visual engineering
LIGHTWARE

Lightware Lab summary of Nureva HDL300+CV30 kit validation

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1. Introduction

The Nureva HDL300+CV30 kit is an all-in-one microphone, speaker, and camera solution for mid-size conference rooms. HDL300 comes with a wall mountable speaker and microphone array, and a DSP box. The DSP is connected to your VC solution via USB. The CV30 camera is capable of 4k@30Hz resolution, accompanied with auto framing ePTZ functionality, and comes with a 10m USB-A-to USB-B extension cable in the box. The HDL300 is connected to the DSP via the genuine, included 10m CAT6A cable, that acts like an extender for your peripherals. For the CV30 camera, the solution is similar, with the included 10m long USB-A to USB-B extension cable. Thus, this document assumes that no further USB extension is needed nor applied to the configuration.

The Lightware Taurus UCX expands the functionality of the Nureva HDL300+CV30 kit, enabling BYOD mode for multiple clients, while also providing charging and networking for them. With the MMX4x2-HDMI-USB20-L, we only provide BYOD selection expansion, without charging or networking.

Our customers need confirmation that the UCX/MMX interoperability with Nureva HDL300+CV30 kit has been tested, validated, and recommended by Lightware.

1.1. Test cases

For testing, a videocall was initiated by Zoom and MS Teams software clients running on laptops described below.

During calls, we tested the quality and reliability of the audio/video that was sent to the far end, and we tested the video and audio received from the far end. In addition to the above, the laptops were dis- and reconnected ten times to check the video/USB auto switching feature of Taurus UCX/MMX.

Taurus UCX/MMX was set to the default settings, auto-select on the input ports, using last-detect, and we used manual input selection, when it was needed.

We distinguish the following test results:

- **Passed** – The peripheral (camera, speaker and microphone) signal is reliable, and redirection of the peripheral signal works by the video/USB auto switching.
- **Failed** – The peripheral signal is unstable or not presented at all.
- **Not tested** - The test case cannot be interpreted in the given configuration, e.g. due to lack of HDMI port.

1.2. Test environment

Unit	Type	FW/OS version
Peripheral	Nureva HDL300+CV30 kit	
HDMI/USB matrix switcher	Lightware UCX-4x2-HC30	v2.2.3b4
HDMI/USB matrix switcher	Lightware MMX4x2-HDMI-USB20-L	
USB extender (if applicable)	Nureva genuine extension cables	
Display	Dell P2422	
Laptop 1	Lenovo Yoga7	Win10 Pro, Build:19045.2546
Laptop 2	Dell Latitude 5520	Win10 Pro, Build:19044.1620
Laptop 3	MacBook 2020 M1	MacOS Monterey, 12.6

1.3. Tested cables

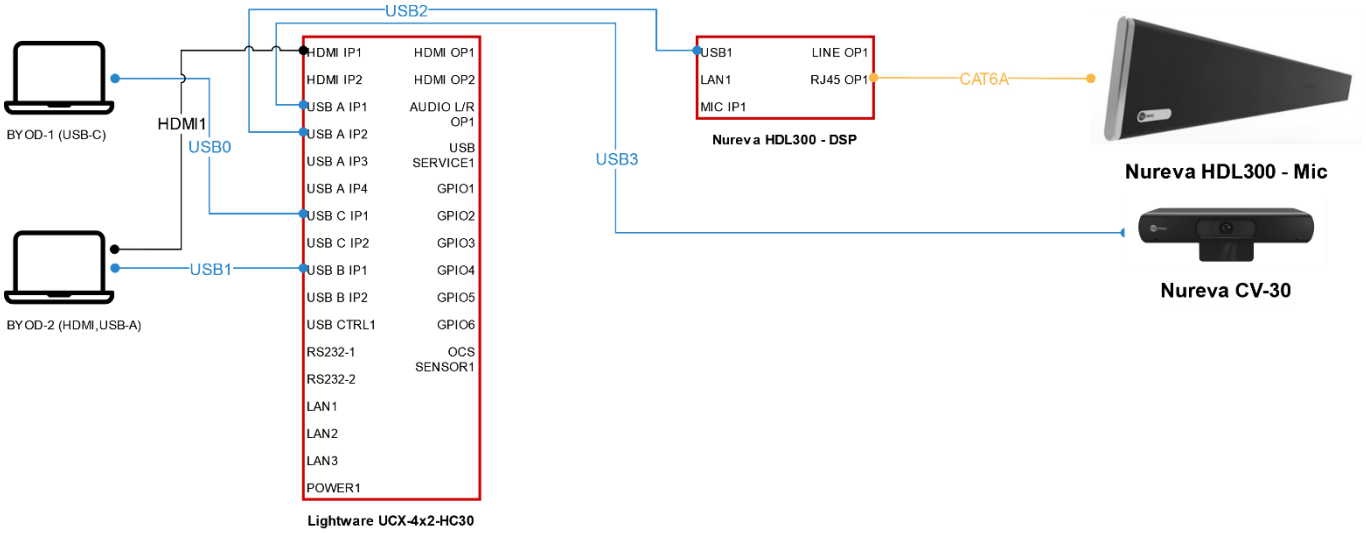
	Unit	Type
USB0	Lightware CAB-USBC-T100A	1m Type C – Type C
	Lightware CAB-USBC-T200A	2m Type C – Type C
	Lightware CAB-USBC-T300A	3m Type C – Type C
	Lightware CAB-USBC-T400B	4m Type C – Type C
	Lightware CAB-USBC-T500B	5m Type C – Type C
	Lightware CAB-USBC-AOC800K	8m Type C – Type C
	Lightware CAB-USBC-AOC1000K	10m Type C – Type C
USB1	Unitek AWM2725 2m	3m Type A – Type B
	Unitek AWM2725 3m	3m Type A – Type B
	Unitek AWM2725 5m	5m Type A – Type B

