, and the default value is 60. If set to 0, no delay is applied, and the Dark mode can be enabled immediately by the **DarkModeEnable** property. This delay affects the **wakeFromDarkMode** method as well.

**Example**

- SET /V1/MANAGEMENT/UI/DARKMODE.Delay=10
- pw /V1/MANAGEMENT/UI/DARKMODE.Delay=10

### 8.5.10. Enabling Remote System Logging

**Request and Response**

- SET /V1/MANAGEMENT/LOG/REMOTE.Enabled=<status>
- pw /V1/MANAGEMENT/LOG/REMOTE.Enabled=<status>

**Parameters**

| Parameter | Value | Value Description |
|---|---|---|
| <status> | **true** | The remote system logging is enabled. |
| | **false** | The remote system logging is disabled. |

**Example**

- SET /V1/MANAGEMENT/LOG/REMOTE.Enabled=true
- pw /V1/MANAGEMENT/LOG/REMOTE.Enabled=true

### 8.5.11. Setting the Remote Server Address

**Request and Response**

- SET /V1/MANAGEMENT/LOG/REMOTE.ServerAddress=<server_address>
- pw /V1/MANAGEMENT/LOG/REMOTE.ServerAddress=<server_address>

**Parameters**

| Parameter | Value | Value Description |
|---|---|---|
| <server_address> | **e.g. mycompany.com (domain)**<br>**192.168.0.1 (IPv4)** | The server domain name (RFC1035) or IP address (IPv4) where the logs should be sent to. |

**Example**

- SET /V1/MANAGEMENT/LOG/REMOTE.ServerAddress=192.168.0.1
- pw /V1/MANAGEMENT/LOG/REMOTE.ServerAddress=192.168.0.1

### 8.5.12. Setting the Protocol for the Remote System Logging

**Request and Response**

- SET /V1/MANAGEMENT/LOG/REMOTE.Protocol=<protocol>
- pw /V1/MANAGEMENT/LOG/REMOTE.Protocol=<protocol>

**Parameters**

| Parameter | Value | Value Description |
|---|---|---|
| <protocol> | **TCP** | The logs are forwarded using TCP protocol. |
| | **UDP** | The logs are forwarded using UDP protocol. |
| | **TLS** | The logs are forwarded using TLS protocol. |

**Example**

- SET /V1/MANAGEMENT/LOG/REMOTE.Protocol=TLS
- pw /V1/MANAGEMENT/LOG/REMOTE.Protocol=TLS

### 8.5.13. Setting the Format of the Remote System Logging

**Request and Response**

- SET /V1/MANAGEMENT/LOG/REMOTE.LogFormat=<format>
- pw /V1/MANAGEMENT/LOG/REMOTE.LogFormat=<format>

**Parameters**

| Parameter | Value | Value Description |
|---|---|---|
| <format> | **RFC3164** | This is a simplified format for human readability. |
| | **RFC5424** | This is an all-encompassing format for analitical systems. |

**Example**

- SET /V1/MANAGEMENT/LOG/REMOTE.LogFormat=RFC3164
- pw /V1/MANAGEMENT/LOG/REMOTE.LogFormat=RFC3164

### 8.5.14. Setting the Port for Remote System Logging

**Request and Response**

- SET /V1/MANAGEMENT/LOG/REMOTE.PortNumber=<port_number>
- pw /V1/MANAGEMENT/LOG/REMOTE.PortNumber=<port_number>

**Parameters**

| Parameter | Value | Value Description |
|---|---|---|
| <port_number> | **1-65535** | The port number on the remote host to send log messages to. |

INFO: The port number cannot be set to 0.

**Example**

- SET /V1/MANAGEMENT/LOG/REMOTE.PortNumber=6514
- pw /V1/MANAGEMENT/LOG/REMOTE.PortNumber=6514

### 8.5.15. Enabling/Disabling SNMP Monitoring

**Command and Response**

- SET·/V1/MANAGEMENT/NETWORK/SERVICES/SNMP.Enabled=<status>
- pw·/V1/MANAGEMENT/NETWORK/SERVICES/SNMP.Enabled=<status>

**Parameters**

| Parameter | Value | Value Description |
|---|---|---|
| <status> | **true** | The SNMP mointoring is enabled. |
| | **false** | The SNMP monitoring is disabled. |

**Example**

- SET /V1/MANAGEMENT/NETWORK/SERVICES/SNMP.Enabled=true
- pw /V1/MANAGEMENT/NETWORK/SERVICES/SNMP.Enabled=true

### 8.5.16. Setting the Device Location

**Command and Response**

- SET·/V1/MANAGEMENT/NETWORK/SERVICES/SNMP.SysLocation=<location>
- pw·/V1/MANAGEMENT/NETWORK/SERVICES/SNMP.SysLocation=<location>

**Parameters**

| Parameter | Value | Value Description |
|---|---|---|
| <location> | **e.g. Room 306** | The physical or logical location of the device. The string might contain letters of the English alphabet (A-Z, a-z), numbers (0-9), space ( ), period (.), underscore (_) and hyphen (-). |

**Example**

- SET /V1/MANAGEMENT/NETWORK/SERVICES/SNMP.SysLocation=Room 306
- pw /V1/MANAGEMENT/NETWORK/SERVICES/SNMP.SysLocation=Room 306

## 8.6. Video Port Settings - General

### 8.6.1. Switching Video Input

**Command and Response**

- CALL·/V1/MEDIA/VIDEO/XP:switch(<in>:<out>)
- mO·/V1/MEDIA/VIDEO/XP:switch=

**Example**

- CALL /V1/MEDIA/VIDEO/XP:switch(I5:O1)
- mO /V1/MEDIA/VIDEO/XP:switch=

INFO: When using the '0' value as an input, the input will be disconnected and no signal will appear on the output.

**ATTENTION:** Video crosspoint has a limitation: I1 and I3/I5* ports are not available at the same time, only one of them can be selected to any output. When one of the outputs is switched to I1 or I3/I5*, the other output can not be switched to I1 or I3/I5*. In this case the switch command returns an error message.

* **I3** in case of **UCX-2x1-HC60**, **UCX-2x2-H60** and **SCX-2x1-HC60** models, and **I5** in case of **UCX-4x2-HC60**, **UCX-4x2-HC60D**, **UCX-4x3-HC60** and **UCX-4x3-HC60-BD** models.

**Example**

- GET /V1/MEDIA/VIDEO/XP/O1.ConnectedSource
- pw /V1/MEDIA/VIDEO/XP/O1.ConnectedSource=I5
- GET /V1/MEDIA/VIDEO/XP/O2.ConnectedSource
- pw /V1/MEDIA/VIDEO/XP/O2.ConnectedSource=I5
- CALL /V1/MEDIA/VIDEO/XP:switch(I1:O1)
- mE /V1/MEDIA/VIDEO/XP:switch %E006: Illegal operation

### 8.6.2. Switching an Input to All Outputs

**Command and Response**

- CALL·/V1/MEDIA/VIDEO/XP:switchAll(<input>)
- mO·/V1/MEDIA/VIDEO/XP:switchAll=

**Example**

- CALL /V1/MEDIA/VIDEO/XP:switchAll(I1)
- mO /V1/MEDIA/VIDEO/XP:switchAll=

### 8.6.3. Locking the Video Port

**Command and Response**

- SET·/V1/MEDIA/VIDEO/XP/<port>.Lock=<locked_state>
- pw·/V1/MEDIA/VIDEO/XP/<port>.Lock=<locked_state>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <locked_state> | Locked state | **true** | The port is locked |
| | | **false** | The port is unlocked |

**Example**

- SET /V1/MEDIA/VIDEO/XP/I2.Lock=false
- pw /V1/MEDIA/VIDEO/XP/I2.Lock=false

### 8.6.4. Muting the Video Port

**Command and Response**

- SET·/V1/MEDIA/VIDEO/XP/<port>.Mute=<muted_state>
- pw·/V1/MEDIA/VIDEO/XP/<port>.Mute=<muted_state>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <muted_state> | Muted state | **true** | The port is locked. |
| | | **false** | The port is unlocked. |

**Example**

- SET /V1/MEDIA/VIDEO/XP/I2.Mute=false
- pw /V1/MEDIA/VIDEO/XP/I2.Mute=false

### 8.6.5. Setting the Autoselect Policy

**Command and Response**

- SET·/V1/MEDIA/VIDEO/AUTOSELECT/<out>.Policy=<autoselect_mode>
- pw·/V1/MEDIA/VIDEO/AUTOSELECT/<out>.Policy=<autoselect_mode>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <autoselect_mode> | The autoselect policy | **Off** | The autoselect function is disabled. |
| | | **Last Detect** | It is always the last attached input that is automatically switched to the output.. |
| | | **First Detect** | The first active video input is selected. |

**Example**

- SET /V1/MEDIA/VIDEO/AUTOSELECT/O2.Policy=First detect
- pw /V1/MEDIA/VIDEO/AUTOSELECT/O2.Policy=First detect

### 8.6.6. Changing the Autoselect Included Input Ports

**Command and Response**

- SET·/V1/MEDIA/VIDEO/AUTOSELECT/<out>/<in>.Included=<state>
- pw·/V1/MEDIA/VIDEO/AUTOSELECT/<out>/<in>.Included=<state>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <state> | The chosen input is ignored in the autoselect process or not. | **true** | The port is included in autoselect. |
| | | **false** | The autoselect function ignores that port. |

**Example**

- SET /V1/MEDIA/VIDEO/AUTOSELECT/O2/I1.Included=false
- pw /V1/MEDIA/VIDEO/AUTOSELECT/O2/I1.Included=false

### 8.6.7. Changing the Input Port Priority

**Command and Response**

- SET·/V1/MEDIA/VIDEO/AUTOSELECT/<out>/<in>.Priority=<prio_num>
- pw·/V1/MEDIA/VIDEO/AUTOSELECT/<out>/<in>.Priority=<prio_num>

**Parameters**

The <prio> parameter means the priority number from 1 to 100, equal numbers are allowed. Inputs can have different priorities in relation to two or more outputs. Therefore, the output port number is part of the node path of input port priorities.

**Example**

- SET /V1/MEDIA/VIDEO/AUTOSELECT/O2/I2.Priority=51
- pw /V1/MEDIA/VIDEO/AUTOSELECT/O2/I2.Priority=51

### 8.6.8. Querying the Connected Source

**Command and Response**

- GET·/V1/MEDIA/VIDEO/XP/<out>.ConnectedSource
- pw·/V1/MEDIA/VIDEO/XP/<out>.ConnectedSource=<in>

**Example**

- GET /V1/MEDIA/VIDEO/XP/O3.ConnectedSource
- pw /V1/MEDIA/VIDEO/XP/O3.ConnectedSource=I2

### 8.6.9. Querying the Input Switching Capability

Video crosspoint has a limitation: I1 or I3/I5* ports can not be selected to any output at the same time. **Busy** value of the switchable property refers to the limitation.

***I3** in case of **UCX-2x1-HC60**, **UCX-2x2-H60** and **SCX-2x1-HC60** models, **I5** in case of **UCX-4x2-HC60**, **UCX-4x2-HC60D**, **UCX-4x3-HC60** and **UCX-4x3-HC60-BD**

**Command and Response**

- GET·/V1/MEDIA/VIDEO/XP/<out>/SWITCHABLE.<in>
- pr·/V1/MEDIA/VIDEO/XP/<out>/SWITCHABLE.<in>=<switchable_state>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <switchable_state> | The chosen input can be switched to the output or not. | **OK** | The connection of the chosen input and output is allowed. |
| | | **Busy** | The chosen input can not be switched to the output. |

**Example**

- GET /V1/MEDIA/VIDEO/XP/O2/SWITCHABLE.I1
- pr /V1/MEDIA/VIDEO/XP/O2/SWITCHABLE.I1=Busy

### 8.6.10. Querying the Connected Destinations

**Command and Response**

- GET·/V1/MEDIA/VIDEO/XP/<n>.ConnectedDestinations
- pr·/V1/MEDIA/AUDIO/XP/<in>.ConnectedDestinations=<out>

**Example**

- GET /V1/MEDIA/VIDEO/XP/I3.ConnectedDestinations
- pr /V1/MEDIA/VIDEO/XP/I3.ConnectedDestinations=O1;O2

### 8.6.11. Querying the Video Signal Presence

**Command and Response**

- GET·/V1/MEDIA/VIDEO/<port>.SignalPresent
- pr·/V1/MEDIA/VIDEO/<port>.SignalPresent=<state>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <state> | This property gives a feedback about the current signal presence of the port. | **true** | The video signal is present. |
| | | **false** | The video signal is not present. |

**Example**

- GET /V1/MEDIA/VIDEO/I1.SignalPresent
- pr /V1/MEDIA/VIDEO/I1.SignalPresent=false

### 8.6.12. HDCP Setting (Input Port)

HDCP capability can be set on the input ports, thus non-encrypted content can be seen on a non-HDCP compliant display. See more information in the HDCP Management section.

**ATTENTION:** HDCP 2.2 signal handling is limited to up to two input ports at the same time.

**Command and Response** *#hdcp*

- SET·/V1/MEDIA/VIDEO/<in>/HDCP.AllowedHdcpVersion=<allowed_hdcp>
- pw·/V1/MEDIA/VIDEO/<in>/HDCP.AllowedHdcpVersion=<allowed_hdcp>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <allowed_hdcp> | The input port reports the HDCP capability. | **HDCP 1.4** | The input port reports HDCP 1.4 capability. |
| | | **HDCP 2.2** | The input port reports HDCP 2.2 capability. |
| | | **Off** | The input port reports non-HDCP compliance. |

**Example**

- SET /V1/MEDIA/VIDEO/I1/HDCP.AllowedHdcpVersion=HDCP 1.4
- pw /V1/MEDIA/VIDEO/I1/HDCP.AllowedHdcpVersion=HDCP 1.4

### 8.6.13. HdcpMode

HDCP capability can be set to Auto/Always on the output ports, thus non-encrypted content can be transmitted to a non-HDCP compliant display. See more information in the HDCP Management section.

**Command and Response** *#hdcp*

- SET·/V1/MEDIA/VIDEO/<out>.HdcpMode=<hdcp_mode>
- pw·/V1/MEDIA/VIDEO/<out>.HdcpMode=<hdcp_mode>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <hdcp_mode> | HDCP encryption setting on the output port | **Auto** | The encryption is enabled on the output port if the signal on the input port is encrypted. |
| | | **Always** | The outgoing signal is HDCP-encrypted. |

**Example**

- SET /V1/MEDIA/VIDEO/O1/HDCP.HdcpMode=Auto
- pw /V1/MEDIA/VIDEO/O1/HDCP.HdcpMode=Auto

### 8.6.14. OutputSignalType

**Command and Response** *#signaltype*

- SET·/V1/MEDIA/VIDEO/<out>.OutputSignalType=<signal_type>
- pw·/V1/MEDIA/VIDEO/<out>.OutputSignalType=<signal_type>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <signal_type> | Signal type setting | **Auto** | The outgoing signal type is HDMI. |
| | | **DVI** | The outgoing signal type is DVI. |

**Example**

- SET /V1/MEDIA/VIDEO/O1.OutputSignalType=Auto
- pw /V1/MEDIA/VIDEO/O1.OutputSignalType=Auto

### 8.6.15. EmbeddedAudioPresent

**Command and Response**

- GET·/V1/MEDIA/VIDEO/<port>.EmbeddedAudioPresent
- pr·/V1/MEDIA/VIDEO/<port>.EmbeddedAudioPresent=<embedded_state>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <embedded_state> | It shows if the video contains audio or not. | **true** | There is embedded audio in the video signal. |
| | | **false** | There is no embedded audio in the video signal. |

**Example**

- GET /V1/MEDIA/VIDEO/I2.EmbeddedAudioPresent
- pr /V1/MEDIA/VIDEO/I2.EmbeddedAudioPresent=false

### 8.6.16. EmbeddedAudioMute

**Command and Response**

- SET·/V1/MEDIA/VIDEO/<port>.EmbeddedAudioMute=<mute_state>
- pw·/V1/MEDIA/VIDEO/<port>.EmbeddedAudioMute=<mute_state>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <mute_state> | It shows if the embedded audio is muted or not. | **true** | The embedded audio is muted. |
| | | **false** | The embedded audio is unmuted. |

**Example**

- SET /V1/MEDIA/VIDEO/O1.EmbeddedAudioMute=false
- pw /V1/MEDIA/VIDEO/O1.EmbeddedAudioMute=false

### 8.6.17. Output5VMode

The 5V power towards the sink can be enabled or disabled as follows:

**Command and Response**

- SET·/V1/MEDIA/VIDEO/<out>.Output5VMode=<5V_pwr>
- pw·/V1/MEDIA/VIDEO/<out>.Output5VMode=<5V_pwr>

**Parameters**

| Parameter | Parameter description | Value | Value description |
|---|---|---|---|
| <5V_pwr> | 5V power towards the sink | **Auto** | 5V power is enabled when a sink is connected to the port |
| | | **On** | Enable 5V power on HDMI port |
| | | **Off** | Disable 5V power on HDMI port |
| | | **Follow signal present** | 5V power is only enabled if there is active video signal on the port |

**Example**

- SET /V1/MEDIA/VIDEO/O1.Output5VMode=On
- pw /V1/MEDIA/VIDEO/O1.Output5VMode=On

### 8.6.18. HDCP Capability (Output Port)

HDCP capability of the connected sink device can be queried at each output port. See more information in the HDCP Management section.

**Command and Response** *#hdcp*

- GET·/V1/MEDIA/VIDEO/<out>/HDCP/SinkMaxHdcpVersion=<hdcp_ver>
- pr·/V1/MEDIA/VIDEO/<out>/HDCP/SinkMaxHdcpVersion=<hdcp_ver>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <hdcp_ver> | The HDCP capability is reported from the sink. | **N/A** | Sink is not connected or the HDCP-capability cannot be determined. |
| | | **None** | The connected sink is non-HDCP compliant. |
| | | **HDCP 1.4** | The connected sink supports HDCP 1.4 capability. |
| | | **HDCP 2.2** | The connected sink supports HDCP 2.2 capability. |

**Example**

- GET /V1/MEDIA/VIDEO/O1/HDCP/SinkMaxHdcpVersion=HDCP 1.4
- pr /V1/MEDIA/VIDEO/O1/HDCP/SinkMaxHdcpVersion=HDCP 1.4

### 8.6.19. HDCP Setting (Output Port)

The maximum allowed HDCP encryption can be queried at each output port. See more information in the HDCP Management section.

> **ATTENTION:** HDCP 2.2 signal handling is limited when 3 outputs are available: O1 and O2 ports support up to HDCP 2.2, O3 port supports HDCP 1.4.

**Command and Response** *#hdcp*

- GET·/V1/MEDIA/VIDEO/<out>/HDCP.AllowedHdcpVersion=<allowed_hdcp>
- pr·/V1/MEDIA/VIDEO/<out>/HDCP.AllowedHdcpVersion=<allowed_hdcp>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <allowed_hdcp> | The maximum allowed HDCP encryption on the output port | **HDCP 1.4** | HDCP 1.4 is supported. |
| | | **HDCP 2.2** | HDCP 2.2 and HDCP 1.4 are supported. |

**Example**

- GET /V1/MEDIA/VIDEO/O1/HDCP/AllowedHdcpVersion=HDCP 1.4
- pr /V1/MEDIA/VIDEO/O1/HDCP/AllowedHdcpVersion=HDCP 1.4

## 8.7. Welcome Screen Settings

For details about the Welcome screen feature, please see the Welcome Screen section.

### 8.7.1. Displaying the Welcome Screen Image

**Command and Response** *#welcomescreen*

- SET·/V1/MEDIA/VIDEO/I5/WELCOMESCREEN.ImageEnabled=<image_state>
- pw·/V1/MEDIA/VIDEO/I5/WELCOMESCREEN.ImageEnabled=<image_state

**Parameters**

| Parameter | Values | Value description |
|---|---|---|
| <image_state> | **true** | The welcome screen image is displayed. |
| | **false** | The welcome screen image is not displayed. |

**Example**

- SET /V1/MEDIA/VIDEO/I5/WELCOMESCREEN.ImageEnabled=true
- pw /V1/MEDIA/VIDEO/I5/WELCOMESCREEN.ImageEnabled=true

### 8.7.2. Displaying the Welcome Screen Text

**Command and Response**

- SET·/V1/MEDIA/VIDEO/I5/WELCOMESCREEN.MessageEnabled=<text_state>
- pw·/V1/MEDIA/VIDEO/I5/WELCOMESCREEN.MessageEnabled=<text_state

**Parameters**

| Parameter | Values | Value description |
|---|---|---|
| <text_state> | **true** | The welcome screen text is displayed. |
| | **false** | The welcome screen text is not displayed. |

**Example**

- SET /V1/MEDIA/VIDEO/I5/WELCOMESCREEN.MessageEnabled=false
- pw /V1/MEDIA/VIDEO/I5/WELCOMESCREEN.MessageEnabled=false

### 8.7.3. Setting the Welcome Screen Text

**Command and Response**

- SET·/V1/MEDIA/VIDEO/I5/WELCOMESCREEN.MessageText=<text>
- pw·/V1/MEDIA/VIDEO/I5/WELCOMESCREEN.MessageText=<text>

**Parameters**

The <text> may consist of letters (A-Z) and (a-z), hyphen (-), underscore (_), numbers (0-9), space ( ) and dot (.). Max length: 63 characters. Longer names are truncated.

**Example**

- SET /V1/MEDIA/VIDEO/I5/WELCOMESCREEN.MessageText=info
- pw /V1/MEDIA/VIDEO/I5/WELCOMESCREEN.MessageText=info

### 8.7.4. Resetting the Welcome Screen Image

This command restores the original welcome screen image.

**Command and Response**

- CALL·/V1/MEDIA/VIDEO/I5/WELCOMESCREEN:resetImage()
- mO /V1/MEDIA/VIDEO/I5/WELCOMESCREEN:resetImage=

**Example**

- CALL /V1/MEDIA/VIDEO/I5/WELCOMESCREEN:resetImage()
- mO /V1/MEDIA/VIDEO/I5/WELCOMESCREEN:resetImage=

## 8.8. Video Port Settings - USB-C Related Commands

### 8.8.1. Restarting the Link Training

This method is equal to pulling the USB-C connector out and plugging it in again.

**Command and Response** *#linktraining*

- CALL·/V1/MEDIA/VIDEO/<in>/DP:restartLinkTraining()
- mO·/V1/MEDIA/VIDEO/<in>/DP:restartLinkTraining=

**Example**

- CALL /V1/MEDIA/VIDEO/I1/DP:restartLinkTraining()
- mO /V1/MEDIA/VIDEO/I1/DP:restartLinkTraining=

## 8.9. CEC Command Sending

The device is able to send Consumer Electronics Control (CEC) commands. This feature is for remote controlling the source or sink device. CEC is a bi-directional communication via the HDMI cable.

**ATTENTION:** To have a successful CEC command processing, the connected HDMI device must support CEC. #cec

### 8.9.1. Simple CEC Code Sending

This command is for sending simple CEC commands to the connected sink device.

The commands can be sent by the following two formats – defined in the header:

- **text/plain**: hexa strings (as seen in the example)
- **application/octet-stream**: binary data that allows sending a file with the desired codes

**Command and Response**

- CALL /V1/MEDIA/VIDEO/<out>/CEC:send(<command>)
- mO /V1/MEDIA/VIDEO/<out>/CEC:send=OK

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <port> | Video output port | **O1-O3** | Video output port number |
| <command> * | Two-digit-long hexa code to control the sink device | **446D** | Power on |
| | | **446C** | Power off |
| | | **36** | Standby |
| | | **446901** | Select input 1 |
| | | **446902** | Select input 2 |
| | | **446903** | Select input 3 |

* The supported list of <commands> depends on the connected sink device.

INFO: For the full list of commands supported by the UCX switcher, please see the next page.

**Example**

- CALL /V1/MEDIA/VIDEO/O2/CEC:send(446D)
- mO /V1/MEDIA/VIDEO/O2/CEC:send=OK

### 8.9.2. Remote Control Code Sending

This command is for sending the so-called 'push-button-commands'. There is a range within the CEC commands for this purpose, e.g. volume up/down. With this method one <command> is put between the 0x44 and 0x45 opcodes in the background.

**Request and Response**

- CALL·/V1/MEDIA/VIDEO/<port>/CEC:sendUserControlClick(<command>)
- mO /V1/MEDIA/VIDEO/<port>/CEC:sendUserControlClick=OK

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <port> | Video output port | **O1-O3** | Video output port number |
| <command> * | A hexa code to control the sink device | **446D** | Power on |
| | | **446C** | Power off |

* The supported list of <commands> depends on the connected sink device.

INFO: For the full list of commands supported by the UCX switcher, please see the next page.

