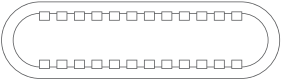


visual engineering
LIGHTWARE

USB-C 
CABLE TEST GUIDE

Test guide for Lightware UCX and Full-Featured Type-C cables

Test Result Summary Table

Cable	USB2.0 enumeration	USB3.x enumeration	Power delivery	DisplayPort Alt mode	Ethernet
CAB-USBC-T100A	✓	✓	✓	✓	✓
CAB-USBC-T200A	✓	✓	✓	✓	✓
CAB-USBC-T300A	✓	✓	✓	✓	✓
Lanberg CA-CMCM-31CU-0030-BK	✓	✓	✓	✗	✓
Apple USB-C Charge Cable	✓	✗	✓	✗	✓

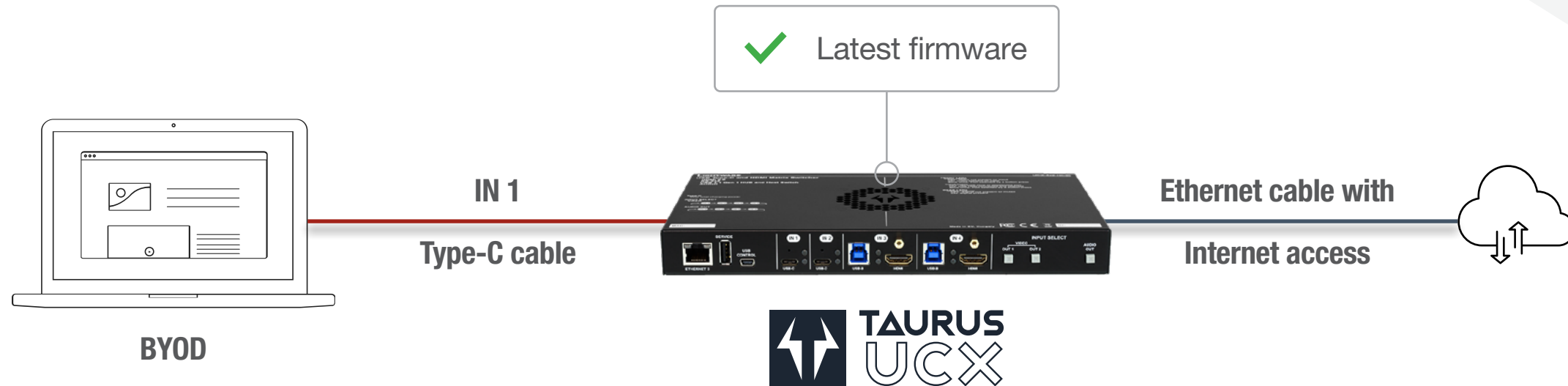
Please record the host computer brand, type, chipset, operational system and video card type e.g. **Apple Macbook Air M1 16GB macOS Big Sur 11.5.2**