2. Scenario 1 – UCX

2.1. Overview

The first test scenario contains one Taurus UCX and Nureva HDL300+CV30 kit.

2.2. Wiring



2.3. Cable numbering

Nr	Type
USB 0	*See tested cable list – USB Type C-C*
USB 1	*See tested cable list – USB Type A-B*
USB 2	Genuine Nureva 2m USB Type A-B
USB 3	Genuine Nureva 10m USB Type A-B
HDMI 1	Lightware CAB-HDMI20-PHS500P

2.4. Results

Platform:	BYOD - Lenovo Yoga7 OS: Win10 Pro, Build:19045.2546								
USB1:	Unitek USB A-B 3m	Unitek USB A-B 5m	-	-	-	-	-	-	-
USB0:	-	-	CAB-USBC-T100A	CAB-USBC-T200A	CAB-USBC-T300A	CAB-USBC-T400B	CAB-USBC-T500B	CAB-USBC-T800A	CAB-USBC-T1000A
Results:	No USB-A on Yoga7	No USB-A on Yoga8	CV30 OK HDL300 OK	CV30 OK HDL300 OK	CV30 OK HDL300 OK	CV30 OK HDL300 OK	CV30 OK HDL300 OK	CV30 OK HDL300 OK	CV30 OK HDL300 OK
Platform:	BYOD - Dell Latitude 5520: Win10Pro, Build: 19044.1620								
USB1:	Unitek USB A-B 3m	Unitek USB A-B 5m	-	-	-	-	-	-	-
USB0:	-	-	CAB-USBC-T100A	CAB-USBC-T200A	CAB-USBC-T300A	CAB-USBC-T400B	CAB-USBC-T500B	CAB-USBC-T800A	CAB-USBC-T1000A
Results:	CV30 OK HDL300 OK	CV30 OK HDL300 OK	CV30 OK HDL300 OK	CV30 OK HDL300 OK	CV30 OK HDL300 OK	CV30 OK HDL300 OK	CV30 OK HDL300 OK	CV30 OK HDL300 OK	CV30 OK HDL300 OK

Platform:	BYOD - MacBook 2020 M1, MacOS Monterey, 12.6								
USB1:	Unitek USB A-B 3m	Unitek USB A-B 5m	-	-	-	-	-	-	-
USB0:	-	-	CAB-USBC-T100A	CAB-USBC-T200A	CAB-USBC-T300A	CAB-USBC-T400B	CAB-USBC-T500B	CAB-USBC-T800A	CAB-USBC-T1000A
Results:	No USB-A on Macbook	No USB-A on Macbook	CV30 OK HDL300 OK	CV30 OK HDL300 OK	CV30 OK HDL300 OK	CV30 OK HDL300 OK	CV30 OK HDL300 OK	CV30 OK HDL300 OK	CV30 OK HDL300 OK