**Example**

- CALL·/V1/MEDIA/VIDEO/O2/CEC:sendUserControlClick(446D)
- mO /V1/MEDIA/VIDEO/O2/CEC:sendUserControlClick=OK

**Command List**

| Command | Hexa | Binary |
|---|---|---|
| Ok | 4400 | 0100010000000000 |
| Up | 4401 | 0100010000000001 |
| Down | 4402 | 0100010000000010 |
| Left | 4403 | 0100010000000011 |
| Right | 4404 | 0100010000000100 |
| Root menu | 4409 | 0100010000001001 |
| Setup menu | 440A | 0100010000001010 |
| Contents menu | 440B | 0100010000001011 |
| Favorite menu | 440C | 0100010000001100 |
| Back | 440D | 0100010000001101 |
| Media top menu | 4410 | 0100010000010000 |
| Media context menu | 4411 | 0100010000010001 |
| Number 0 | 4420 | 0100010000100000 |
| Number 1 | 4421 | 0100010000100001 |
| Number 2 | 4422 | 0100010000100010 |
| Number 3 | 4423 | 0100010000100011 |
| Number 4 | 4424 | 0100010000100100 |
| Number 5 | 4425 | 0100010000100101 |
| Number 6 | 4426 | 0100010000100110 |
| Number 7 | 4427 | 0100010000100111 |
| Number 8 | 4428 | 0100010000101000 |
| Number 9 | 4429 | 0100010000101001 |
| Dot | 442A | 0100010000101010 |
| Enter | 442B | 0100010000101011 |
| Clear | 442C | 0100010000101100 |
| Channel up | 4430 | 0100010000000000 |
| Channel down | 4431 | 0100010000110001 |
| Sound select | 4433 | 0100010000110011 |
| Input select | 4434 | 0100010000110100 |
| Display info | 4435 | 0100010000110101 |
| Page up | 4437 | 0100010000110111 |
| Page down | 4438 | 0100010000111000 |
| Power legacy | 4440 | 0100010001000000 |
| Volume up | 4441 | 0100010001000001 |
| Volume down | 4442 | 0100010001000010 |
| Mute toggle | 4443 | 0100010001000011 |
| Play | 4444 | 0100010001000100 |
| Stop | 4445 | 0100010001000101 |
| Pause | 4446 | 0100010001000110 |

| Command | Hexa | Binary |
|---|---|---|
| Record | 4447 | 0100010001000111 |
| Rewind | 4448 | 0100010001001000 |
| Fast forward | 4449 | 0100010001001001 |
| Eject | 444A | 0100010001001010 |
| Skip forward | 444B | 0100010001001011 |
| Skip backward | 444C | 0100010001001100 |
| 3D mode | 445A | 0100010001011010 |
| Stop record | 444D | 0100010001001101 |
| Play forward | 446024 | 01000100011000000100100 |
| Play reverse | 446020 | 01000100011000000100000 |
| Stop function | 4464 | 0100010001100100 |
| Mute | 4465 | 0100010001100101 |
| Unmute | 4466 | 0100010001100110 |
| Select next media | 446800 | 01000100011010000000000 |
| Select media 1 | 446801 | 01000100011010000000001 |
| Select media 2 | 446802 | 01000100011010000000010 |
| Select media 3 | 446803 | 01000100011010000000011 |
| Select media 4 | 446804 | 01000100011010000000100 |
| Select media 5 | 446805 | 01000100011010000000101 |
| Select next input | 446900 | 01000100011010010000000 |
| Select input 1 | 446901 | 01000100011010010000001 |
| Select input 2 | 446902 | 01000100011010010000010 |
| Select input 3 | 446903 | 01000100011010010000011 |
| Select input 4 | 446904 | 01000100011010010000100 |
| Select input 5 | 446905 | 01000100011010010000101 |
| Power toggle | 446B | 0100010001101011 |
| Power on | 446D | 0100010001101101 |
| Power off | 446C | 0100010001101100 |
| Standby | 36 | 00110110 |
| Image view on | 04 | 00000100 |
| Text view on | 0D | 00001101 |
| F1 | 4471 | 0100010001110001 |
| F2 | 4472 | 0100010001110010 |
| F3 | 4473 | 0100010001110011 |
| F4 | 4474 | 0100010001110100 |
| Clear OSD | 6480 | 0110010010000000 |
| Get CEC version | 9F | 10011111 |

## 8.10. Audio Port Settings

INFO: Audio port numbers may differ depending on the model. For more information, see the Port Numbering section.

### 8.10.1. Switching the Audio Input

**Command and Response**

- CALL·/V1/MEDIA/AUDIO/XP:switch(<audio_in>:<audio_out>)
- mO·/V1/MEDIA/AUDIO/XP:switch=

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <audio_in> | Audio input port | I1-I4 | Audio input port number |
| <audio_out> | Analog audio output port | O2-O4 | Analog audio output port number |

**Example**

- CALL /V1/MEDIA/AUDIO/XP:switch(I2:O3)
- mO /V1/MEDIA/AUDIO/XP:switch=

INFO: When using the '0' value as an input, the input will be disconnected and no signal will appear on the output.

**ATTENTION:** When I5 is selected for video source, the de-embedded audio of the I1 is not available, because the video crosspoint has a limitation: I1 and I5 ports are not available at the same time, only one of them can be selected to any output. For more details about it, see the port diagram in the Audio Interface section.

### 8.10.2. Querying the Connected Source

**Command and Response**

- GET·/V1/MEDIA/AUDIO/XP/<audio_out>.ConnectedSource
- pw·/V1/MEDIA/AUDIO/XP/<audio_out>.ConnectedSource=<audio_in>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <audio_in> | Audio input port | I1-I4 | Audio input port number |
| <audio_out> | Analog audio output port | O2-O4 | Analog audio output port number |

**Example**

- GET /V1/MEDIA/AUDIO/XP/O3.ConnectedSource
- pw /V1/MEDIA/AUDIO/XP/O3.ConnectedSource=I2

### 8.10.3. Querying the Connected Destinations

**Command and Response**

- GET·/V1/MEDIA/AUDIO/XP/<audio_in>.ConnectedDestinations
- pr·/V1/MEDIA/AUDIO/XP/<audio_in>.ConnectedDestinations=

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <audio_in> | Audio input port | I1-I4 | Audio input port number |

**Example**

- GET /V1/MEDIA/AUDIO/XP/I3.ConnectedDestinations
- pr /V1/MEDIA/AUDIO/XP/I3.ConnectedDestinations=

### 8.10.4. Setting the Autoselect Operation Mode

**Command and Response**

- SET·/V1/MEDIA/AUDIO/AUTOSELECT/<audio_out>.Policy=<op_mode>
- pw·/V1/MEDIA/AUDIO/AUTOSELECT/<audio_out>.Policy=<op_mode>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <audio_out> | Analog audio output port | O2-O4 | Analog audio output port number |
| <op_mode> | Operation mode | Follow video | Follows the video crosspoint state automatically. |
| | | Off | Autoselect function is disabled. |

**Example**

- SET /V1/MEDIA/AUDIO/AUTOSELECT/O3.Policy=Follow video
- pw /V1/MEDIA/AUDIO/AUTOSELECT/O3.Policy=Follow video

### 8.10.5. Setting the Followed Video Port to Autoselect

**Command and Response**

- SET·/V1/MEDIA/AUDIO/AUTOSELECT/<audio_out>.VideoFollowPort=<out>
- pw·/V1/MEDIA/AUDIO/AUTOSELECT/<audio_out>.VideoFollowPort=<out>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <audio_out> | Analog audio output port | O2-O4 | Analog audio output port number |

**Example**

- SET /V1/MEDIA/AUDIO/AUTOSELECT/O3.VideoFollowPort=O1
- pw /V1/MEDIA/AUDIO/AUTOSELECT/O3.VideoFollowPort=O1

### 8.10.6. Enabling/Disabling the Dante USB Sound Card

**DIFFERENCE:** This command is only available for the UCX-4x3-HC60-BD model.

This command enables or disables the Dante USB Sound Card, toggling the Dante input functionality. When enabled, the Dante audio input devices will appear as USB audio inputs on the host computer.

INFO: Dante input devices can only be detected by the computer when the USB sound card is enabled.

**Command and Response**

- SET /V1/SYS/BD_DANTE_ADDON.Enabled=<status>
- pw /V1/SYS/BD_DANTE_ADDON.Enabled=<status>

**Parameters**

| Parameter | Parameter description | Values |
|---|---|---|
| <status> | Enables or disables the USB sound card. Default value is **true**. | **true** |
| | | **false** |

**Example**

- SET /V1/SYS/BD_DANTE_ADDON.Enabled=true
- pw /V1/SYS/BD_DANTE_ADDON.Enabled=true

### 8.10.7. Setting the Audio Device Type for the Dante Input

**DIFFERENCE:** This command is only available for the UCX-4x3-HC60-BD model.

This command allows setting the type of audio input device through the Dante channel.

**Command and Response**

- SET /V1/MEDIA/AUDIO/DANTE_IN.AudioDeviceType=<device_type>
- pw /V1/MEDIA/AUDIO/DANTE_IN.AudioDeviceType=<device_type>

**Parameters**

| Parameter | Parameter description | Values |
|---|---|---|
| <device_type> | Sets the type of the audio input device | **Speakerphone** |
| | | **Echo-canceling speakerphone** |
| | | **Echo-suppressing speakerphone** |

**Example**

- SET /V1/MEDIA/AUDIO/DANTE_IN.AudioDeviceType=Speakerphone
- pw /V1/MEDIA/AUDIO/DANTE_IN.AudioDeviceType=Speakerphone

### 8.10.8. Setting the Name of the Dante Input

With this command you can set the descriptor of the device connected to the Dante input connector, making it easier to manage your system as it will appear with this custom name in other applications.

It can be 1-25 characters long, the letters of the English alphabet (A-Z, a-z), numbers (0-9), underscore (_), hyphen (-) and space ( ) are allowed. Please be aware that space cannot be used as a first or last character.

**Command and Response**

- SET /V1/MEDIA/AUDIO/DANTE_IN.DeviceDescriptor=<custom_name>
- pw /V1/MEDIA/AUDIO/DANTE_IN.DeviceDescriptor=<custom_name>

**Example**

- SET /V1/MEDIA/AUDIO/DANTE_IN.DeviceDescriptor=Dante mic - M_Room 12
- pw /V1/MEDIA/AUDIO/DANTE_IN.Devicedescriptor=Dante mic - M_Room 12

### 8.10.9. Locking the Audio Port

**Command and Response**

- SET·/V1/MEDIA/AUDIO/XP/<audio_port>.Lock=<locked_state>
- pw·/V1/MEDIA/AUDIO/XP/<audio_port>.Lock=<locked_state>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <audio_port> | Audio port | **I1-I4** | Audio input port number |
| | | **O3** | Audio output port number |
| <locked_state> | Locked state | **true** | The port is locked |
| | | **false** | The port is unlocked |

**Example**

- SET /V1/MEDIA/AUDIO/XP/I2.Lock=false
- pw /V1/MEDIA/AUDIO/XP/I2.Lock=false

### 8.10.10. Muting the Audio Port 1.

INFO: Suspends the connection of the chosen port (no signal is forwarded).

**Command and Response**

- SET·/V1/MEDIA/AUDIO/XP/<audio_port>.Mute=<muted_state>
- pw·/V1/MEDIA/AUDIO/XP/<audio_port>.Mute=<muted_state>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <audio_port> | Audio port | **I1-I4** | Audio input port number |
| | | **O2-O4** | Analog audio output port number |
| <muted_state> | Muted state | **true** | The port is muted. |
| | | **false** | The port is unmuted. |

**Example**

- SET /V1/MEDIA/AUDIO/XP/I2.Mute=false
- pw /V1/MEDIA/AUDIO/XP/I2.Mute=false

INFO: All inputs and analog output ports have a mute property in the audio XP (e.g. /V1/MEDIA/AUDIO/XP/I1.Mute). Outputs have a separate mute function within the port node as well:

- /V1/MEDIA/VIDEO/XP/O1.EmbeddedAudioMute
- /V1/MEDIA/VIDEO/XP/O2.EmbeddedAudioMute
- /V1/MEDIA/AUDIO/O3.Mute

### 8.10.11. Muting the Audio Port 2.

INFO: The volume of the analog audio output is set to low.

**Command and Response**

- SET·/V1/MEDIA/AUDIO/<audio_out>.Mute=<muted_state>
- pw·/V1/MEDIA/AUDIO/<audio_out>.Mute=<muted_state>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <audio_port> | Audio port | **O2-O4** | Analog audio output port number |
| <muted_state> | Muted state | **true** | The port is muted. |
| | | **false** | The port is unmuted. |

**Example**

- SET /V1/MEDIA/AUDIO/O3.Mute=true
- pw /V1/MEDIA/AUDIO/O3.Mute=true

### 8.10.12. Querying the Audio Signal Presence

**Command and Response**

- GET·/V1/MEDIA/AUDIO/<audio_port>.SignalPresent
- pr·/V1/MEDIA/AUDIO/<audio_port>.SignalPresent=<signal_state>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <audio_port> | Audio port | **I1-I4** | Audio input port number |
| | | **O2-O4** | Analog audio output port number |
| <signal_state> | Signal presence | **true** | The audio signal is present. |
| | | **false** | No audio signal is present. |

**Example**

- GET /V1/MEDIA/AUDIO/I1.SignalPresent
- pr /V1/MEDIA/AUDIO/I1.SignalPresent=false

### 8.10.13. Analog Audio Output Volume (dB) Setting

**Command and Response** *#analogaudio #volume*

- SET·/V1/MEDIA/AUDIO/<audio_out>.VolumedB=<level>
- pw·/V1/MEDIA/AUDIO/<audio_out>.VolumedB=<level>

**Parameter**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <audio_out> | Analog audio output port | **O2-O4** | Analog audio output port number |
| <level> | Sets the output volume (attenuation) in step of -0.375 dB. | **-95.62 dB-0 dB** | The value is rounded up if necessary, to match with the step value. |

**Example**

- SET /V1/MEDIA/AUDIO/O3.VolumedB=-15
- pw /V1/MEDIA/AUDIO/O3.VolumedB=-15.00

### 8.10.14. Analog Audio Output Volume Percent Setting

**Command and Response**

- SET·/V1/MEDIA/AUDIO/<audio_out>.VolumePercent=<percent>
- pw·/V1/MEDIA/AUDIO/<audio_out>.VolumePercent=<percent>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <audio_out> | Analog audio output port | **O2-O4** | Analog audio output port number |
| <percent> | Sets the output volume (attenuation) in step of 1%. | **100%-0%** | The value is rounded up if necessary, to match with the step value. |

**Example**

- SET /V1/MEDIA/AUDIO/O3.VolumePercent=50
- pw /V1/MEDIA/AUDIO/O3.VolumePercent=50.00

### 8.10.15. Setting the Balance

**Command and Response** *#balance*

- SET·/V1/MEDIA/AUDIO/<audio_out>.Balance=<level>
- pw·/V1/MEDIA/AUDIO/<audio_out>.Balance=<level>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <audio_out> | Analog audio output port | **O2-O4** | Analog audio output port number |
| <level> | Sets the output volume (attenuation) in step of 1. | **-100-100** | -100 means left balance, 100 means right balance, center is 0 (default). |

**Example**

- SET /V1/MEDIA/AUDIO/O3.Balance=0
- pw /V1/MEDIA/AUDIO/O3.Balance=0

### 8.10.16. Analog Audio Output Level Setting by Steps (dB)

**Command and Response** *#analogaudio #volume*

- CALL·/V1/MEDIA/AUDIO/<audio_out>:stepVolumedB(<step>)
- m0·/V1/MEDIA/AUDIO/<audio_out>:stepVolumedB=

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <audio_out> | Analog audio output port | **O2-O4** | Analog audio output port number |
| <step> | The volume is increased or decreased with the given value in dB. | | Increase the dB with +<number><br>Decrease the dB with -<number> |

**Example**

- CALL /V1/MEDIA/AUDIO/O3:stepVolumedB(-1)
- m0 /V1/MEDIA/AUDIO/O3:stepVolumedB=

The volume is decreased with 1 dB, the current volume is -1.95 dB, which means 77.84% in percent.

### 8.10.17. Analog Audio Output Level Setting by Steps in Percent

**Command and Response**

- CALL·/V1/MEDIA/AUDIO/<audio_out>:stepVolumePercent(<step>)
- m0·/V1/MEDIA/AUDIO/<audio_out>:stepVolumePercent=

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <audio_out> | Analog audio output port | **O2-O4** | Analog audio output port number |
| <step> | The volume is increased or decreased with the given value in percent. | **0-100** | |

**Example**

- CALL /V1/MEDIA/AUDIO/O3:stepVolumePercent(5)
- m0 /V1/MEDIA/AUDIO/O3:stepVolumePercent=

The volume is increased with 5%, the current volume is -1.52 dB, which means 82.84% in percent.

### 8.10.18. Analog Audio Output Balance Setting by Steps

**Command and Response**

- CALL·/V1/MEDIA/AUDIO/<audio_out>:stepBalance(<step>)
- m0·/V1/MEDIA/AUDIO/<audio_out>:stepBalance=

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <audio_out> | Analog audio output port | **O2-O4** | Analog audio output port number |
| <step> | The volume is increased or decreased with the given value. | | Increase the volume with <number><br>Decrease the volume with -<number> |

**Example**

- CALL /V1/MEDIA/AUDIO/O3:stepBalance(-5)
- mO /V1/MEDIA/AUDIO/O3:stepBalance=

## 8.11. USB Port Settings

INFO: USB port numbers may differ depending on the model. For more information, see the Port Numbering section.

### 8.11.1. Switching the USB Input

**Command and Response** *#usb*

- CALL·/V1/MEDIA/USB/XP:switch(<host>:H1)
- mO·/V1/MEDIA/USB/XP:switch=

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <host> | USB Host | **0** | disconnected |
| | | **U1-U4** | USB-C and USB-B port number |

**Example**

- CALL /V1/MEDIA/USB/XP:switch(U1:H1)
- mO /V1/MEDIA/USB/XP:switch=

INFO: When using the '0' value as an input, the input will be disconnected and no signal will appear on the output.

### 8.11.2. Querying the Connected Source

**Command and Response**

- GET·/V1/MEDIA/USB/XP/H1.ConnectedSource
- pw·/V1/MEDIA/USB/XP/H1.ConnectedSource=<host>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <host> | USB Host | **U1-U4** | USB-C and USB-B port number |

**Example**

- GET /V1/MEDIA/USB/XP/H1.ConnectedSource
- pw /V1/MEDIA/USB/XP/H1.ConnectedSource=U4

### 8.11.3. Querying the Connected Destinations

**Command and Response** *#autoselect*

- GET·/V1/MEDIA/USB/XP/<host>.ConnectedDestinations
- pr·/V1/MEDIA/USB/XP/<host>.ConnectedDestinations=H1

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <host> | USB Host | **U1-U4** | USB-C and USB-B port number |

**Example**

- GET /V1/MEDIA/USB/XP/U3.ConnectedDestinations
- pr /V1/MEDIA/USB/XP/U3.ConnectedDestinations=H1

### 8.11.4. Locking the USB Port

**Command and Response** *#lock*

- SET·/V1/MEDIA/USB/XP/<usb_port>.Lock=<locked_state>
- pw·/V1/MEDIA/USB/XP/<usb_port>.Lock=<locked_state>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <usb_port> | USB Port | **U1-U4** | USB-C and USB-B port number |
| | | **H1** | USB hub |
| <locked_state> | Locked state | **true** | The port is locked |
| | | **false** | The port is unlocked |

**Example**

- SET /V1/MEDIA/USB/XP/U2.Lock=false
- pw /V1/MEDIA/USB/XP/U2.Lock=false

### 8.11.5. Setting the 5V Sending to the USB Peripherals

The 5V power towards the USB A-type ports can be enabled or disabled as follows:

**Command and Response**

- SET·/V1/MEDIA/USB/H1/<device_id>.Power5VMode=<device_pwr>
- pw·/V1/MEDIA/USB/H1/<device_id>.Power5VMode=<device_pwr>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <device_id> | USB A-type port | **D1-D4** | Downstream port number |
| <device_pwr> | | **Auto** | The host controls the 5V power sending. |
| | | **Off** | Disable 5V power on USB downstream port |

**Example**

- SET /V1/MEDIA/USB/H1/D1.Power5VMode=Auto
- pw /V1/MEDIA/USB/H1/D1.Power5VMode=Auto

### 8.11.6. Setting the USB Autoselect Policy

**Command and Response**

- SET·/V1/MEDIA/USB/AUTOSELECT/H1.Policy=<op_mode>
- pw·/V1/MEDIA/USB/AUTOSELECT/H1.Policy=<op_mode>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <op_mode> | Operation mode | **Off** | The autoselect function is disabled. |
| | | **Last Detect** | It is always the last attached input that is switched to the output automatically. |
| | | **First Detect** | The first active USB input is selected. |
| | | **Follow video** | Follows the video crosspoint state automatically. |

**Example**

- SET /V1/MEDIA/USB/AUTOSELECT/H1.Policy=Follow video
- pw /V1/MEDIA/USB/AUTOSELECT/H1.Policy=Follow video

### 8.11.7. Setting the Followed Video Port to Autoselect

**Command and Response**

- SET·/V1/MEDIA/USB/AUTOSELECT/H1.VideoFollowPort=<out>
- pw·/V1/MEDIA/USB/AUTOSELECT/H1.VideoFollowPort=<out>

**Example**

- SET /V1/MEDIA/USB/AUTOSELECT/H1.VideoFollowPort=O1
- pw /V1/MEDIA/USB/AUTOSELECT/H1.VideoFollowPort=O1

### 8.11.8. Changing the Autoselect Included USB Ports

**Command and Response**

- SET·/V1/MEDIA/USB/AUTOSELECT/H1/<host>.Included=<state>
- pw·/V1/MEDIA/USB/AUTOSELECT/H1/<host>.Included=<state>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <host> | USB Host | **U1-U4** | USB-C and USB-B port number |
| <state> | The chosen input is ignored in the autoselect process or not. | **true** | The port is included in autoselect. |
| | | **false** | The autoselect function ignores that port. |

**Example**

- SET /V1/MEDIA/USB/AUTOSELECT/H1/U1.Included=true
- pw /V1/MEDIA/USB/AUTOSELECT/H1/U1.Included=true

### 8.11.9. Changing the USB Port Priority

**Command and Response**

- SET·/V1/MEDIA/USB/AUTOSELECT/H1/<host>.Priority=<prio_num>
- pw·/V1/MEDIA/USB/AUTOSELECT/H1/<host>.Priority=<prio_num>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <host> | USB Host | **U1-U4** | USB-C and USB-B port number |
| <prio_num> | Priority number from 1 to 100, equal numbers are allowed. | **1-100** | 1: the highest priority<br>100: the lowest priority |

**Example**

- SET /V1/MEDIA/USB/AUTOSELECT/H1/U1.Priority=51
- pw /V1/MEDIA/USB/AUTOSELECT/H1/U1.Priority=51

## 8.12. USB Port Settings - USB-C Related Commands

INFO: USB-C port numbers may differ depending on the model. For more information, see the Port Numbering section.

### 8.12.1. Setting the USB-C Power

Allows setting the supplied power over the USB-C port. Default is 100W.

**Command and Response** *#power*

- SET·/V1/MEDIA/USB/<usb-c_port>/POWER.Reserved=<power>
- pw·/V1/MEDIA/USB/<usb-c_port>/POWER.Reserved=<power>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <power> | Reserved power to the USB-C port | **15W** | Minimum supplied power if **AllocationMode** is **Auto**. If **AllocationMode** is **Static**, this is the maximum supplied power. |
| | | **30W** | Minimum supplied power if **AllocationMode** is **Auto**. If **AllocationMode** is **Static**, this is the maximum supplied power. |
| | | **60W** | Minimum supplied power if **AllocationMode** is **Auto**. If **AllocationMode** is **Static**, this is the maximum supplied power. |
| | | **100W** | Minimum supplied power if **AllocationMode** is **Auto**. If **AllocationMode** is **Static**, this is the maximum supplied power. |

**Example**

- SET /V1/MEDIA/USB/U1/POWER.Reserved=100W
- pw /V1/MEDIA/USB/U1/POWER.Reserved=100W

### 8.12.2. Setting the Displayport Alternate Mode Policy

**Command and Response**

- SET·/V1/MEDIA/USB/<usb-c_port>.DpAltModePolicy=<dp_policy>
- pw·/V1/MEDIA/USB/<usb-c_port>.DpAltModePolicy=<dp_policy>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <usb-c_port> | USB-C port number | **U1-U2** | USB-C port number |
| <dp_policy> | The preferred video or USB data transmission | **Auto** | **Auto:** Taurus offers both operation modes described below. A BYOD device can choose between the two. Neither USB3, nor 4 lane DP Alt mode operation (4K@60) is guaranteed. BYOD devices supporting USB3.x usually choose shared mode: USB3.1 and 2 lane DP. |
| | | **Force C** | **Prefer video**: all the four lanes are reserved for video transmission, USB 3.1 data transmission does not operate. |
| | | **Force D** | **Prefer USB 3.1:** 2 lanes are reserved for USB 3.1, 2 lanes for video. |

**Example**

- SET /V1/MEDIA/USB/U2.DpAltModePolicy=Auto
- pw /V1/MEDIA/USB/U2.DpAltModePolicy=Auto

**ATTENTION:** Changing DpAltModePolicy is recommended before connecting a computer to the input.

**ATTENTION:** When the USB-C input of a UCX device is disconnected while operating in Displayport Alternate Mode, visual artifacts may appear on the downstream display.

