One Braham

Customer Experience Centre

Operational and Maintenance Manual version 1.0

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Document History

Description	Revision	Date of Issue
Operation and Maintenance Manual	V1.0	01/10/2022

Contacts

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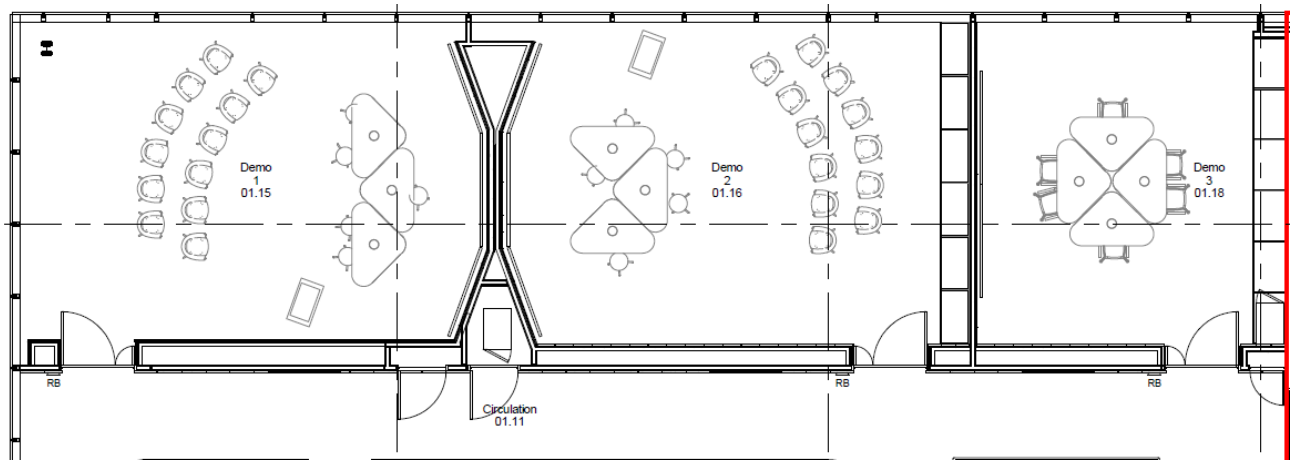
1 Introduction

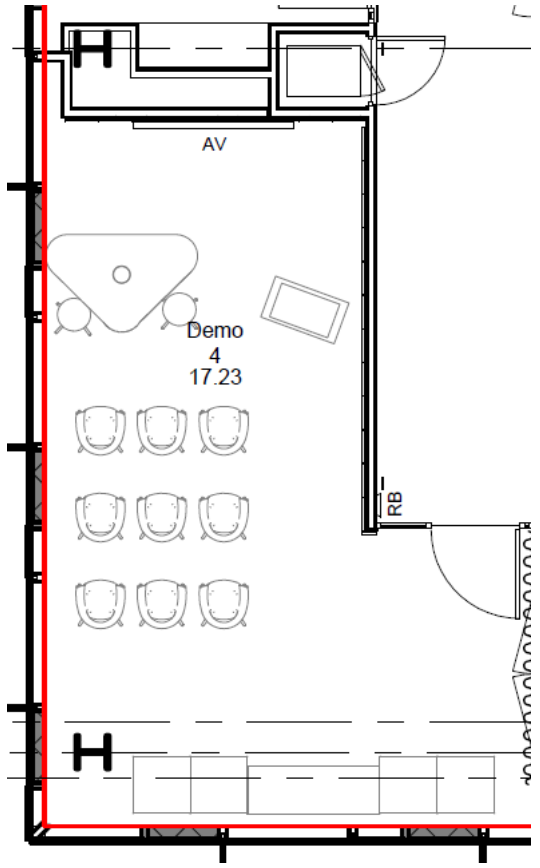
There are four collaboration rooms within BT Customer Experience Centre at One Braham.

Three of these room are located on level 1 with the fourth located on level 17.

Level 1



Level 17



2 Room identification

These rooms have now been named by BT but to help identify them on build drawings and documentation there is a cross reference table below.

Location	Build Drawing Ref.	Build Name	Current Room Number	Current Room Name
Level 1	1.15	Demo Room 1	1.04	Zephyr
Level 1	1.16	Demo Room 2	1.05	Notus
Level 1	1.18	Demo Room 3	1.06	Eurus
Level 17	17.23	Demo Room 4	17.07	Luna

3 ThinkHub

The core collaboration technology in these rooms is delivered by T1V ThinkHub.

3.1 ThinkHub Features

The key functionality and user experience of each room is identical but has been scaled to suit the size of each room, the difference in each room are high-lighted below under each room description.

However, the way you interact and use the system within your collaboration session is the same for each room.

Security is at the core of ThinkHub, by default ThinkHub is an OnPrem solution and not cloud based.

Multi-site collaboration allowing for rooms in the same or different buildings remain on your network.

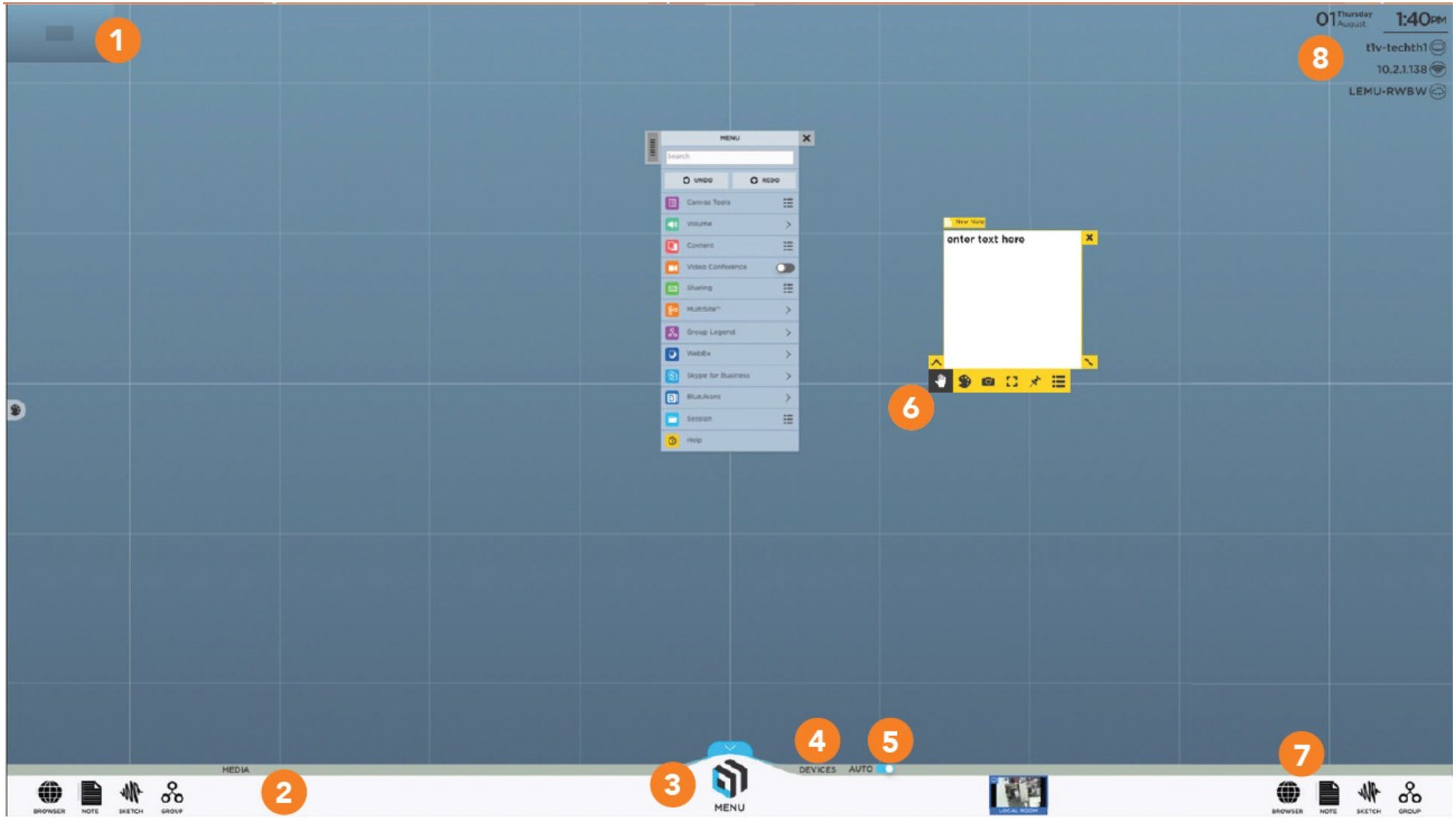
Thinkhub provides all of the collaboration tools you would expect…

- Whiteboard
- Post it notes
- Web browser [1]
- Content [2]
- Content sharing
- Content grouping
- Annotate
- Video Conferencing
- Multi-Site collaboration

1. Web Browser
    - for reasons of security ThinkHub web browser does not provide the full desk top experience, it blocks the ability to download content, store bookmarks and install plug ins
    - if you require some of these features you can either use the House PC or your own laptop
    - if you have URL that you regularly use it is possible to create a URL shortcut that appears in the media tray. See Appendix 13 how to create these.
2. Content
    - Supported media includes
        - Images .jpg, .tiff, .png, .bmp
        - Video's .mp4, .mov, .mp3, .m4a
        - Documents .PDF
    - As a non Windows based platform ThinkHub does not support Windows file formats natively, in order to shows these files on the canvas they should first be converted into PDF format.
    - However, It is also possible to show Windows documents in their native format say for example to see all of your transitions and animation in your PPT by using either one of the House PC's, a Laptop or your own device using the T1V App to share your content.

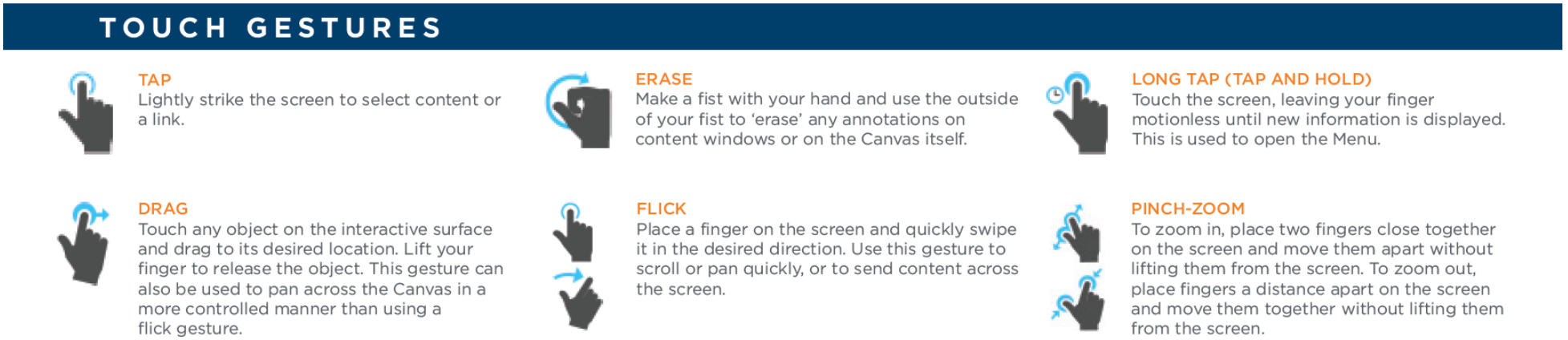
3.2 ThinkHub Getting Started

Pressing the Start button on the Home screen will open the ThinkHub Canvas



1 Canvas view

- the virtual canvas is approx. x20 the physical real estate of the display, pinch, zoom and scroll anywhere on the canvas.
- or tap on the canvas view to jump to any area of the canvas.



2 Media tray

- your content is shown here, by default it is stored locally on the ThinkHub however, it can be stored anywhere. The path to the storage location needs to be defined by the user but implemented by T1V.
- Tap or drag and drop content from the media tray onto the canvas
- This can link directly to BT content store. Currently not implemented BT to provide path to directory.

3 Menu

- press the menu button in the tray or press and hold anywhere on the canvas to open the menu

4 Devices

- all your connected devices (PC's Laptop, tablets) appear here
- tap or drag and drop content from the media tray onto the canvas
- each room has 2no. House PC's, these BT PC onto which are loaded with the customer demo's.
- Each room has 4no. Laptop connections, except for Demo Room 4 which has two. However only 2no. Laptops can be shown simultaneously. Which laptops are shown on the canvas can be selected from the canvas.
- Laptops, tablets and phones can also be connected wirelessly to the ThinkHub canvas using T1V App.

5 Autopresent

- toggle Autopresent mode 'On' to automatically push device to canvas when connected

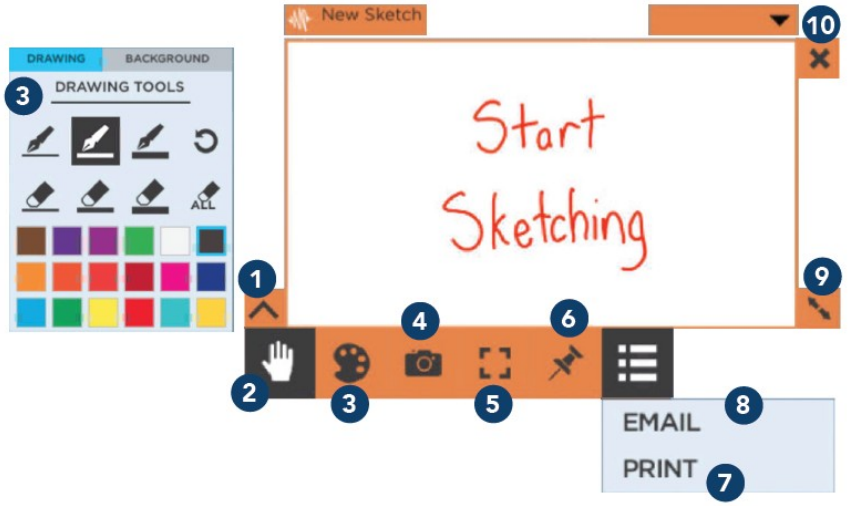
6 Content Menu

- tap on the content window to open content menu, this menu is specific to the content and allows for annotation, zoom, snapshot etc.

CONTENT TRAY

To activate a content tray, tap inside the content window. While the content tray is open, you can not flick or drag/drop content windows.

1. **CLOSE CONTENT TOOLS**
2. **SELECT MODE (DEFAULT)**
3. **DRAWING TOOLS**
4. **SNAPSHOT**
   Creates a jpeg image copy of the content window.
5. **FULL-SCREEN**
   Enlarges content window to full-screen.
6. **PIN**
   Locks content window to that area of the Canvas.
7. **PRINT**
8. **EMAIL**
9. **RESIZE WINDOW**
10. **DELETE CONTENT WINDOW**



7 Apps

- tap or drag web browser, notes whiteboard or groups onto the canvas

8 T1V App (previously know as AirConnect)

- download the T1V App at https://www.t1v.com/app
- open the T1V App on your device and then enter key, your device will appear in the tray under devices

To join a ThinkHub session you need to enter the AirConnect Key followed by the Password into the T1V app on your device.

4 T1V App (previously known as AirConnect)

The T1V application enables you to co-create and collaborate from the convenience of your laptop.

The T1V app supports macOS, Windows, iOS, and Android.