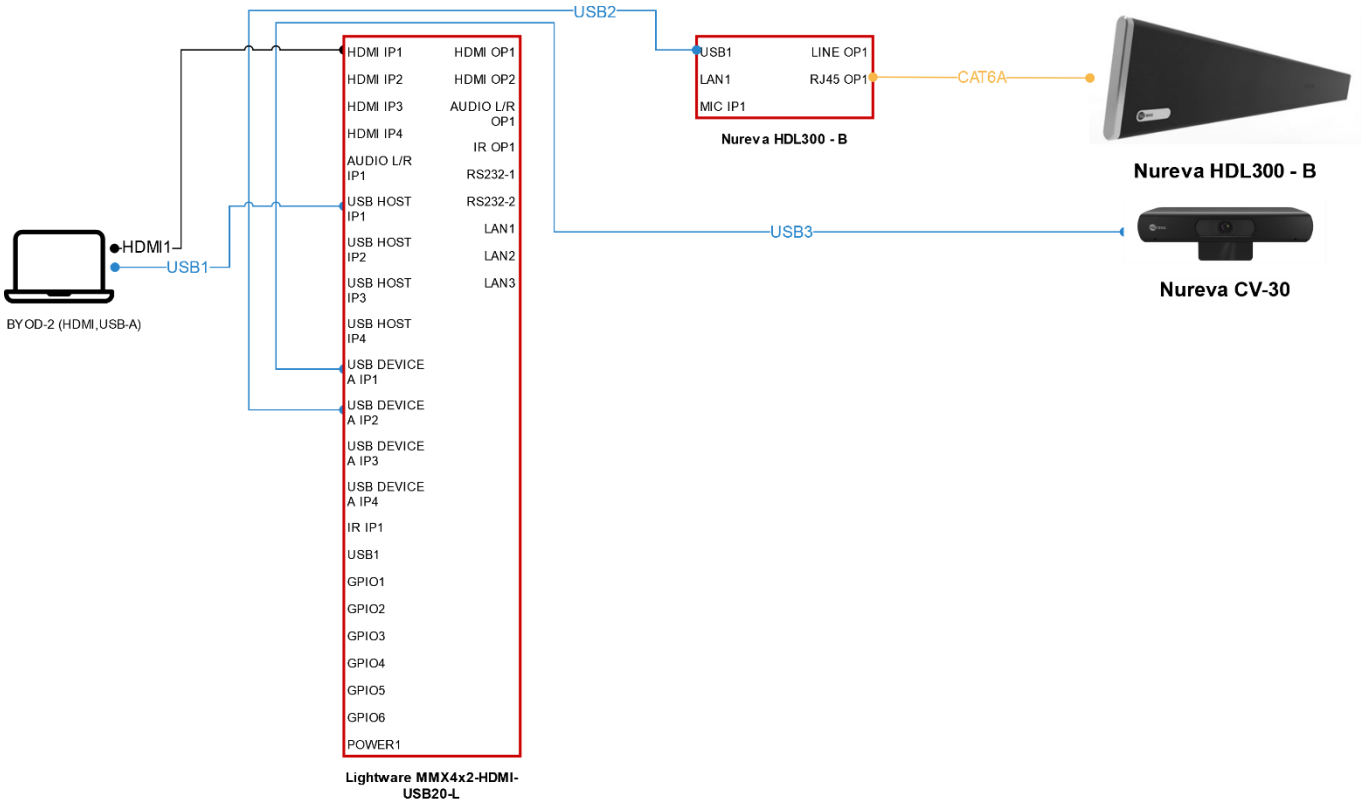
3. Scenario 2 – MMX4x2-HDMI-USB20-L

3.1. Overview

This test scenario contains one MMX4x2-HDMI-USB-20-L and Nureva HDL300+CV30 kit. Due to the lack of USB-C functionality of the MMX matrix switcher, this scenario only focuses on traditional USB-A connections, paired with HDMI.

3.2. Wiring

For clarity, only USB/HDMI connections are shown. (Plus the included CAT extension cable of Nureva)



3.3. Cable numbering

Nr	Type
USB 1	*See tested cable list – USB Type A-B*
USB 2	Genuine Nureva 2m USB Type A-B
USB 3	Genuine Nureva 10m USB Type A-B
HDMI 1	Lightware CAB-HDMI20-PHS500P

3.4. Results

Platform:	**BYOD - Lenovo Yoga7 OS: Win10 Pro, Build:19045.2546**		
USB1:	Unitek USB A-B 2m	Unitek USB A-B 3m	Unitek USB A-B 5m
Results:	CV30 OK HDL300 OK	CV30 OK HDL300 OK	CV30 OK HDL300 OK

Platform:	**BYOD - Dell Latitude 5520: Win10Pro, Build: 19044.1620**		
USB1:	Unitek USB A-B 2m	Unitek USB A-B 3m	Unitek USB A-B 5m
Results:	CV30 OK HDL300 OK	CV30 OK HDL300 OK	CV30 OK HDL300 OK

4. Conclusion

During our tests, we recognized, that the length of the used Lightware CAB-xxx cables itself does not affect the signal and connection quality as we expected. Either USB and Video signals were present, or they were not present at all. We did not find any states between.

However, in a system design the USB standard's specifications, and USB tree structure should be considered. The maximum layer count, or levels of the tree must not exceed 7. (Layer of the USB tree is also called tier.) Nureva kit uses USB 2.x, for the audio connections, and 3.x for the CV30 camera. This means that one must consider tier counts accordingly. Tier counts may vary depending on the USB version. Generally speaking USB 2.x connections using extenders and/or hubs may add more tiers to the system, than using USB 3.x connections. However, in case of CV30, we recognized that the provided extension cable adds one more hub to the USB tree.

It worth mentioning, that Lightware USB-C cables, even if they are AOC, do not add any tiers to the USB tree on the USB 3.x layer.

We highly recommend to design the AV system taking into account the above considerations, and choose the peripherals, and extenders wisely. Counting the USB tiers, and designing the system consciously reduces the risk of an unstable system.

Our tests show that by using UCX/MMX, the functionality of the Nureva HDL300+CV30 kit can be expanded in a stable way to multiple clients.

5. Appendix

5.1. Further information

Rev.	Release date	Changes	Editor
1.0	July 8,2023	Initial version	István Kozma