Result: ✓ / ✗



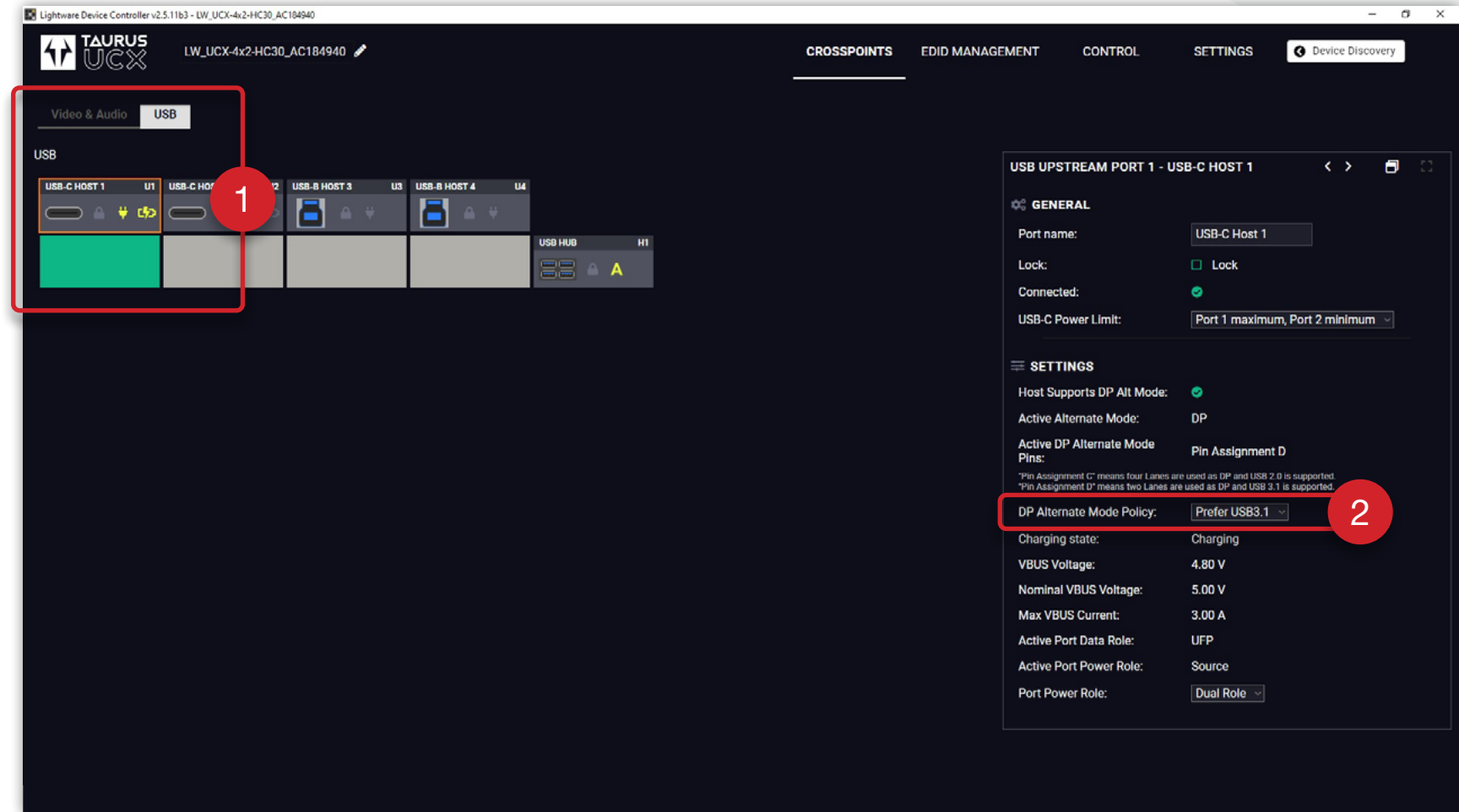
Preparation and Wiring Diagram



- ✓ Connect the BYOD's USB-C connector directly (no HUB or docking station) to UCX
- ✓ For BYOD on Windows, install the USB Device Tree Viewer utility:
https://www.uwe-sieber.de/files/UsbTreeView_x64.zip
- ✓ For BYOD on macOS, it is not necessary to install a utility
- ✓ Connect to UCX with Lightware Device Controller. Use the latest version.

Preparation for Testing USB 2.0 and USB 3.x Enumeration

- ✓ (1) By clicking on the USB-C HOST 1 icon in USB crosspoint tab results that USB Upstream Port 1 properties window opens
- ✓ (2) Set the DisplayPort Alternate Mode to Prefer USB 3.1



Testing USB2.0 Enumeration on Windows BYOD

- ✓ Open on Windows BYOD the USB Device Tree Viewer utility
- ✓ **(1)** Locate the UCX USB2.0 HUB
Name: Generic USB 2.1 HUB
Vendor ID: 0x04B4
(Cypress Semiconductor)
- ✓ **(2)** If the hub is visible and the Device Connection Speed is High-Speed, **USB 2.0 enumeration works** ✓

The screenshot shows the USB Device Tree Viewer V3.5.1 interface. On the left, a tree view shows the USB hierarchy. A red box highlights a 'Generic USB 2.1 Hub' under a 'USB Root Hub (USB 3.0)'. A callout box points to it with the text 'The USB2.0 HUB of UCX'. On the right, the properties pane shows details for 'USB Port3'. Two red circles with numbers 1 and 2 highlight the 'Vendor ID: 0x04B4 (Cypress Semiconductor)' and 'Device Connection Speed: High-Speed' respectively. Below the screenshot is a Windows logo.

```
----- USB Port3 -----
Connection Status      : 0x01 (Device is connected)
Port Chain             : 2-1-3
----- Summary -----
Vendor ID              : 0x04B4 (Cypress Semiconductor)
Product ID             : 0x6506
USB version            : 2.10
Port maximum Speed    : High-Speed
Device maximum Speed  : SuperSpeed
Device Connection Speed : High-Speed
Self Powered          : yes
Demanded Current      : 0 mA
Used Endpoints        : 2
----- USB Hub -----
+++++ Device Information +++++
Device Description    : Generic USB Hub
Device Path           : \\?\USB\VID_04B4&PID_6506&MSFT20123456789A#{f18a0e88-c30c-11d0-8815-0
Kernel Name          : \Device\USBPDO-7
Device ID            : USB\VID_04B4&PID_6506\MSFT20123456789A
Hardware IDs         : USB\VID_04B4&PID_6506&REV_5000 USB\VID_04B4&PID_6506
Driver KeyName       : {36fc9e60-c465-11cf-8056-444553540000}\0009 (GUID_DEVCLASS_USB)
Driver               : \SystemRoot\System32\drivers\UsbHub3.sys (Version: 10.0.19041.964 Da
Driver Inf           : C:\WINDOWS\inf\usbhub3.inf
Legacy BusType       : PNPBus
Class                : USB
Class GUID           : {36fc9e60-c465-11cf-8056-444553540000} (GUID_DEVCLASS_USB)
Service              : USBHUB3
Enumerator           : USB
Location Info        : Port_#0003.Hub_#0003
Location IDs         : PCIROOT(0)#PCI(1C04)#PCI(0000)#PCI(0200)#PCI(0000)#USBROOT(0)#USB(1)#
Container ID         : {708e857d-a10c-11eb-93fd-806e6f6e6963}
Manufacturer Info    : (Standard USB HUBs)
Capabilities         : 0x90 (UniqueID, SurpriseRemovalOK)
Status               : 0x0180200A (DN_DRIVER_LOADED, DN_STARTED, DN_DISABLEABLE, DN_NT_ENUME
Problem Code         : 0
Address              : 3
```