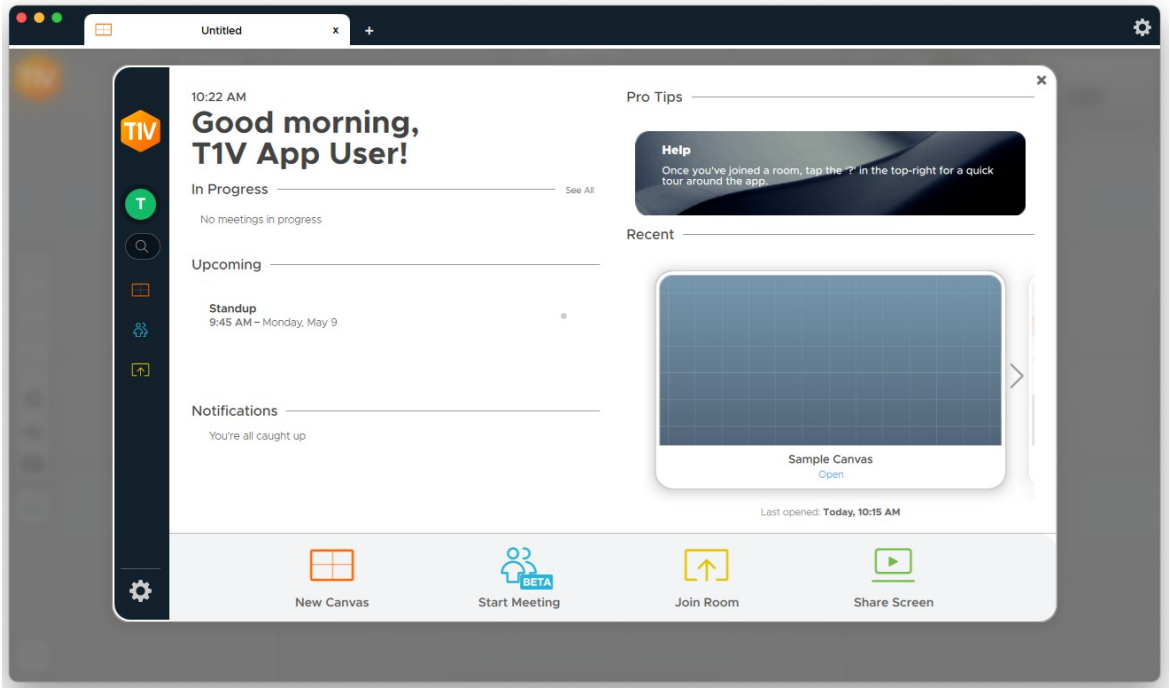
To install T1V on your device, visit **t1v.com/app**.

Notes when using BT devices:

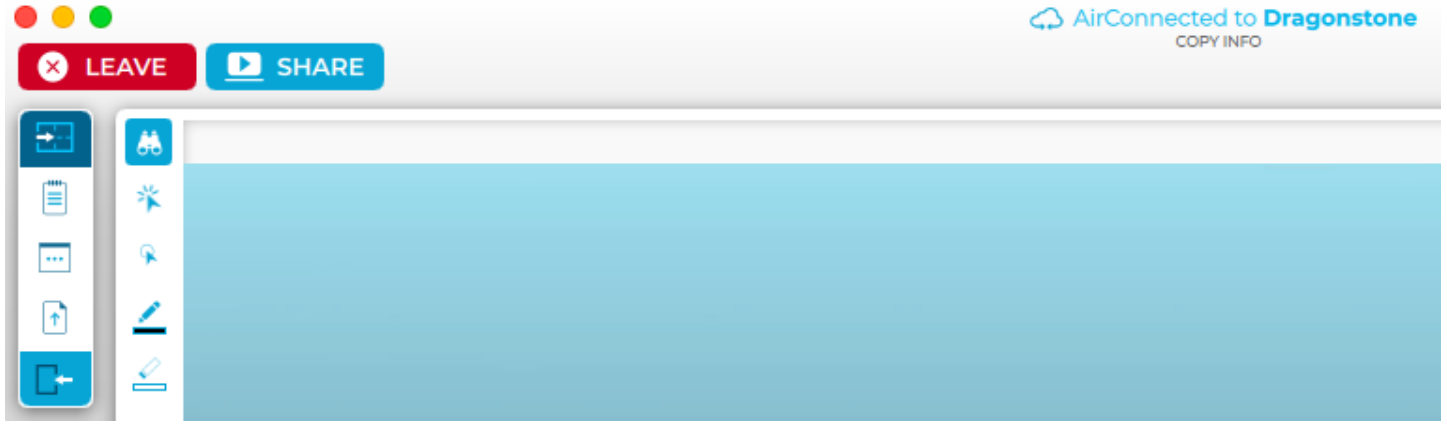
- You will need an exemption to download and use this app, although the app has already been approved.
- Do not use VPN

The T1V app allows both in room and remote user to view and participate a ThinkHub session from any network including a cellular connection.

To join you need to know both the AirConnect Key (8 characters not case sensitive and hyphen not need only used for clarity) and Passcode (4 digits) these are shown on the top right hand corner of the ThinkHub canvas.



Using the App you can…

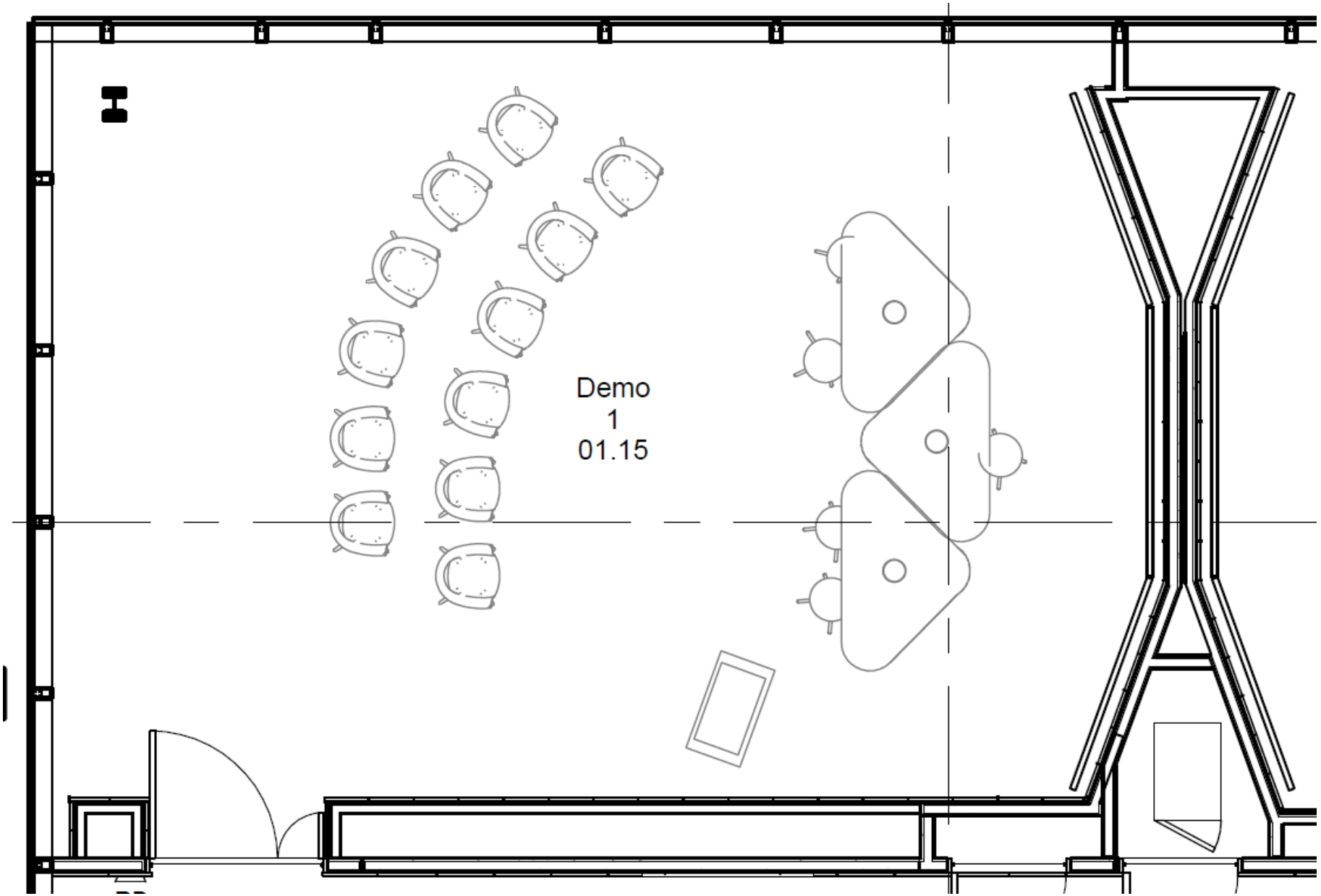


- View the canvas
- Interact with the canvas
- Send Post it Notes to the canvas
- Send URL's to the canvas
- Create and Send Groups to the canvas
- Send files to the canvas
- Share your screen on the canvas
- Download Notes from the canvas
- Download File from the canvas
- Download individual content from the Canvas.
- Download the entire canvas

The full Thinkhub and T1V App (AirConnect) user guides can be found on the support pages via the HELP button see section 8

5 Zephyr specification

5.1 Room Layout



5.2 **Room Photo**

5.3 Room Equipment

This room equipped with the following equipment...

3no. 86” Avocor 4K displays

1no. T1V ThinkHub collaboration system

1no. T1V Quad HLI (Hard Line Inputs)

- 4no. HDMI inputs for House PC’s and Laptops
- 2no. Touchback for the House PC’s [1]

2no. House PC’s

4no. Laptop connections [2]

1no. PTZ camera [3]

1no. Web cam [3]

1no. Camera switcher

- this allows the presenter to share a view of themselves via the PTZ camera, the audience using the web cam or both to a remote audience.

1no. Lectern with 24” touch screen and NUC PC. [4]

- this is to allow the presenter remote control over the ThinkHub canvas whilst facing the audience.
- this PC connects to the canvas via T1V App.

1no. Radio microphone **(supplied by BT)**

- this is for speech reinforcement for far end audiences only.

1. House PC

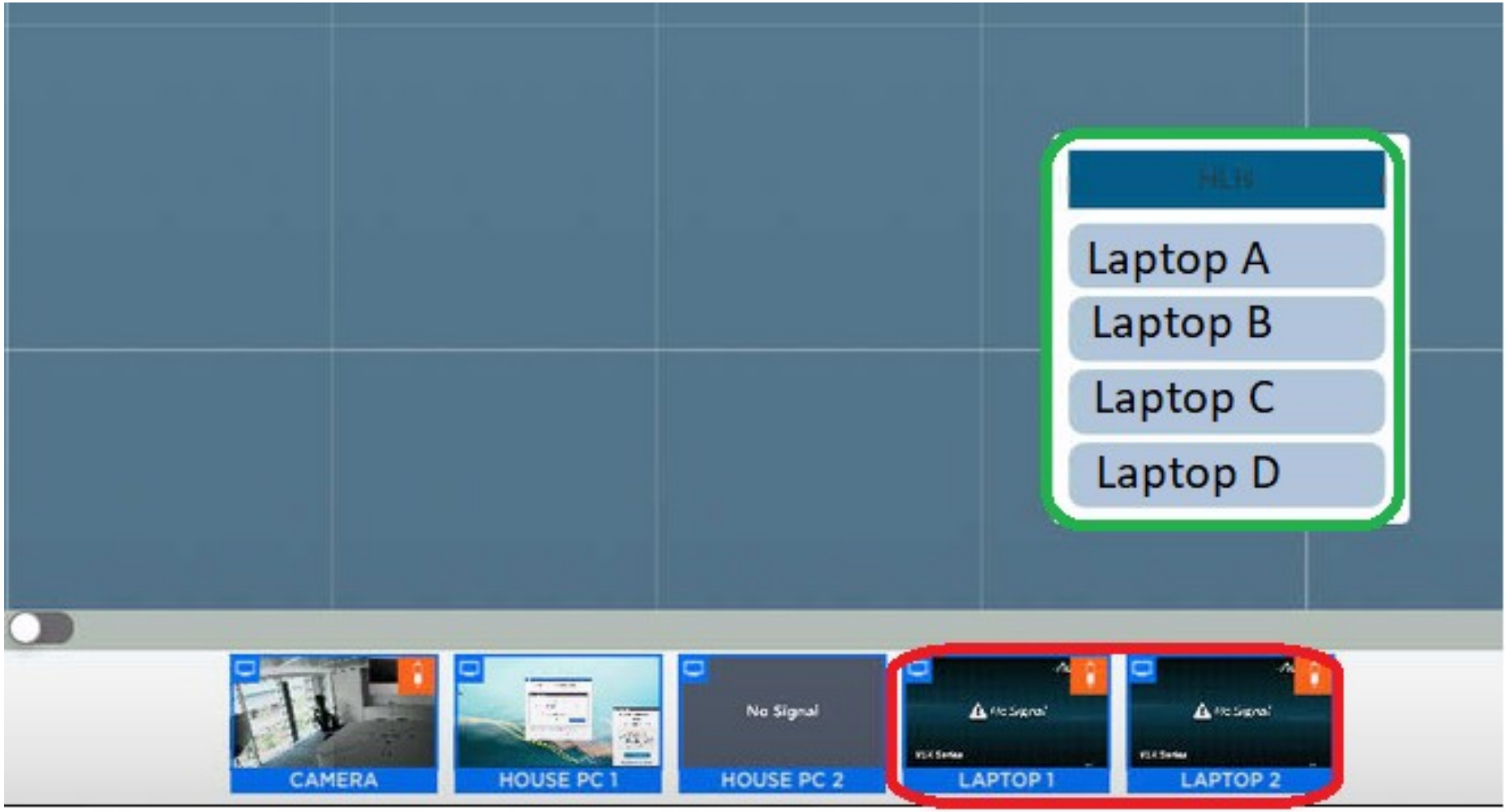
- whilst the House PC's can be controlled from the ThinkHub's canvas via touchback there are occasions when the On Screen Keyboard (OSK) is not the ideal for entering long text strings, be it URL's or passwords.
- to create a better user experience each room is equipped with a wireless keyboard and mouse connected to the KVM system.
- the KVM is located in the cupboard and has two USB dongles attached
- **DO NOT REMOVE or MOVE either USB dongles**
- the first USB dongle for the wireless keyboard and are specific to each room.
- the second USB is a dummy HDMI Monitor and is essential for the KVM to work.

The KVM is located in the left hand side of the credenza

2. Laptops

- laptops are connected and streamed via the network to the ThinkHubs using Aurora VLX.
- these units are housed in the legs of tables, with HDMI cables presented in the cable management boxes on the top of the tables.
- there are HDMI adaptors for
  - Mini Display Port
  - Display Port
  - USB Type C

- the adaptors are secured to one of the HDMI cables to ensure that they are not lost.
- laptops can be connected to any floor box, via the labelled **RED** network cables.
- each floor box is equipped with four network ports.
- however, the Laptop extenders MUST be connected to either of the two lowest number ports to ensure they receive PoE.
- whilst 4no. Laptops can be connected at the same time only 2no. laptops can be shown simultaneously.
- which two of the four possible connected laptops are shown on the canvas, can be selected from the pop menu when one the laptop icon in the device tray is tapped.
- the labels mirror those on the HDMI cables and the corresponding **RED** network cables.
- additional devices laptops, tablets and phones can also be connected wirelessly to the ThinkHub canvas using T1V App.