### 8.12.3. Querying the Host Alternate Mode Support

**Command and Response**

- GET·/V1/MEDIA/USB/<usb-c_port>.HostSupportsDpAltMode
- pr·/V1/MEDIA/USB/<usb-c_port>.HostSupportsDpAltMode=<altmode_support>

**Parameters**

| Parameter | Parameter description | Value | Value description |
|---|---|---|---|
| <usb-c_port> | USB-C port number | **U1-U2** | USB-C port number |
| <altmode_support> | | **False** | The host does not support the alternate mode. |
| | | **True** | The host supports the alternate mode. |

**Example**

- GET /V1/MEDIA/USB/U1.HostSupportsDpAltMode
- pr /V1/MEDIA/USB/U1.HostSupportsDpAltMode=true

### 8.12.4. Querying the Status of the Alternate Mode

**Command and Response** *#dpaltmode #alternatemode #displayportalternatemode*

- GET·/V1/MEDIA/USB/<usb-c_port>.ActiveAltMode
- pr·/V1/MEDIA/USB/<usb-c_port>.ActiveAltMode=<altmode_state>

**Parameters**

| Parameter | Parameter description | Value | Value description |
|---|---|---|---|
| <usb-c_port> | USB-C port number | **U1-U2** | USB-C port number |
| <altmode_state> | | **N/A** | The host is not connected |
| | | **None** | DP Alt mode is not active |
| | | **DP** | DP Alt mode is active. |

**Example**

- GET /V1/MEDIA/USB/U2.ActiveAltMode
- pr /V1/MEDIA/USB/U2.ActiveAltMode=DP

### 8.12.5. Querying the Port Data Role

**Command and Response**

- GET·/V1/MEDIA/USB/<usb_port>.ActivePortDataRole
- pr·/V1/MEDIA/USB/<usb_port>.ActivePortDataRole=<data_role>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <usb-c_port> | USB-C port number | **U1-U2** | USB-C port number |
| <data_role> | | **N/A** | No information about the data role. |
| | | **DFP** | Downstream Facing Port (usually a Host / HUB ports)<br>The port data role is configured as USB Host.<br>This is for building up the connection (USB data transmission operates after the data role swap) |
| | | **UFP** | Upstream Facing Port (usually a device) |

**Example**

- GET /V1/MEDIA/USB/U2.ActivePortDataRole
- pr /V1/MEDIA/USB/U2.ActivePortDataRole=UFP

### 8.12.6. Querying the Port Power Role

**Command and Response** *#power*

- GET·/V1/MEDIA/USB/<usb_port>.ActivePortPowerRole
- pr·/V1/MEDIA/USB/<usb_port>.ActivePortPowerRole=<power_role>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <usb-c_port> | USB-C port number | **U1-U2** | USB-C port number |
| <power_role> | | **N/A** | No information about the power role. |
| | | **Sink** | The port is configured as a sink. |
| | | **Source** | The port is configured as a source. |

**Example**

- GET /V1/MEDIA/USB/U2.ActivePortPowerRole
- pr /V1/MEDIA/USB/U2.ActivePortPowerRole=Source

### 8.12.7. Setting the Port Power Role

**Command and Response**

- SET·/V1/MEDIA/USB/<usb-c_port>.PortPowerRoleSetting=<power_role>
- pw·/V1/MEDIA/USB/<usb_port>.PortPowerRoleSetting=<power_role>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <usb-c_port> | USB-C port number | **U1-U2** | USB-C port number |
| <power_role> | | **Sink** | The port is configured as a sink. |
| | | **Source** | The port is configured as a source. |
| | | **Dual Role** | The port is configured to be in Dual Power Role mode. |

**Example**

- SET /V1/MEDIA/USB/U1.PortPowerRoleSetting=Dual Role
- pw /V1/MEDIA/USB/U1.PortPowerRoleSetting=Dual Role

## 8.13. EDID Management

### 8.13.1. Querying the Emulated EDIDs

**Command and Response** *#edid*

- GET·/V1/EDID.EdidStatus
- pr·/V1/EDID.EdidStatus=<source>:E1;<source>:E2; <source>:E3;<source>:E4

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <source> | Source EDID memory place | **F1-F159** | Factory EDIDs |
| | | **U1-U100** | User EDIDs |
| | | **D1-D3** | Dynamic EDIDs |

**Example**

- GET /V1/EDID.EdidStatus
- pr /V1/EDID.EdidStatus=F89:E1;D1:E2;D1:E3;D1:E4

Emulated EDID memory for input port is listed with the EDID number that is currently emulated on the input.

### 8.13.2. Querying the Validity of a Dynamic EDID

**Command and Response**

- GET·/V1/EDID/D/<dynamic_edid>.Validity
- pr·/V1/EDID/D/<dynamic_edid>.Validity=<validity>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <dynamic_edid> | The Dynamic EDID to be queried | **D1-D3** | Dynamic EDIDs |
| <validity> | Validity of a Dynamic EDID | **true** | The Dynamic EDID is valid. |
| | | **false** | The Dynamic EDID is invalid. |

**Example**

- GET /V1/EDID/D/D1.Validity
- pr /V1/EDID/D/D1.Validity=true

The 'Validity' property is true, valid EDID is stored in D1 memory place.

### 8.13.3. Querying the Preferred Resolution of a User EDID

**Command and Response**

- GET·/V1/EDID/U/<user_edid>.PreferredResolution
- pr·/V1/EDID/U/<user_edid>.PreferredResolution=<preferred_resolution>

**Example**

- GET /V1/EDID/U/U2.PreferredResolution
- pr /V1/EDID/U/U2.PreferredResolution=1920x1080p60.00Hz

INFO: Use the **Manufacturer** and **MonitorName** properties to query further information.

### 8.13.4. Emulating an EDID to an Input Port

**Command and Response**

- CALL·/V1/EDID:switch(<source>:<destination>)
- mO·/V1/EDID:switch

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <source> | Source EDID memory place | **F1-F159** | Factory EDIDs |
| | | **U1-U100** | User EDIDs |
| | | **D1-D3** | Dynamic EDIDs |
| <destination> | The emulated EDID memory of the desired input port | **E1-E4** | Emulated EDIDs |

**Example**

- CALL /V1/EDID:switch(F49:E2)
- mO /V1/EDID:switch

### 8.13.5. Emulating an EDID to All Input Ports

**Command and Response**

- CALL·/V1/EDID:switchAll(<source>)
- mO·/V1/EDID:switchAll

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <source> | Source EDID memory place | **F1-F159** | Factory EDIDs |
| | | **U1-U100** | User EDIDs |
| | | **D1-D3** | Dynamic EDIDs |

**Example**

- CALL /V1/EDID:switchAll(F47)
- mO /V1/EDID:switchAll

### 8.13.6. Copying an EDID to User Memory

**Command and Response**

- CALL·/V1/EDID:copy(<source>:<destination>)
- mO·/V1/EDID:copy

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <source> | Source EDID memory place | **F1-F159** | Factory EDIDs |
| | | **U1-U100** | User EDIDs |
| | | **D1-D3** | Dynamic EDIDs |
| <destination> | The User EDID spot you wish to copy the EDID to | **U1-U100** | User EDIDs |

**Example**

- CALL /V1/EDID:copy(F1:U2)
- mO /V1/EDID:copy

### 8.13.7. Deleting an EDID from User Memory

**Command and Response**

- CALL·/V1/EDID:delete(<user_edid>)
- mO·/V1/EDID:delete

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <user_edid> | The User EDID spot you wish to delete an EDID from | **U1-U100** | User EDIDs |

**Example**

- CALL /V1/EDID:delete(U2)
- mO /V1/EDID:delete

### 8.13.8. Resetting the Emulated EDIDs

**Command and Response**

- CALL·/V1/EDID:reset()
- mO·/V1/EDID:reset

**Example**

- CALL /V1/EDID:reset()
- mO /V1/EDID:reset

Calling this method switches all emulated EDIDs to a factory default one. See the table in the Factory EDID List section.

## 8.14. Ethernet Port Configuration

### 8.14.1. Setting the DHCP State

**ATTENTION:** When you change a network property, the new value is stored, but the **applySettings** method must always be called to apply the new settings. When two or more network parameters are changed, the **applySettings** method is enough to be called once as a final step; it will reboot the device.

**Command and Response** *#dhcp #network #ipaddress*

- SET·/V1/MANAGEMENT/NETWORK.DhcpEnabled=<dhcp_status>
- pw·/V1/MANAGEMENT/NETWORK.DhcpEnabled=<dhcp_status>

**Parameters**

If the <dhcp_status> parameter is **true**, the current IP address setting is DHCP, if the parameter is **false,** the current IP address is static.

**Example**

- SET /V1/MANAGEMENT/NETWORK.DhcpEnabled=true
- pw /V1/MANAGEMENT/NETWORK.DhcpEnabled=true
- CALL /V1/MANAGEMENT/NETWORK:applySettings()
- mO /V1/MANAGEMENT/NETWORK:applySettings

INFO: The **applySettings** method will save and apply the new value, and it will reboot the device.

INFO: The current setting can be queried by using the GET Command.

### 8.14.2. Changing the IP Address (Static)

**Command and Response**

- SET·/V1/MANAGEMENT/NETWORK.StaticIpAddress=<IP_address>
- pw·/V1/MANAGEMENT/NETWORK.StaticIpAddress=<IP_address>

**Example**

- SET /V1/MANAGEMENT/NETWORK.StaticIpAddress=192.168.0.85
- pw /V1/MANAGEMENT/NETWORK.StaticIpAddress=192.168.0.85
- CALL /V1/MANAGEMENT/NETWORK:applySettings()
- mO /V1/MANAGEMENT/NETWORK:applySettings

INFO: The **applySettings** method will save and apply the new value and it will reboot the device.

INFO: The current setting can be queried by using the GET Command.

### 8.14.3. Changing the Subnet Mask (Static)

**Command and Response** *#ipaddress*

- SET·/V1/MANAGEMENT/NETWORK.StaticNetworkMask=<netmask>
- pw·/V1/MANAGEMENT/NETWORK.StaticNetworkMask=<netmask>

**Example**

- SET /V1/MANAGEMENT/NETWORK.StaticNetworkMask=255.255.255.0
- pw /V1/MANAGEMENT/NETWORK.StaticNetworkMask=255.255.255.0
- CALL /V1/MANAGEMENT/NETWORK:applySettings()
- mO /V1/MANAGEMENT/NETWORK:applySettings

INFO: The **applySettings** method will save and apply the new value and it will reboot the device.

INFO: The current setting can be queried by using the GET Command.

### 8.14.4. Changing the Gateway Address (Static)

**Command and Response**

- SET·/V1/MANAGEMENT/NETWORK.StaticGatewayAddress=<gw_address>
- pw·/V1/MANAGEMENT/NETWORK.StaticGatewayAddress=<gw_address>

**Example**

- SET /V1/MANAGEMENT/NETWORK.StaticGatewayAddress=192.168.0.5
- pw /V1/MANAGEMENT/NETWORK.StaticGatewayAddress=192.168.0.5
- CALL /V1/MANAGEMENT/NETWORK:applySettings()
- mO /V1/MANAGEMENT/NETWORK:applySettings

INFO: The **applySettings** method will save and apply the new value, and it will reboot the device.

INFO: The current setting can be queried by using the GET Command.

### 8.14.5. Applying the Network Settings

**Command and Response**

- CALL·/V1/MANAGEMENT/NETWORK:applySettings()
- m0·/V1/MANAGEMENT/NETWORK:applySettings

**Example**

- CALL /V1/MANAGEMENT/NETWORK:applySettings()
- m0 /V1/MANAGEMENT/NETWORK:applySettings

All network settings that were changed are applied and network interface restarts.

### 8.14.6. Setting the Host Name

The host name is a property that can be used instead of the IP address when connecting to the device. It is also suitable for finding the device in the Device Discovery window of the LDC, see more details in the Add New Favorite Device section. If the IP address of the device is changing, the host name can be used as a fixed property.

Restarting HTTP(S) Services is required after the host name changed. A new certificate is generated after modifying the host name.

**Command and Response**

- SET·/V1/MANAGEMENT/NETWORK.HostName=<unique_name>
- pw·/V1/MANAGEMENT/NETWORK.HostName=<unique_name>

**Parameters**

The <unique_name> can be 1-64 character(s) long, and the following are allowed for naming: the elements of the English alphabet and numbers. Hyphen (-) is also accepted, except as last character.

**Example**

- SET /V1/MANAGEMENT/NETWORK.HostName=room-switcher
- pw /V1/MANAGEMENT/NETWORK.HostName=room-switcher

## 8.15. Network Security

### 8.15.1. Enabling/Disabling the Ethernet Port

**ATTENTION:** Disabling the Ethernet layer of a USB-C port while it is in a VLAN (aside from IDs 1 and 2000) with only one Ethernet port connected to it will disable the Ethernet port as well. This happens because the Ethernet functionality of the two ports is connected as long as they are in a VLAN with only the USB-C and one selected Ethernet port in it.

**Command and Response**

- SET·/V1/MEDIA/ETHERNET/<ethernet_port>.Enabled=<status>
- pw·/V1/MEDIA/ETHERNET/<ethernet_port>.Enabled=<status>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <ethernet_port> | Ethernet port number | **P1-P5** | |
| | | **true** | The port is enabled. |
| | | **false** | The port is disabled. |

**Example**

- SET /V1/MEDIA/ETHERNET/P4.Enabled=true
- pw /V1/MEDIA/ETHERNET/P4.Enabled=true

### 8.15.2. Querying the Service Port Number

**Command and Response**

- GET·/V1/MANAGEMENT/NETWORK/SERVICES/<port>.Port
- pr·/V1/MANAGEMENT/NETWORK/SERVICES/<port>.Port=<port_num>

**Parameters**

| Parameter | Parameter description | Parameter values |
|---|---|---|
| <port> | Port type | **HTTP**<br>**HTTPS**<br>**LW3**<br>**UART1**<br>**UART2** |
| <port_num> | Port number | **80**<br>**443**<br>**6107**<br>**8001**<br>**8002** |

**Example**

- GET /V1/MANAGEMENT/NETWORK/SERVICES/HTTP.Port
- pr /V1/MANAGEMENT/NETWORK/SERVICES/HTTP.Port=80

### 8.15.3. Enabling/Disabling the Service Port

INFO: HTTP port is disabled by default.

**Command and Response** *#http #https*

- SET·/V1/MANAGEMENT/NETWORK/SERVICES/<port>.Enabled=<status>
- pw·/V1/MANAGEMENT/NETWORK/SERVICES/<port>.Enabled=<status>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <port> | Port type | **HTTP**<br>**HTTPS** | |
| <status> | | **true** | The port is enabled. |
| | | **false** | The port is disabled. |

**Example**

- SET /V1/MANAGEMENT/NETWORK/SERVICES/HTTP.Enabled=true
- pw /V1/MANAGEMENT/NETWORK/SERVICES/HTTP.Enabled=true

### 8.15.4. Querying the Username for Authentication

INFO: UCX series deal with one user for authentication and the username (admin) can not be changed.

**Command and Response**

- GET·/V1/MANAGEMENT/NETWORK/AUTH/USER1.Name
- pr /V1/MANAGEMENT/NETWORK/AUTH/USER1.Name=admin

**Example**

- GET /V1/MANAGEMENT/NETWORK/AUTH/USER1.Name
- pr /V1/MANAGEMENT/NETWORK/AUTH/USER1.Name=admin

### 8.15.5. Setting a Password for Authentication

**ATTENTION:** Password setting is only available through REST API.

### 8.15.6. Enabling the Authentication

INFO: Authentication is enabled by default.

**Command and Response**

- SET·/V1/MANAGEMENT/NETWORK/SERVICES/<port>.AuthenticationEnabled=<status>
- pw·/V1/MANAGEMENT/NETWORK/SERVICES/<port>.AuthenticationEnabled=<status>
- CALL /V1/MANAGEMENT/NETWORK/SERVICES/HTTP:restart()
- mO /V1/MANAGEMENT/NETWORK/SERVICES/HTTP:restart=

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <port> | Port type | **HTTP**<br>**HTTPS** | |
| <status> | | **true** | The authentication is enabled. |
| | | **false** | The authentication is disabled. |

**Example**

- SET /V1/MANAGEMENT/NETWORK/SERVICES/HTTP.AuthenticationEnabled=true
- pw /V1/MANAGEMENT/NETWORK/SERVICES/HTTP.AuthenticationEnabled=true
- CALL /V1/MANAGEMENT/NETWORK/SERVICES/HTTP:restart()
- mO /V1/MANAGEMENT/NETWORK/SERVICES/HTTP:restart=

INFO: Restart HTTP(S) Services is required after the authentication settings changed.

### 8.15.7. Restarting the Network Services

**Command and Response** *#http #https*

- CALL·/V1/MANAGEMENT/NETWORK/SERVICES/<port>:restart()
- mO·/V1/MANAGEMENT/NETWORK/SERVICES/<port>:restart=

**Parameters**

| Parameter | Parameter description | Parameter values |
|---|---|---|
| <port> | Port type | **HTTP**<br>**HTTPS** |

**Example**

- CALL /V1/MANAGEMENT/NETWORK/SERVICES/HTTP:restart()
- mO /V1/MANAGEMENT/NETWORK/SERVICES/HTTP:restart=

# 8.16. Advanced Ethernet Security

## 8.16.1. Setting the VLAN Preset

**Command and Response**

- SET·/V1/MEDIA/ETHERNET.VlanPreset=<vlan_preset>
- pw·/V1/MEDIA/ETHERNET.VlanPreset=<vlan_preset>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <vlan_preset> | VLAN preset mode | **Transparent** | The same open network is used by the Taurus and the BYOD devices. |
| | | **SeparateBYOD** | The BYOD devices use a network that is separated from the main line. |
| | | **Dedicated** | Every BYOD device uses a separate network. |

**Example**

- SET /V1/MEDIA/ETHERNET.VlanPreset=Transparent
- pw /V1/MEDIA/ETHERNET.VlanPreset=Transparent

## 8.16.2. Setting the VLAN Membership

**ATTENTION:** Changing the VLAN membership of the Control Ethernet port will cause loss of the connection to the device. Please make sure you are changing the correct settings.

With this command the Ethernet ports can be arranged into separate networks in any setup desired.

**Command and Response**

- SET·/V1/MEDIA/ETHERNET/<port_number>.VlanMembership=<vlan_membership>
- pw·/V1/MEDIA/ETHERNET/<port_number>.VlanMembership=<vlan_membership>

**Parameters**

| Parameter | Parameter description | Values | Value description |
|---|---|---|---|
| <vlan_membership> | VLAN membership number | **1-8** | The ports with the same mebership number are part of the same network. |

**Example**

- SET /V1/MEDIA/ETHERNET/P3.VlanMembership=3
- pw /V1/MEDIA/ETHERNET/P3.VlanMembership=3

## 8.16.3. Setting the VLAN ID

You can create separate networks by setting different VLAN IDs for the Ethernet ports. You can create any number of setups for limiting access to the corporate or management network or providing separate networks for each user. Default VLAN ID is 1 for all of the ports.

**ATTENTION:** VLAN ID 2000 is reserved for the Room LAN.

**Command and Response**

- SET·/V1/MEDIA/ETHERNET/<port>.VlanMembership=<vlan_id>
- pw·/V1/MEDIA/ETHERNET/<port>.VlanMembership=<vlan_id>

**Example**

- SET /V1/MEDIA/ETHERNET/P1.VlanMembership=2
- pw /V1/MEDIA/ETHERNET/P1.VlanMembership=2

**Enabling the Room LAN on an Ethernet Port**

**Command and Response**

- SET·/V1/MEDIA/ETHERNET/<port>.VlanMembership=2000
- pw·/V1/MEDIA/ETHERNET/<port>.VlanMembership=2000

**Example**

- SET /V1/MEDIA/ETHERNET/P1.VlanMembership=2000
- pw /V1/MEDIA/ETHERNET/P1.VlanMembership=2000

## 8.16.4. Setting the Static IP Address for the Room LAN

In case there is no DHCP server on the Room LAN, a static IP address is needed to be set before enabling the function, so that it remains available.

**Command and Response**

- SET·/EXPERIMENTAL/MANAGEMENT/NETWORKINTERFACES/ROOM/IPV4/STATIC.ConfiguredIpAddress=<static_management_ip>
- pw·/EXPERIMENTAL/MANAGEMENT/NETWORKINTERFACES/ROOM/IPV4/STATIC.ConfiguredIpAddress=<static_management_ip>

**Example**

- SET /EXPERIMENTAL/MANAGEMENT/NETWORKINTERFACES/ROOM/IPV4/STATIC.ConfiguredIpAddress=10.10.128.1
- pw /EXPERIMENTAL/MANAGEMENT/NETWORK/INTERFACES/ROOM/IPV4/STATIC.ConfiguredIpAddress=10.10.128.1

### 8.16.5. Setting the Gateway for Static IP on the Room LAN

**Command and Response**

- SET·/EXPERIMENTAL/MANAGEMENT/NETWORKINTERFACES/ROOM/IPV4/STATIC.ConfiguredGatewayAddress=<static_management_gateway>
- pw·/EXPERIMENTAL/MANAGEMENT/NETWORKINTERFACES/ROOM/IPV4/STATIC.ConfiguredGatewayAddress=<static_management_gateway>

**Example**

- SET /EXPERIMENTAL/MANAGEMENT/NETWORKINTERFACES/ROOM/IPV4/STATIC.ConfiguredGatewayAddress=10.10.128.1
- pw /EXPERIMENTA/MANAGEMENT/NETWORK/INTERFACES/ROOM/IPV4/STATIC.ConfiguredGatewayAddress=10.10.128.1

## 8.17. Serial Port Configuration

### 8.17.1. BAUD Rate Setting

**Command and Response** *#rs-232 #rs232*

- SET·/V1/MEDIA/SERIAL/<serial_port>.Baudrate=<baudrate>
- pw·/V1/MEDIA/SERIAL/<serial_port>.Baudrate=<baudrate>

**Parameters**

| Identifier | Parameter description | Parameter values |
|---|---|---|
| <serial_port> | Serial port number | **P1-P2** |
| <baudrate> | Baud rate value | **9600**<br>**19200**<br>**38400**<br>**57600**<br>**115200** |

**Example**

- SET /V1/MEDIA/SERIAL/P1.Baudrate=19200
- pw /V1/MEDIA/SERIAL/P1.Baudrate=19200

### 8.17.2. Stop Bits Setting

**Command and Response** *#rs-232 #rs232*

- SET·/V1/MEDIA/SERIAL/<serial_port>.StopBits=<stopbits>
- pw·/V1/MEDIA/SERIAL/<serial_port>.StopBits=<stopbits>

**Parameters**

| Identifier | Parameter description | Parameter values |
|---|---|---|
| <serial_port> | Serial port number | **P1-P2*** |
| <stopbits> | Stop bit value | **1**<br>**2** |

*The UCX-2x1-HC60 models have one serial port (P1).

**Example**

- SET /V1/MEDIA/SERIAL/P1.StopBits=1
- pw /V1/MEDIA/SERIAL/P1.StopBits=1

### 8.17.3. Querying the Data Bits

**Command and Response** *#rs-232 #rs232*

- GET·/V1/MEDIA/SERIAL/<serial_port>.DataBits
- pr·/V1/MEDIA/SERIAL/<serial_port>.DataBits=<databits>

**Parameters**

| Identifier | Parameter description | Parameter values |
|---|---|---|
| <serial_port> | Serial port number | **P1-P2** |
| <databits> | DataBits value | **8**<br>**9** |

**Example**

- GET /V1/MEDIA/SERIAL/P1.DataBits
- pr /V1/MEDIA/SERIAL/P1.DataBits=8

### 8.17.4. Parity Setting

**Command and Response** *#rs-232 #rs232*

- SET·/V1/MEDIA/SERIAL/<serial_port>.Parity=<parity>
- pw·/V1/MEDIA/SERIAL/<serial_port>.Parity=<parity>

**Parameters**

| Identifier | Parameter description | Parameter values |
|---|---|---|
| <serial_port> | Serial port number | **P1-P2** |
| <parity> | Parity value | **None**<br>**Odd**<br>**Even** |

**Example**

- SET /V1/MEDIA/SERIAL/P1.Parity=None
- pw /V1/MEDIA/SERIAL/P1.Parity=None

## 8.18. Sending a Message via RS-232

**ATTENTION:** Serial message sending is implemented only via Lightware REST API. This function is not available with LW3 protocol command. For more details, see Serial Port Messaging.

## 8.19. GPIO Port Configuration

### 8.19.1. Querying the Direction of a GPIO Pin

**Command and Response** *#gpio*

- GET·/V1/MEDIA/GPIO/<port>.Direction
- pw·/V1/MEDIA/GPIO/<port>.Direction(<dir>)

**Parameters**

| Parameter | Parameter description | Value | Value description |
|---|---|---|---|
| <dir> | The direction of the GPIO pin. | **Input** | input |
| | | **Output** | output |

**Example**

- GET /V1/MEDIA/GPIO/P1.Direction
- pw /V1/MEDIA/GPIO/P1.Direction=Input

### 8.19.2. Setting the Direction of a GPIO Pin

**Command and Response**

- SET·/V1/MEDIA/GPIO/<port>.Direction(<dir>)
- pw·/V1/MEDIA/GPIO/<port>.Direction(<dir>)

**Parameters**

See the previous section.

**Example**

- SET /V1/MEDIA/GPIO/P1.Direction=Input
- pw /V1/MEDIA/GPIO/P1.Direction=Input

### 8.19.3. Querying the Output Level of a GPIO Pin

**Command and Response**

- GET·/V1/MEDIA/GPIO/<port>.Output
- pw·/V1/MEDIA/GPIO/<port>.Output(<value>)

**Parameters**

| Parameter | Parameter description | Value | Value description |
|---|---|---|---|
| <value> | The output value of the GPIO pin. | **High** | high level |
| | | **Low** | low level |

**Example**

- GET /V1/MEDIA/GPIO/P1.Output
- pw /V1/MEDIA/GPIO/P1.Output=Low

### 8.19.4. Setting the Output Level of a GPIO Pin

**Command and Response**

- SET·/V1/MEDIA/GPIO/<port>.Output(<value>)
- pw·/V1/MEDIA/GPIO/<port>.Output(<value>)

**Parameters**

See the previous section.

**Example**

- SET /V1/MEDIA/GPIO/P1.Output=High
- pw /V1/MEDIA/GPIO/P1.Output=High

### 8.19.5. Setting the Output Level for a Specified Time

**Command and Response**

- CALL·/V1/MEDIA/GPIO/<port>:interval(<value>;<time>)
- mO·/V1/MEDIA/GPIO/<port>:interval=

**Parameters**

| Parameter | Parameter description | Value | Value description |
|---|---|---|---|
| <value> | The output value of the GPIO pin. | **High** | high level |
| | | **Low** | low level |
| <time> | Duration of the desired value in seconds. | **1-120** | second(s) |

**Example**

- CALL /V1/MEDIA/GPIO/P1:interval(Low;1)
- mO /V1/MEDIA/GPIO/P1:interval=

### 8.19.6. Toggling the Level of a GPIO Pin

The output level can be changed from high to low and from low to high by the command below.