Testing USB3.x Enumeration on Windows BYOD

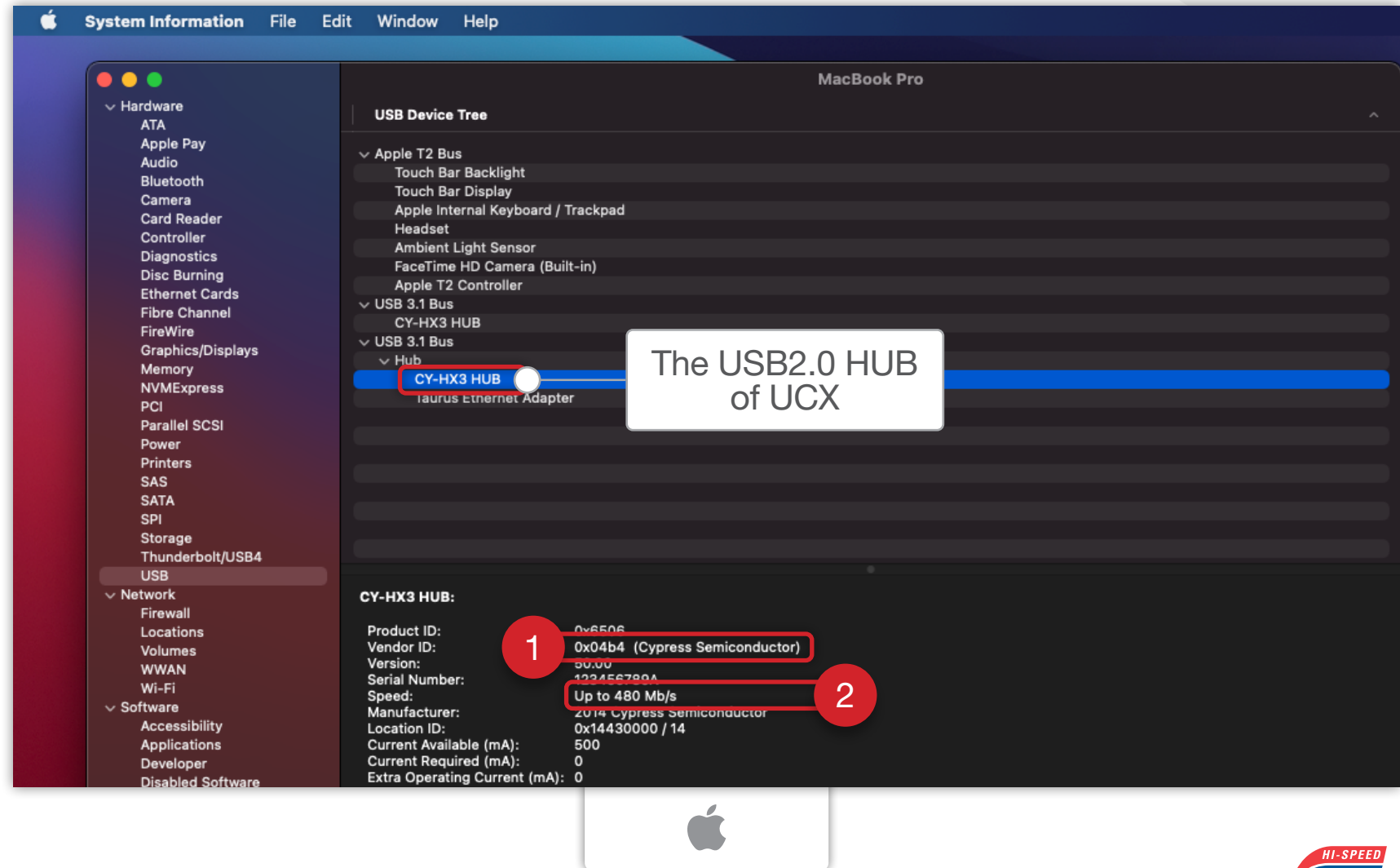
- ✓ Open on Windows BYOD the USB Device Tree Viewer utility
- ✓ **(1)** Locate the UCX USB3.x HUB
Name: Generic SuperSpeed USB HUB
Vendor ID: 0x04B4
(Cypress Semiconductor)
- ✓ **(2)** If the hub is visible and the Device Connection Speed is SuperSpeed, **USB3.x enumeration works** ✓