Laptop A
Laptop B
Laptop C
Laptop D
CAMERA
HOUSE PC 1
No Signal
HOUSE PC 2
LAPTOP 1
LAPTOP 2

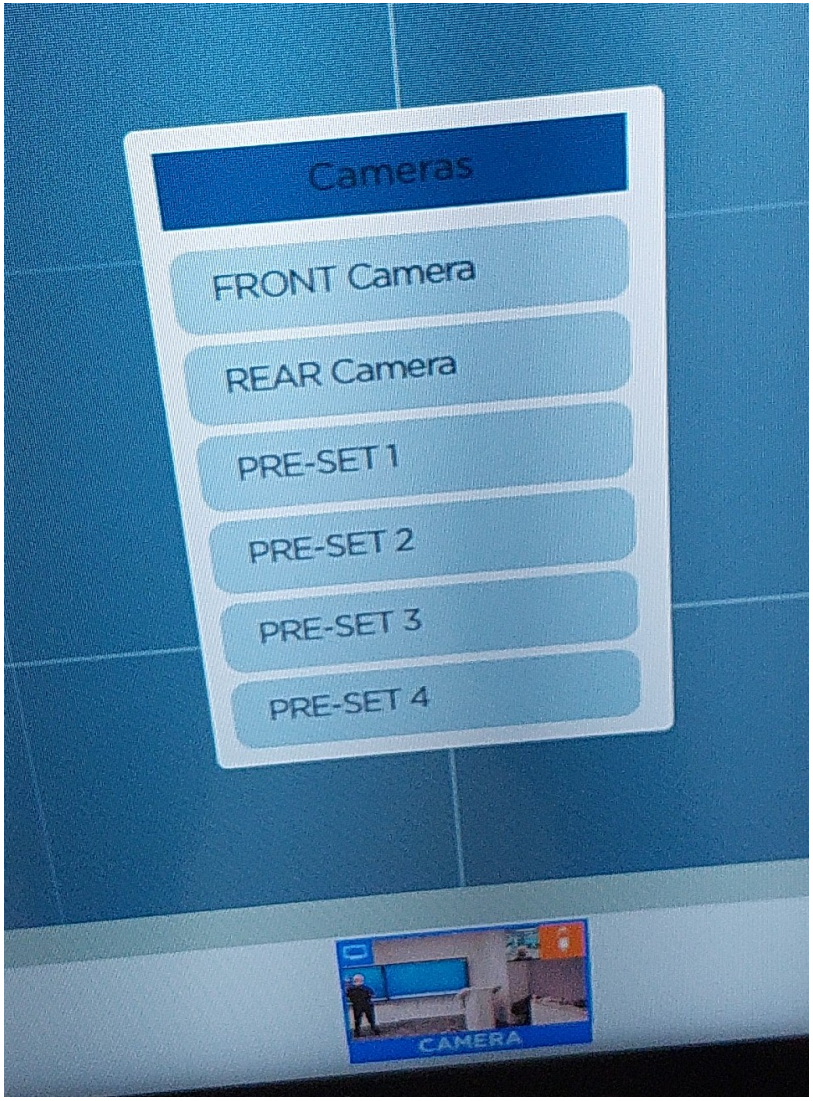
3. Camera

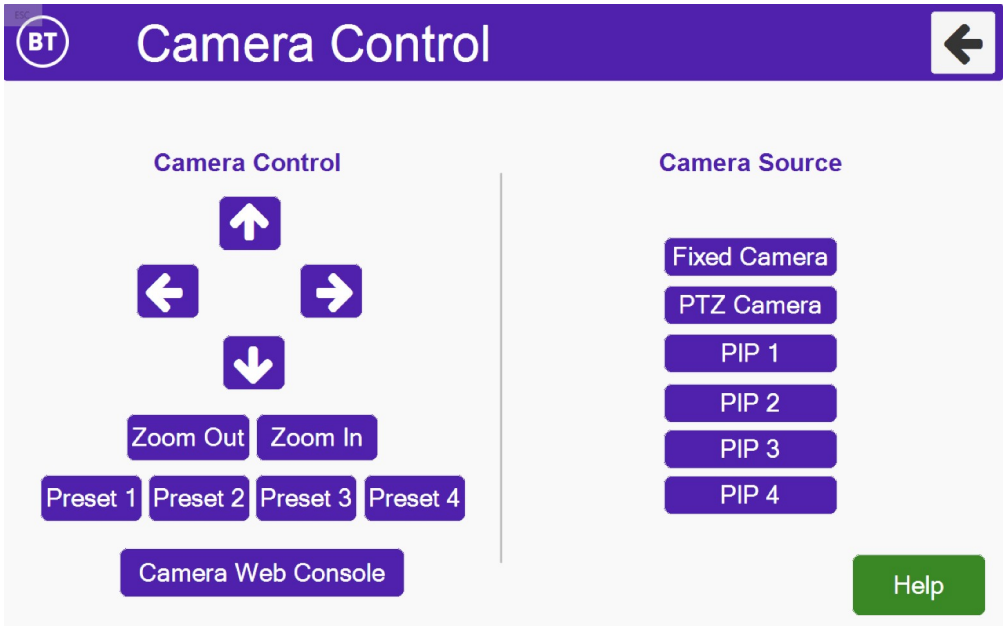
Clicking on the orange menu on the camera icon in the device tray opens the menu as shown.

This menu allows the user to select which camera, Front facing (showing presenter) or Rear facing (showing audience) or a mix of both as a PiP by selecting a pre-set.

These controls are also found on the control panel show below (see section 8).`

This control panel also allows for advanced control such a Pan Tilt and Zoom functions of the Front facing camera as well as setting up pre-set vis the camera's own web portal (see notes in appendix 9)





4 Lectern

This room is equipped with a lectern to allow the presenter to face the audience, whilst still having the ability to interact with the ThinkHub.

The Lectern is equipped with the following…

1no. 24” touch screen

1no. NUC c/w

- T1V app for control of the ThinkHub
- Aurora app for laptop matrix configuration (service personnel only)

1no. KVM

1no. Wired mouse and Keyboard, this is to avoid confusion with the wireless keyboard and mouse that can be used either with or without the lectern.

Both keyboards via Hot Keys can be used to control either of the house PC’s (1&2) or the lectern PC.

The keyboard Hot Keys to access each of the PC

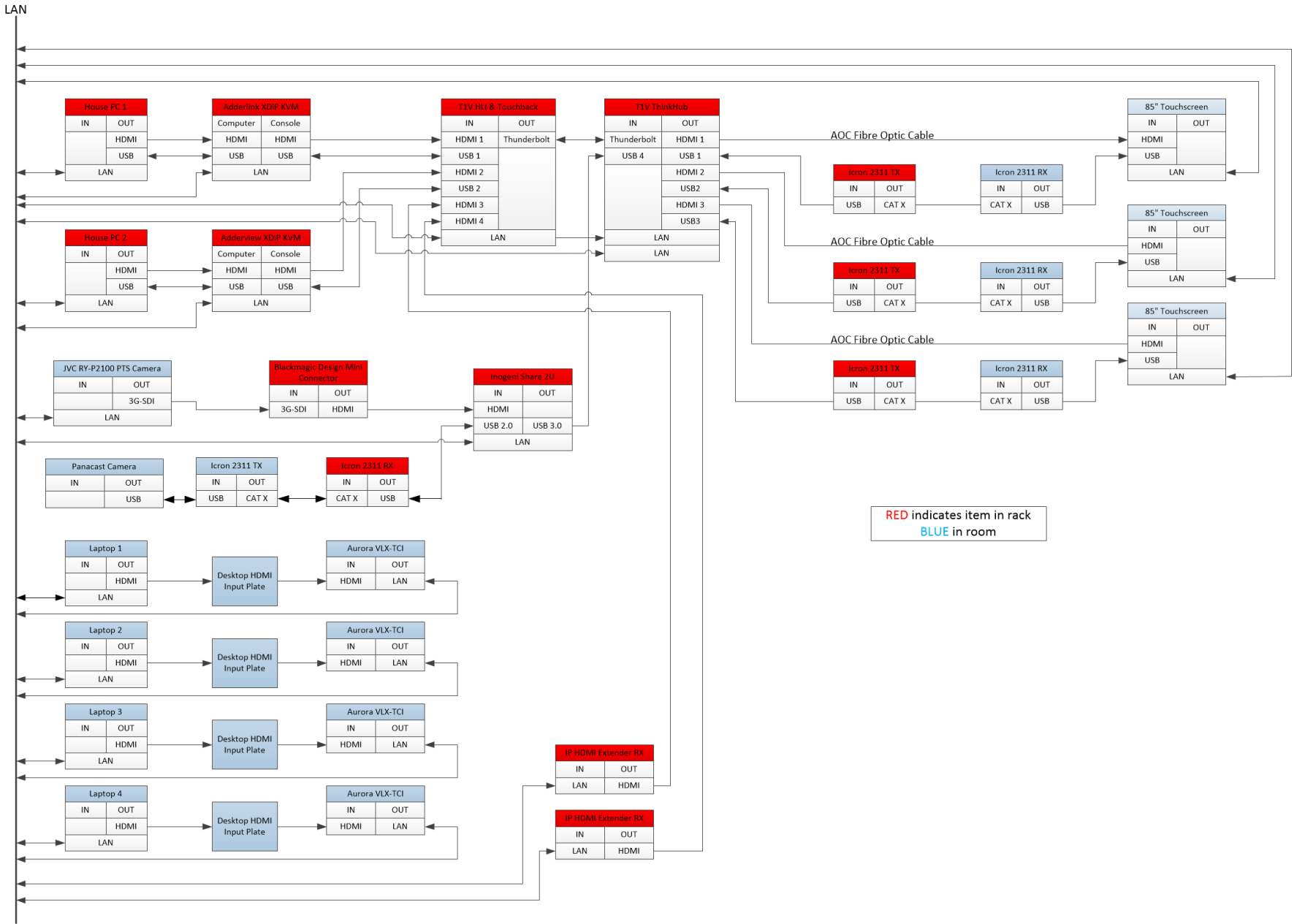
- CTRL + ALT + 1 for House PC 1
- CTRL + ALT + 2 for House PC 2
- CTRL + ALT + 3 for Lectern PC (Zephyr and Notus only)

The KVM is mounted under the shelf.

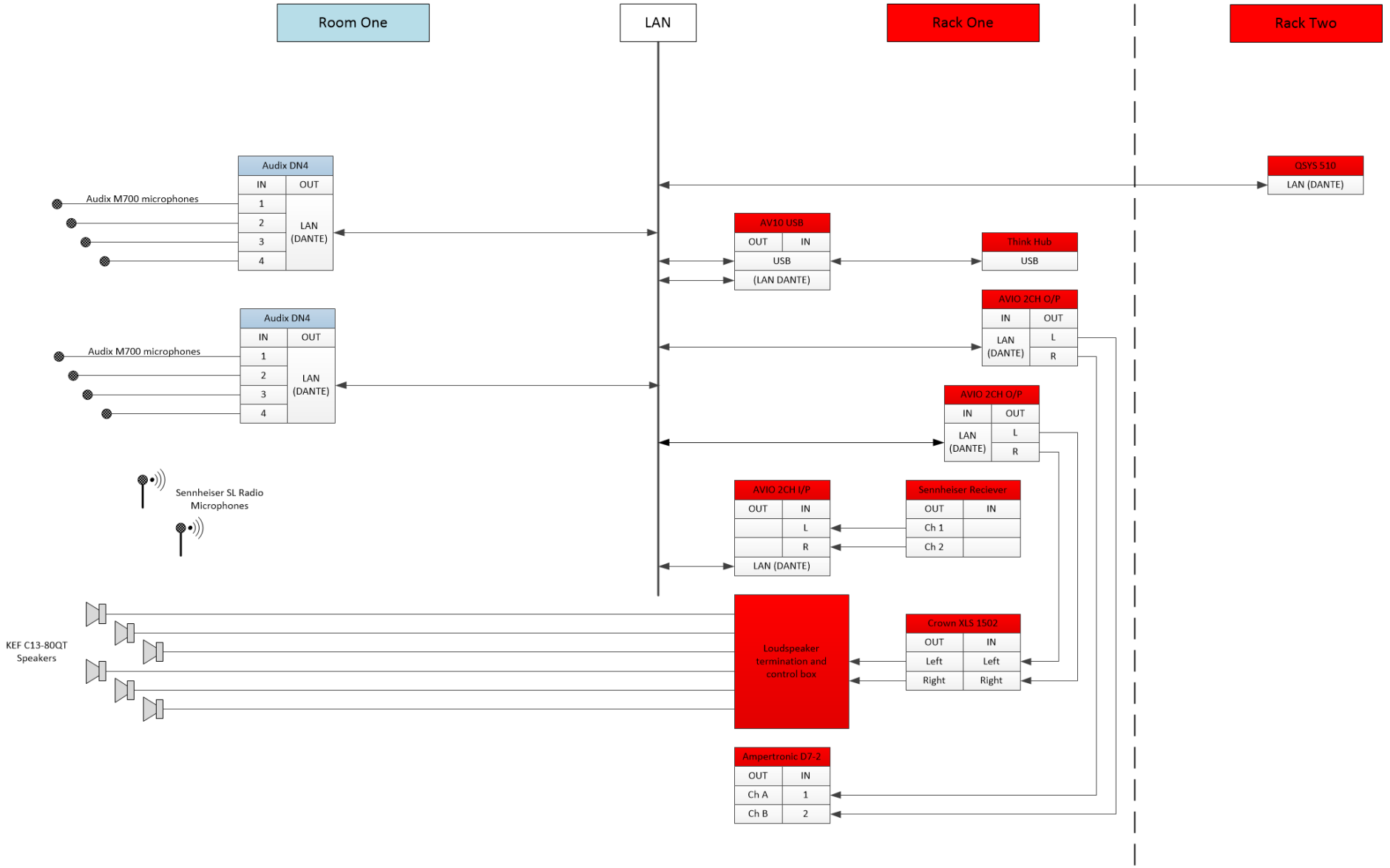
There is a wired remote control for the display as shown on the picture