**Command and Response**

- CALL·/V1/MEDIA/GPIO/<port>:toggle()
- mO·/V1/MEDIA/GPIO/<port>:toggle

**Example**

- CALL /V1/MEDIA/GPIO/P1:toggle()
- mO /V1/MEDIA/GPIO/P1:toggle

# 8.20. OCS Port Configuration

## 8.20.1. Querying the Input Level of an OCS Pin

**Command and Response** *#ocs*

- GET·/V1/MEDIA/OCS/P1.InputLevel
- pr·/V1/MEDIA/OCS/P1.InputLevel=<value>

**Parameters**

| Parameter | Parameter description | Value | Value description |
|---|---|---|---|
| <value> | The input value of the OCS pin. | **High** | high level |
| | | **Low** | low level |

**Example**

- GET /V1/MEDIA/OCS/P1.InputLevel
- pr /V1/MEDIA/OCS/P1.InputLevel=Low

## 8.20.2. Setting the Sensor Type

**Command and Response**

- SET·/V1/MEDIA/OCS/P1.SensorType=<sensor_type>
- pw·/V1/MEDIA/OCS/P1.SensorType=<sensor_type>

**Parameters**

| Parameter | Parameter description | Value | Value description |
|---|---|---|---|
| <sensor_type> | It defines whether the low or high input level means the occupancy. | **Active low** | Occupancy status is 'Occupied' when the input level is low. |
| | | **Active high** | Occupancy status is 'Occupied' when the input level is high (default value). |

**Example**

- SET /V1/MEDIA/OCS/P1.SensorType=Active low
- pw /V1/MEDIA/OCS/P1.SensorType=Active low

## 8.20.3. Querying the Reported OCS State

**Command and Response**

- GET·/V1/MEDIA/OCS/P1.State
- pr·/V1/MEDIA/OCS/P1.State=<status>

**Parameters**

| Parameter | Parameter description | Value | Value description |
|---|---|---|---|
| <status> | It reports the occupancy state of the room depending on the sensor type. | **Free** | When the SensorType=Active high and the Inputlevel=Low or when SensorType=Active low and Inputlevel=High |
| | | **Occupied** | When the SensorType=Active high and the Inputlevel=High or when SensorType=Active low and Inputlevel=Low |

**Example**

- GET /V1/MEDIA/OCS/P1.State
- pr /V1/MEDIA/OCS/P1.State=Free

## 8.21. LW3 Commands - Quick Summary

**System Commands**

Setting the Device Label
- SET·/V1/MANAGEMENT/LABEL.DeviceLabel=<custom_name>

Resetting the Device
- CALL·/V1/SYS:restart()

Restoring the Factory Default Settings
- CALL·/V1/SYS:factoryDefaults()

Querying the Firmware Package Version
- GET·/V1/MANAGEMENT/UID/PACKAGE.Version

Control Lock
- SET·/V1/MANAGEMENT/UI.ControlLock=<lock_status>

Setting the Current Time
- CALL·/V1/MANAGEMENT/DATETIME:setTime(<current_time>)

Identifying the Device
- CALL /V1/MANAGEMENT/UI:identifyMe()

Toggling the Dark Mode Setting
- SET·/V1/MANAGEMENT/UI/DARKMODE.Enable=<mode_state>

Setting the Delay of the Dark Mode Setting
- SET·/V1/MANAGEMENT/UI/DARKMODE.Delay=<delay_time>

Enabling Remote System Logging
- SET /V1/MANAGEMENT/LOG/REMOTE.Enabled=<status>

Setting the Remote Server Address
- SET /V1/MANAGEMENT/LOG/REMOTE.ServerAddress=<server_address>

Setting the Protocol for the Remote System Logging
- SET /V1/MANAGEMENT/LOG/REMOTE.Protocol=<protocol>

Setting the Format of the Remote System Logging
- SET /V1/MANAGEMENT/LOG/REMOTE.LogFormat=<format>

Setting the Port for Remote System Logging
- SET /V1/MANAGEMENT/LOG/REMOTE.PortNumber=<port_number>

Enabling/Disabling SNMP Monitoring
- SET·/V1/MANAGEMENT/NETWORK/SERVICES/SNMP.Enabled=<status>

Setting the Device Location
- SET·/V1/MANAGEMENT/NETWORK/SERVICES/SNMP.SysLocation=<location>

**Video Port Settings - General**

Switching Video Input
- CALL·/V1/MEDIA/VIDEO/XP:switch(<in>:<out>)

Switching an Input to All Outputs
- CALL·/V1/MEDIA/VIDEO/XP:switchAll(<input>)

Locking the Video Port
- SET·/V1/MEDIA/VIDEO/XP/<port>.Lock=<locked_state>

Muting the Video Port
- SET·/V1/MEDIA/VIDEO/XP/<port>.Mute=<muted_state>

Setting the Autoselect Policy
- SET·/V1/MEDIA/VIDEO/AUTOSELECT/<out>.Policy=<autoselect_mode>

Changing the Autoselect Included Input Ports
- SET·/V1/MEDIA/VIDEO/AUTOSELECT/<out>/<in>.Included=<state>

Changing the Input Port Priority
- SET·/V1/MEDIA/VIDEO/AUTOSELECT/<out>/<in>.Priority=<prio_num>

Querying the Connected Source
- GET·/V1/MEDIA/VIDEO/XP/<out>.ConnectedSource

Querying the Input Switching Capability
- GET·/V1/MEDIA/VIDEO/XP/<out>/SWITCHABLE.<in>

Querying the Connected Destinations
- GET·/V1/MEDIA/VIDEO/XP/<n>.ConnectedDestinations

Querying the Video Signal Presence
- GET·/V1/MEDIA/VIDEO/<port>.SignalPresent

HDCP Setting (Input Port)
- SET·/V1/MEDIA/VIDEO/<in>/HDCP.AllowedHdcpVersion=<allowed_hdcp>

HdcpMode
- SET·/V1/MEDIA/VIDEO/<out>.HdcpMode=<hdcp_mode>

OutputSignalType
- SET·/V1/MEDIA/VIDEO/<out>.OutputSignalType=<signal_type>

EmbeddedAudioPresent

- GET·/V1/MEDIA/VIDEO/<port>.EmbeddedAudioPresent

EmbeddedAudioMute

- SET·/V1/MEDIA/VIDEO/<port>.EmbeddedAudioMute=<mute_state>

Output5VMode

- SET·/V1/MEDIA/VIDEO/<out>.Output5VMode=<5V_pwr>

HDCP Capability (Output Port)

- GET·/V1/MEDIA/VIDEO/<out>/HDCP/SinkMaxHdcpVersion=<hdcp_ver>

HDCP Setting (Output Port)

- GET·/V1/MEDIA/VIDEO/<out>/HDCP.AllowedHdcpVersion=<allowed_hdcp>

**Welcome Screen Settings**

Displaying the Welcome Screen Image

- SET·/V1/MEDIA/VIDEO/I5/WELCOMESCREEN.ImageEnabled=<image_state>

Displaying the Welcome Screen Text

- SET·/V1/MEDIA/VIDEO/I5/WELCOMESCREEN.MessageEnabled=<text_state>

Setting the Welcome Screen Text

- SET·/V1/MEDIA/VIDEO/I5/WELCOMESCREEN.MessageText=<text>

Resetting the Welcome Screen Image

- CALL·/V1/MEDIA/VIDEO/I5/WELCOMESCREEN:resetImage()

**Video Port Settings - USB-C Related Commands**

Restarting the Link Training

- CALL·/V1/MEDIA/VIDEO/<in>/DP:restartLinkTraining()

**CEC Command Sending**

Simple CEC Code Sending

- CALL /V1/MEDIA/VIDEO/<out>/CEC:send(<command>)

Remote Control Code Sending

- CALL·/V1/MEDIA/VIDEO/<port>/CEC:sendUserControlClick(<command>)

**Audio Port Settings**

Switching the Audio Input

- CALL·/V1/MEDIA/AUDIO/XP:switch(<audio_in>:<audio_out>)

Querying the Connected Source

- GET·/V1/MEDIA/AUDIO/XP/<audio_out>.ConnectedSource

Querying the Connected Destinations

- GET·/V1/MEDIA/AUDIO/XP/<audio_in>.ConnectedDestinations

Setting the Autoselect Operation Mode

- SET·/V1/MEDIA/AUDIO/AUTOSELECT/<audio_out>.Policy=<op_mode>

Setting the Followed Video Port to Autoselect

- SET·/V1/MEDIA/AUDIO/AUTOSELECT/<audio_out>.VideoFollowPort=<out>

Enabling/Disabling the Dante USB Sound Card

- SET /V1/SYS/BD_DANTE_ADDON.Enabled=<status>

Setting the Audio Device Type for the Dante Input

- SET /V1/MEDIA/AUDIO/DANTE_IN.AudioDeviceType=<device_type>

Setting the Name of the Dante Input

- SET /V1/MEDIA/AUDIO/DANTE_IN.DeviceDescriptor=<custom_name>

Locking the Audio Port

- SET·/V1/MEDIA/AUDIO/XP/<audio_port>.Lock=<locked_state>

Muting the Audio Port 1.

- SET·/V1/MEDIA/AUDIO/XP/<audio_port>.Mute=<muted_state>

Muting the Audio Port 2.

- SET·/V1/MEDIA/AUDIO/<audio_out>.Mute=<muted_state>

Querying the Audio Signal Presence

- GET·/V1/MEDIA/AUDIO/<audio_port>.SignalPresent

Analog Audio Output Volume (dB) Setting

- SET·/V1/MEDIA/AUDIO/<audio_out>.VolumedB=<level>

Analog Audio Output Volume Percent Setting

- SET·/V1/MEDIA/AUDIO/<audio_out>.VolumePercent=<percent>

Setting the Balance

- SET·/V1/MEDIA/AUDIO/<audio_out>.Balance=<level>

Analog Audio Output Level Setting by Steps (dB)

- CALL·/V1/MEDIA/AUDIO/<audio_out>:stepVolumedB(<step>)

Analog Audio Output Level Setting by Steps in Percent

- CALL·/V1/MEDIA/AUDIO/<audio_out>:stepVolumePercent(<step>)

Analog Audio Output Balance Setting by Steps

- CALL·/V1/MEDIA/AUDIO/<audio_out>:stepBalance(<step>)

**USB Port Settings**

Switching the USB Input
- CALL·/V1/MEDIA/USB/XP:switch(<host>:H1)

Querying the Connected Source
- GET·/V1/MEDIA/USB/XP/H1.ConnectedSource

Querying the Connected Destinations
- GET·/V1/MEDIA/USB/XP/<host>.ConnectedDestinations

Locking the USB Port
- SET·/V1/MEDIA/USB/XP/<usb_port>.Lock=<locked_state>

Setting the 5V Sending to the USB Peripherals
- SET·/V1/MEDIA/USB/H1/<device_id>.Power5VMode=<device_pwr>

Setting the USB Autoselect Policy
- SET·/V1/MEDIA/USB/AUTOSELECT/H1.Policy=<op_mode>

Setting the Followed Video Port to Autoselect
- SET·/V1/MEDIA/USB/AUTOSELECT/H1.VideoFollowPort=<out>

Changing the Autoselect Included USB Ports
- SET·/V1/MEDIA/USB/AUTOSELECT/H1/<host>.Included=<state>

Changing the USB Port Priority
- SET·/V1/MEDIA/USB/AUTOSELECT/H1/<host>.Priority=<prio_num>

**USB Port Settings - USB-C Related Commands**

Setting the USB-C Power
- SET·/V1/MEDIA/USB/<usb-c_port>/POWER.Reserved=<power>

Setting the Displayport Alternate Mode Policy
- SET·/V1/MEDIA/USB/<usb-c_port>.DpAltModePolicy=<dp_policy>

Querying the Host Alternate Mode Support
- GET·/V1/MEDIA/USB/<usb-c_port>.HostSupportsDpAltMode

Querying the Status of the Alternate Mode
- GET·/V1/MEDIA/USB/<usb-c_port>.ActiveAltMode

Querying the Port Data Role
- GET·/V1/MEDIA/USB/<usb_port>.ActivePortDataRole

Querying the Port Power Role
- GET·/V1/MEDIA/USB/<usb_port>.ActivePortPowerRole

Setting the Port Power Role
- SET·/V1/MEDIA/USB/<usb-c_port>.PortPowerRoleSetting=<power_role>

**EDID Management**

Querying the Emulated EDIDs
- GET·/V1/EDID.EdidStatus

Querying the Validity of a Dynamic EDID
- GET·/V1/EDID/D/<dynamic_edid>.Validity

Querying the Preferred Resolution of a User EDID
- GET·/V1/EDID/U/<user_edid>.PreferredResolution

Emulating an EDID to an Input Port
- CALL·/V1/EDID:switch(<source>:<destination>)

Emulating an EDID to All Input Ports
- CALL·/V1/EDID:switchAll(<source>)

Copying an EDID to User Memory
- CALL·/V1/EDID:copy(<source>:<destination>)

Deleting an EDID from User Memory
- CALL·/V1/EDID:delete(<user_edid>)

Resetting the Emulated EDIDs
- CALL·/V1/EDID:reset()

**Ethernet Port Configuration**

Setting the DHCP State
- SET·/V1/MANAGEMENT/NETWORK.DhcpEnabled=<dhcp_status>

Changing the IP Address (Static)
- SET·/V1/MANAGEMENT/NETWORK.StaticIpAddress=<IP_address>

Changing the Subnet Mask (Static)
- SET·/V1/MANAGEMENT/NETWORK.StaticNetworkMask=<netmask>

Changing the Gateway Address (Static)
- SET·/V1/MANAGEMENT/NETWORK.StaticGatewayAddress=<gw_address>

Applying the Network Settings
- CALL·/V1/MANAGEMENT/NETWORK:applySettings()

Setting the Host Name
- SET·/V1/MANAGEMENT/NETWORK.HostName=<unique_name>

**Network Security**

Enabling/Disabling the Ethernet Port
- SET·/V1/MEDIA/ETHERNET/<ethernet_port>.Enabled=<status>

Querying the Service Port Number
- GET·/V1/MANAGEMENT/NETWORK/SERVICES/<port>.Port

Enabling/Disabling the Service Port
- SET·/V1/MANAGEMENT/NETWORK/SERVICES/<port>.Enabled=<status>

Querying the Username for Authentication
- GET·/V1/MANAGEMENT/NETWORK/AUTH/USER1.Name

Enabling the Authentication
- SET·/V1/MANAGEMENT/NETWORK/SERVICES/<port>.AuthenticationEnabled=<status>
- CALL /V1/MANAGEMENT/NETWORK/SERVICES/HTTP:restart()

Restarting the Network Services
- CALL·/V1/MANAGEMENT/NETWORK/SERVICES/<port>:restart()

**Advanced Ethernet Security**

Setting the VLAN Preset
- SET·/V1/MEDIA/ETHERNET.VlanPreset=<vlan_preset>

Setting the VLAN Membership
- SET·/V1/MEDIA/ETHERNET/<port_number>.VlanMembership=<vlan_membership>

Setting the VLAN ID
- SET·/V1/MEDIA/ETHERNET/<port>.VlanMembership=<vlan_id>
- SET·/V1/MEDIA/ETHERNET/<port>.VlanMembership=2000

Setting the Static IP Address for the Room LAN
- SET·/EXPERIMENTAL/MANAGEMENT/NETWORKINTERFACES/ROOM/IPV4/STATIC.ConfiguredIpAddress=<static_management_ip>

Setting the Gateway for Static IP on the Room LAN
- SET·/EXPERIMENTAL/MANAGEMENT/NETWORKINTERFACES/ROOM/IPV4/STATIC.ConfiguredGatewayAddress=<static_management_gateway>

**Serial Port Configuration**

BAUD Rate Setting
- SET·/V1/MEDIA/SERIAL/<serial_port>.Baudrate=<baudrate>

Stop Bits Setting
- SET·/V1/MEDIA/SERIAL/<serial_port>.StopBits=<stopbits>

Querying the Data Bits
- GET·/V1/MEDIA/SERIAL/<serial_port>.DataBits

Parity Setting
- SET·/V1/MEDIA/SERIAL/<serial_port>.Parity=<parity>

**GPIO Port Configuration**

Querying the Direction of a GPIO Pin
- GET·/V1/MEDIA/GPIO/<port>.Direction

Setting the Direction of a GPIO Pin
- SET·/V1/MEDIA/GPIO/<port>.Direction(<dir>)

Querying the Output Level of a GPIO Pin
- GET·/V1/MEDIA/GPIO/<port>.Output

Setting the Output Level of a GPIO Pin
- SET·/V1/MEDIA/GPIO/<port>.Output(<value>)

Setting the Output Level for a Specified Time
- CALL·/V1/MEDIA/GPIO/<port>:interval(<value>;<time>)

Toggling the Level of a GPIO Pin
- CALL·/V1/MEDIA/GPIO/<port>:toggle()

**OCS Port Configuration**

Querying the Input Level of an OCS Pin
- GET·/V1/MEDIA/OCS/P1.InputLevel

Setting the Sensor Type
- SET·/V1/MEDIA/OCS/P1.SensorType=<sensor_type>

Querying the Reported OCS State
- GET·/V1/MEDIA/OCS/P1.State

# 9

## Firmware Update

**This chapter is meant to help customers perform firmware updates on our products by giving a few tips on how to start and by explaining the features of the Lightware Device Updater v2 (LDU2) software. The latest software and firmware pack can be downloaded from www.lightware.com.**


- Introduction **183**
- Preparation **183**
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- Command Line Interface (CLI) **187**
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- Updating via REST API **191**
- If the Update is Not Successful **191**

**ATTENTION:** While the firmware is being updated, the normal operation mode is suspended, as the transmitter is switched to bootload mode. Signal processing is not performed. Do not interrupt the firmware update. If any problem occurs, reboot the device and restart the process.

## 9.1. Introduction

Lightware Device Updater v2 (LDU2) software is the second generation of the LFP-based (Lightware Firmware Package) firmware update process.



LDU2

## 9.2. Preparation

Most Lightware devices can be controlled over several interfaces (e.g. Ethernet, USB, RS-232). But the firmware can be updated usually over one dedicated interface, which is the Ethernet in most cases.

If you want to update the firmware of one or more devices, you need the following:

- **LFP2 file**,
- **LDU2 software** installed on your PC or Mac.

Both can be downloaded from www.lightware.com.

Optionally, you can download the **release notes** file in HTML format.

### 9.2.1. About the Firmware Package (LFP2 File)

All the necessary tools and binary files are packed into the LFP2 package file. You only need this file to do the update on your device.

- This allows the use of the same LFP2 package for different devices.
- The package contains all the necessary components, binary, and other files.
- The release notes is included in the LFP2 file, which is displayed in the window where you select the firmware package file in LDU2.

INFO: The size of the LFP2 file is more than 200 MB due to the components of the package. That is not a fault: Taurus runs embedded Linux inside that is necessary for the complex functions and features of the device.

### 9.2.2. LDU2 Installation

**ATTENTION:** Minimum system requirement: 2 GB RAM. The minimum display resolution is 1600x900.

INFO: The Windows and the Mac applications have the same look and functionality.

Download the software from www.lightware.com.

**Installation in case of Windows OS**



Run the installer. If the User Account Control displays a pop-up message, click **Yes**.

**Installation Modes**

| Normal install | Snapshot install |
|---|---|
| Available for Windows, MacOS and Linux | Available for Windows |
| The installer can update only this instance | Cannot be updated |
| One updateable instance may exist for all users | Many different versions can be installed for all users |

**ATTENTION:** Using the default Normal install is highly recommended.

INFO: If you have a previously installed version, you will be prompted to remove the old version before installing the new one.

**Installation in case of macOS**




Mount the DMG file by double clicking on it, and drag the LDU2 icon over the Applications icon to copy the program into the Applications folder. If you want to copy LDU2 into another location, just drag the icon over the desired folder.

**ATTENTION:** Please check the firewall settings on the macOS device. LDC needs to be added to the exceptions of the blocked software for the proper operation.

INFO: This type of installer is equal to the **Normal install** of Windows.

**Installation in case of Linux**



**Step 1.** Download the **archive file** (tar.gz) from www.lightware.com and unpack it to a temp folder.

**Step 2.** Run the **install_ldu2.sh** file in the temp folder. The script will install LDU2 into the following folder: HOME/.local/share/lightware/ldu2.

**Step 3.** The folder above will contain this file: **LightwareDeviceUpdaterV2.sh,** which can be used to start LDU2.

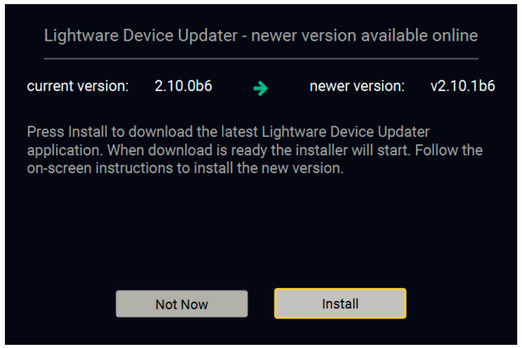
## 9.3. Running the Software

You have two options:

- **Starting the LDU2** by double-clicking on the shortcut/program file, or
- Double-clicking on an **LFP2 file**.

### LDU2 Auto-Update

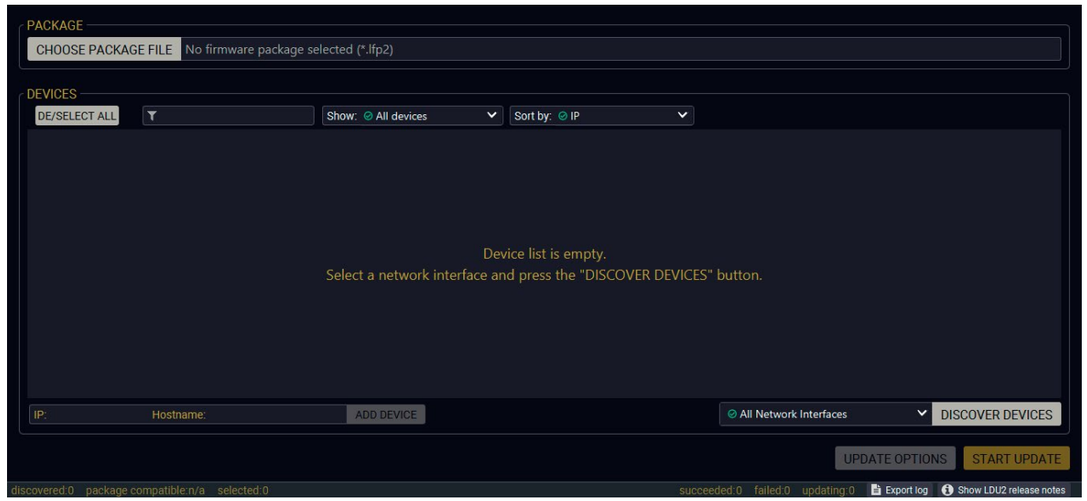
At startup, the software checks if a newer version is available on the web.




### Main Screen

When the software is started by the shortcut, the device discovery screen appears. Press the **Discover devices** button to start finding the Lightware devices:




Devices may also be added manually by typing the IP address in the box near the bottom of the screen. Manual addition of devices can also be done using the host name.

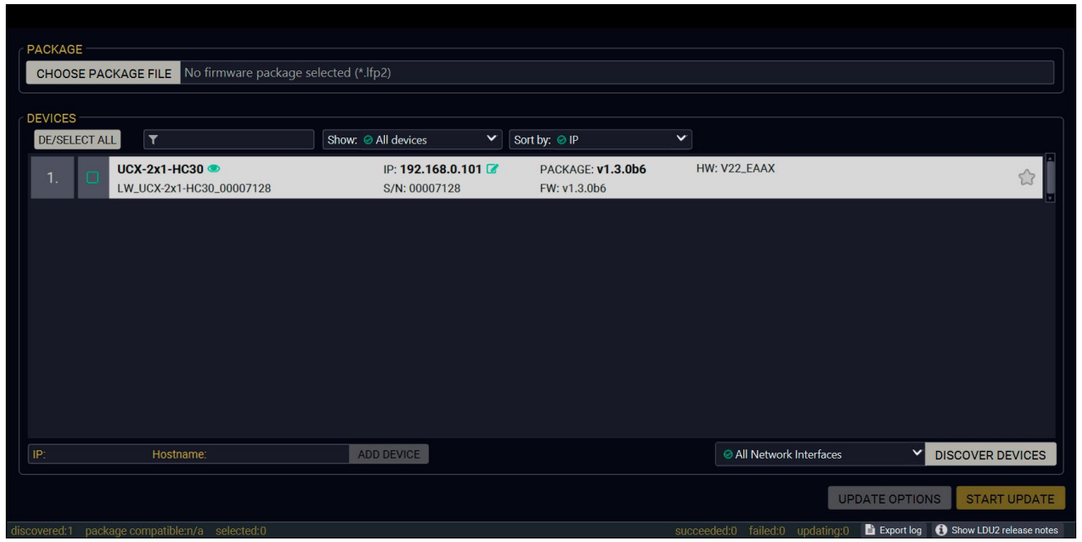
**ATTENTION:** If the device cannot be added by the host name, please use the IP address.

If you start the software by double-clicking on the LFP2 file, the firmware will be loaded. Press the **Search for devices** button; all the devices will be listed that are compatible with the selected firmware pack.

INFO: If you press the **Choose package file** button, the release notes of the LFP2 file will be displayed in the right panel; see the Step 1. Select the Firmware Package. section.

### Device List

When the discovery has completed, the devices available on the network are listed in the application.




### Legend of the Icons

| | | |
|---|---|---|
| | **IP address editor** | The IP address of the device can be changed in the pop-up window. |
| | **Identify me** | Clicking on the icon makes the front panel LEDs blink for 10 seconds, which helps identify the device physically. |
| | **Authentication required** | The password-protection is enabled. You have to enter the password to perform the firmware update in the pop-up window at the beginning of the update. |
| | **Favorite device** | The device has been marked, thus the IP address is stored. When a device is connected with that IP address, the star will be highlighted in that line. |
| | **Further information available** | Device is unreachable. Change the IP address using the front panel LCD menu or the IP address editor of the LDU2. |

## 9.4. Updating Via GUI

To update the desired device(s) via the Graphical User Interface, follow these steps.