The screenshot shows the USB Device Tree Viewer V3.5.1 interface. On the left, a tree view shows the system's USB hierarchy. Under 'My Computer', there are two 'Intel(R) USB 3.1 eXtensible Host Controller - 1.10 (Microsoft)' entries. The first one is expanded to show a 'USB Root Hub (USB 3.0)'. Under this hub, there are 18 ports. Port 10 is an 'Intel(R) Wireless Bluetooth(R)'. Port 3 is a 'Generic SuperSpeed USB Hub', which is highlighted with a red box and a callout box that says 'The USB3.x HUB of UCX'. Below the tree view, there are two more 'Intel(R) USB 3.1 eXtensible Host Controller' entries, each with its own 'USB Root Hub (USB 3.0)'. The second root hub is expanded to show a 'Generic USB 2.0 Hub' and a 'Generic USB 2.1 Hub'. The 'Generic USB 2.1 Hub' is expanded to show four ports, with Port 3 being a 'Generic SuperSpeed USB Hub', also highlighted with a red box. On the right side of the window, the properties for the selected 'Generic SuperSpeed USB Hub' are displayed. The 'Device Connection Speed' is 'SuperSpeed', and the 'Vendor ID' is '0x04B4 (Cypress Semiconductor)'. Two red circles with numbers 1 and 2 are placed over the 'Vendor ID' and 'Device Connection Speed' fields respectively. Below the screenshot, there is a Windows logo and the text 'Windows'.



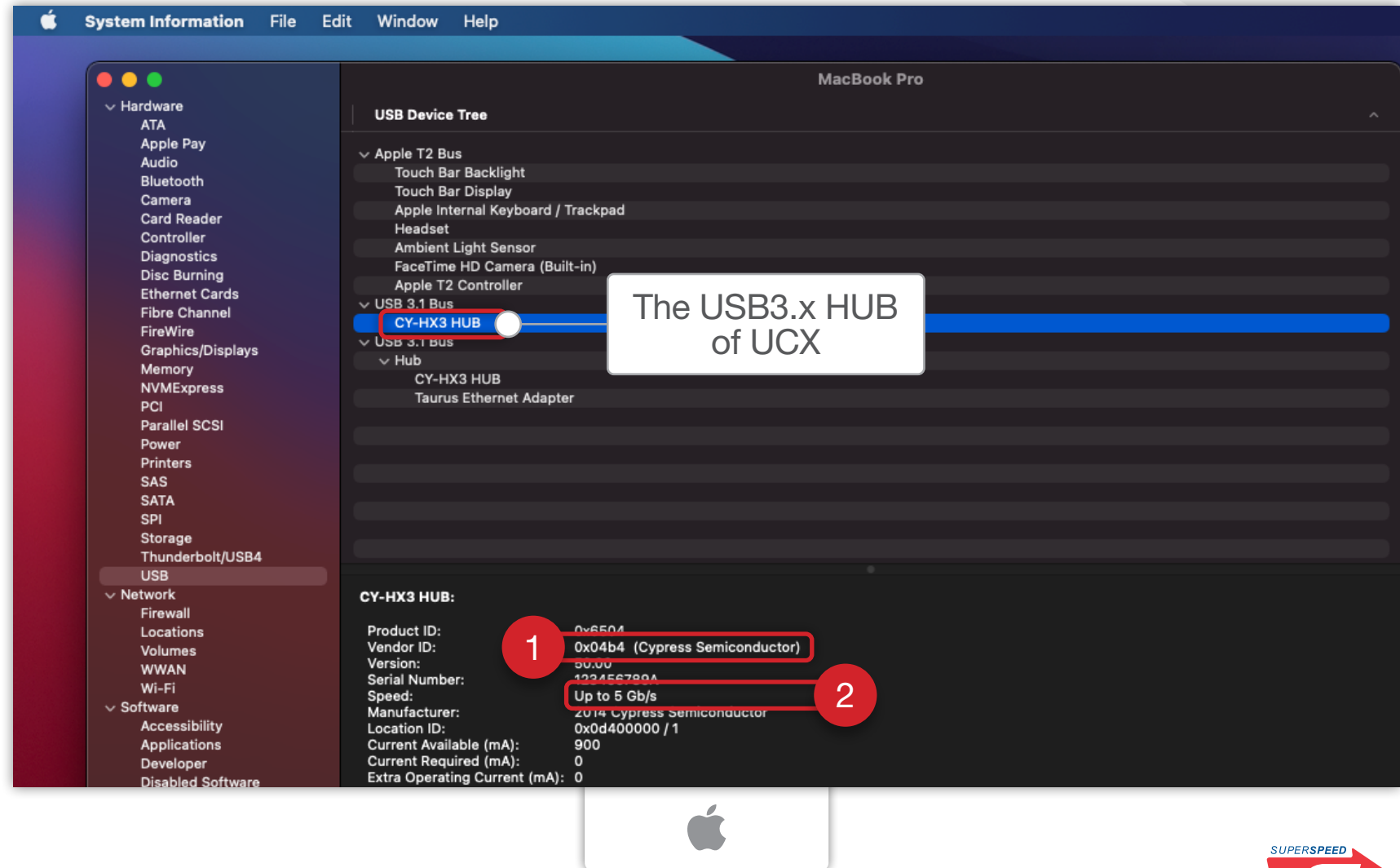
Testing USB2.0 Enumeration on macOS BYOD