5.4 Room Schematic

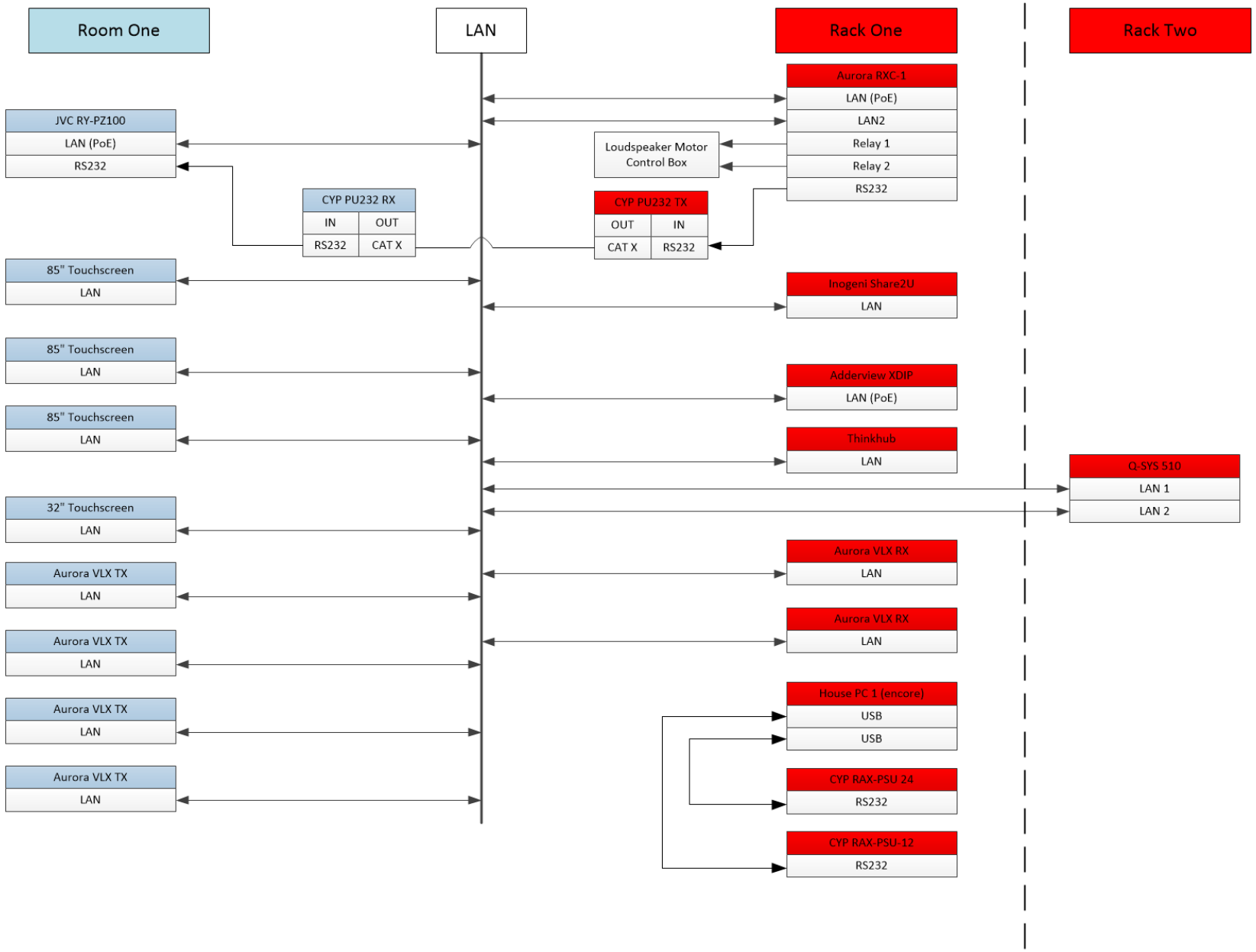
5.4.1 Video



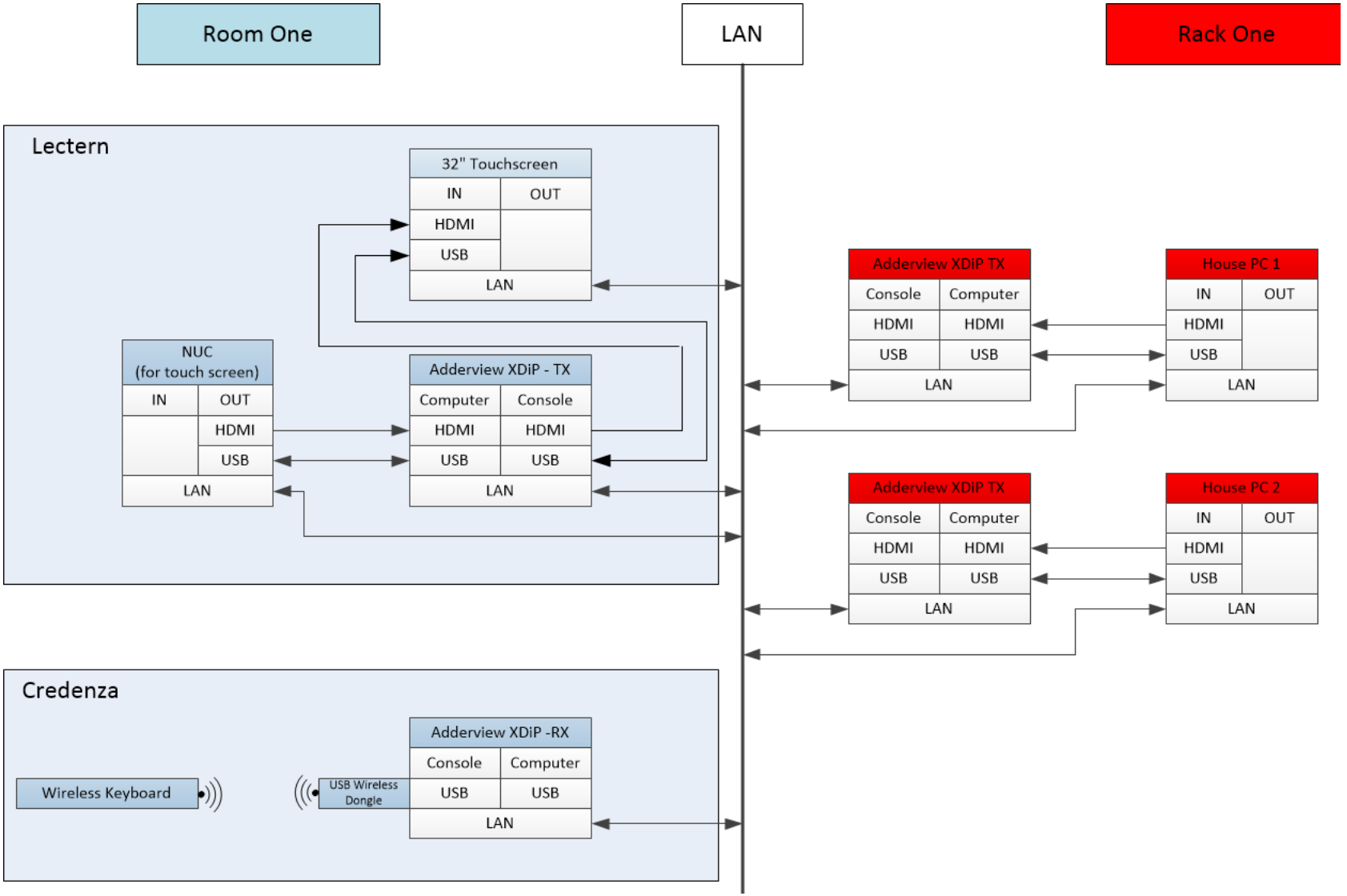
5.4.2 Audio


Room One
LAN
Rack One
Rack Two
Audix DN4
IN
OUT
1
2
3
4
LAN (DANTE)
Audix M700 microphones
Audix DN4
IN
OUT
1
2
3
4
LAN (DANTE)
Audix M700 microphones
Sennheiser SL Radio Microphones
KEF C13-80QT Speakers
QSYS 510
LAN (DANTE)
AV10 USB
OUT
IN
USB
(LAN DANTE)
Think Hub
USB
AVIO 2CH O/P
IN
OUT
LAN (DANTE)
L
R
AVIO 2CH O/P
IN
OUT
LAN (DANTE)
L
R
AVIO 2CH I/P
OUT
IN
L
R
LAN (DANTE)
Sennheiser Reciever
OUT
IN
Ch 1
Ch 2
Loudspeaker termination and control box
Crown XLS 1502
OUT
IN
Left
Left
Right
Right
Ampertronic D7-2
OUT
IN
Ch A
1
Ch B
2

5.4.3 Control

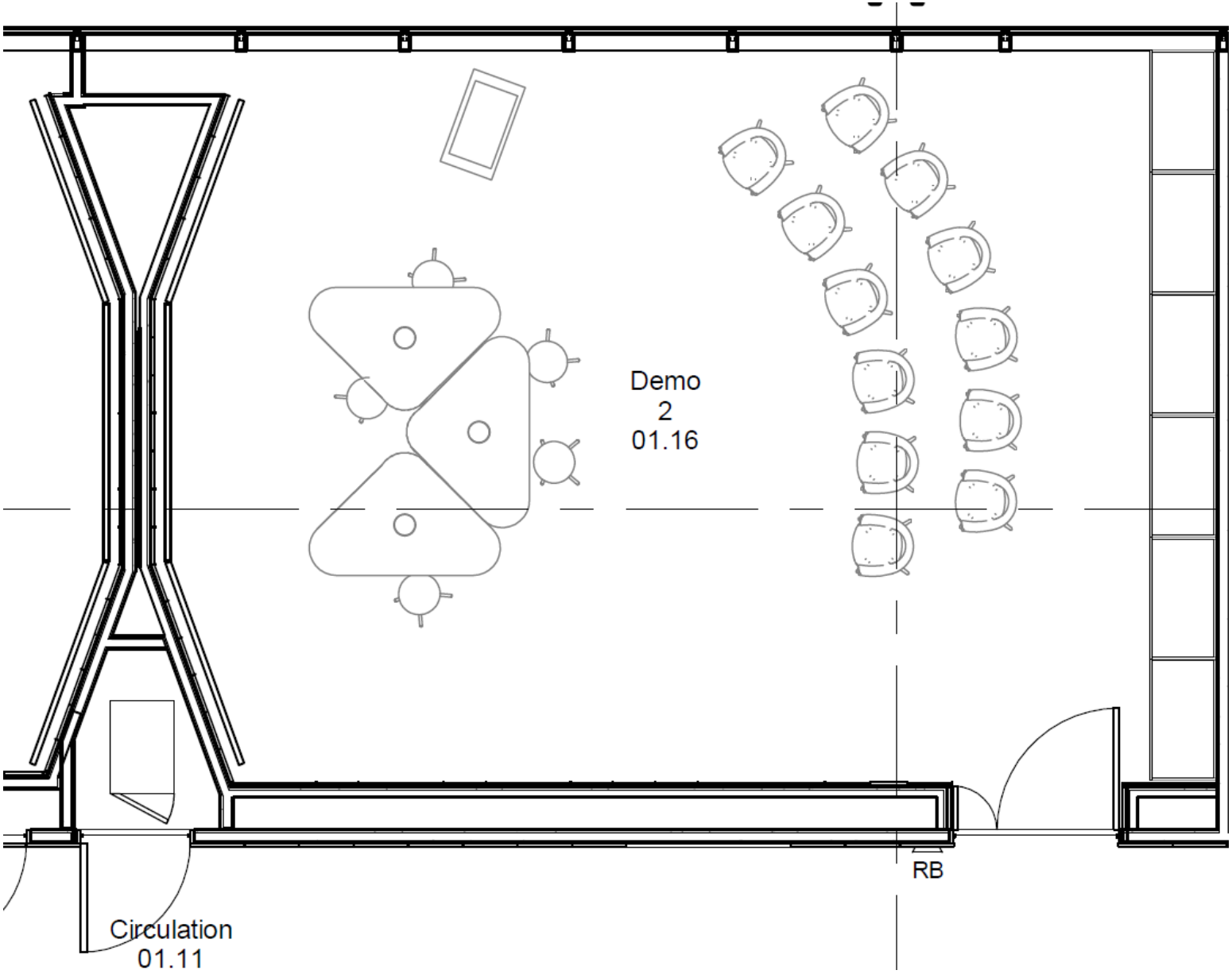

Room One
LAN
Rack One
Rack Two
Aurora RXC-1
LAN (PoE)
LAN2
Relay 1
Relay 2
RS232
JVC RY-PZ100
LAN (PoE)
RS232
Loudspeaker Motor Control Box
CYP PU232 RX
IN
OUT
RS232
CAT X
CYP PU232 TX
OUT
IN
CAT X
RS232
85" Touchscreen
LAN
Inogeni Share2U
LAN
85" Touchscreen
LAN
Adderview XDIP
LAN (PoE)
85" Touchscreen
LAN
Thinkhub
LAN
Q-SYS 510
LAN 1
LAN 2
32" Touchscreen
LAN
Aurora VLX RX
LAN
Aurora VLX TX
LAN
Aurora VLX RX
LAN
Aurora VLX TX
LAN
House PC 1 (encore)
USB
USB
Aurora VLX TX
LAN
CYP RAX-PSU 24
RS232
Aurora VLX TX
LAN
CYP RAX-PSU-12
RS232

5.4.4 KVM


Room One
LAN
Rack One
Lectern
32" Touchscreen
IN
OUT
HDMI
USB
LAN
NUC
(for touch screen)
IN
OUT
HDMI
USB
LAN
Adderview XDiP - TX
Computer
Console
HDMI
HDMI
USB
USB
LAN
Adderview XDiP TX
Console
Computer
HDMI
HDMI
USB
USB
LAN
House PC 1
IN
OUT
HDMI
USB
LAN
Adderview XDiP TX
Console
Computer
HDMI
HDMI
USB
USB
LAN
House PC 2
IN
OUT
HDMI
USB
LAN
Credenza
Wireless Keyboard
USB Wireless Dongle
Adderview XDiP -RX
Console
Computer
USB
USB
LAN

6 Notus specification

6.1 Room Layout



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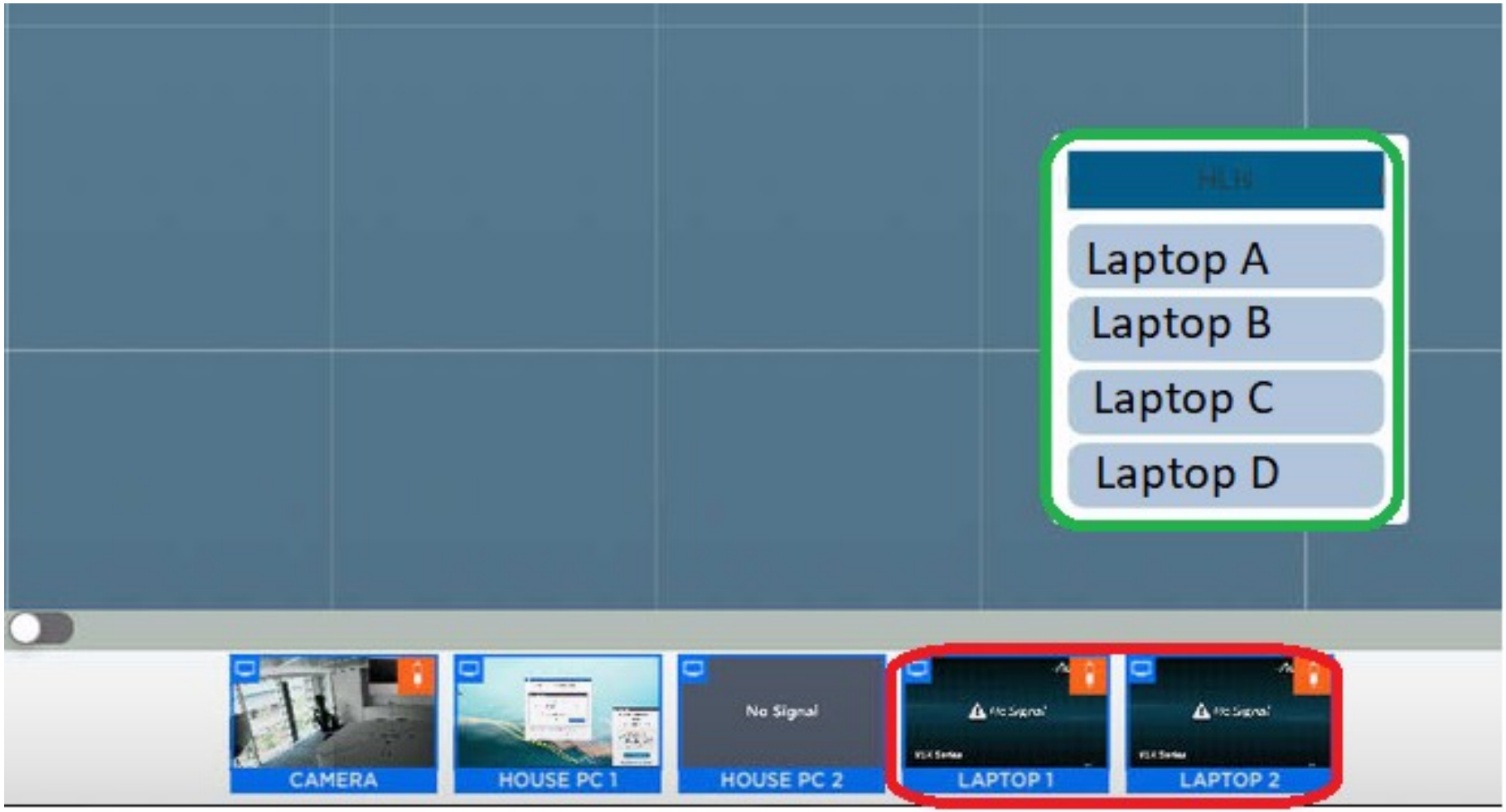
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Laptop B
Laptop C
Laptop D
CAMERA
HOUSE PC 1
No Signal
HOUSE PC 2
LAPTOP 1
LAPTOP 2