**ATTENTION:** The computer that runs LDU2 and the target device (that will be updated) must be in the same subnet. The update cannot be performed from behind a firewall or gateway.

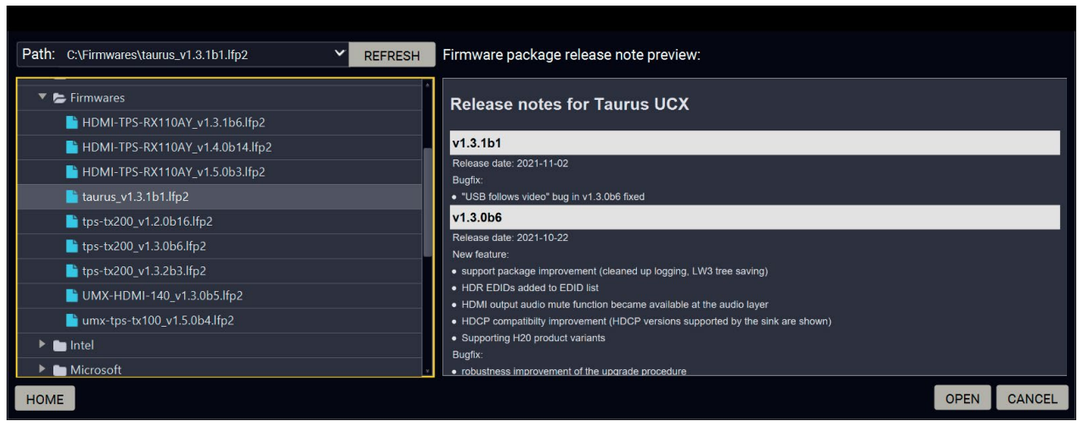
**ATTENTION:** Device configuration can be kept during update, however, downgrading the device will call factory default settings.

**ATTENTION:** While the firmware is being updated, the normal operation mode is suspended, as the device is switched to bootload mode. Signal processing is not performed. Do not interrupt the firmware update. If any problem occurs, reboot the unit and restart the process.

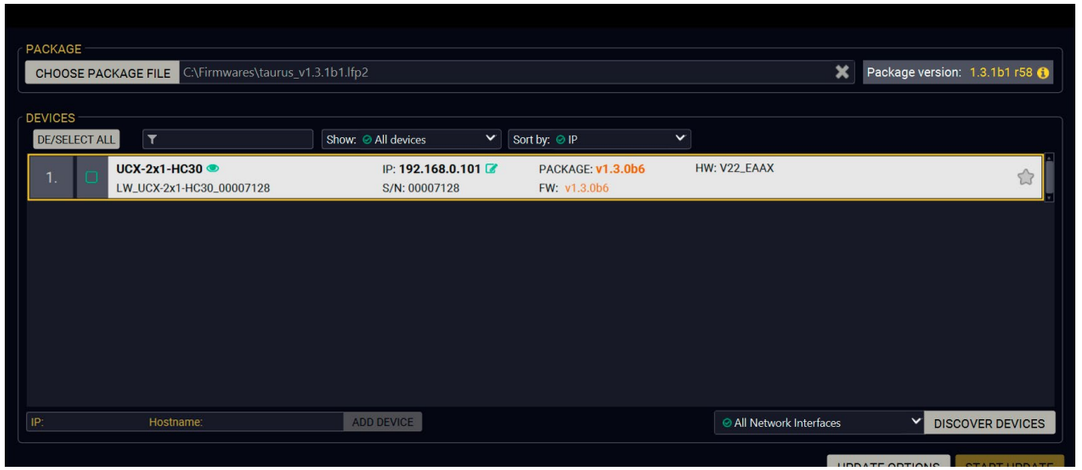
Device Cloning – Configuration Backup and Restore feature supports copying all the settings from one device to another, but cloning is only possible between devices using the same firmware. Uploading of the firmware package happens on http (80) and https (443) ports, so one of them has to be enabled.

### Step 1. Select the Firmware Package.

Click on the **Choose package file** button and navigate to the location where the LFP2 file was saved. When you click on the name of the package, the preview of the release notes is displayed in the right panel.




After the package file is loaded, the list is filtered to show the compatible devices only. The current firmware version of the device is highlighted in orange if it is different from the version of the package loaded.



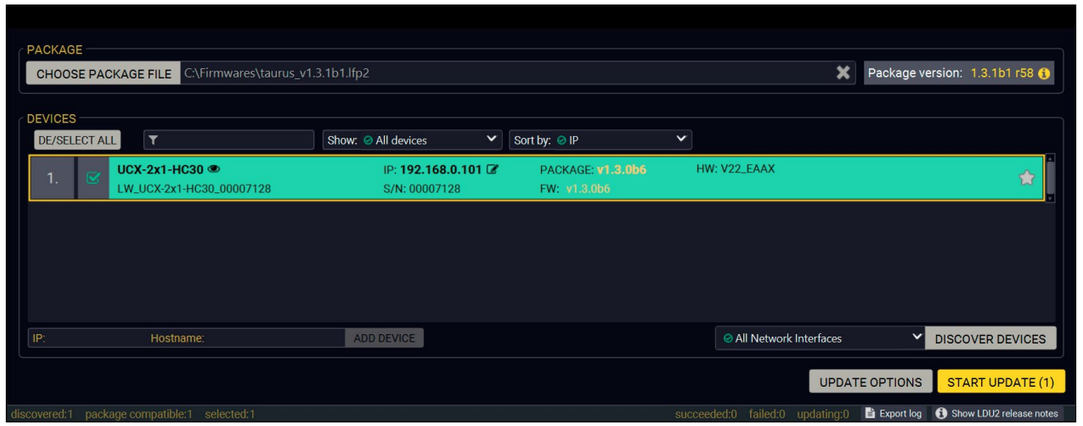

If you start the update by double-clicking on the LFP file, the screen above will be loaded right away.

**The Meaning of the Symbols**

| | |
|---|---|
| Show details | The log about the updating process of the device can be displayed in a new window. |
| Service mode | The device is in bootload mode. Backup and restore cannot be performed in this case. |

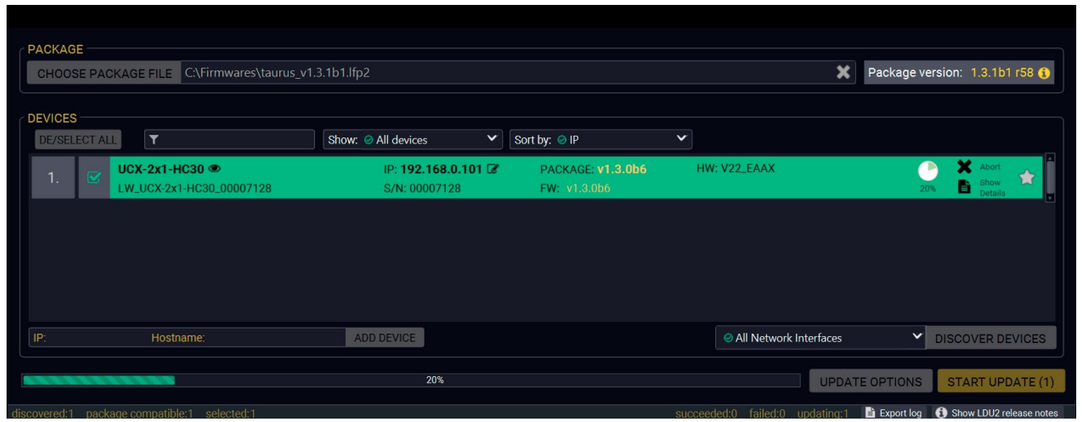
### Step 2. Select the desired devices for updating

Select the devices for updating; the selected line will be highlighted in green.



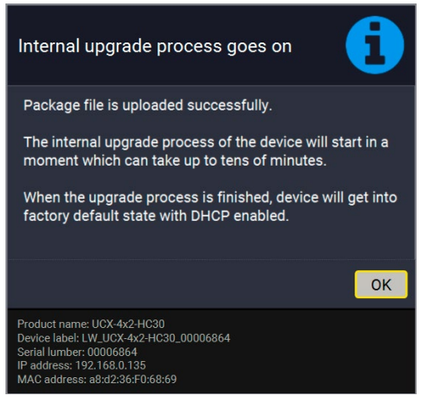
**Step 3. Start the update and wait until it is finished.**

Click on the **Start Update** button to start the procedure. The status is shown in percent in the right side of the device line and the overall process in the bottom progress bar. The device might reboot during the firmware update procedure.

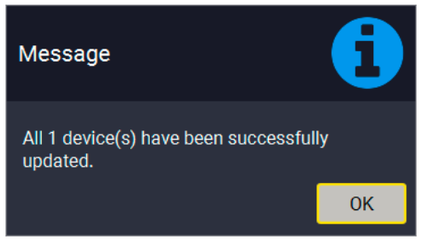



When the progress bar reaches 100% (**Done** is displayed at all devices), the update of all devices are finished successfully and a message appears; you can close the software.

**Step 4. Wait until the unit reboots with the new firmware.**




Once the firmware update procedure is completed, the device is rebooted with the new firmware. Shutting down and restarting the device is recommended.



## 9.5. Command Line Interface (CLI)

The CLI of the LDU2 software is a simple tool for creating scriptable device updates without the need of human interactions. It allows batch updating just like in case of GUI usage.

### 9.5.1. How to Run

#### Running under Windows® OS

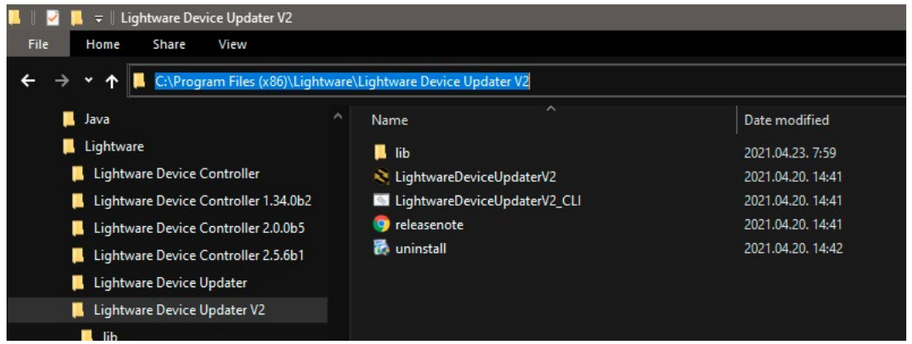
The installer of LDU2 puts the following file into the installation folder:

`LightwareDeviceUpdaterV2_CLI.cmd`

CLI is available via this file, the exe is not suitable for that purpose. Open a command line window to execute or test the features directly.

**Step 1.** Open an Explorer window where the cmd file is located, the default is: `c:\Program Files (x86)\Lightware\Lightware Device Updater V2\LightwareDeviceUpdaterV2_CLI.cmd`.

**Step 2.** Click on the address line (highlighted in blue in the picture), type `cmd.exe` and press enter. The command interpreter window of Windows is opened at the path of the LDU2 install folder.




**Step 3.** Now you can use the `LightwareDeviceUpdaterV2_CLI.cmd` file with the commands and options, which are described in the coming sections:

#### Running under Linux

The Command Line Interface under Linux Operating Systems can be run by the following:

`LightwareDeviceUpdaterV2.sh.`

Running an update:

```
bash LightwareDeviceUpdaterV2.sh update --ip 172.24.5.27 --package ~/Downloads/taurus_ucx_
hc60_v2.23.0b4.1fp2
```

The commands and options are the same under Windows® and Linux, too. Following sections contain examples with **LightwareDeviceUpdaterV2_CLI.cmd**.

### 9.5.2. How to Use

#### Command Structure

The commands can be run over CLI in the following way:

`LightwareDeviceUpdaterV2_CLI.cmd [command] [options]`

`[Command]`: a certain command described in the coming sections; only one command can be run at a time

`[Options]`: mandatory and/or optional parameters of the command, if any. Optional parameters have a default value, which can be found at each affected command. You only have to define the parameter if you want to apply a different value. The **order of the options** is arbitrary.

#### Important Notes

- CLI is **case-sensitive** (including commands, options and other parameters).
- There is **no limit** regarding the number of the devices to update. At most 20 devices are updated simoultaneously, when one of them is finished, the following (21st) will be started automatically.
- If an update is failed, the IP address of the affected device(s) are listed at the end.
- The computer that runs LDU2 and the target device (that will be updated) must be in the same subnet. The update cannot be performed from behind a firewall or gateway.

## 9.6. CLI Commands

INFO: The commands and options described in the following sections are the same under Windows® and Linux, too. The examples contain **LightwareDeviceUpdaterV2_CLI.cmd**.

#### About the Examples

- Sent command is in **blue**, response is in **grey**.
- If the response in practice is **longer than listed** in the example, this symbol can be seen: `[...]`.

### 9.6.1. Help

The defined commands and options can be listed by the **help** command.

#### Command

`LightwareDeviceUpdaterV2_CLI.cmd help`

**Example**

```
C:\Program Files (x86)\Lightware\Lightware Device Updater V2>LightwareDeviceUpdaterV2_CLI.cmd help

C:\Program Files (x86)\Lightware\Lightware Device Updater V2>lib\jre\bin\java.exe -jar lib\ldu2.jar help
Command line usage:
    Win: LightwareDeviceUpdaterV2_CLI.cmd [command] [options]
    Linux: LightwareDeviceUpdaterV2.sh [command] [options]

    Commands:
        * help
        * version
        * update
        * deviceInfo
        * restore
        * packageOptions
[...]
```

### 9.6.2. LDU2 Version

The response shows the version of the LDU2 and the version of the Script API (the Application Programming Interface that is used by the LDU2 and the script).

**Command**

`LightwareDeviceUpdaterV2_CLI.cmd version`

**Example**

```
C:\Program Files (x86)\Lightware\Lightware Device Updater V2>LightwareDeviceUpdaterV2_CLI.cmd version


C:\Program Files (x86)\Lightware\Lightware Device Updater V2>lib\jre\bin\java.exe -jar lib\ldu2.jar version
LDU2 version: 2.39.0b9
Script API version: 1.3.38
```

### 9.6.3. Check For New LDU2 Version

The following command can be used to check if an update of LDU2 is available. This is just a request, since the CLI is not suitable for handling the complete installer of the software.

**Command**

`LightwareDeviceUpdaterV2_CLI.cmd checkForUpdates`

**Example 1**

```
c:\Program Files (x86)\Lightware\Lightware Device Updater V2>LightwareDeviceUpdaterV2_CLI.cmd checkForUpdates

c:\Program Files (x86)\Lightware\Lightware Device Updater V2>lib\jre\bin\java.exe -jar lib\ldu2.jar checkForUpdates
Current LDU2 version: 2.39.0b9
LDU2 is up-to-date
```

**Example 2**

```
c:\Program Files (x86)\Lightware\Lightware Device Updater V2>LightwareDeviceUpdaterV2_CLI.cmd checkForUpdates

c:\Program Files (x86)\Lightware\Lightware Device Updater V2>lib\jre\bin\java.exe -jar lib\ldu2.jar checkForUpdates
Current LDU2 version: 2.38.0b4
New version is available online: 2.39.0b9
Download URL: http://update.lightware.hu/ldu2/lwr/v2.39.0b9/install_LDU2_v2.39.0b9.exe
```

### 9.6.4. Device Info

The most important information about the selected device is displayed; see the example for more details.

**Command**

```
LightwareDeviceUpdaterV2_CLI.cmd deviceInfo [options]
```

**Options**

| Option | Description | Required? |
|---|---|---|
| -i or --ip | List of IP addresses of devices to be updated | one of them is mandatory |
| -n or --hostName | List of host names of devices to be updated | |
| -v or --packageVersion | Shows installed package version only | optional |

**Example 1**

```
C:\Program Files (x86)\Lightware\Lightware Device Updater V2>LightwareDeviceUpdaterV2_CLI.cmd deviceInfo --ip
192.168.1.123

C:\Program Files (x86)\Lightware\Lightware Device Updater V2>lib\jre\bin\java.exe -jar lib\ldu2.jar deviceInfo --ip
192.168.1.123
Product name:    UCX-4x2-HC60D
IP address:      192.168.1.123
Serial number:   26237511
MAC address:     A8:D2:36:07:F8:18
Part number:     91310113
Device label:    LW_UCX-4x2-HC60D_26237511
Package version: v2.22.12b2
CPU FW version:  v3.20.0b3
HW version:      V61_RABX
Operation mode:  Application mode
```

**Example 2**

```
C:\Program Files (x86)\Lightware\Lightware Device Updater V2>LightwareDeviceUpdaterV2_CLI.cmd deviceInfo --ip
192.168.1.123 --packageVersion

C:\Program Files (x86)\Lightware\Lightware Device Updater V2>lib\jre\bin\java.exe -jar lib\ldu2.jar deviceInfo --ip
192.168.1.123 --packageVersion
v2.22.12b2
```

### 9.6.5. Update

This command can be used to update the firmware of the devices.

**Command**

```
LightwareDeviceUpdaterV2_CLI.cmd update [options]
```

**Options**

| Option | Description | Required? |
|---|---|---|
| -p or --package | The path of the firmware package file | yes |
| -i or --ip | List of IP addresses of devices to be updated | one of them is mandatory |
| -n or --hostName | List of host names of devices to be updated | |
| -r or --reportProgress | Report update progress in percentage form. Default: false | optional |
| Package-specific options | Certain LFP2 packages have features that can be applied at this command; see the Package Options section. | optional |

**ATTENTION:** The configuration is restored automatically if the factory default option is not applied in the **update** command. In that case, there is no need to run the **restore** command after the update.

**Example**

**ATTENTION:** This example command will only work if authentication is turned off. For the command with authentication enabled, see the next page.

```
C:\Program Files (x86)\Lightware\Lightware Device Updater V2>LightwareDeviceUpdaterV2_CLI.cmd update --ip
192.168.1.123 --package c:\Firmwares\taurus_ucx_hc60_v2.23.0b4.lfp2 --reportProgress

C:\Program Files (x86)\Lightware\Lightware Device Updater V2>lib\jre\bin\java.exe -jar lib\ldu2.jar update --ip
192.168.1.123 --package c:\Firmwares\taurus_ucx_hc60_v2.23.0b4.lfp2 --reportProgress
[2026-09-23 16:44:40.052] [ INFO] [           main] - Device IPs: [192.168.1.123]
[2026-09-23 16:44:46.404] [ INFO] [           main] - All selected devices are available over the network.
[2026-09-23 16:44:46.621] [ INFO] [           main] - All the selected devices are compatible with the specified
package.
[2026-09-23 16:44:46.820] [ INFO] [   192.168.1.123] - Update process started
[2026-09-23 16:44:49.135] [ INFO] [   192.168.1.123] - Update API version: 1.1
[2026-09-23 16:44:50.241] [ INFO] [   192.168.1.123] - Current package version on the device : v2.23.0b4
[2026-09-23 16:44:50.247] [ INFO] [   192.168.1.123] - Version of the package to be uploaded : v2.23.0b4
[2026-09-23 16:44:50.255] [ INFO] [   192.168.1.123] - Update parameters: deviceIp: 192.168.1.123, factoryDefault:
false
[2026-09-23 16:44:51.358] [ INFO] [   192.168.1.123] - Update protocol: https://
[2026-09-23 16:44:51.359] [ INFO] [   192.168.1.123] - Authentication type: NONE
[2026-09-23 16:44:52.217] [ INFO] [   192.168.1.123] - Device info: Product name: UCX-4x2-HC60D, Device label: LW_
UCX-4x2-HC60D_26237511, Serial number: 26237511, Mac address: A8:D2:36:07:F8:18, Ip address: 192.168.1.123, Package
version: v2.23.0b4, Part number: 91310113, Hw version: V61_RABX
[2026-09-23 16:44:52.222] [ INFO] [   192.168.1.123] - Creating backup of the device's configuration settings.
[2026-09-23 16:45:51.413] [ INFO] [   192.168.1.123] - Configuration backup file created: C:\Users\nikolett.
keindl\.ldu2\backup\backup_91310113_26237511_2026-09-23_16-45-51.bkp
[2026-09-23 16:45:51.438] [ INFO] [   192.168.1.123] - Uploading firmware package.
[2026-09-23 16:45:56.730] [ INFO] [ProgressReporter] - Progress: 2%
[2026-09-23 16:46:01.740] [ INFO] [ProgressReporter] - Progress: 3%
[2026-09-23 16:46:06.748] [ INFO] [ProgressReporter] - Progress: 5%
[...]
[2026-09-23 16:56:42.695] [ INFO] [ProgressReporter] - Progress: 94%
[2026-09-23 16:56:45.901] [ INFO] [   192.168.1.123] - Done

All 1 update(s) finished successfully.
```

The lines containing "ProgressReporter" can be enabled optionally. If it is enabled, the current state is displayed every 5 seconds.

### 9.6.6. Package Options

Shows package-specific update options.

#### Command

`LightwareDeviceUpdaterV2_CLI.cmd packageOptions [options]`

#### Options

| Option | Description | Required? |
|---|---|---|
| -p or --package | The path of the firmware package file | yes |

#### Example

```
C:\Program Files (x86)\Lightware\Lightware Device Updater V2>lib\jre\bin\java.exe -jar lib\ldu2.jar packageOptions
--package c:\Firmwares\taurus_ucx_hc60_v2.23.0b4.lfp2

Login options:
        --user : HTTP(s) basic authentication user (Default: empty string)
        --pw : HTTP(s) basic authentication password (Default: empty string)

Device configuration settings:
        --factoryDefault : if set, device resets to factory default during update (Default: false. Please note: In
some cases, the factory default switch automatically sets to true, based on the version on the device.)
```

Package option example can be seen in the following section.

### 9.6.7. Complex Example

The following options applied:

- Firmware is updated
- Authentication enabled

```
C:\Program Files (x86)\Lightware\Lightware Device Updater V2>LightwareDeviceUpdaterV2_CLI.cmd update --ip
192.168.1.123 --package c:\Firmwares\taurus_ucx_hc60_v2.23.0b4.lfp2 --user admin --pw Lightware10g --reportProgress

C:\Program Files (x86)\Lightware\Lightware Device Updater V2>lib\jre\bin\java.exe -jar lib\ldu2.jar update --ip
192.168.1.123 --package c:\Firmwares\taurus_ucx_hc60_v2.23.0b4.lfp2 --user admin --pw Lightware10g --reportProgress
[2026-09-23 15:14:11.924] [ INFO] [           main] - Device IPs: [192.168.1.123]
[2026-09-23 15:14:18.074] [ INFO] [           main] - All selected devices are available over the network.
[2026-09-23 15:14:18.312] [ INFO] [           main] - All the selected devices are compatible with the specified
package.
[2026-09-23 15:14:18.489] [ INFO] [   192.168.1.123] - Update process started
[2026-09-23 15:14:21.325] [ INFO] [   192.168.1.123] - Update API version: 1.1
[2026-09-23 15:14:22.709] [ INFO] [   192.168.1.123] - Current package version on the device : v2.22.12b2
[2026-09-23 15:14:22.716] [ INFO] [   192.168.1.123] - Version of the package to be uploaded : v2.23.0b4
[2026-09-23 15:14:22.724] [ INFO] [   192.168.1.123] - Update parameters: deviceIp: 192.168.1.123, factoryDefault:
false
[2026-09-23 15:14:24.068] [ INFO] [   192.168.1.123] - Update protocol: https://
[2026-09-23 15:14:24.070] [ INFO] [   192.168.1.123] - Authentication type: BASIC
[2026-09-23 15:14:26.557] [ INFO] [   192.168.1.123] - Device info: Product name: UCX-4x2-HC60D, Device label: LW_
UCX-4x2-HC60D_26237511, Serial number: 26237511, Mac address: A8:D2:36:07:F8:18, Ip address: 192.168.1.123, Package
version: v2.22.12b2, Part number: 91310113, Hw version: V61_RABX
[2026-09-23 15:14:26.562] [ INFO] [   192.168.1.123] - Creating backup of the device's configuration settings.
[2026-09-23 15:15:03.831] [ INFO] [   192.168.1.123] - Configuration backup file created: C:\Users\nikolett.
keindl\.ldu2\backup\backup_91310113_26237511_2026-09-23_15-15-03.bkp
[2026-09-23 15:15:03.845] [ INFO] [   192.168.1.123] - Uploading firmware package.
[2026-09-23 15:15:08.389] [ INFO] [ProgressReporter] - Progress: 2%
[2026-09-23 15:15:13.394] [ INFO] [ProgressReporter] - Progress: 3%
[2026-09-23 15:15:18.400] [ INFO] [ProgressReporter] - Progress: 5%
[2026-09-23 15:15:23.401] [ INFO] [ProgressReporter] - Progress: 7%
[2026-09-23 15:15:28.402] [ INFO] [ProgressReporter] - Progress: 8%
[2026-09-23 15:15:33.409] [ INFO] [ProgressReporter] - Progress: 10%
[2026-09-23 15:15:38.425] [ INFO] [ProgressReporter] - Progress: 12%
[2026-09-23 15:15:43.437] [ INFO] [ProgressReporter] - Progress: 14%
[2026-09-23 15:15:48.441] [ INFO] [ProgressReporter] - Progress: 16%
[2026-09-23 15:15:53.446] [ INFO] [ProgressReporter] - Progress: 17%
[2026-09-23 15:15:58.452] [ INFO] [ProgressReporter] - Progress: 19%
[2026-09-23 15:16:03.454] [ INFO] [ProgressReporter] - Progress: 21%
[2026-09-23 15:16:08.456] [ INFO] [ProgressReporter] - Progress: 23%
[2026-09-23 15:16:13.458] [ INFO] [ProgressReporter] - Progress: 25%
[2026-09-23 15:16:18.466] [ INFO] [ProgressReporter] - Progress: 26%
[2026-09-23 15:16:23.471] [ INFO] [ProgressReporter] - Progress: 28%
[2026-09-23 15:16:28.480] [ INFO] [ProgressReporter] - Progress: 30%
[2026-09-23 15:16:30.846] [ INFO] [   192.168.1.123] - Package upload finished.
[2026-09-23 15:16:32.044] [ INFO] [   192.168.1.123] - Starting internal update process. Device is about to reboot.
[2026-09-23 15:17:07.703] [ INFO] [   192.168.1.123] - Waiting for the device...
[2026-09-23 15:17:08.537] [ INFO] [ProgressReporter] - Progress: 35%
[2026-09-23 15:17:13.540] [ INFO] [ProgressReporter] - Progress: 36%
[2026-09-23 15:17:18.545] [ INFO] [ProgressReporter] - Progress: 37%
[2026-09-23 15:17:23.554] [ INFO] [ProgressReporter] - Progress: 38%
[2026-09-23 15:17:28.565] [ INFO] [ProgressReporter] - Progress: 39%
[2026-09-23 15:17:33.572] [ INFO] [ProgressReporter] - Progress: 40%
[2026-09-23 15:17:38.586] [ INFO] [ProgressReporter] - Progress: 41%
[2026-09-23 15:17:43.587] [ INFO] [ProgressReporter] - [...]
[2026-09-23 15:24:04.184] [ INFO] [ProgressReporter] - Progress: 70%
[2026-09-23 15:24:29.199] [ INFO] [ProgressReporter] - Progress: 71%
[2026-09-23 15:24:39.215] [ INFO] [ProgressReporter] - Progress: 72%
[2026-09-23 15:24:49.219] [ INFO] [ProgressReporter] - Progress: 73%
[2026-09-23 15:24:59.236] [ INFO] [ProgressReporter] - Progress: 94%
[2026-09-23 15:25:03.249] [ INFO] [   192.168.1.123] - Done

All 1 update(s) finished successfully.
```

### 9.6.8. Exit Codes

There is a return value in all cases when a command run is finished. Currently, three codes are defined:

| Code | Displayed text | Description |
|---|---|---|
| 0 | N/A | The update performed successfully |
| 1 | Update error (ErrorCode:1) | The error happened during the update |
| 2 | CLI error (ErrorCode:2) | The error happened before starting the update |

The error line contains further information about the error.