- ✓ Open on macOS BYOD the USB Device Tree utility (Apple logo/About this Mac/System Report/Hardware/USB)
- ✓ **(1)** Locate the UCX USB2.0 HUB
Name: CY-HX3 HUB
Vendor ID: 0x04B4
(Cypress Semiconductor)
- ✓ **(2)** If the hub is visible and the Speed is Up to 480 Mb/s, **USB2.0 enumeration works** ✓



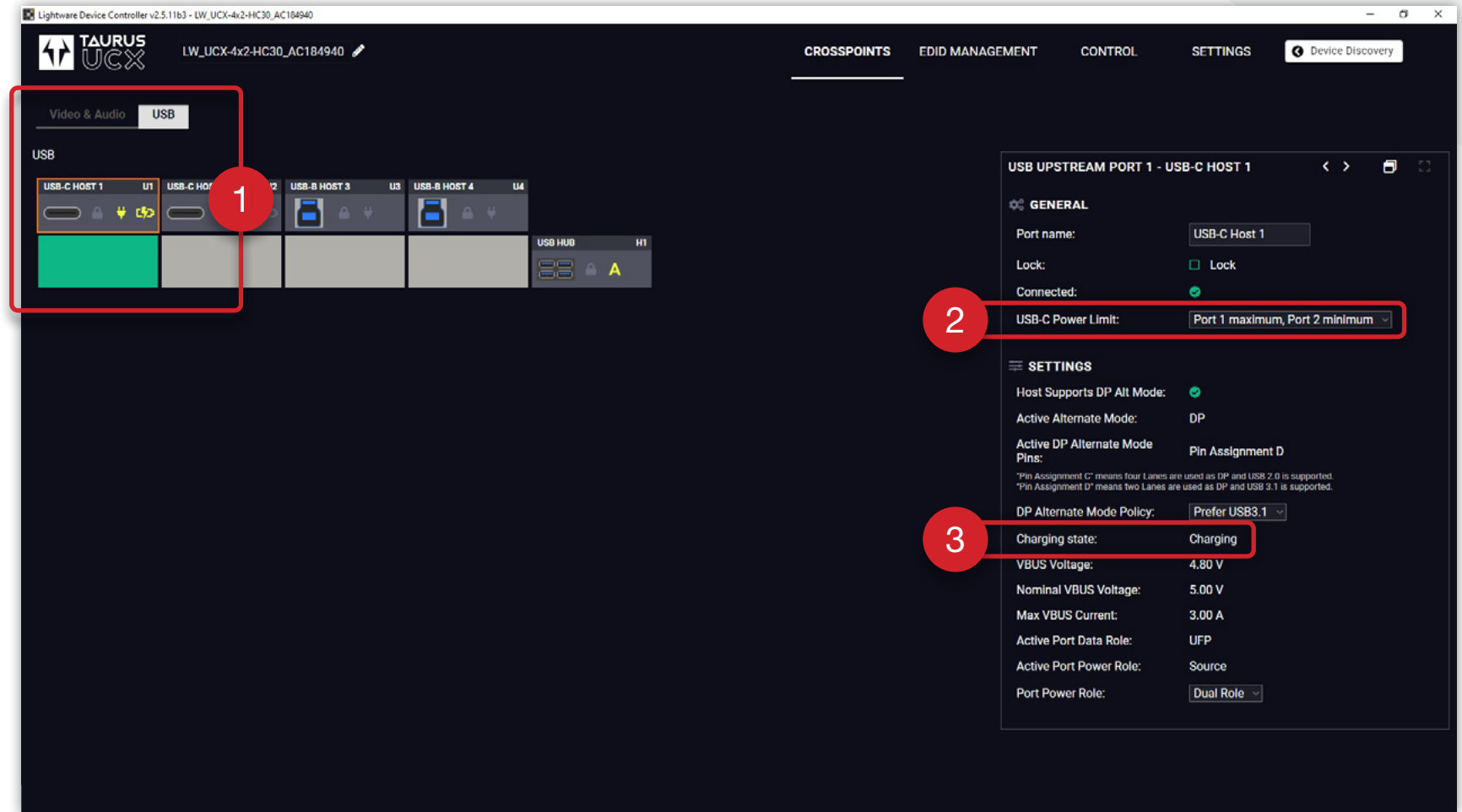
Testing USB3.x Enumeration on macOS BYOD