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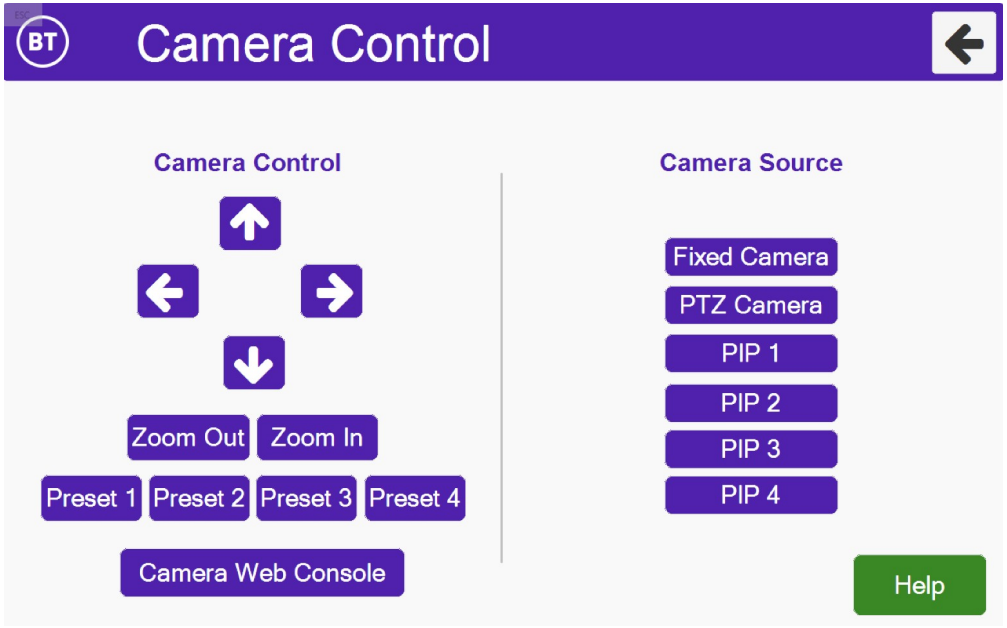

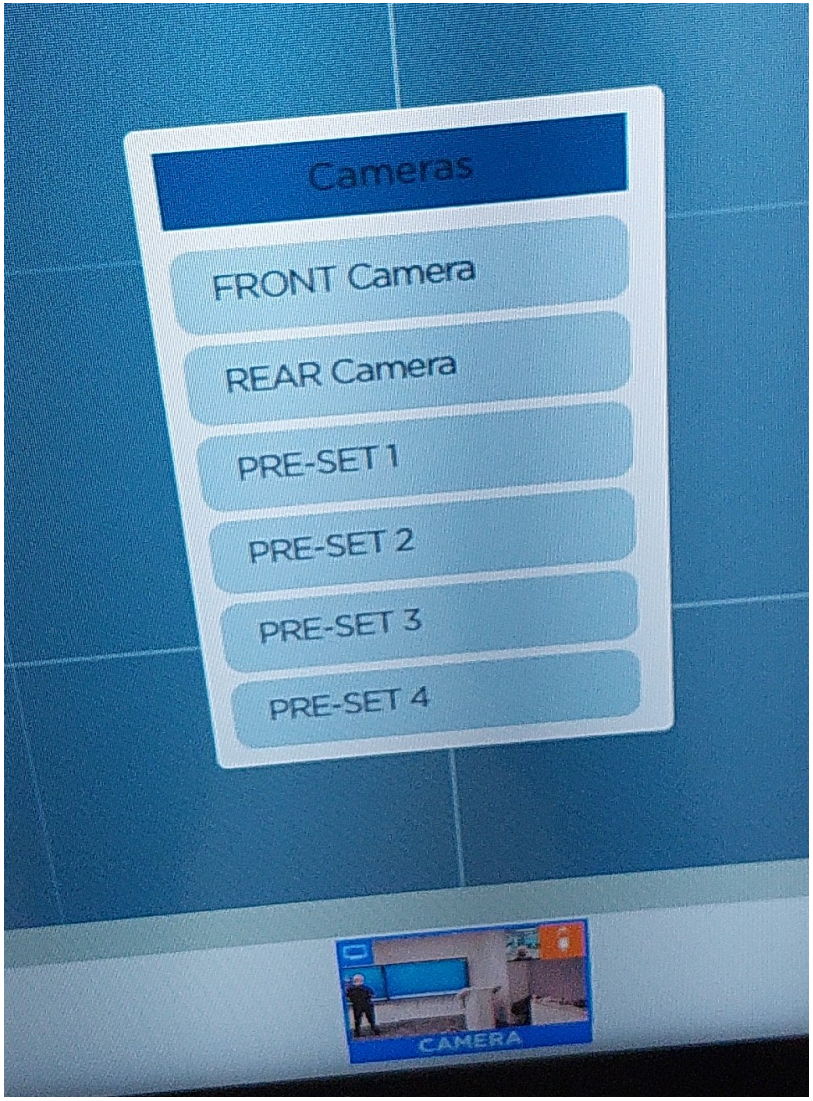

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- CTRL + ALT + 1 for House PC 1
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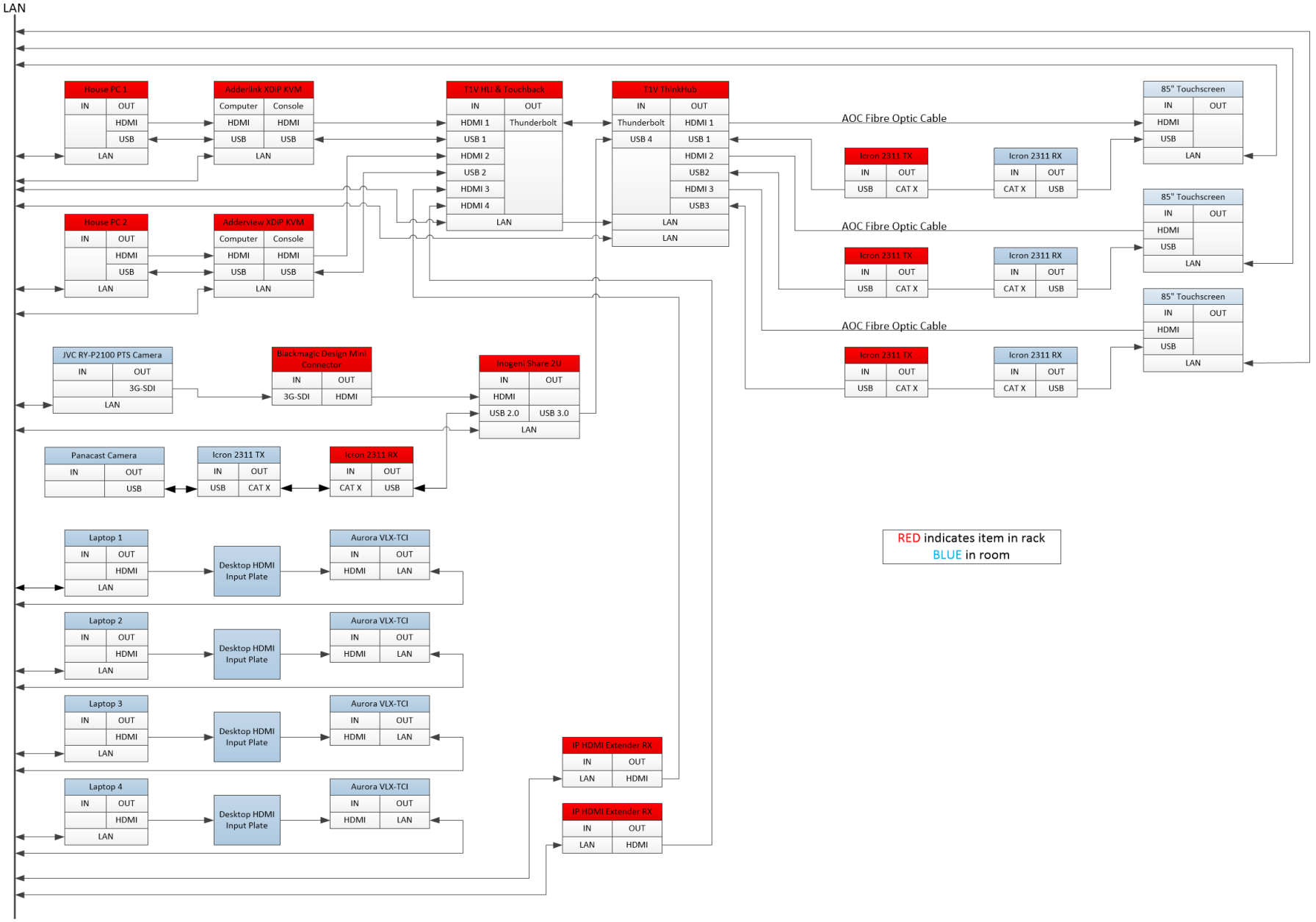
The KVM is mounted under the shelf.

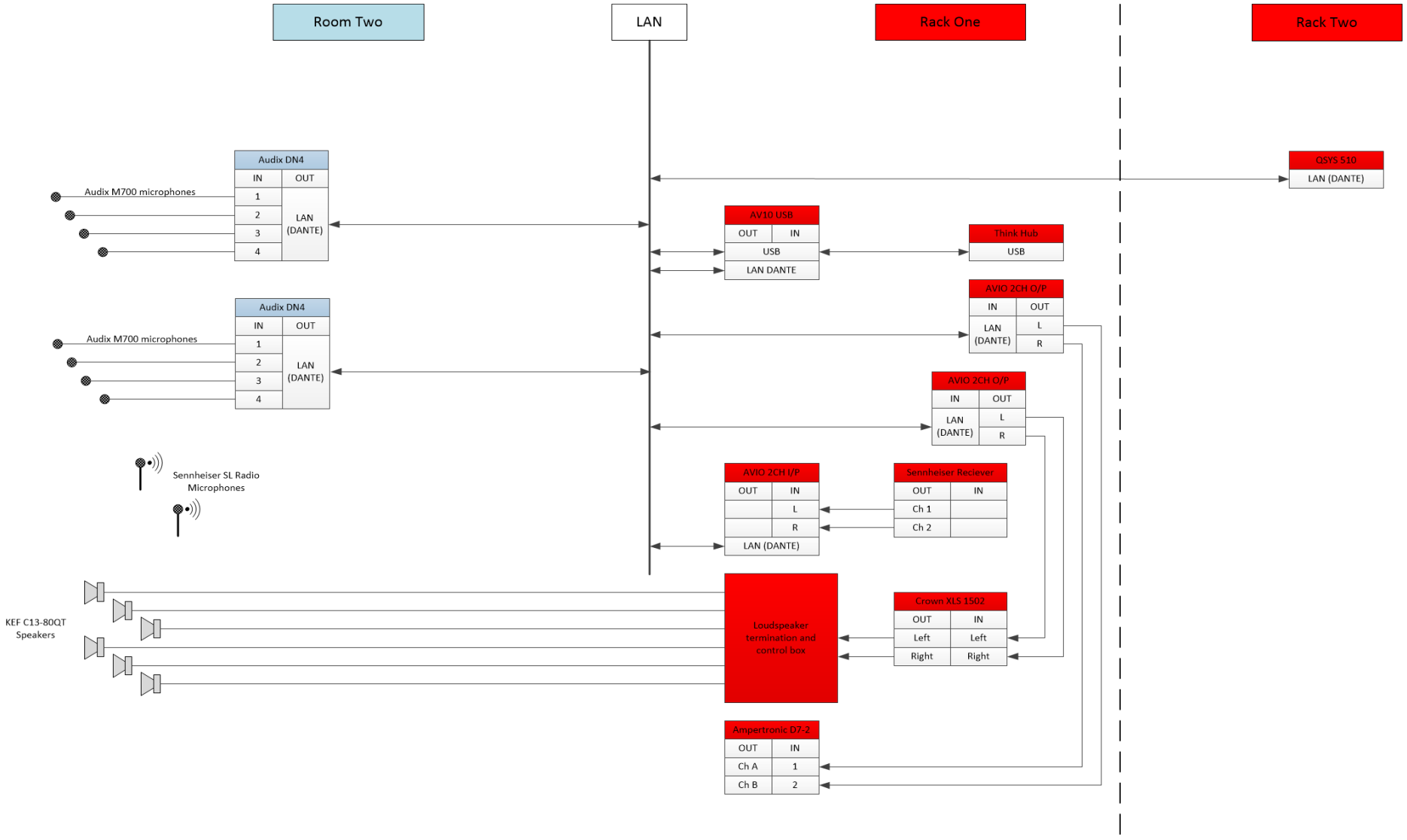
There is a wired remote control for the display as shown on the picture