**Querying the Exit Code under Windows®**

```
c:\Program Files (x86)\Lightware\Lightware Device Updater V2\echo %errorlevel%
0
```

**Querying the Exit Code under Linux**

```
echo $?
0
```

If this value is queried after the update and it is 0, the update performed successfully.

## 9.7. Updating via REST API

The **Update REST API (REpresentational State Transfer Application Public Interface)** is developed to have a standardized update interface between the Lightware device and a third-party software tool (e.g. external controller). The update means – generally – to install a new Lightware Firmware Package (LFP2) to the Lightware device. The Update REST API is part of the entire **Lightware REST API** software architecture.

The Update REST API is available over **HTTPS** and with **basic authentication** (with setting a password for the user **admin**).

For more details on updating with REST API, see the Updating the Device via REST API section.

## 9.8. If the Update is Not Successful

- Restart the process and try the update again.
- If the backup cannot be created for some reason, you will get a message whether to continue the process without backup or stop the update. A root cause can be that the desired device is already in bootload (firmware update) mode, thus the normal operation mode is suspended and backup cannot be made.

If an update is not successful, the **Export log** button becomes red. If you press the button, you can download the log file as a ZIP package, which can be sent to Lightware Support if needed. The log files contain useful information about the circumstances to find the root cause. #bootload

# 10

# Troubleshooting

**Usually, if the system seems not to transport the signal as expected, the best strategy for troubleshooting is to check signal integrity through the whole signal chain starting from source side and moving forward to receiver end.**


- Use Cases **193**
- How to Speed Up the Troubleshooting Process? **194**

First, check the front panel LEDs and take the necessary steps according to their states. For more information about front panel LEDs of the switcher, see the Status LEDs section.

**Legend**

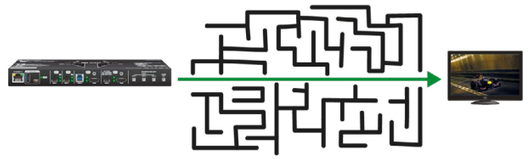
- Section to connections/cabling.
- Section to front panel operation.
- Section to LDC software.
- Section to LW3 protocol commands.

## 10.1. Use Cases

| Symptom | Root cause | Action | Refer to |
|---|---|---|---|
| **Video layer** | | | |
| **No picture on the video output** | Device(s) not powered properly | Check the switcher and the other devices if they are properly powered; try to unplug and reconnect them. | 4.6 |
| | Cable connection problem | Cables must fit very well, check all the connectors. | 4.6 |
| | No incoming signal | No video signal is present on the HDMI input ports. Check the source device and the HDMI cables. | 4.6 |
| | Not the proper video port is the active one | Check the video crosspoint settings. | 3.1.1<br>6.7<br>8.6.1 |
| | Not the proper interface is the active one | If the source/display has more connectors, check if the proper interface is selected. | |
| | Output port is muted | Check the mute state of output ports. | 6.7.1<br>8.6.4 |
| | Display is not able to receive the video format | Check the emulated EDID and select another (e.g. emulate the display's EDID on the input port). | 6.11.1<br>8.13.4 |
| | HDCP is disabled | Enable HDCP on input port(s) of the switcher. | 6.8<br>8.6.12 |
| **No picture on the video output + signal error rate is high, HDMI2.0 scrambling is disabled, clock rate is set 1:10** | The source sends 4K signals, but the emulated EDID does not support this resolution. | Check the emulated EDID and select another (e.g. F139 EDID on the input port). | 6.11.1<br>8.13.4 |
| **No 4K60 video signal on the USB-C input** | The source is not able to send 4K60Hz | Check the documentation of the source and the ability of the connected port. Certain USB-C ports are only for power and not for video transmission. The icons beside the port can help. | |
| | The source PC or BYOD resolution is not 4K60Hz | Check the source resolution and modify it if necessary. Certain sources require restarting. | |
| | The USB-C cable is not appropriate | The USB-C standard allows two cable types: the Full-Featured Type-C Cable Assembly or 2.0 Type-C Cable Assembly. The latter will not operate with 4K60Hz. | 4.5 |
| | | Always use high-quality cables. The no-name USB 3.1 Gen1-compatible cables can use only 2 SS channels instead of 4. The minimum cable requirement is USB 3.1 Gen1-compatiblity and support of Displayport HBR2. | 4.5 |
| | | The active Thunderbolt3 cable is not appropriate, because it is not compatible backwards (with USB 3.x or DP). The passive TBT3 (20Gbps) cable may be appropriate if it supports USB3 Gen1 or Gen2 and Displayport. | 4.5 |
| | Not proper Displayport alternate mode setting | Check if the DP Altmode Policy is set to Prefer video (Force C). | 6.10.1<br>8.12.2 |
| **USB layer** | | | |
| **The USB 3.x data transmission does not operate** | The USB-C cable is not appropriate | The USB-C standard allows two cable types: the Full-Featured Type-C Cable Assembly or 2.0 Type-C Cable Assembly. The latter will not operate for USB3 Gen1. | 4.5 |
| | | Always use a high-quality cable. Noname cables do not guarantee the USB 3.x support. | 4.5 |

| Symptom | Root cause | Action | Refer to | |
|---|---|---|---|---|
| **The USB 3.x data transmission does not operate** | The USB-C cable is not appropriate | The active Thunderbolt3 cable is not appropriate, because it is not compatible backwards (with USB 3.x). The passive TBT3 (20Gbps) cable could be proper when it supports USB3 Gen1 or Gen2. | | 4.5 |
| | Not proper Displayport alternate mode setting | Check if the DPAltmode Policy is set to Prefer USB3 (Force D) or Auto. | | 6.10.1 |
| | | | LW3 | 8.12.2 |
| **The USB 2.0 data transmission does not operate** | IR drop level of the USB Type-C cable is low. | It can cause communication problems. Always use high quality cables. | | 4.5 |
| **The USB 2.0 data transmission or Power delivery do not operate** | If the resistor of the conductor in USB-C cable is too high, the voltage difference could be more than 0.25V, which can cause USB 2.0 or Power Delivery communication problems. | Always use high quality cables. | | 4.5 |
| **Power via USB-C** | | | | |
| **BYOD charges slowly** | The BYOD needs more than 100W | An error message will appear, because the UCX series maximum power capacity is 100W. | | 4.3 |
| | Not proper power setting of the USB-C port | Check the output power setting the connected port. | | 6.13.4 |

## 10.2. How to Speed Up the Troubleshooting Process?



Lightware's technical support team is always working hard to provide the fastest support possible. Our team's response time is one of the best in the industry, and in the toughest of cases we can directly consult with the hardware or software engineer who designed the product to get the information from the most reliable source.

However, the troubleshooting process can be even faster... with your help.

There are certain pieces of information that push us in the right direction to find the root cause of the problem. If we receive most of this information in the first e-mail, or it is gathered at the time when you call us, then there is a pretty high chance that we will be able to respond with the final solution right away.

**This information is the following:**

- Schematic (a pdf version is preferred, but a hand drawing is sufficient).
- Serial number(s) of the device(s) (it is either printed somewhere on the box or you can query it in the Device Controller software or on the built-in website).
- Firmware versions of the devices (please note that there may be multiple CPUs or controllers in the device and we need to know all of their firmware versions, a screenshot is the best option).
- Cable lengths and types (in our experience, it's usually the cable).
- Patch panels, gender changers or anything else in the signal path that can affect the transmission.
- Signal type (resolution, refresh rate, color space, deep color).
- Emulated EDID(s) (please save them as a file and send it to us).
- Actions to take in order to re-create the problem (if we cannot reproduce the problem, it is hard for us to find the cause).
- Photo or video about the problem ('image noise' can mean many different things, it's better if we see it too).
- Error logs from the Device Controller software.
- In the case of an Event Manager issue, the event file and/or backup file from the Device Controller software.

The more of the information above you can give us, the better. Please send this information to the Lightware Support Team (support@lightware.com) to speed up the troubleshooting process.

# 11

## Technologies

**The following sections contain descriptions and useful technical information on how the devices work in the background. The content is based on experiences and cases we met in the practice. These sections help understand features and technical standards like the following:**

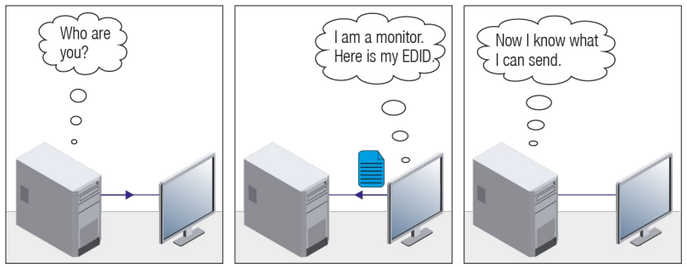

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- HDCP Management **197**
- Pixel Accurate Reclocking **199**

# 11.1. EDID Management

## 11.1.1. Understanding the EDID

The Extended Display Identification Data (EDID) is the passport of display devices (monitors, TV sets, projectors). It contains information about the capabilities of the display, such as supported resolutions, refresh rates (these are called Detailed Timings), the type and manufacturer of the display device, etc.

After connecting a source to a display (DVI, HDMI, DP), the source reads out the EDID to determine the resolution and refresh rate of the image to be transmitted.




***EDID Communication***

Most DVI computer displays have a 128-byte-long EDID structure. However, Digital Televisions and HDMI capable displays may have another 128 bytes, which is called E-EDID and is defined by CEA (Consumer Electronics Association). This extension contains information about additional Detailed Timings, audio capabilities, speaker allocation and HDMI capabilities. It is important to know that all HDMI capable devices must have CEA extension, but not all devices with CEA extension are HDMI capable.

**Common Problems Related to EDID**

Problem: "My system consists of the following: a computer, a Lightware device, a WUXGA (1920x1200) LCD monitor, and an SXGA (1280x1024) projector. I would like to see the same image on the monitor and the projector. What EDID should I choose on the Lightware device?"

Solution: If you want to see the image on both displays, you need to select the resolution of the smaller display (in this case SXGA), otherwise the smaller display may not show the higher resolution image.

Problem: "I have changed to a different EDID on an input port of the Lightware device to have a different resolution, but nothing happens."

Solution: Some graphics cards and video sources read out the EDID only after power-up and later they do not sense that the EDID has been changed. You need to restart your source to make it read out the EDID again.

## 11.1.2. Advanced EDID Management

Each DVI sink (e.g. monitors, projectors, plasma displays, etc...) must support the EDID data structure. Source BIOS and operating systems are likely to query the sink using DDC2B protocol to determine what pixel formats and interface are supported. DVI standard uses EDID data structure to identify the monitor type and capabilities. Most DVI sources (VGA cards, set top boxes, etc.) will output DVI signal after accepting the connected sink's EDID information. In the case of EDID readout failure or missing EDID, the source will not output DVI video signal.

Lightware devices provide the Advanced EDID Management function that helps system integration. The built-in EDID Router can store and emulate factory pre-programmed- and User programmable EDIDs. The EDID of the attached monitors or projectors for each output are stored in a non-volatile memory. This way the EDID of a monitor is available when the monitor is unplugged or switched off.

Any EDID can be emulated on any input. An emulated EDID can be copied from the EDID router's memory (static EDID emulation), or from the last attached monitor's memory (dynamic EDID emulation). For example, the Lightware device can be set up to emulate a sink device that is connected to one of the outputs. In this case, the EDID automatically changes if the monitor is replaced with another display device (as long as it has a valid EDID).

The EDID is independently programmable for all inputs without affecting each other. All inputs have their own EDID circuit.

INFO: The user is not required to disconnect the video cable to change an EDID as opposed to other manufacturer's products. The EDID can be changed even if a source is connected to the input and powered ON.

INFO: When the EDID has been changed, the router toggles the HOTPLUG signal for 2 seconds. Some sources do not sense this signal. In such cases, the source device must be restarted or powered OFF and ON again.

## 11.2. HDCP Management

Lightware Visual Engineering is a legal HDCP adopter. Several functions have been developed that help to solve HDCP related problems. Complex AV systems often have both HDCP and non-HDCP components. The switcher allows transmitting HDCP encrypted and unencrypted signals. The devices will be still HDCP compliant, as they will never output an encrypted signal to a non-HDCP compliant display device. If an encrypted signal is switched to a non-compliant output, a red screen alert or muted screen will appear.

### 11.2.1. Protected and Unprotected Content

Many video sources send HDCP protected signal if they detect that the sink is HDCP capable – even if the content is not copyrighted. This can cause trouble if an HDCP capable device is connected between the source and the display. In this case, the content cannot be viewed on non-HDCP capable displays and interfaces like event controllers. Rental and staging technicians often complain about certain laptops that always send HDCP encrypted signals if the receiver device (display, matrix router, etc.) reports HDCP compliancy. Even though HDCP encryption is not required all the time (e.g. computer desktop image), certain laptops still do that.

To avoid unnecessary HDCP encryption, Lightware introduced the HDCP enabling/disabling function: the HDCP capability can be disabled in the Lightware device. If HDCP is disabled, the connected source will detect that the sink is not HDCP capable, and turn off authentication.

### 11.2.2. Disable Unnecessary Encryption

#### HDCP Compliant Sink

All the devices are HDCP-compliant, no manual setting is required, both protected and unprotected contents are transmitted and displayed on the sink.




#### Not HDCP-compliant Sink 1.

Not-HDCP compliant sink is connected to the switcher. Some sources (e.g. computers) always send HDCP encrypted signals if the receiver device reports HDCP compliancy, however, HDCP encryption is not required all the time (e.g. computer desktop image). If HDCP is enabled in the switcher, the image will not be displayed on the sink.




Setting the HDCP parameter to Auto on the output port and disable HDCP on the input port, the transmitted signal will not be encrypted if the content is not protected. Thus, non-HDCP compliant sinks will display non-encrypted signal.

#### Not HDCP-compliant Sink 2.

The layout is the same as in the previous case: non-HDCP compliant display device is connected to the switcher but the source would send protected content with encryption. If HDCP is enabled on the input port of the switcher, the source will send encrypted signal.




The sink is not HDCP compliant, thus it will not display the video signal (but blank/red/muted/etc. screen). If HDCP is disabled on the input port of the switcher, the source will not send the signal. The solution is to replace the display device with an HDCP-capable one.

### 11.2.3. HDCP 2.2

HDCP 2.2 is the latest evolution of copy protection. It is designed to create a secure connection between a source and a display. The 2.x version of HDCP is not a continuation of HDCPv1, and is rather a completely different link protection. One of the main differences is the number of the allowed devices within a closed AV system: HDCP 2.2 allows 32 devices (HDCP 1.4 allows 128 devices). A further limit is that up to four level is allowed, which means the protected signal can be transmitted over at most four repeater/matrix/switcher device. HDCP content protection is activated only if an active video stream is transmitted from the source to the display. The encryption is not activated without a video signal.

HDCP 2.2 standard allows the application of a previous version of HDCP (e.g. HDCP 1.4) between the source and the display if the source device allows it. According to the standard, if the image content is protected with HDCP, the highest supported content protection level has to be applied. However, if the highest level of protection is not justified by the source content, the level may be decreased to avoid compatibility problems; this case is determined by the source.

#### HDCP 2.2 Source and HDCP 1.4 Sink

In this case the signal of an HDCP 2.2 compliant source is switched to an HDCP 1.4 compliant sink device. The signal is encrypted with HDCP 2.2 on the input and encrypted with HDCP 1.4 on the output of the Lightware device. A lower level of encryption may be applied only if the source device/content allows it - according to the HDCP standard. In this case the HDCP setting on the input port has to be set to HDCP 1.4 and Depends on input on the output port.




#### HDCP 1.4 Source and HDCP 2.2 Sink

The example below is the reversal of the previous case. An HDCP 1.4 compliant source sends a signal with HDCP 1.4 encryption. The signal is switched to an HDCP 2.2 compliant sink device. In this case the outgoing signal has to be encrypted with the highest supported encryption level towards the sink, as the Lightware device and the sink are both HDCP 2.2 compliant. The HDCP 2.2 standard does not allow keeping the original HDCP 1.4 encryption level on the output.




#### What Kind of Signal Will be on the Output of the Lightware Device?

See below table that summarizes the possible cases:

| Incoming Signal | HDCP 1.4 Compatible Sink on the Output | HDCP 2.2. Compatible Sink on the Output |
|---|---|---|
| HDCP 1.4 | HDCP 1.4 | HDCP 2.2 |
| HDCP 2.2 (convertable)* | HDCP 1.4 | HDCP 2.2 |
| HDCP 2.2 (not convertable)** | Red screen | HDCP 2.2 |

* Stream type 0: the video stream allows the conversion of the signal to apply a lower level of encryption.

** Stream type 1: the video stream does not allow the conversion of the signal.

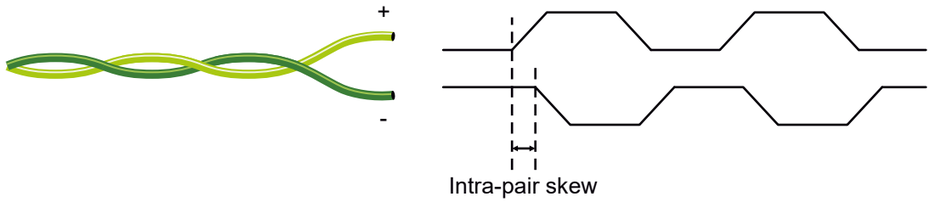
## 11.3. Pixel Accurate Reclocking

Signal reclocking is an essential procedure in digital signal transmission. After passing the reclocking circuit, the signal becomes stable, jitter-free, and can be transmitted over more equipment like processors or event controllers. Without reclocking, sparkles, noise, and jaggies appear on the image.

Lightware's sophisticated Pixel Accurate Reclocking technology fixes more problems than general TMDS reclocking. It removes not only intra-pair skew, but inter-pair skew as well. The Pixel Accurate Reclocking circuit eliminates the following errors:

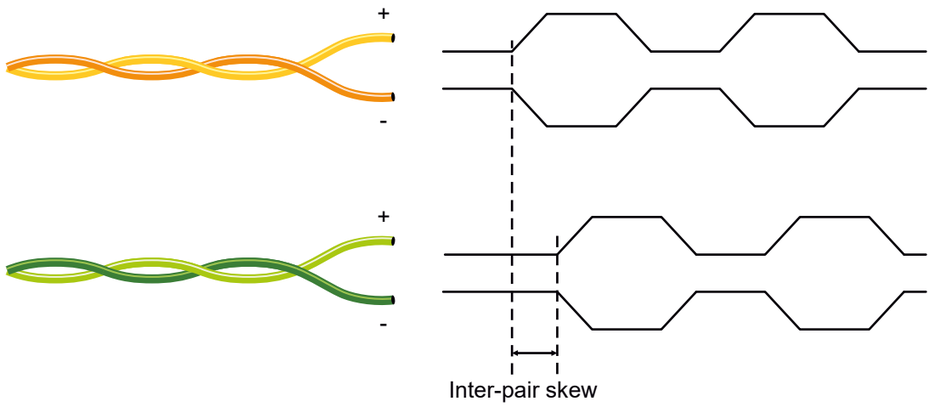
**Intra-pair skew**

Skew between the + and - wires within a differential wire pair (e.g. Data2- and Data2+). It's caused by different wire lengths or slightly different wire construction (impedance mismatch) in the DVI cable. It results in jitter.



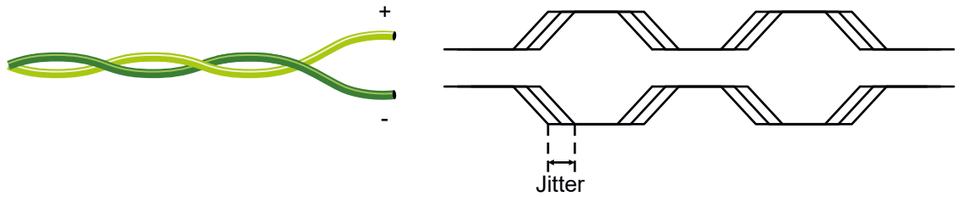

**Inter-pair skew**

Skew between two differential wire pairs in a cable. It is caused by different wire pair lengths or different number of twists in the DVI cable. Too much inter-pair skew results in color shift in the picture or sync loss.



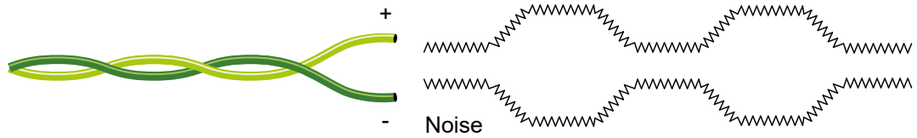

**Jitter**

Signal instability in the time domain. The time difference between two signal transitions should be a fixed value, but noise and other effects cause variations.




**Noise**

Electromagnetic interference between other electronic devices such as mobile phones, motors, etc. and the DVI cable are coupled onto the signal. Too much noise results in increased jitter.



# 12

## Appendix

**Tables, drawings, guides, technical details and hashtag keyword list as follows:**


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## 12.1. Specifications

INFO: Specifications are subject to change without notice.

### General

| | |
|---|---|
| Compliance | CE; UKCA |
| Electrical safety | EN 62368-1:2024 |
| EMC (emission) | EN 55032:2015+A1:2020 |
| EMC (immunity) | EN 55035:2017+A11:2020 |
| RoHS | EN 63000:2018 |
| FCC Compliance | FCC CFR Title 47, Part 15, Subpart B |
| DGUV Vorschrift 3 | Schutzklasse III |
| Warranty | 3 years |
| Operating temperature | 0° to +50°C (+32° to +122°F) |
| Operating humidity | 10% to 90%, non-condensing |
| Cooling | Passive |

### Power

| | |
|---|---|
| Power supply option | External Power Supply |
| IEC insulation class | IEC 62368-1, Class I |
| Supported power source | 100-240 V AC; 50/60 Hz |
| Supplied power | 24V DC, 5A |
| AC power plug | Interchangeable (EU, UK, JP/US, AUS/NZ) |
| Battery cell type | BR1632A |

**UCX-2x1-HC60**

| | |
|---|---|
| Power consumption (max., measured) [1] | 137 W |
| Heat dissipation | 468 BTU/h (max) |

**SCX-2x1-HC60**

| | |
|---|---|
| Power consumption (max., measured) [1] | 137 W |
| Heat dissipation | 468 BTU/h (max) |

[1] Counting with 450mA power over the HDMI output and 100W over the USB-C port.

**UCX-2x2-H60**

| | |
|---|---|
| Power consumption (max., measured) | 10 W |
| Heat dissipation | 34 BTU/h (max) |

**UCX-4x2-HC60**

| | |
|---|---|
| Power consumption (max., calculated) [2] | 138 W |
| Heat dissipation | 471 BTU/h (max) |

**UCX-4x2-HC60D**

| | |
|---|---|
| Power consumption (max, calculated) [2] | 138 W |
| Heat dissipation | 471 BTU/h (max) |

**UCX-4x3-HC60-BD**

| | |
|---|---|
| Power consumption (max, calculated) [2] | 137.8 W |
| Heat dissipation | 471 BTU/h (max) |

**UCX-4x3-HC60**

| | |
|---|---|
| Power consumption (max) [2] | 137.3 W |
| Heat dissipation | 469 BTU/h (max) |

[2] Counting with 450mA power over the HDMI outputs and 120W over the USB-C ports.