- ✓ Open on macOS BYOD the USB Device Tree utility (Apple logo/About this Mac/System Report/Hardware/USB)
- ✓ **(1)** Locate the UCX USB 3.x HUB
Name: CY-HX3 HUB
Vendor ID: 0x04B4
(Cypress Semiconductor)
- ✓ **(2)** If the hub is visible and the Speed is Up to 5 Gb/s, **USB3.x enumeration works** ✓



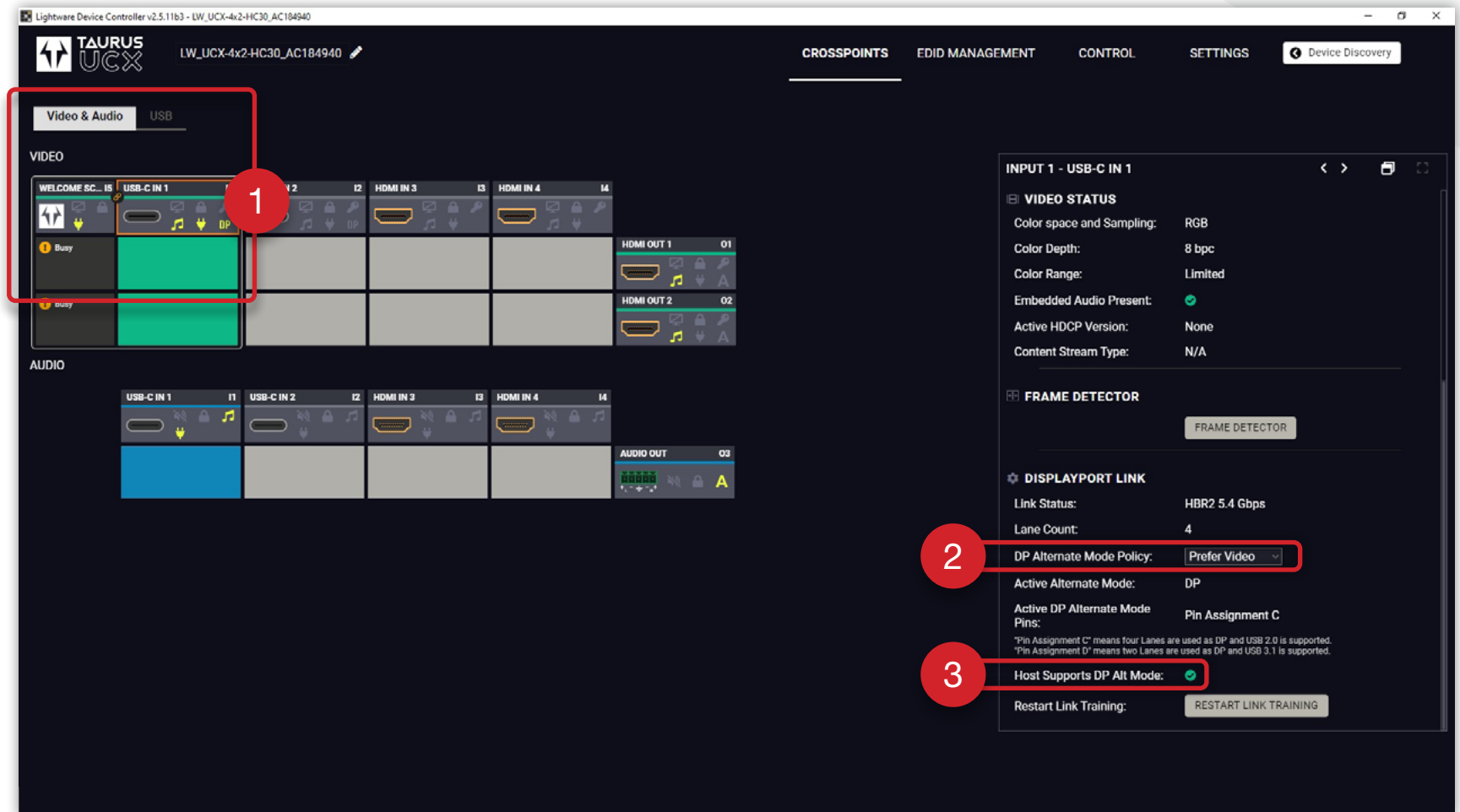
Testing Power Delivery

- ✓ (1) Clicking on the USB-C HOST 1 icon in USB crosspoint tab results that USB Upstream Port 1 properties window opens
- ✓ (2) Set the USB-C Power Limit to Port 1 maximum, Port 2 minimum
- ✓ (3) If the Charging states shows Charging, **Power Delivery works** ✓