6.4 Room Schematic

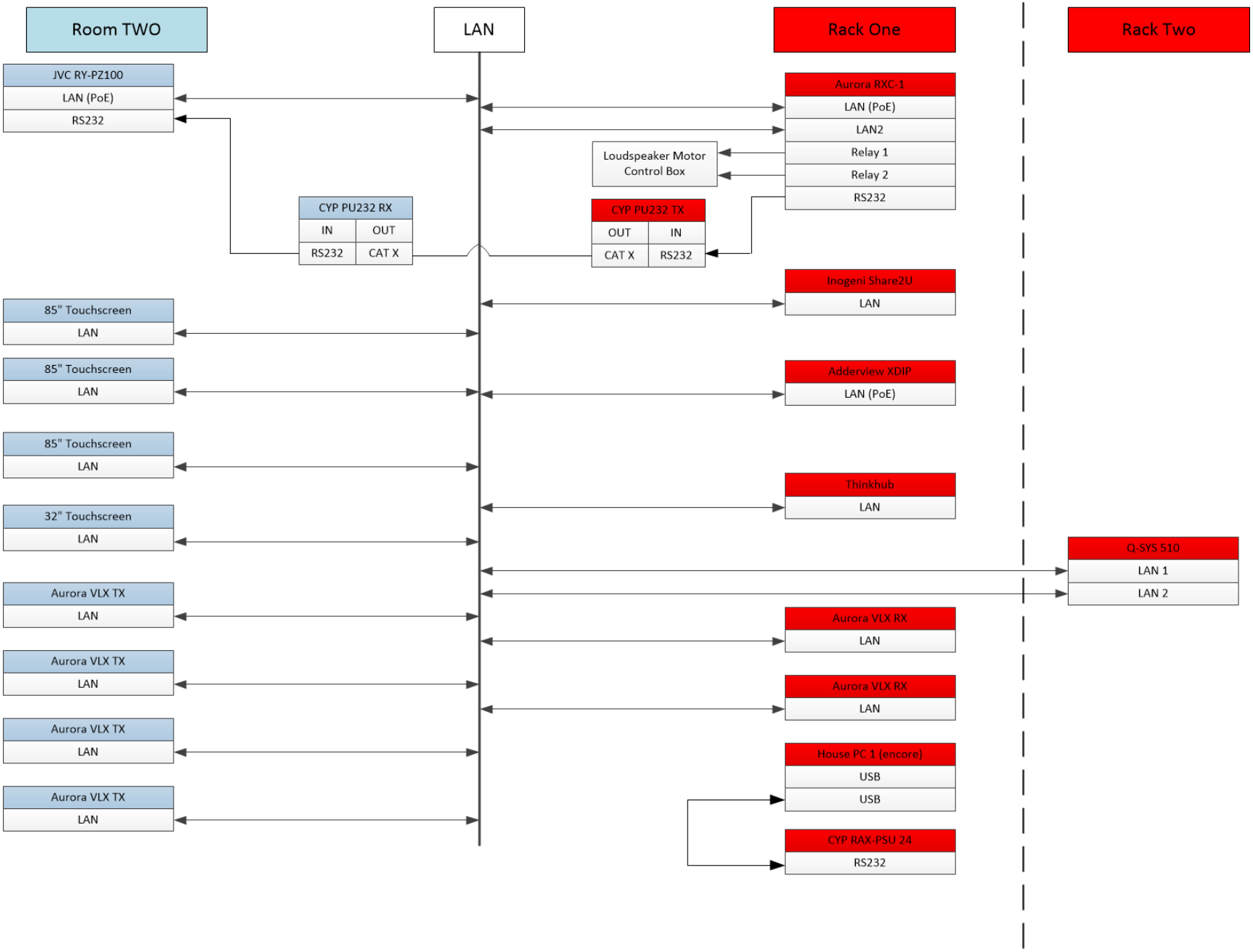
6.4.1 Video



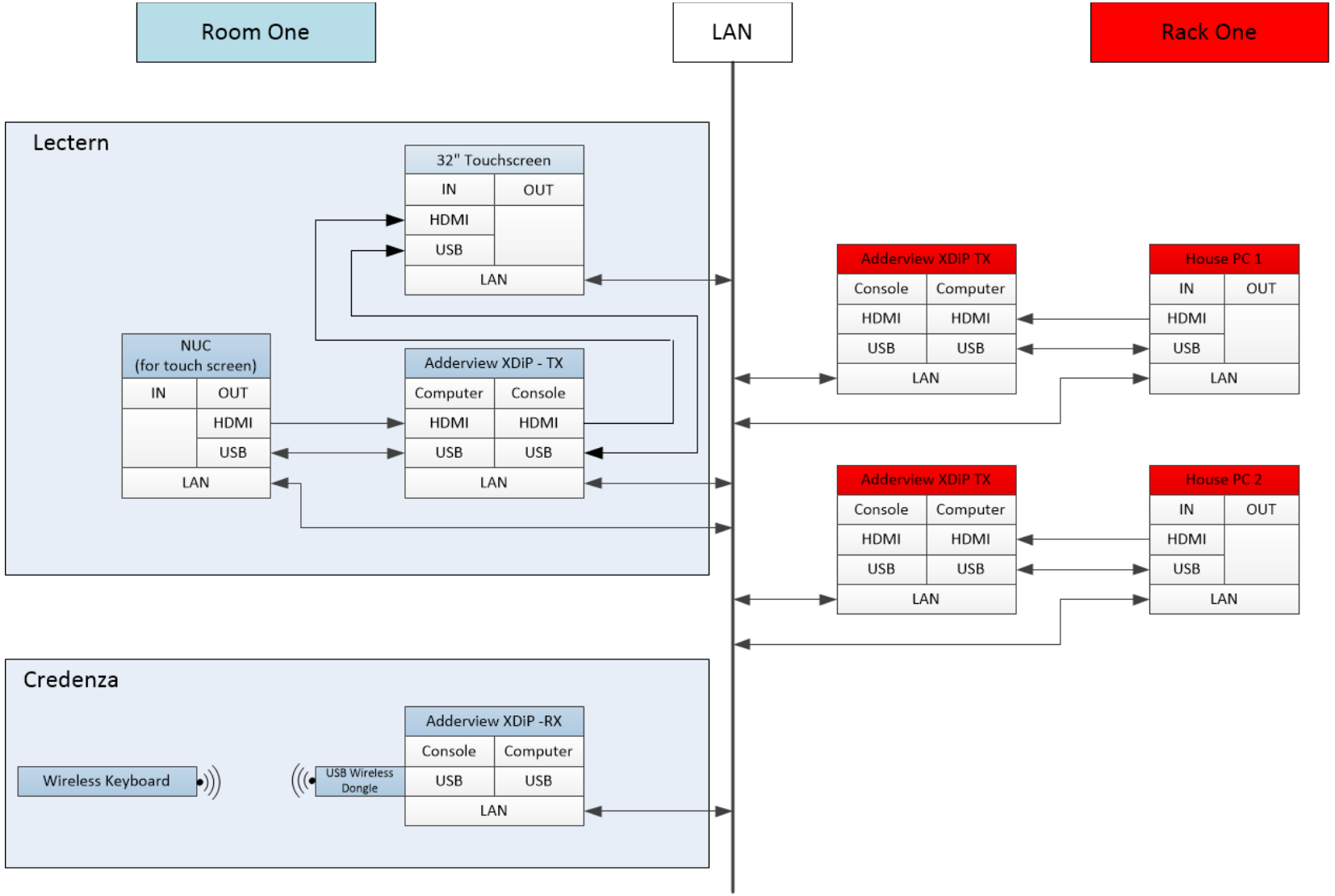
6.4.2 Audio


Room Two
LAN
Rack One
Rack Two
Audix DN4
IN
OUT
1
2
3
4
LAN (DANTE)
Audix M700 microphones
Audix DN4
IN
OUT
1
2
3
4
LAN (DANTE)
Audix M700 microphones
Sennheiser SL Radio Microphones
KEF C13-80QT Speakers
QSYS 510
LAN (DANTE)
AV10 USB
OUT
IN
USB
LAN DANTE
Think Hub
USB
AVIO 2CH O/P
IN
OUT
LAN (DANTE)
L
R
AVIO 2CH O/P
IN
OUT
LAN (DANTE)
L
R
AVIO 2CH I/P
OUT
IN
L
R
LAN (DANTE)
Sennheiser Reciever
OUT
IN
Ch 1
Ch 2
Loudspeaker termination and control box
Crown XLS 1502
OUT
IN
Left
Left
Right
Right
Ampertronic D7-2
OUT
IN
Ch A
1
Ch B
2

6.4.3 Control

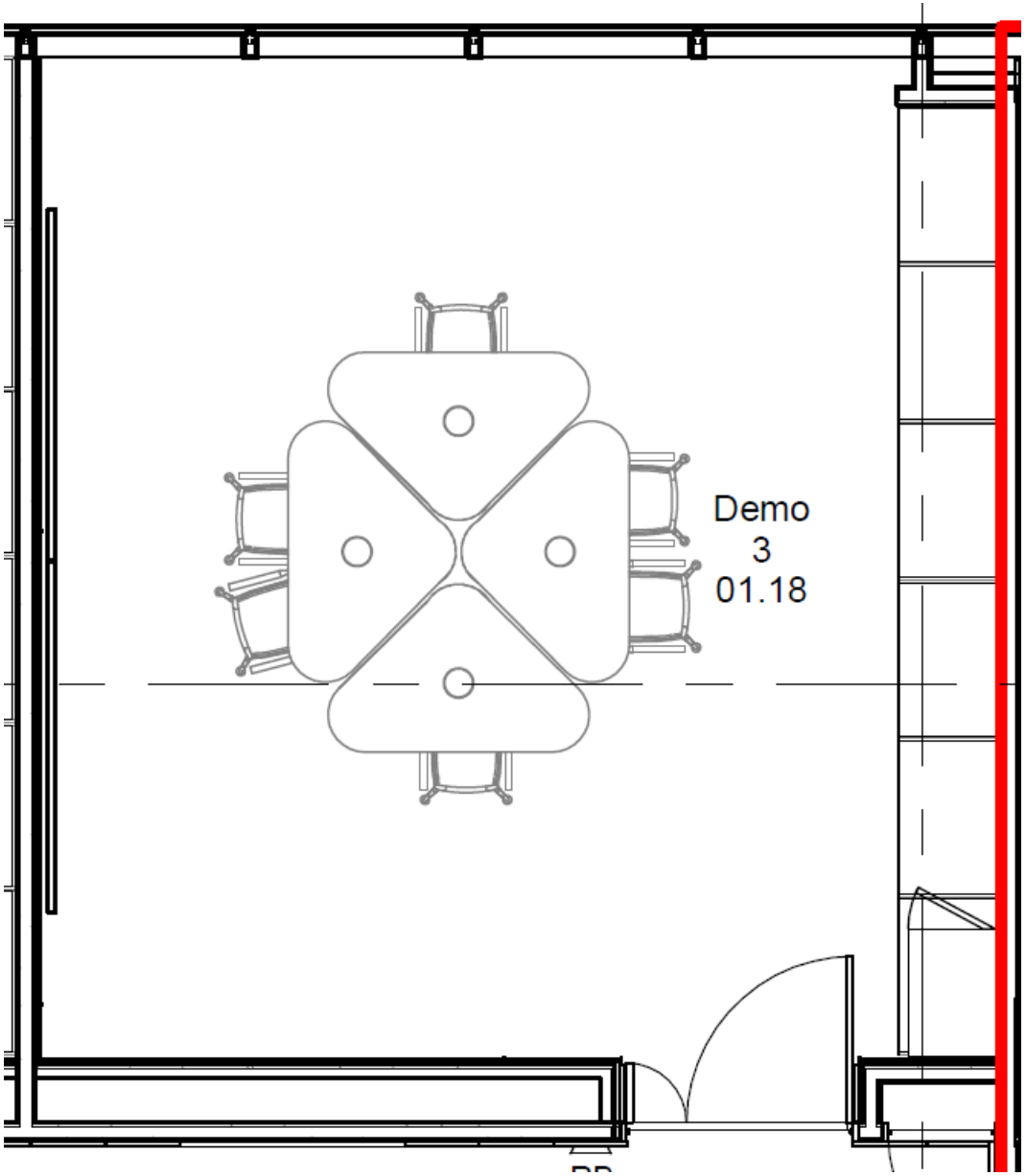

Room TWO
LAN
Rack One
Rack Two
JVC RY-PZ100
LAN (PoE)
RS232
Aurora RXC-1
LAN (PoE)
LAN2
Relay 1
Relay 2
RS232
Loudspeaker Motor Control Box
CYP PU232 RX
IN
OUT
RS232
CAT X
CYP PU232 TX
OUT
IN
CAT X
RS232
Inogeni Share2U
LAN
85" Touchscreen
LAN
85" Touchscreen
LAN
Adderview XDIP
LAN (PoE)
85" Touchscreen
LAN
Thinkhub
LAN
32" Touchscreen
LAN
Q-SYS 510
LAN 1
LAN 2
Aurora VLX TX
LAN
Aurora VLX RX
LAN
Aurora VLX TX
LAN
Aurora VLX RX
LAN
Aurora VLX TX
LAN
House PC 1 (encore)
USB
USB
Aurora VLX TX
LAN
CYP RAX-PSU 24
RS232

6.4.4 KVM

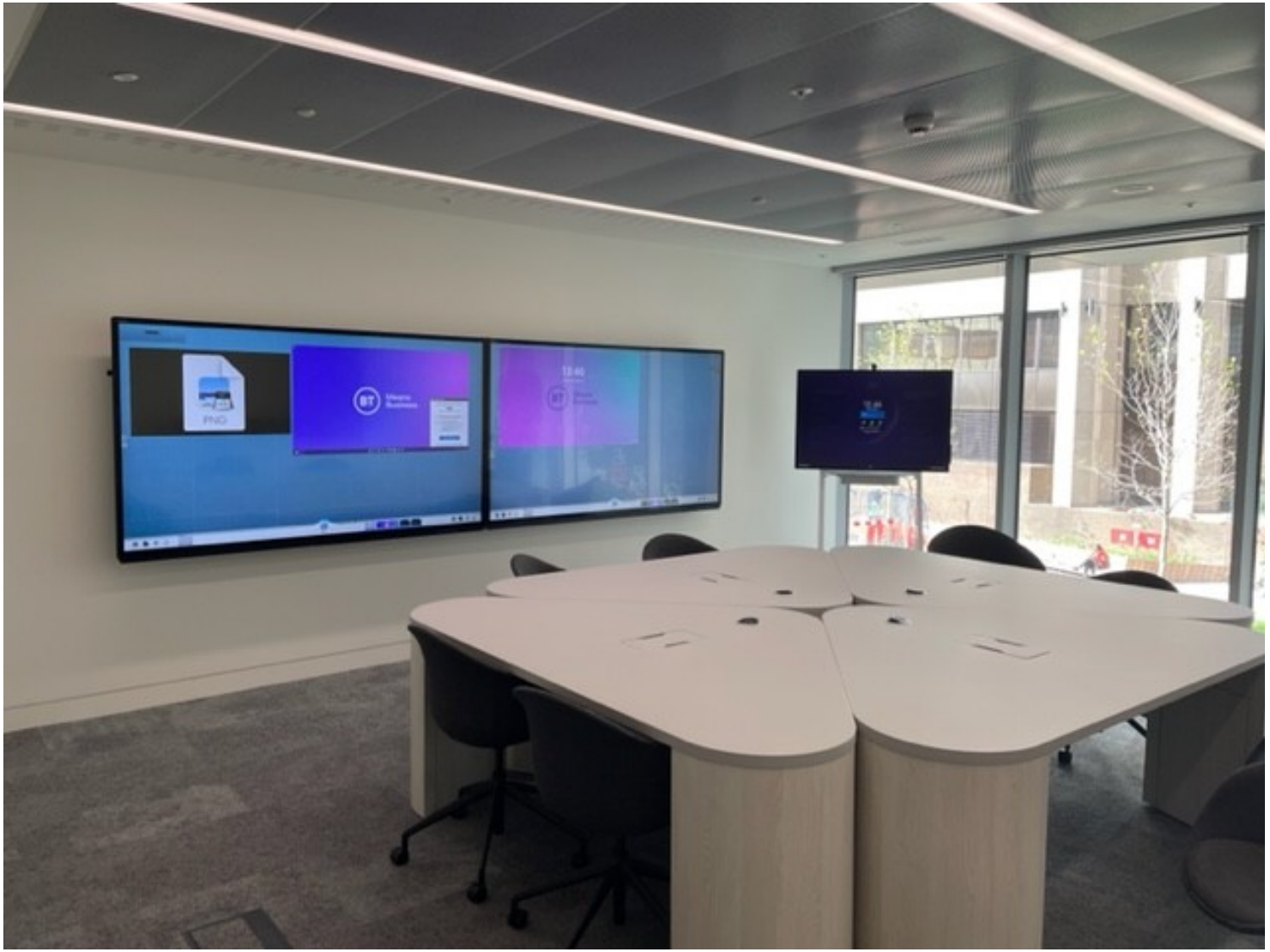

Room One
LAN
Rack One
Lectern
32" Touchscreen
IN
OUT
HDMI
USB
LAN
NUC
(for touch screen)
IN
OUT
HDMI
USB
LAN
Adderview XDiP - TX
Computer
Console
HDMI
HDMI
USB
USB
LAN
Adderview XDiP TX
Console
Computer
HDMI
HDMI
USB
USB
LAN
House PC 1
IN
OUT
HDMI
USB
LAN
Adderview XDiP TX
Console
Computer
HDMI
HDMI
USB
USB
LAN
House PC 2
IN
OUT
HDMI
USB
LAN
Credenza
Wireless Keyboard
USB Wireless Dongle
Adderview XDiP -RX
Console
Computer
USB
USB
LAN

7 Eurus specification

7.1 Room Layout



7.2 Room Photo



7.3 Room Equipment

This room equipped with the following equipment...

2no. 86” Avocor 4K displays

1no. T1V ThinkHub collaboration system

1no. T1V Quad HLI (Hard Line Inputs)

- 4no. HDMI inputs for House PC’s and Laptops
- 2no. Touchback for the House PC’s [1]

2no. House PC’s

4no. Laptop connections [2]

1no. PTZ camera [3]

1no. Web cam [3]

1no. Camera switcher

- this allows the presenter to share a view of themselves via the PTZ camera, the audience using the web cam or both to a remote audience.