### Enclosure

**UCX-2x1-HC60, UCX-2x2-H60, UCX-4x2-HC60, UCX-4x3-HC60, SCX-2x1-HC60**

| | |
|---|---|
| Enclosure material | 1 mm steel |
| Dimensions in mm | 246 W x 140.3 D x 26 H |
| Dimensions in inch | 9.59 W x 5.57 D x 1.01 H |
| Weight (UCX-2x1-HC60, SCX-2x1-HC60) | 895 g (1.97 lb) |
| Weight (UCX-2x2-H60) | 898 g (1.98 lb) |
| Weight (UCX-4x2-HC60) | 918 g (2.02 lb) |
| Weight (UCX-4x3-HC60) | 914 g (2.02 lb) |

**UCX-4x2-HC60D, UCX-4x3-HC60-BD**

| | |
|---|---|
| Enclosure material | 1 mm steel |
| Dimensions in mm | 271 W x 140.3 D x 26 H |
| Dimensions in inch | 10.67 W x 5.57 D x 1.02 H |
| Weight (UCX-4x2-HC60D) | 997 g (2.2 lb) |
| Weight (UCX-4x3-HC60-BD) | 970 g (2.14 lb) |

## Video Inputs

### USB-C input

| | |
|---|---|
| Connector type | 24-pole USB type C receptacle |
| AV standard | DP 1.4a |
| HDCP compliance | HDCP 1.4, HDCP 2.2 |
| Color space | RGB, YCbCr |
| Video delay | 0 frame |
| Max. video resolution | 4096x2160@60Hz RGB 4:4:4 (up to 600MHz pixel clock);<br>1920x1080@120 Hz, 36 bit |
| Audio formats | all formats in line with HDMI 2.0 standard |
| 3D support | yes |

### HDMI input

| | |
|---|---|
| Connector type | 19-pole HDMI Type A receptacle (with screw locking option) |
| AV standard | DVI 1.0, HDMI 1.4, HDMI 2.0 |
| Maximum data rate | 18Gbps |
| Maximum pixel clock | 597MHz |
| HDCP compliance | HDCP 1.4, HDCP 2.2 |
| Color space | RGB, YCbCr |
| Video delay | 0 frame |
| Max. video resolution | 4096x2160@60Hz RGB 4:4:4 (up to 600MHz pixel clock);<br>1920x1080@120 Hz, 36 bit |
| Max. input HDMI cable length (with premium certified cable) at 3840x2160@60Hz 4:4:4 | 5m |
| Reclocking | Pixel Accurate Reclocking |
| 3D support | yes |
| Audio mode | Simultaneous pass-through and de-embedding to the Audio layer |
| Supported audio formats for pass-through | All HDMI2.0 audio formats |
| Supported audio formats for de-embedding | Uncompressed |
| Compressed | Dolby Digital, DTS;<br>Compressed HBR;<br>Dolby TrueHD, DTS-HD |

## Video Outputs

### HDMI output

| | |
|---|---|
| Connector type | 19-pole HDMI Type A receptacle |
| AV standard | DVI 1.0, HDMI 1.4, HDMI 2.0 |
| HDCP compliance | HDCP 1.4, HDCP 2.2 |
| Color space | RGB, YCbCr |
| Supported resolutions at 8 bits/color * | up to 4096x2048@60Hz (4:4:4);<br>3840x2160@60Hz (4:4:4) or;<br>1920x1080@60Hz (4:4:4) up to 12 bits/color |
| Audio formats | 8 channel PCM, Dolby TrueHD;<br>DTS-HD Master Audio 7.1 |

* All standard VESA and CEA resolutions up to 300MHz (HDMI1.4) and other custom resolutions up to 300Mhz are supported.

## Audio Ports

### Analog audio output

| | |
|---|---|
| Connector type | 5-pole Phoenix connector |
| Audio formats | 2-ch PCM |
| Sampling frequency | 48 kHz |
| Volume | -95.62 dB - 0 dB |
| Balance | -100 - +100 (0 = center) |

### Dante® Audio Output Port

| | |
|---|---|
| Connector type | RJ45 female connector |
| Signal transmission | Dante® or AES67 |
| Supported channels | 2-channel stereo |
| Sampling rates | 44.1, 48, 88,2, 96 kHz |

## Control Ports

### Ethernet port

| | |
|---|---|
| Connector type | RJ45 female connector |
| Ethernet data rate | 1 Gbit/s |
| Power over Ethernet (PoE) | Not supported |

**GPIO port**

| | |
|---|---|
| Connector type | 8-pole Phoenix |
| Function (pin 1-6) | Configurable (input/output) |
| Function (pin 7) | 5V output |
| Function (pin 8) | Ground |

**OCS port**

| | |
|---|---|
| Connector type | 3-pole Reversed Gender Plug Phoenix connector |
| Number of configurable pins | 1 |
| Port direction | Input |

**USB port**

| | |
|---|---|
| Connector type | C-type receptacle |
| USB compliance | USB 3.1 Gen1 |
| Maximum supplied power | 1000mA |
| Connector type | A-type receptacle |
| USB compliance | USB 2.0 |
| Maximum supplied power | 500mA |
| Connector type | A-type receptacle |
| USB compliance | USB 3.1 Gen1 |
| Maximum supplied power | 1000mA |
| Connector type | B-type receptacle |
| USB compliance | USB 3.0 |
| Connector type | mini-B type |
| USB compliance | USB 2.0 |

**RS-232 port**

| | |
|---|---|
| Connector type | 3-pole Phoenix connector |
| Baud rates | between 9600 and 115200 baud |
| Data bits | 8 |
| Parity | None / Odd / Even |
| Stop bits | 1 / 2 |
| Output voltage: Low level | 3 to 15V |
| Output voltage: High level | -15V to - 3V |

INFO: The -LCC models have the same values as non-LCC models.

## 12.2. Port Numbering

### Audio/Video Ports

| Model name | | UCX-2x1-HC60 / SCX-2x1-HC60 | | UCX-2x2-H60 | | UCX-4x2-HC60 | | UCX-4x2-HC60D | | UCX-4x3-HC60 | | UCX-4x3-HC60-BD | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Port name | | Video port nr. | Audio port nr. | Video port nr. | Audio port nr. | Video port nr. | Audio port nr. | Video port nr. | Audio port nr. | Video port nr. | Audio port nr. | Video port nr. | Audio port nr. |
| Inputs | USB-C in 1 | I1 | I1 | - | - | I1 | I1 | I1 | I1 | I1 | I4 | I1 | I1 |
| | USB-C in 2 | - | - | - | - | I2 | I2 | I2 | I2 | I2 | I2 | I2 | I2 |
| | HDMI in 3 | I2 | I2 | I1 | I1 | I3 | I3 | I3 | I3 | I3 | I3 | I3 | I3 |
| | HDMI in 4 | - | - | I2 | I2 | I4 | I4 | I4 | I4 | I4 | I4 | I4 | I4 |
| | Welcome Screen | I5 | - | I5 | - | I5 | - | I5 | - | I5 | - | I5 | - |
| Outputs | HDMI out 1 | O1 | O1 | O1 | O1 | O1 | O1 | O1 | O1 | O1 | O1 | O1 | O1 |
| | HDMI out 2 | - | - | O2 | O2 | O2 | O2 | O2 | O2 | O2 | O2 | O2 | O2 |
| | HDMi out 3 | - | - | - | - | - | - | - | - | O3 | O3 | O3 | O3 |
| | Analog audio out | - | O2 | - | O3 | - | O3 | - | O3 | O4 | O4 | O4 | O4 |
| | Dante audio out* | - | - | - | - | - | - | - | O3 | - | - | - | O4 |

* In case of UCX-4x3-HC60-BD the Dante audio port also functions as input.

INFO: The -LCC models have the same values as non-LCC models.

### USB Ports

| Model name | | UCX-2x1-HC60 / SCX-2x1-HC60 | UCX-2x2-H60 | UCX-4x2-HC60 | UCX-4x2-HC60D | UCX-4x3-HC60 | UCX-4x3-HC60-BD |
|---|---|---|---|---|---|---|---|
| Port name | | USB port nr. | | | | | |
| Upstream Facing Ports | USB-C Host 1 | U1 | - | U1 | U1 | U1 | U1 |
| | USB-C Host 2 | - | - | U2 | U2 | U2 | U2 |
| | USB-B Host 3 | U2 | U1 | U3 | U3 | U3 | U3 |
| | USB-B/USB-C Host 4 | - | U2 | U4 | U4 | U4 | U4 |
| USB Hub/ Downstream Port | USB hub | H1 | H1 | H1 | H1 | H1 | H1 |
| | USB Device 1 | D1 | D1 | D1 | D1 | D1 | D1 |
| | USB Device 2 | D2 | D2 | D2 | D2 | D2 | D2 |
| | USB Device 3 | D3 | D3 | D3 | D3 | D3 | D3 |
| | USB Device 4 | D4 | D4 | D4 | D4 | D4 | D4 |
| | Dante audio in | - | - | - | - | - | DANTE_IN |

INFO: The -LCC models have the same values as non-LCC models.

**Ethernet Ports**

| Model name | UCX-2x1-HC60 / SCX-2x1-HC60 | UCX-2x2-H60 | UCX-4x2-HC60 | UCX-4x2-HC60D | UCX-4x3-HC60 | UCX-4x3-HC60-BD |
|---|---|---|---|---|---|---|
| **Port name** | **Ethernet port nr.** | | | | | |
| Ethernet 1 | P1 | P1 | P1 | P1 | P1 | P1 |
| Ethernet 2 | P2 | - | P2 | P2 | P2 | P2 |
| Ethernet 3 | P3 | - | P3 | P3 | P3 | P3 |
| USB-C in1 | P4 | - | P4 | P4 | P4 | P4 |
| USB-C in2 | P5 | - | P5 | P5 | P5 | P5 |

INFO: The -LCC models have the same values as non-LCC models.

**GPIO**

| Port name | Port nr. |
|---|---|
| GPIO1 | P1 |
| GPIO2 | P2 |
| GPIO3 | P3 |
| GPIO4 | P4 |
| GPIO5 | P5 |
| GPIO6 | P6 |

**OCS**

| Port name | Port nr. |
|---|---|
| OCS1 | P1 |

**RS-232 Ports**

| Port name | Port nr. | Serial over IP port nr. |
|---|---|---|
| Rs232 1 | P1 | 8001 |
| Rs232 2 | P2 | 8002 |

## 12.3. Applied Ports (Network Settings)

The following ports are necessary to pass via a network switch/firewall for a proper working between the device and the software:

| Purpose/function | Protocol | Port nr. |
|---|---|---|
| Firmware update TFTP | UDP | 69 |
| | UDP | 49990 |
| | UDP | 49995 |
| Device Discovery | UDP | 224.0.0.251:5353 |
| Remote IP | UDP | 230.76.87.82:37421 |
| SNMP daemon/agent | UDP | 161 |
| HTTP - file transfer and update API | TCP | 80 |
| HTTPS - file transfer and update API | TCP | 443 |
| LW3 control API | TCP | 6107 |

**WARNING! Enabling LARA on your device will open TCP ports 20,000 to 30,000 for service deployment. These ports will not be protected or filtered by the device's firewall, making them accessible from the device's network interfaces. Please be aware that running services on these ports could expose potential vulnerabilities on the device. Make sure to only activate services that have undergone thorough testing and do not contain any vulnerabilities.**

## 12.4. Factory EDID List

| Mem | Resolution | Type | EDID features |
|---|---|---|---|
| **F1** | 640 x 480p @ 60.00 Hz | D | DVI |
| **F2** | 848 x 480p @ 60.00 Hz | D | DVI |
| **F3** | 800 x 600p @ 60.32 Hz | D | DVI |
| **F4** | 1024 x 768p @ 60.00 Hz | D | DVI |
| **F5** | 1280 x 768p @ 50.00 Hz | D | DVI |
| **F6** | 1280 x 768p @ 59.94 Hz | D | DVI |
| **F7** | 1280 x 768p @ 75.00 Hz | D | DVI |
| **F8** | 1360 x 768p @ 60.02 Hz | D | DVI |
| **F9** | 1280 x 1024p @ 50.00 Hz | D | DVI |
| **F10** | 1280 x 1024p @ 60.02 Hz | D | DVI |
| **F11** | 1280 x 1024p @ 75.02 Hz | D | DVI |
| **F12** | 1400 x 1050p @ 50.00 Hz | D | DVI |
| **F13** | 1400 x 1050p @ 60.00 Hz | D | DVI |
| **F14** | 1400 x 1050p @ 75.00 Hz | D | DVI |
| **F15** | 1680 x 1050p @ 60.00 Hz | D | DVI |
| **F16** | 1920 x 1080p @ 50.00 Hz | D | DVI |
| **F17** | 1920 x 1080p @ 60.00 Hz | D | DVI |
| **F18** | 2048 x 1080p @ 50.00 Hz | D | DVI |
| **F19** | 2048 x 1080p @ 60.00 Hz | D | DVI |
| **F20** | 1600 x 1200p @ 50.00 Hz | D | DVI |
| **F21** | 1600 x 1200p @ 60.00 Hz | D | DVI |
| **F22** | 1920 x 1200p @ 50.00 Hz | D | DVI |
| **F23** | 1920 x 1200p @ 59.56 Hz | D | DVI |
| **F24** | 2048 x 1200p @ 59.96 Hz | D | DVI |
| **F29** | 1920 x 1080p @ 60.00 Hz | U | DVI |
| **F30** | 1440 x 480i @ 60.05 Hz | H | HDMI; YUV444; YUV422; 2CH_AUD |
| **F31** | 1440 x 576i @ 50.08 Hz | H | HDMI; YUV444; YUV422; 2CH_AUD |
| **F32** | 640 x 480p @ 59.95 Hz | H | HDMI; YUV444; YUV422; 2CH_AUD |
| **F33** | 720 x 480p @ 59.94 Hz | H | HDMI; YUV444; YUV422; 2CH_AUD |
| **F34** | 720 x 576p @ 50.00 Hz | H | HDMI; YUV444; YUV422; 2CH_AUD |
| **F35** | 1280 x 720p @ 50.00 Hz | H | HDMI; YUV444; YUV422; 2CH_AUD |
| **F36** | 1280 x 720p @ 60.00 Hz | H | HDMI; YUV444; YUV422; 2CH_AUD |
| **F37** | 1920 x 1080i @ 50.04 Hz | H | HDMI; YUV444; YUV422; 2CH_AUD |
| **F38** | 1920 x 1080i @ 50.00 Hz | H | HDMI; YUV444; YUV422; 2CH_AUD |
| **F39** | 1920 x 1080i @ 60.05 Hz | H | HDMI; YUV444; YUV422; 2CH_AUD |
| **F40** | 1920 x 1080i @ 60.05 Hz | H | HDMI; YUV444; YUV422; 2CH_AUD |
| **F41** | 1920 x 1080p @ 24.00 Hz | H | HDMI; YUV444; YUV422; 2CH_AUD |
| **F42** | 1920 x 1080p @ 25.00 Hz | H | HDMI; YUV444; YUV422; 2CH_AUD |
| **F43** | 1920 x 1080p @ 30.00 Hz | H | HDMI; YUV444; YUV422; 2CH_AUD |
| **F44** | 1920 x 1080p @ 50.00 Hz | H | HDMI; YUV444; YUV422; 2CH_AUD |
| **F45** | 1920 x 1080p @ 59.94 Hz | H | HDMI; YUV444; YUV422; 2CH_AUD |
| **F46** | 1920 x 1080p @ 60.00 Hz | H | HDMI; YUV444; YUV422; 2CH_AUD |
| **F47** | 1920 x 1080p @ 60.00 Hz | U | HDMI; YUV444; YUV422; 2CH_AUD |
| **F48** | 1920 x 1080p @ 60.00 Hz | U | HDMI; YUV444; YUV422; 8CH_AUD |
| **F49** | 1920 x 1080p @ 60.00 Hz | U | HDMI; YUV444; YUV422; DC30; DC36; YUVDC; 8CH_AUD |
| **F98** | 1280 x 720p @ 60.00 Hz | H | HDMI; YUV444; YUV422; 2CH_AUD; 3D |
| **F99** | 1920 x 1080p @ 60.00 Hz | H | HDMI; YUV444; YUV422; 2CH_AUD; 3D |
| **F100** | 1024 x 768p @ 60.00 Hz | H | HDMI; YUV444; YUV422; 2CH_AUD |
| **F101** | 1280 x 1024p @ 50.00 Hz | H | HDMI; YUV444; YUV422; 2CH_AUD |
| **F102** | 1280 x 1024p @ 60.02 Hz | H | HDMI; YUV444; YUV422; 2CH_AUD |
| **F103** | 1280 x 1024p @ 75.02 Hz | H | HDMI; YUV444; YUV422; 2CH_AUD |
| **F104** | 1600 x 1200p @ 50.00 Hz | H | HDMI; YUV444; YUV422; 2CH_AUD |
| **F105** | 1600 x 1200p @ 60.00 Hz | H | HDMI; YUV444; YUV422; 2CH_AUD |
| **F106** | 1920 x 1200p @ 59.56 Hz | H | HDMI; YUV444; YUV422; 2CH_AUD |
| **F107** | 2560 x 1440p @ 59.95 Hz | H | HDMI; YUV444; YUV422; 2CH_AUD |
| **F108** | 2560 x 1600p @ 59.86 Hz | H | HDMI; YUV444; YUV422; 2CH_AUD |
| **F109** | 3840 x 2400p @ 24.00 Hz | H | HDMI; YUV444; YUV422; 2CH_AUD |
| **F110** | 3840 x 2160p @ 24.00 Hz | H | HDMI; YUV444; YUV422; 2CH_AUD |
| **F111** | 3840 x 2160p @ 25.00 Hz | H | HDMI; YUV444; YUV422; 2CH_AUD |
| **F112** | 3840 x 2160p @ 30.00 Hz | H | HDMI; YUV444; YUV422; 2CH_AUD |

| Mem | Resolution | Type | EDID features |
|---|---|---|---|
| **F118** | 3840 x 2160p @ 30.00 Hz | U | HDMI; YUV444; YUV422; 2CH_AUD |
| **F119** | 3840 x 2160p @ 30.00 Hz | U | HDMI; YUV444; YUV422; 8CH_AUD |
| **F120** | 3840 x 2160p @ 60.00 Hz | H | HDMI; YUV444; YUV422; YUV420; 2CH_AUD |
| **F121** | 1440 x 1080p @ 59.91 Hz | H | HDMI; YUV444; YUV422; 2CH_AUD |
| **F122** | 2560 x 2048p @ 59.98 Hz | H | HDMI; YUV444; YUV422; 2CH_AUD |
| **F123** | 1280 x 800p @ 59.91 Hz | H | HDMI; YUV444; YUV422; 2CH_AUD |
| **F124** | 1440 x 900p @ 59.90 Hz | H | HDMI; YUV444; YUV422; 2CH_AUD |
| **F125** | 1366 x 768p @ 60.00 Hz | H | HDMI; YUV444; YUV422; 2CH_AUD |
| **F126** | 1600 x 900p @ 59.98 Hz | H | HDMI; YUV444; YUV422; 2CH_AUD |
| **F127** | 2048 x 1080p @ 60.00 Hz | H | HDMI; YUV444; YUV422; 2CH_AUD |
| **F128** | 2560 x 1080p @ 60.00 Hz | H | HDMI; YUV444; YUV422; 2CH_AUD |
| **F129** | 3440 x 1440p @ 24.99 Hz | H | HDMI; YUV444; YUV422; 2CH_AUD |
| **F130** | 3440 x 1440p @ 29.99 Hz | H | HDMI; YUV444; YUV422; 2CH_AUD |
| **F131** | 4096 x 2160p @ 25.00 Hz | H | HDMI; YUV444; YUV422; 2CH_AUD |
| **F132** | 4096 x 2160p @ 30.00 Hz | H | HDMI; YUV444; YUV422; 2CH_AUD |
| **F133** | 4096 x 2160p @ 60.00 Hz | 4 | HDMI; YUV444; YUV422; YUV420; 2CH_AUD |
| **F134** | 3440 x 1440p @ 23.99 Hz | H | HDMI; YUV444; YUV422; 2CH_AUD |
| **F135** | 4096 x 2160p @ 24.00 Hz | H | HDMI; YUV444; YUV422; 2CH_AUD |
| **F136** | 3840 x 2400p @ 29.99 Hz | H | HDMI; YUV444; YUV422; 2CH_AUD |
| **F137** | 3840 x 2160p @ 60.00 Hz | H | HDMI; HDMI2; YUV444; YUV422; 2CH_AUD |
| **F138** | 3840 x 2160p @ 50.00 Hz | H | HDMI; HDMI2; YUV444; YUV422; 2CH_AUD |
| **F139** | 3840 x 2160p @ 60.00 Hz | H | HDMI; HDMI2; YUV444; YUV422; YUV420; 2CH_AUD |
| **F140** | 3840 x 2160p @ 60.00 Hz | H | HDMI; HDMI2; YUV444; YUV422; YUV420; 8CH_AUD |
| **F141** | 4096 x 2160p @ 60.00 Hz | H | HDMI; HDMI2; YUV444; YUV422; 2CH_AUD |
| **F142** | 4096 x 2160p @ 50.00 Hz | H | HDMI; HDMI2; YUV444; YUV422; 2CH_AUD |
| **F143** | 4096 x 2160p @ 60.00 Hz | H | HDMI; HDMI2; YUV444; YUV422; YUV420; 2CH_AUD |
| **F144** | 4096 x 2160p @ 60.00 Hz | H | HDMI; HDMI2; YUV444; YUV422; YUV420; 8CH_AUD |
| **F145** | 2560 x 2048p @ 49.97 Hz | H | HDMI; YUV444; YUV422; 2CH_AUD |
| **F146** | 3840 x 2160p @ 60.00 Hz | H | HDMI; HDMI2; YUV420; DC30; DC36; YUVDC; YUV420_DC30; YUV420_DC36; 2CH_AUD; HDR |
| **F147** | 3840 x 2160p @ 60.00 Hz | H | HDMI; HDMI2; YUV444; YUV422; 2CH_AUD |
| **F148** | 3840 x 2160p @ 60.00 Hz | H | HDMI; HDMI2; YUV444; YUV422; 8CH_AUD |
| **F154** | 3840 x 2160p @ 60.00 Hz | H | HDMI; HDMI2; YUV444; YUV422; YUV420; DC30; DC36; YUVDC; YUV420_DC30; YUV420_DC36; 2CH_AUD; HDR |
| **F155** | 3840 x 2160p @ 60.00 Hz | H | HDMI; HDMI2; YUV444; YUV422; YUV420; DC30; DC36; YUVDC; YUV420_DC30; YUV420_DC36; 8CH_AUD; HDR |
| **F156** | 5120 x 2160p @ 30.00 Hz | 5 | HDMI; HDMI2; YUV444; YUV422; DC30; DC36; YUVDC; YUV420_DC30; YUV420_DC36; 2CH_AUD; HDR |
| **F157** | 5120 x 2160p @ 30.00 Hz | 5 | HDMI; HDMI2; YUV444; YUV422; DC30; DC36; YUVDC; YUV420_DC30; YUV420_DC36; 8CH_AUD; HDR |
| **F158** | 5120 x 2160p @ 60.00 Hz | 5 | HDMI; HDMI2; YUV420; DC30; DC36; YUVDC; YUV420_DC30; YUV420_DC36; 2CH_AUD; HDR |
| **F159** | 5120 x 2160p @ 60.00 Hz | 5 | HDMI; HDMI2; YUV420; DC30; DC36; YUVDC; YUV420_DC30; YUV420_DC36; 8CH_AUD; HDR |

**Legend**

**D:** DVI EDID

**H:** HDMI EDID

**U:** Universal EDID, supporting many standard resolutions:

- **F29:** Universal EDID for DVI signals (no audio support).
- **F47:** HDMI EDID supporting PCM audio.
- **F48:** HDMI EDID supporting all type of audio.
- **F49:** HDMI EDID supporting all type of audio and deep color.
- **F89:** Universal EDID for analog signals (no audio support).
- **F118:** HDMI EDID supporting PCM audio and 4K@30 Hz signals.
- **F119:** HDMI EDID supporting all type of audio and 4K@30 Hz signals.

**4:** 4K EDID

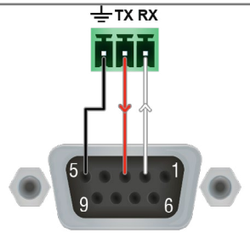
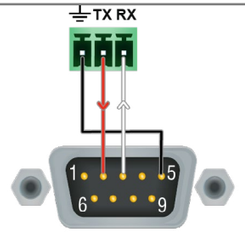
**5:** 5K EDID

Please note that minor changes in the factory EDID list may be applied in further firmware versions.

## 12.5. Cable Wiring Guide

### 12.5.1. Serial Ports

The device is built with a 3-pole Phoenix connector. See the examples below of connecting to a DCE (Data Circuit-terminating Equipment) or a DTE (Data Terminal Equipment) type device:

| Lightware device and a DCE<br>D-SUB 9 and Phoenix | Lightware device and a DTE<br>D-SUB 9 and Phoenix |
|---|---|
| <br>2: TX data<br>3: RX data<br>5: Ground | <br>2: RX data<br>3: TX data<br>5: Ground |

### 12.5.2. Audio Ports

Inputs and outputs of audio devices are symmetric or asymmetric. The main advantage of the symmetric lines is the better protection against the noise, therefore they are widely used in the professional audio industry. Symmetric audio is most often referred to as balanced audio, as opposed to asymmetric, which is referred to as unbalanced audio. Lightware products are usually built with 5-pole Phoenix connectors, so we would like to help users assembling their own audio cables. See the most common cases below.

**ATTENTION:** Symmetric and asymmetric lines can be linked with passive accessories (e.g. special cables), but in this case half of the line level is lost.

**ATTENTION:** There are numerous types of regularly used connector and cable types to connect audio devices. Please always make sure that a connector or cable fits your system before use.

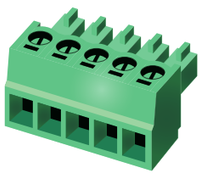
**ATTENTION:** Never join the phase-inverted (negative, cold or -) poles (either right or left) to the ground or to each other on the output side, as this can damage the unit.

INFO: Use a galvanic isolation in case of a ground loop.