Preparation for Testing 4 Lane DisplayPort Alternate mode

- ✓ (1) Clicking on the USB-C IN 1 icon in Video crosspoint tab results that Input 1 port properties window opens
- ✓ (2) Set the DP Alternate Mode Policy to Prefer Video
- ✓ (3) Check the status of the Host Supports DP Alt Mode



If the status is ✓ BYOD is suitable for testing DP Alt mode

If the status is ✗ BYOD is non-suitable for testing the DP Alt mode

Preparation for Testing 4 Lane DisplayPort Alternate mode

- ✓ Set the F137 factory EDID to E1 (USB-C in 1) in EDID management tab

In case BYOD does not support the 3840x2160p60Hz, use F119 EDID (3840x2160p30Hz) or F47 EDID (1920x1080p60Hz)

The screenshot shows the 'EDID MANAGEMENT' tab in the 'Emulated' section. The table below lists the EDID entries:

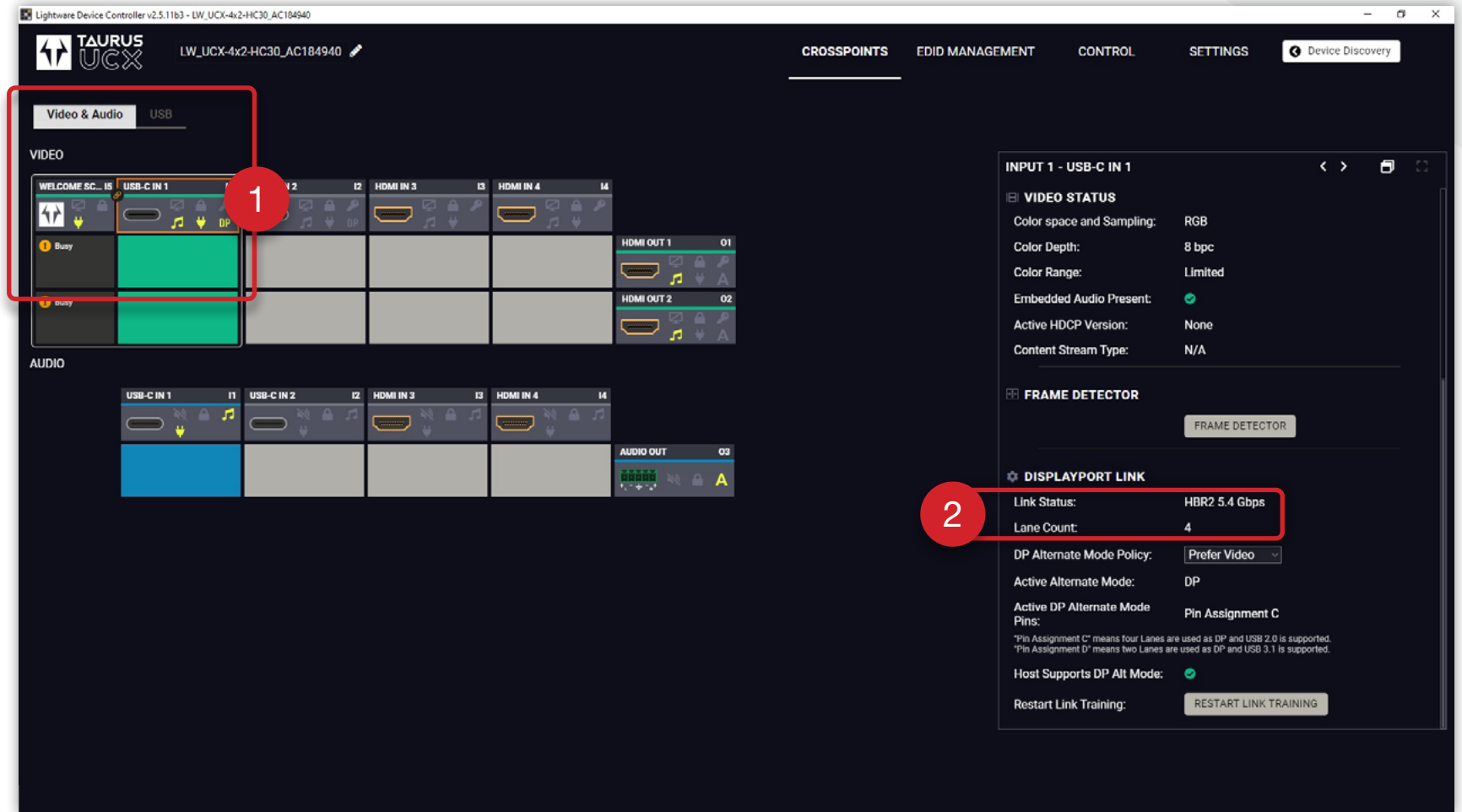
Memory	Manufacturer	Resolution	Audio	Monitor Name	Source
E1 (USB-C in 1)	LWR	3840x2160p60.00Hz	2chLPCM	HUHDp60_444	F137
E2 (USB-C in 2)	LWR	3840x2160p60.00Hz	2chLPCM	HUHDp60_444	F137
E3 (HDMI in 3)	LWR	3840x2160p60.00Hz	2chLPCM	HUHDp60_444	F137
E4 (HDMI in 4)	LWR	3840x2160p60.00Hz	2chLPCM	HUHDp60_444	F137