1. House PC

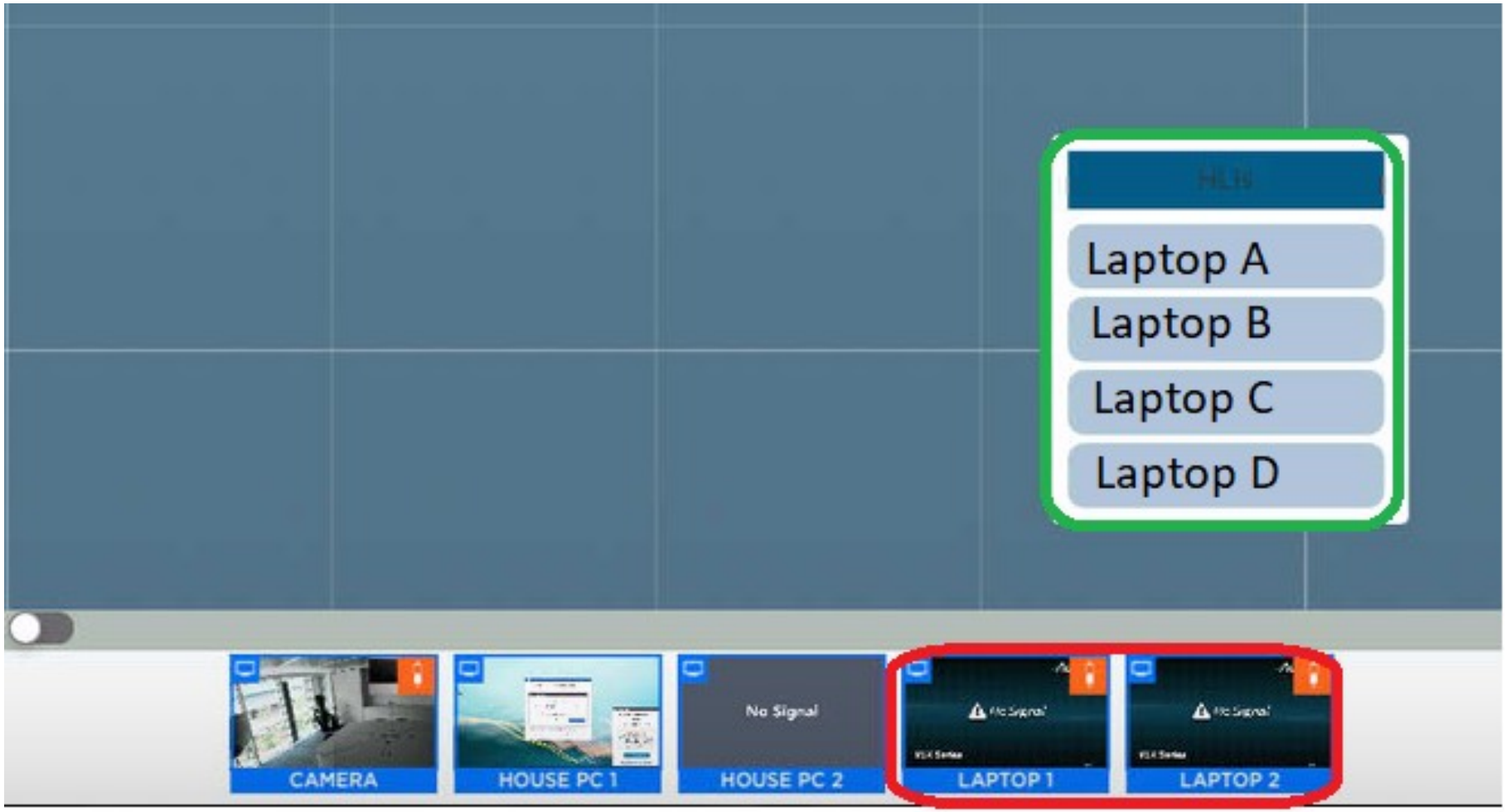
- whilst the House PC's can be controlled from the ThinkHub's canvas via touchback there are occasions when the On Screen Keyboard (OSK) is not the ideal for entering long text strings, be it URL's or passwords.
- to create a better user experience each room is equipped with a wireless keyboard and mouse connected to the KVM system.
- the KVM is located in the cupboard and has two USB dongles attached
- **DO NOT REMOVE or MOVE either USB dongles**
- the first USB dongle for the wireless keyboard and are specific to each room.
- the second USB is a dummy HDMI Monitor and is essential for the KVM to work.

The KVM is located in the middle of the credenza

2. Laptops

- laptops are connected and streamed via the network to the ThinkHubs using Aurora VLX.
- these units are housed in the legs of tables, with HDMI cables presented in the cable management boxes on the top of the tables.
- there are HDMI adaptors for
  - Mini Display Port
  - Display Port
  - USB Type C

- the adaptors are secured to one of the HDMI cables to ensure that they are not lost.
- laptops can be connected to any floor box, via the labelled **RED** network cables.
- each floor box is equipped with four network ports.
- however, the Laptop extenders MUST be connected to either of the two lowest number ports to ensure they receive PoE.
- whilst 4no. Laptops can be connected at the same time only 2no. laptops can be shown simultaneously.
- which two of the four possible connected laptops are shown on the canvas, can be selected from the pop menu when one the laptop icon in the device tray is tapped.
- the labels mirror those on the HDMI cables and the corresponding network cables.
- additional devices laptops, tablets and phones can also be connected wirelessly to the ThinkHub canvas using T1V App.


Laptop A
Laptop B
Laptop C
Laptop D
CAMERA
HOUSE PC 1
No Signal
HOUSE PC 2
LAPTOP 1
LAPTOP 2

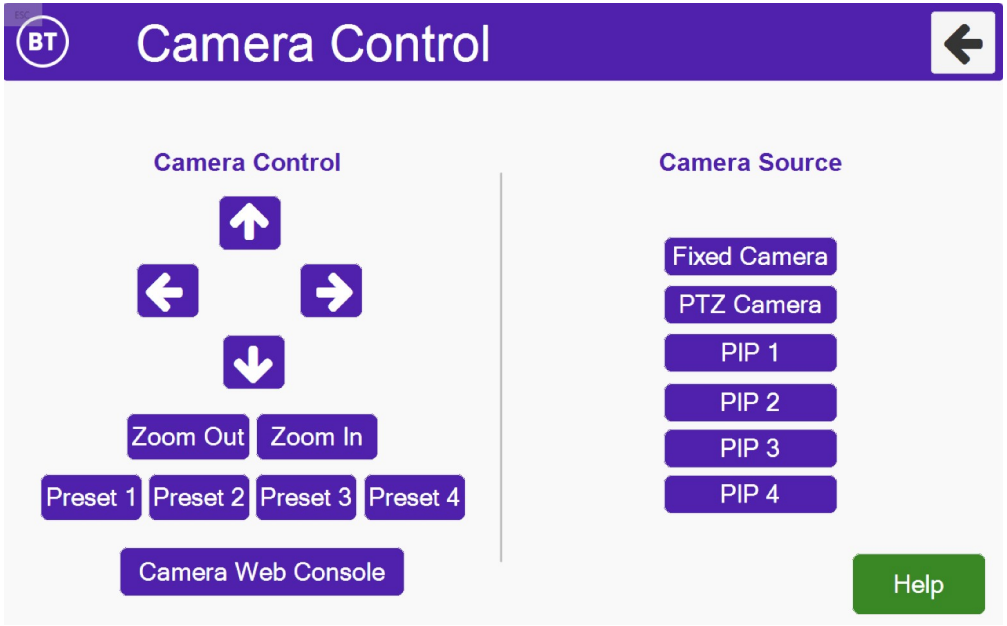
3. Camera

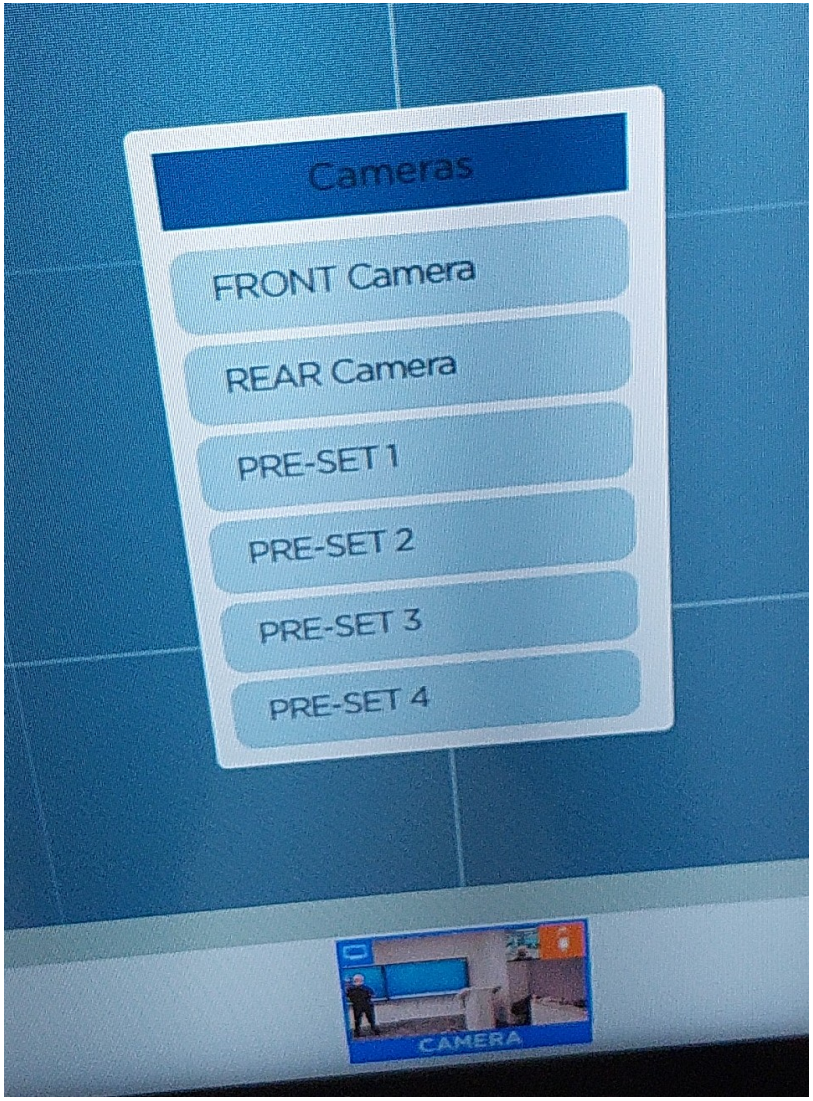
Clicking on the orange menu on the camera icon in the device tray opens the menu as shown.

This menu allows the user to select which camera, Front facing (showing presenter) or Rear facing (showing audience) or a mix of both as a PiP by selecting a pre-set.

These controls are also found on the control panel show below (see section 8.

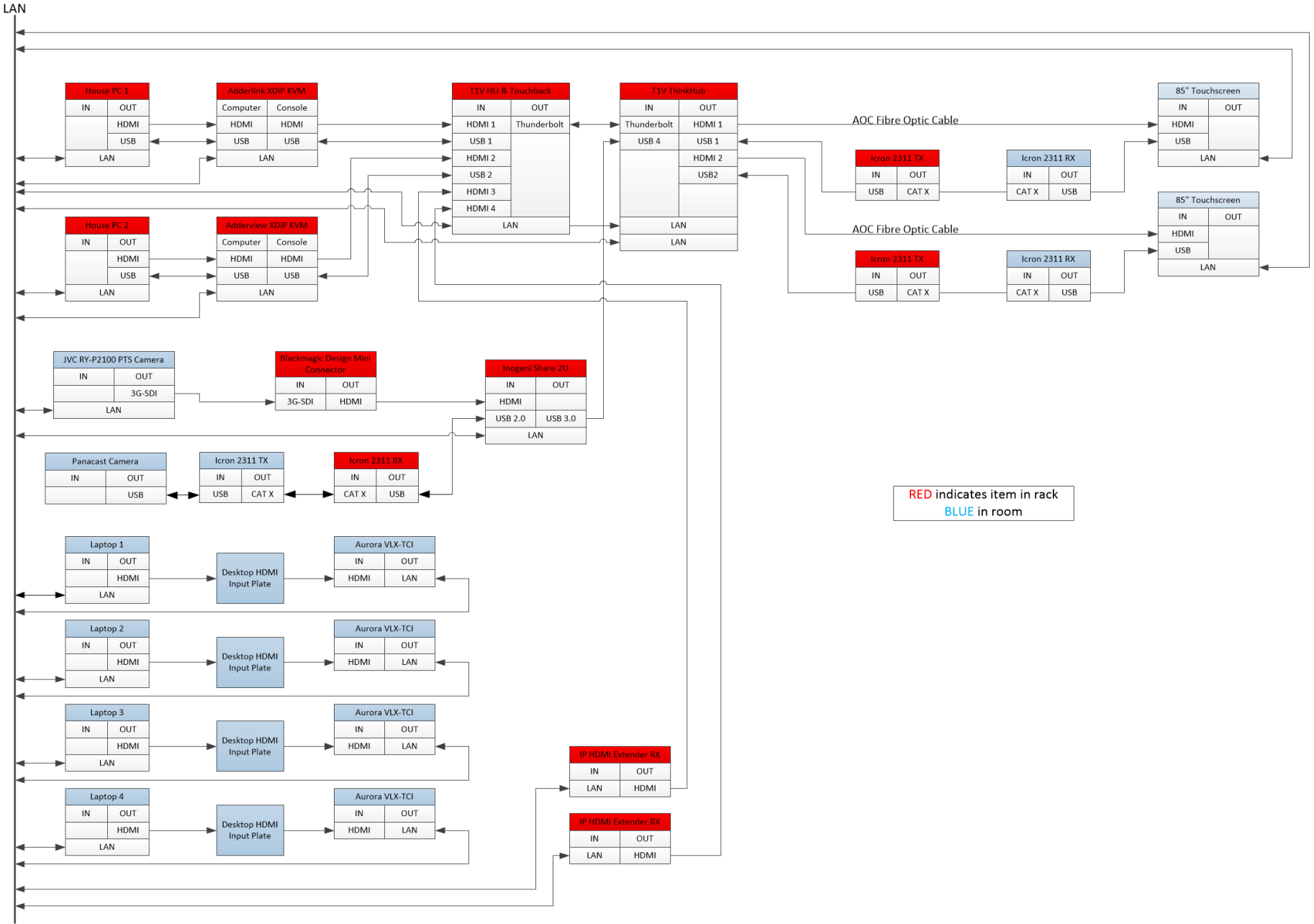
This control panel also allows for advanced control such a Pan Tilt and Zoom functions of the Front facing camera as well as setting up pre-set vis the camera's own web portal (see notes in appendix 9)