**The Pinout of the 5-pole Phoenix Connector**

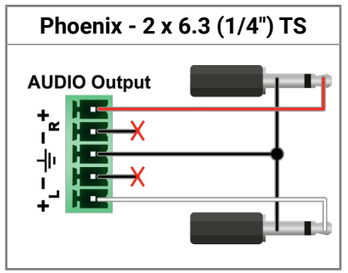


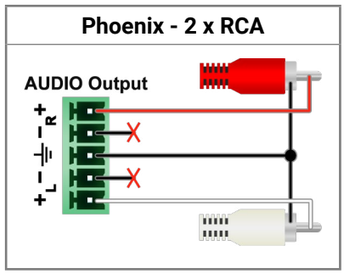

| Pin nr. | Signal |
|---|---|
| 1 | Left+ |
| 2 | Left- |
| 3 | Ground |
| 4 | Right- |
| 5 | Right+ |

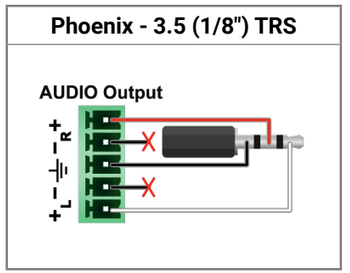


Compatible Plug Type: Phoenix® Combicon series (3.5mm pitch, 5-pole), type: MC 1.5/5-ST-3.5.

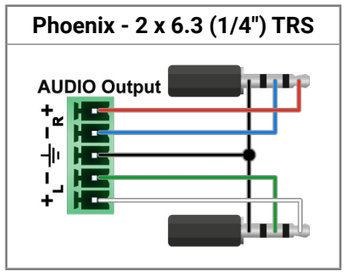
**From Balanced Output to Unbalanced Input**

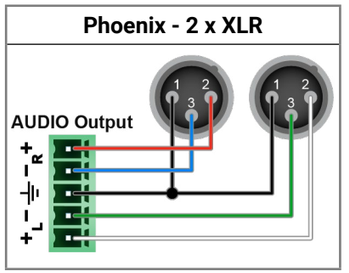


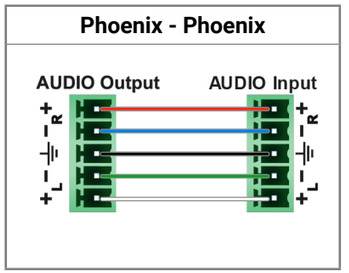




**From Balanced Output to Balanced Input**

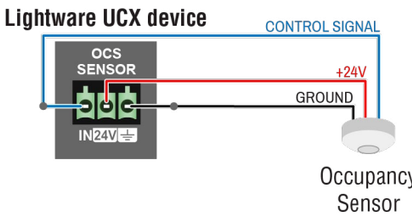



### 12.5.3. OCS Sensor

The switcher is supplied with a 3.81mm 3-pole 90° Reversed Gender Plug Phoenix® connector, which is used for connecting an occupancy sensor. The figure below is an example about how to connect a Leviton OCS10-M0W device.

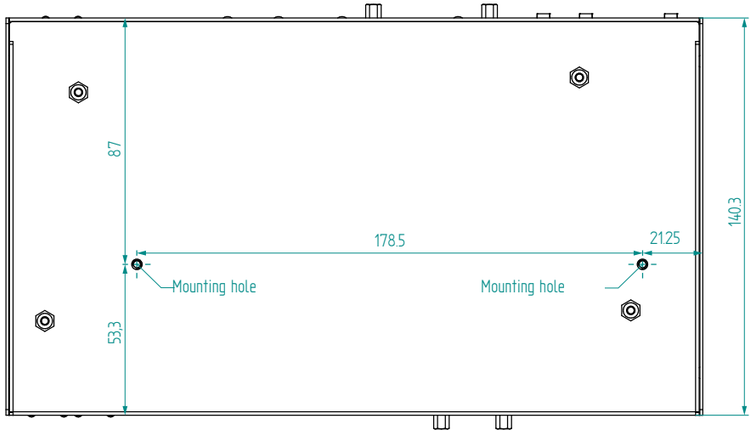


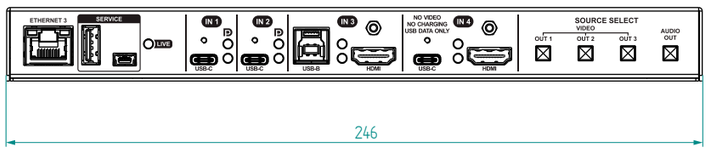
## 12.6. Mechanical Drawings

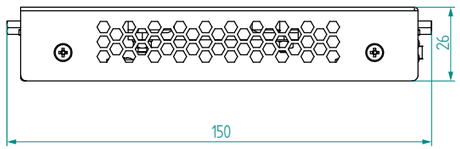
INFO: UCX-2x1-HC60, UCX-2x2-H60, UCX-4x2-HC60, UCX-4x3-HC60 and SCX-2x1-HC60 models have the same size. Dimensions are in mm.

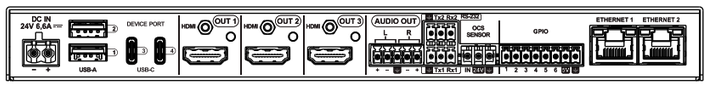
INFO: The -LCC models have the same values as non-LCC models.

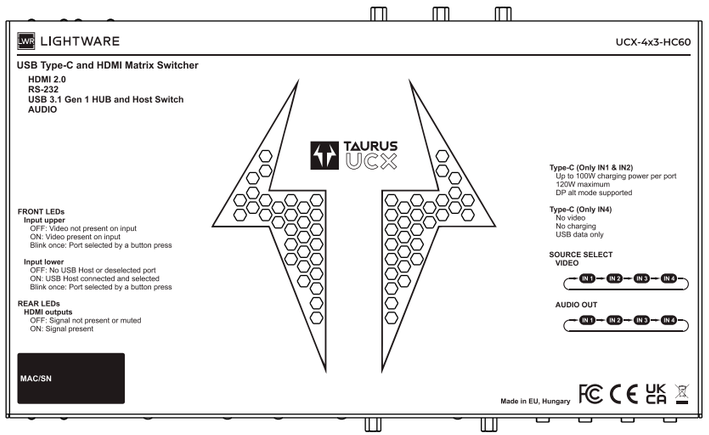
**UCX-2x1-HC60, UCX-2x2-H60, UCX-4x2-HC60, UCX-4x3-HC60 models**



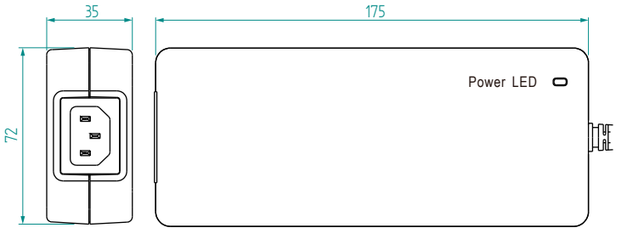



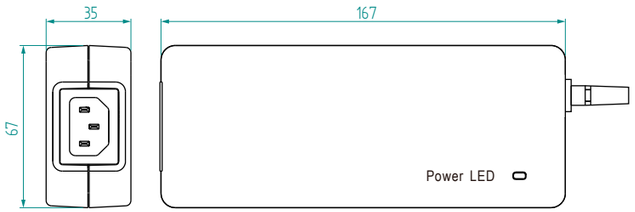




**PSU-24VP3-160 (160W PSU for UCX-2x1-HC60, UCX-4x2-HC60, UCX-4x3-HC60, SCX-2x1-HC60)**




**PSU-24VP3-120 (120W PSU for UCX-2x2-H60)**

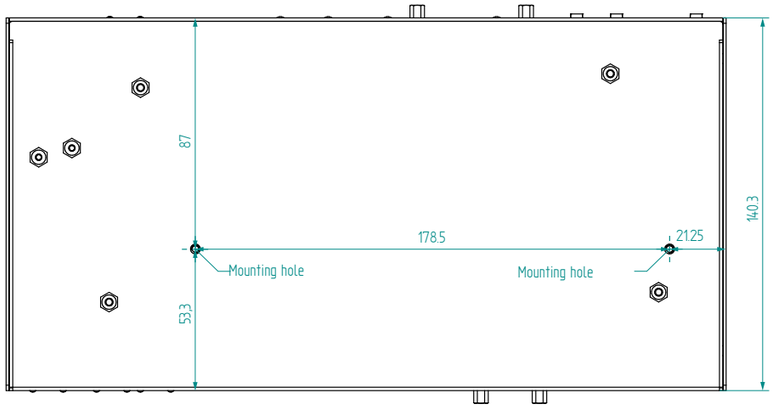


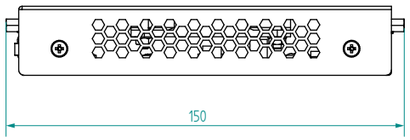
## UCX-4x2-HC60D and UCX-4x3-HC60-BD models

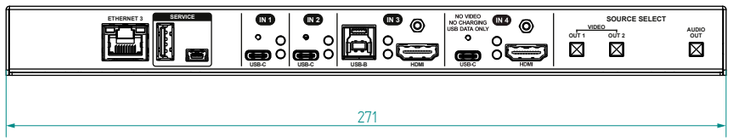
INFO: UCX-4x2-HC60D and UCX-4x3-HC60-BD models have the same size. Dimensions are in mm.

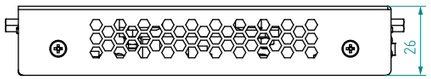
INFO: The -LCC models have the same values as non-LCC models.

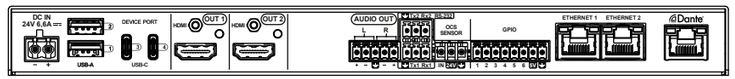
### UCX-4x2-HC60D, UCX-4x3-HC60-BD models

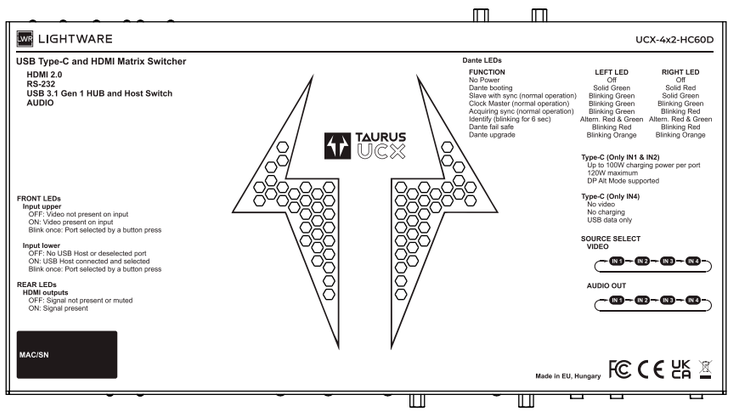


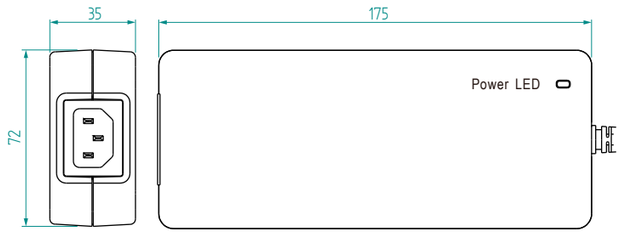




### PSU-24VP3-160 (160W PSU for UCX-4x2-HC60D, UCX-4x3-HC60-BD)



## 12.7. Content of the Backup File

The backup file contains numerous settings and parameters saved from the device. When the file is uploaded to a device, the following will be overwritten:

| Audio / Video crosspoint settings |
|---|
| Mute state, Lock state, Crosspoint state |
| Autoselection (mode, port priority) |
| **USB ports** |
| Port name, Port type, Lock state, Crosspoint state, Power +5V mode |
| Autoselection (mode, port piority) |
| Lane management status, DisplayPort Alternate Mode policy, Power role setting, Power limit |
| USB-C video parameters (HDCP mode, Output signal type, Embedded audio mute state, Power +5V mode) |
| **HDMI input ports** |
| Video port name, Audio port name, HDCP setting |
| **HDMI output ports** |
| Port name, HDCP mode, HDMI mode, Power +5V mode |
| **Analog audio port** |
| Port name, Volume, Balance |
| **Local serial port** |
| Port name, RS-232 mode, Control protocol, Baud rate, Data bits, Stop bits, Parity |
| **GPIO port** |
| Port name, Direction, Level |
| **OCS port** |
| Sensor type, Port name |
| **Network settings** |
| Port name, Port status. PHY (speed and duplexity) mode |
| HTTP/HTTPS port status, HTTP/HTTPS Authentication status |
| LW3 port status, Serial port status |
| LARA full configuration* |
| **Further settings** |
| Control lock status, Device label, Dark mode state, Dark mode delay |
| User EDID data (U1-U100), Emulated EDIDs by ports |
| Welcome screen status, Welcome screen parameters |
| Power supply output power limit |

* SXC-2x1-HC60 does not support LARA.

## 12.8. LARA Package Compatibility by Firmware

With the introduction of LARALone packages that allows users to install a different LARA package on the UCX device than the one built into the firmware package, it is important to keep track of the minimum firmware and LARA package compatibilities for proper operation.

| LARA FW | First UCX-HC60 FW that supports it |
|---|---|
| v1.3.1 | v2.20.1b12 |
| v1.3.2 | v2.20.2b2 |

**DIFFERENCE:** SCX-2x1-HC60 does not support LARA.

## 12.9. Factory Default Settings

| Parameter | UCX-4x2-HC60(D) | UCX-2x1-HC60 / SCX-2x1-HC60 | UCX-2x2-H60 | UCX-4x3-HC60(-BD) |
|---|---|---|---|---|
| **Video port settings** | | | | |
| Connected source (O1/O2/O3) | I1/I3/- | I1/-/- | I1/I2/- | I1/I2/I3 |
| Allowed HDCP Version (I1/I2/I3/I4) | 1.4/1.4/2.2/2.2 | 2.2/2.2/-/- | 2.2/2.2/-/- | 1.4/1.4/2.2/2.2 |
| Hotplug detect mode (HPD) at input ports | auto | auto | auto | auto |
| Display Welcome Screen Image | true | true | true | true |
| Display Welcome Screen Message | false | false | false | false |
| Output 5V mode / signal type | on / auto | on / auto | on / auto | on / auto |
| Output HDCP mode | auto | auto | auto | auto |
| Video autoselect | disabled | | | |
| Emulated EDID | Factory #47: Universal HDMI PCM | | | |
| **Analog audio output port settings** | | | | |
| Volume | 0 dB, 100% | | | |
| Balance | 0 (center) | | | |
| **Network settings** | | | | |
| Factory default IP address mode | DHCP | | | |
| Static IP address | 192.168.0.100 | | | |
| Static network mask | 255.255.255.0 | | | |
| Static gateway address | 192.168.0.1 | | | |
| Hostname | lightware-<serialno> | | | |
| LW3 protocol | enabled | | | |
| HTTP, HTTPS | HTTP disabled, HTTPS enabled | | | |
| HTTP, HTTPS authentication | enabled | | | |
| Authentication setting (user/password) | admin/<unique_default_pw> | | | |
| VLAN preset | Transparent | | | |

| USB port settings | | | | |
|---|---|---|---|---|
| USB-C Power settings | 60 W Reserved, Allocation mode auto | 100 W Reserved, Allocation mode static | - | 60 W Reserved, Allocation mode auto |
| DP Alternate Mode Policy | auto | | - | auto |
| Port Power Role | dual Role | | - | dual Role |
| Autoselect | follow video O1 | | - | follow video O1 |
| D1-D4 Power 5V Mode | auto | | - | auto |
| **RS-232 port settings** | | | | |
| RS-232 port | 9600 BAUD, 8, N, 1 | | | |
| RS-232 serial over IP | enabled | | | |
| **GPIO port settings** | | | | |
| Output level | low | | | |
| Direction | input | | | |
| **Occupancy sensor** | | | | |
| Sensor type | active high | | | |
| **Miscellaneous** | | | | |
| Control lock | disabled | | | |
| Dark mode | disabled | | | |
| Automatic fan control | enabled | | | |
| User EDID memory | empty | | | |
| LARA* | enabled | | | |

INFO: The -LCC models have the same values as non-LCC models.

* SCX-2x1-HC60 doesnot support LARA.

## 12.10. Firmware Release Notes

The list below shows the released firmware packages with important notes.

**v2.23.0b4**

Release date: 2026-09-21

**New feature:**

- New variant: SCX-2x1-HC60 is supported now.
- Added integrated SNMPv3 support on UCX devices to improve remote monitoring and network management capabilities.
- Major LARA update: LARA 2.0.7. integration. Detailed change log is available on the LARA portal.

**Bugfix:**

- A critical security vulnerability in the firmware update REST API that could allow arbitrary code execution has been closed.
- Resolved a regression that prevented factory reset using the device's physical button.
- Fixed: Remote Syslog messages configured for RFC 3164 now include the mandatory PRI field, producing valid syslog messages. The remote syslog API endpoint naming was also corrected to use LogFormat instead of SyslogFormat.
- Resolved potential display noise and visual artifact issues occurring upon USB-C DisplayPort Alternate Mode disconnection.
- Fixed an issue where LARA upgrade could fail after installing a new LARA version, preventing module creation on the latest firmware.

**v2.22.12b2**

Release date: 2026-05-20

**New feature:**

- HC60 devices now support the Google Meet Hardware Peripheral Firmware Updater, enabling firmware updates directly through the Google Meet ecosystem. This integration simplifies maintenance and centralises firmware management for enterprise meeting room deployments.
- Changed to FIPS 140_3
- Fixed an issue where disconnecting a USB-C DP Alt Mode input could cause visual artifacts or frozen corrupted frames on downstream displays.
- This release introduces partial factory reset behaviour for the device. The reset process clears selected device configuration data while intentionally preserving local user credentials and password history. This allows users to restore parts of the device configuration without removing authentication-related information, helping maintain access continuity after the reset.

**v2.22.3b1**

Release date: 2026-04-07

**New feature:**

- Google Meet firmware update integration

**v2.21.0b8**

Release date: 2026-02-23

**New feature:**

- Introducing LARALone: LARA now supports independent upgrade and downgrade processes, separate from the device firmware.

**Bugfix:**

- Resolved a critical issue where Welcome Screen initialization could fail.

**Known issue:**

- I2C busy messages in the logs, highlighting VMR7100 communication is under investigation. Planned to be fixed in the next release.

**v2.20.2b2**

Release date: 2025-11-17

**New feature:**

- LARA version upgrade to 1.3.2. For detailed LARA changelog follow: https://go.lightware.com/lara-release-note-v1.3.2.

**Bugfix:**

- Critical fixes to the LARA integration to maintain proper handling of existing LARA configurations and support for HC60 drivers.

**v2.20.1b12**

Release date: 2025-11-03

**New feature:**

- Initial firmware version of the UCX HC60 product family.

## 12.11. Hashtag Keyword List

This user manual contains keywords with hashtags (#) to help you find the relevant information as quick as possible.

The format of the keywords is the following:

#<keyword>

The usage of the keywords: use the **Search** function (Ctrl+F / Cmd+F) of your PDF reader application, type the **#** (hashtag) character and the wished keyword.

The #new special keyword indicates a new feature/function that has just appeared in the latest firmware or software version.

**Example**

*#dhcp*

This keyword is placed at the DHCP (dynamic IP address) setting in the front panel operation, the Lightware Device Controller (LDC) and the LW3 programmer's reference section.

The following list contains all hashtag keywords placed in the document with a short description belonging to them. The list is in **alphabetical order** by the hashtag keywords.

| Hashtag Keyword | Description |
|---|---|
| *#advancedview* | Advanced view / Terminal window |
| *#alternatemode* | Displayport Alternate mode settings |
| *#analogaudio* | Analog audio related settings |
| *#authentication* | Authentication settings |
| *#autoselect* | Autoselect feature settings |
| *#balance* | Balance (for analog audio) setting |
| *#buttonlock* | Front panel button lock setting |
| *#cablediagnostics* | Cable diagnostics tool in LDC |
| *#cec* | CEC-related settings |
| *#crosspoint* | Crosspoint switch setting |
| *#devicelabel* | Device label |
| *#dhcp* | Dynamic IP address (DHCP) setting |
| *#diagnostic* | Failure diagnostic related tool/information |
| *#displayportalternatemode* | Displayport Alternate mode settings |
| *#dpaltmode* | Displayport Alternate mode settings |
| *#dualscreen* | Settings for multiple displays |
| *#edid* | EDID related settings |
| *#factory* | Factory default settings |
| *#fips* | FIPS related information |
| *#firmwareversion* | Firmware version query |
| *#framedetector* | Frame detector in LDC |
| *#hdcp* | HDCP-encryption related setting |
| *#http* | Http-related settings |
| *#https* | Https-related settings |
| *#ipaddress* | IP address related settings |
| *#label* | Device label |
| *#lock* | Port lock setting |
| *#lockbutton* | Front panel button lock setting |
| *#log* | System log |
| *#mute* | Port mute setting |
| *#network* | Network (IP address) related settings |
| *#password* | Password setting |
| *#portstatus* | Source/destination port status query |
| *#power* | Power sending settings |
| *#producttype* | Product type query |
| *#reboot / #restart* | Restarting the device |
| *#rs232 / #rs-232* | RS-232 related settings |
| *#security* | Network security settings |
| *#serial* | RS-232 related settings |
| *#serialnumber* | Serial number query |
| *#signaltype* | HDMI/DVI signal type setting |
| *#status* | Status query |
| *#switch* | Crosspoint switch setting |
| *#systemlog* | System log |
| *#terminal* | Advanced view / Terminal window |
| *#testpattern* | Test pattern (no sync screen) settings |
| *#unlock* | Port unlock setting |
| *#unmute* | Port unmute setting |
| *#usb* | USB 2.0 interface-related settings |
| *#usbc* | USB-C interface-related settings |
| *#volume* | Volume (for analog audio) setting |
| *#welcomescreen* | Welcome screen settings |

## 12.12. Further Document Information

### Symbol Legend

The following symbols and markings are used in the document:

**WARNING! Safety-related information that is highly recommended to read and keep in every case!**

**ATTENTION:** Useful information for performing a successful procedure; it is recommended to read.

**DIFFERENCE:** Feature or function that is available with a specific firmware/hardware version or product variant.

INFO: A notice, which contains additional information. Procedure can be successful without reading it.

DEFINITION: The short description of a feature or a function.

TIPS AND TRICKS: Ideas that you may have not known yet, but can be useful.

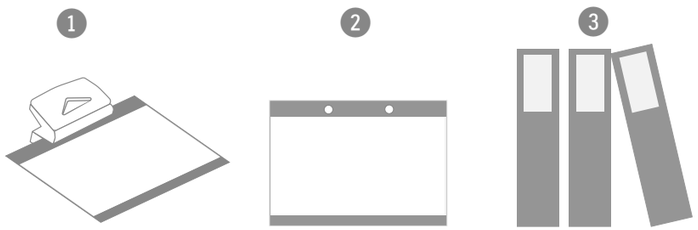
### Navigation Buttons

| Buttons in the PDF version | | Buttons in the HTML version | |
|---|---|---|---|
|  | Navigate to the **Table of Contents**. |  | Open the main **Table of Contents**. |
|  | Go back to the **previous page**. If you clicked on a link previously, you can go back to the source page by pressing the button. |  | Navigate to the **Online User Manuals** webpage. |
|  | Navigate to the **Bookmark page**. |  | Navigate to the **Bookmark page** in this User Manual. |
|  | Visit www.lightware.com. |  | Download the **PDF version** of the User Manual. |

### About Printing

Lightware Visual Engineering supports green technologies and eco-friendly mentality. Thus, this document is made primarily for digital usage.
If you need to print out a few pages for any reason, follow the recommended printing settings:

- Page size: A4
- Output size: Fit to page or Match page size
- Orientation: Landscape




TIPS AND TRICKS: Thanks to the size of the original page, a border around the content (gray on the second picture below) makes it possible to organize the pages better. After punching holes in the printed pages, they can easily be placed into a ring folder.

## 12.13. Limited Warranty Statement

1. Lightware Visual Engineering PLC (Lightware) warrants to all trade and end user customers that any Lightware product purchased will be free from manufacturing defects in both material and workmanship for three (3) years from purchase unless stated otherwise below. The warranty period will begin on the latest possible date where proof of purchase/delivery can be provided by the customer. In the event that no proof can be provided (empty 'Date of purchase' field or a copy of invoice), the warranty period will begin from the point of delivery from Lightware.

1.1. 25G and MODEX product series will be subject to a seven (7) year warranty period under the same terms as outlined in this document.

1.2. If during the first three (3) months of purchase, the customer is unhappy with any aspect of a Lightware product, Lightware will accept a return for full credit.

1.3. Any product that fails in the first six (6) months of the warranty period will automatically be eligible for replacement and advanced replacement where available. Any replacements provided will be warranted for the remainder of the original unit's warranty period.

1.4. Product failures from six (6) months to the end of the warranty period will either be repaired or replaced at the discretion of Lightware. If Lightware chooses to replace the product, then the replacement will be warranted for the remainder of the original unit's warranty period.

2. The above-stated warranty and procedures will not apply to any product that has been:

2.1. Modified, repaired or altered by anyone other than a certified Lightware engineer unless expressly agreed beforehand.

2.2. Used in any application other than that for which it was intended.

2.3. Subjected to any mechanical or electrical abuse or accidental damage.

2.4. Any costs incurred for repair/replacement of goods that fall into the categories above (2.1., 2.2., 2.3.) will be borne by the customer at a pre-agreed figure.

3. All products to be returned to Lightware require a return material authorization number (RMA) prior to shipment, and this number must be clearly marked on the box. If an RMA number is not obtained or is not clearly marked on the box, Lightware will refuse the shipment.

3.1. The customer will be responsible for in-bound, and Lightware will be responsible for out-bound shipping costs.

3.2. Newly repaired or replaced products will be warranted to the end of the originally purchased product's warranty period.