The 'Factory' section shows a list of EDID entries. Entry F137 is highlighted in green:

Memory	Manufacturer	Resolution	Audio	Monitor Name
F119	LWR	3840x2160p30.00Hz	2chLPCM,8chLPCM,DD...	Univ_4K_ALL
F120	LWR	3840x2160p60.00Hz	2chLPCM	H_UHDp60_420
F121	LWR	1440x1080p59.91Hz	2chLPCM	H1440x1080p60
F122	LWR	2560x2048p59.98Hz	2chLPCM	H2560x2048p60
F123	LWR	1280x800p59.91Hz	2chLPCM	H1280x800p60
F124	LWR	1440x900p59.90Hz	2chLPCM	H1440x900p60
F125	LWR	1366x768p60.00Hz	2chLPCM	H1366x768p60
F126	LWR	1600x900p59.98Hz	2chLPCM	H1600x900p60
F127	LWR	2048x1080p60.00Hz	2chLPCM	H2048x1080p60
F128	LWR	2560x1080p60.00Hz	2chLPCM	H2560x1080p60
F129	LWR	3440x1440p24.99Hz	2chLPCM	H3440x1440p25
F130	LWR	3440x1440p29.99Hz	2chLPCM	H3440x1440p30
F131	LWR	4096x2160p25.00Hz	2chLPCM	H4096x2160p25
F132	LWR	4096x2160p30.00Hz	2chLPCM	H4096x2160p30
F133	LWR	4096x2160p60.00Hz	2chLPCM	4Kp60_420
F134	LWR	3440x1440p23.99Hz	2chLPCM	H3440x1440p24
F135	LWR	4096x2160p24.00Hz	2chLPCM	H4096x2160p24
F136	LWR	3840x2160p30.00Hz	2chLPCM	H3840x2160p30
F137	LWR	3840x2160p60.00Hz	2chLPCM	HUHDp60_444
F138	LWR	3840x2160p50.00Hz	2chLPCM	H3840x2160p50
F139	LWR	3840x2160p60.00Hz	2chLPCM	H2_UHD_PCM
F140	LWR	3840x2160p60.00Hz	2chLPCM,8chLPCM,DD...	H2_UHD_ALL
F141	LWR	4096x2160p60.00Hz	2chLPCM	H4Kp60_444
F142	LWR	4096x2160p50.00Hz	2chLPCM	H4Kp50_444
F143	LWR	4096x2160p60.00Hz	2chLPCM	H2_4K_PCM
F144	LWR	4096x2160p60.00Hz	2chLPCM,8chLPCM,DD...	H2_4K_ALL
F145	LWR	2560x2048p49.97Hz	2chLPCM	H2560x2048p50
F146	LWR	3840x2160p60.00Hz	2chLPCM	H2_UHD_HDR
F147	LWR	3840x2160p60.00Hz	2chLPCM	H2_UHD_RB_PCM
F148	LWR	3840x2160p60.00Hz	2chLPCM,8chLPCM,DD...	H2_UHD_RB_ALL

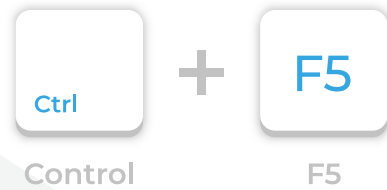
Testing 4 Lane DisplayPort Alternate mode

- ✓ (1) Clicking on the USB-C IN 1 icon in Video crosspoint tab results that Input 1 port properties window opens
- ✓ (2) Check the Link status and the Lane Count
- ✓ If the Link status is HBR2 5.4 Gbps and the Lane Count is 4, **4 Lane DisplayPort Alt mode works** ✓



Testing USB - Ethernet Bridge

- ✓ In case the USB2.0 enumeration works then USB – Ethernet Bridge test is available
- ✓ Turn off the Wi-Fi connection on BYOD
- ✓ Launch a browser, open a website (eg. lightware.com), and refresh the website by clearing the cache



Chrome and Firefox



Safari

- ✓ If the web page is loaded, Ethernet works ✓