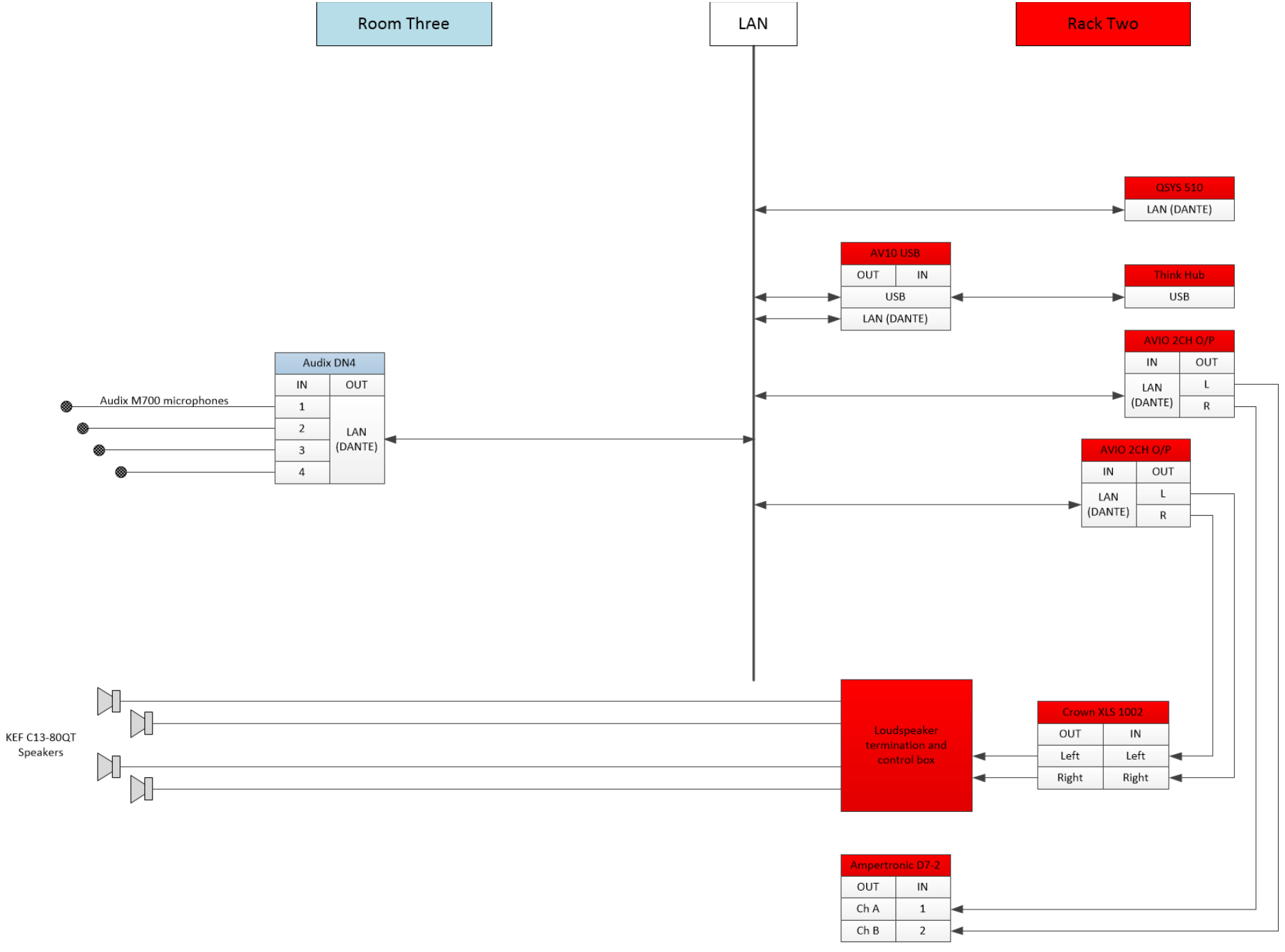


7.4 Room Schematic

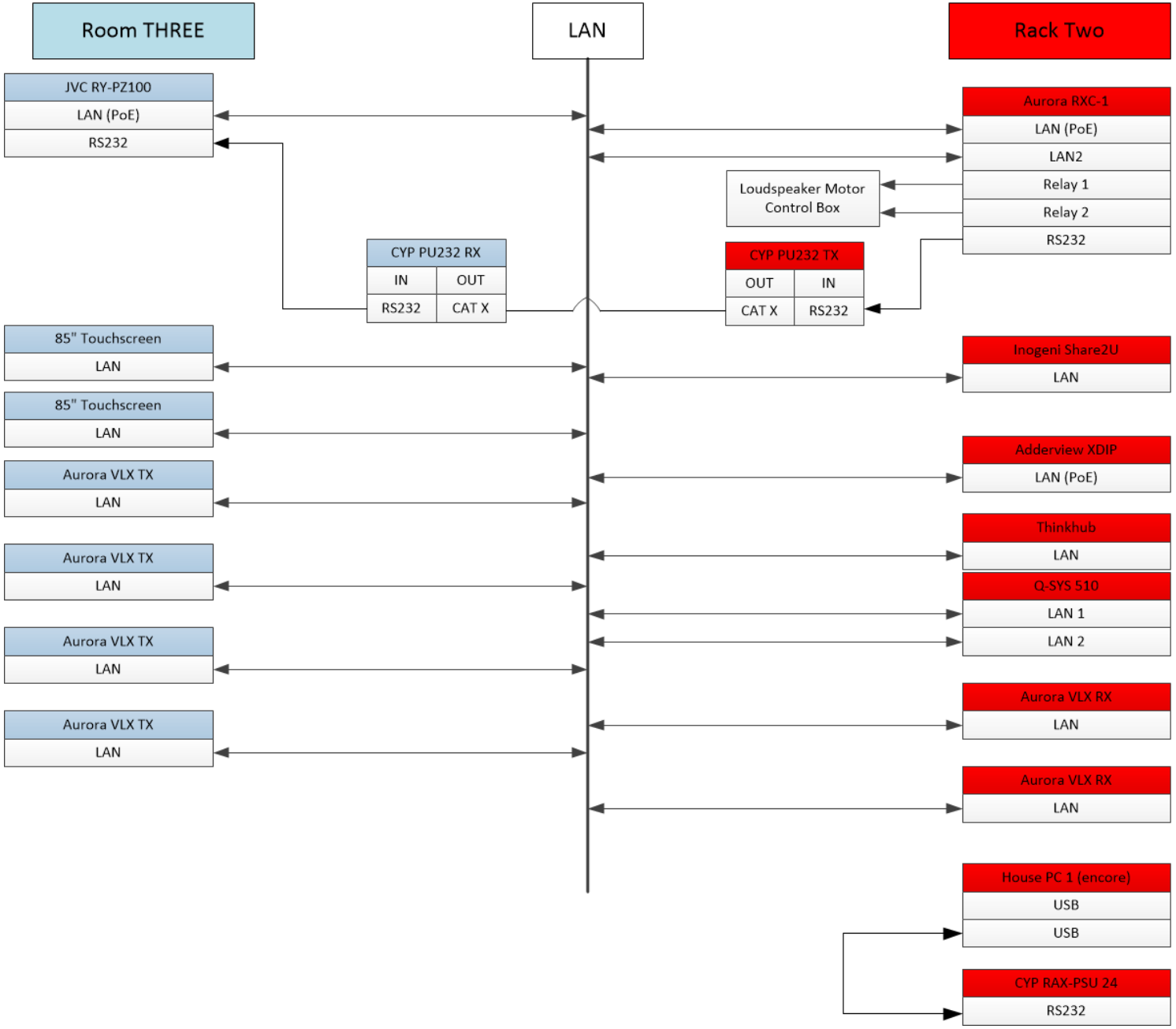
7.4.1 Video



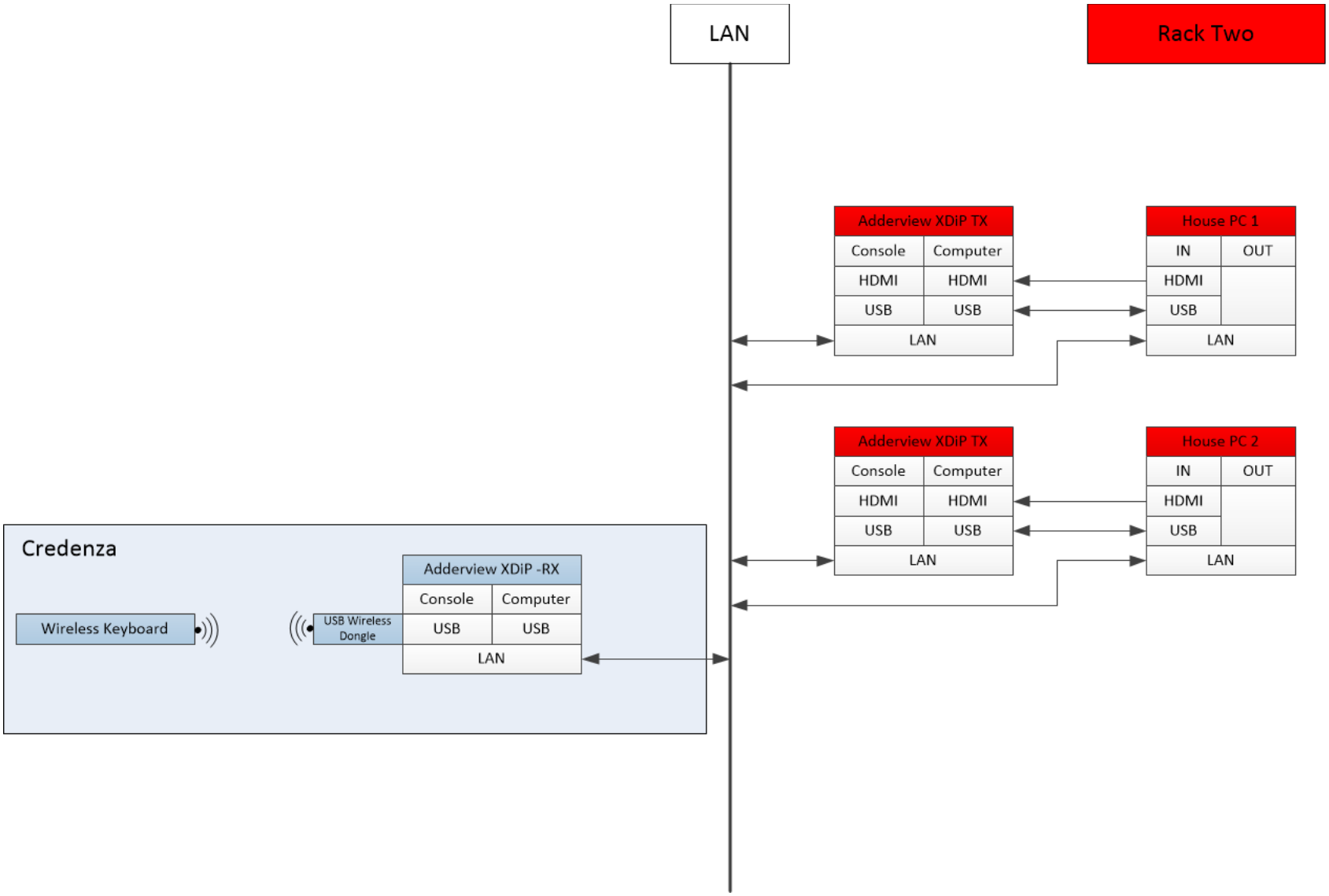
7.4.2 Audio


Room Three
LAN
Rack Two
QSYS 510
LAN (DANTE)
AV10 USB
OUT
IN
USB
LAN (DANTE)
Think Hub
USB
AVIO 2CH O/P
IN
OUT
LAN (DANTE)
L
R
Audix DN4
IN
OUT
1
2
3
4
LAN (DANTE)
Audix M700 microphones
AVIO 2CH O/P
IN
OUT
LAN (DANTE)
L
R
KEF C13-80QT Speakers
Loudspeaker termination and control box
Crown XLS 1002
OUT
IN
Left
Left
Right
Right
Ampertronic D7-2
OUT
IN
Ch A
1
Ch B
2

7.4.3 Control

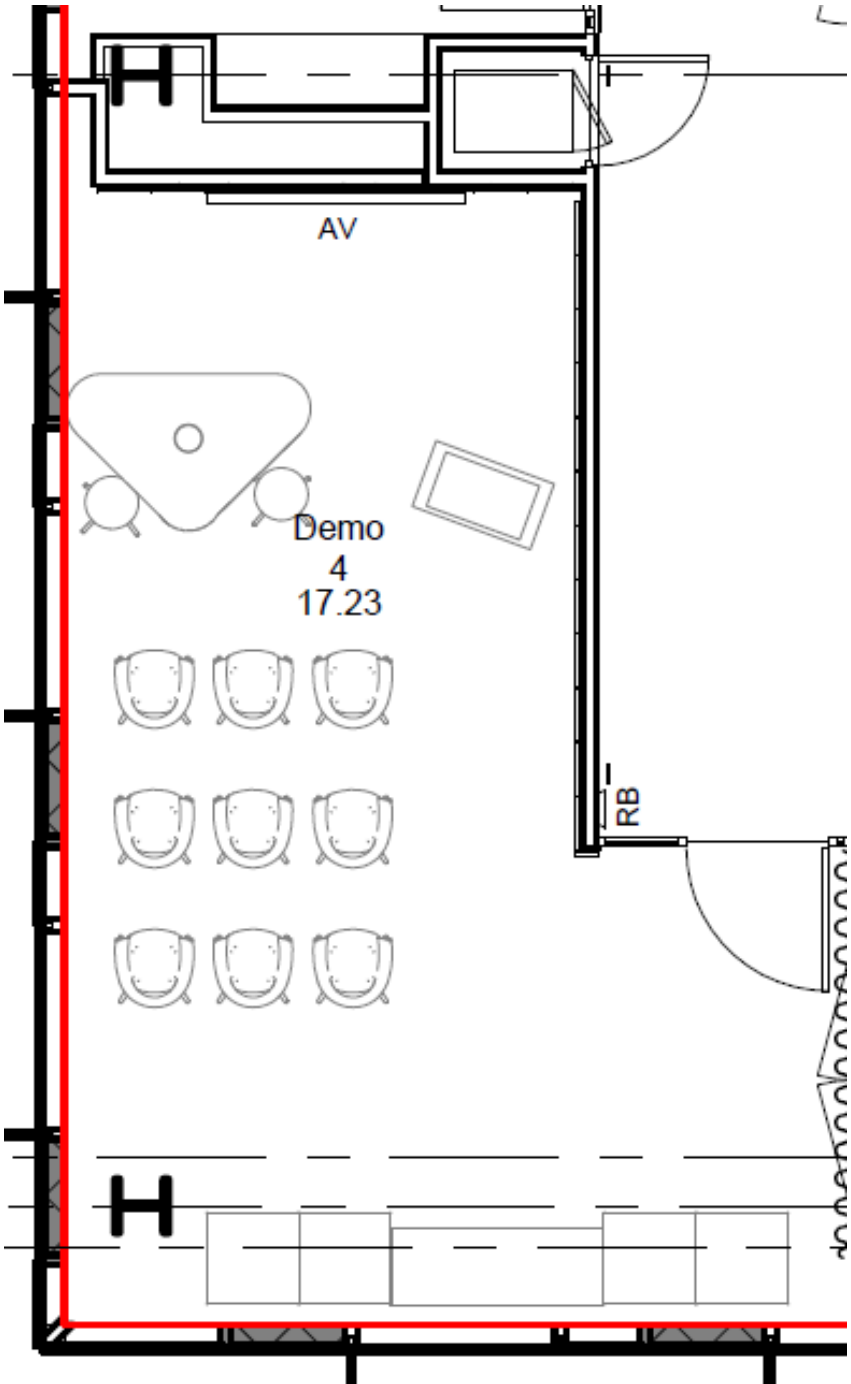

Room THREE
LAN
Rack Two
JVC RY-PZ100
LAN (PoE)
RS232
CYP PU232 RX
IN
OUT
RS232
CAT X
Aurora RXC-1
LAN (PoE)
LAN2
Relay 1
Relay 2
RS232
Loudspeaker Motor Control Box
CYP PU232 TX
OUT
IN
CAT X
RS232
85" Touchscreen
LAN
85" Touchscreen
LAN
Aurora VLX TX
LAN
Aurora VLX TX
LAN
Aurora VLX TX
LAN
Aurora VLX TX
LAN
Inogeni Share2U
LAN
Adderview XDIP
LAN (PoE)
Thinkhub
LAN
Q-SYS 510
LAN 1
LAN 2
Aurora VLX RX
LAN
Aurora VLX RX
LAN
House PC 1 (encore)
USB
USB
CYP RAX-PSU 24
RS232

7.4.4 KVM


LAN
Rack Two
Adderview XDiP TX
Console
Computer
HDMI
HDMI
USB
USB
LAN
House PC 1
IN
OUT
HDMI
USB
LAN
Adderview XDiP TX
Console
Computer
HDMI
HDMI
USB
USB
LAN
House PC 2
IN
OUT
HDMI
USB
LAN
Credenza
Wireless Keyboard
USB Wireless Dongle
Adderview XDiP -RX
Console
Computer
USB
USB
LAN

8 Luna specification

8.1 Room Layout



8.2 **Room Photo**

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- 2no. Touchback for the House PC’s [1]

2no. House PC’s

2no. Laptop connections [2]

1no. PTZ camera [3]

1no. Web cam [3]

1no. Camera switcher

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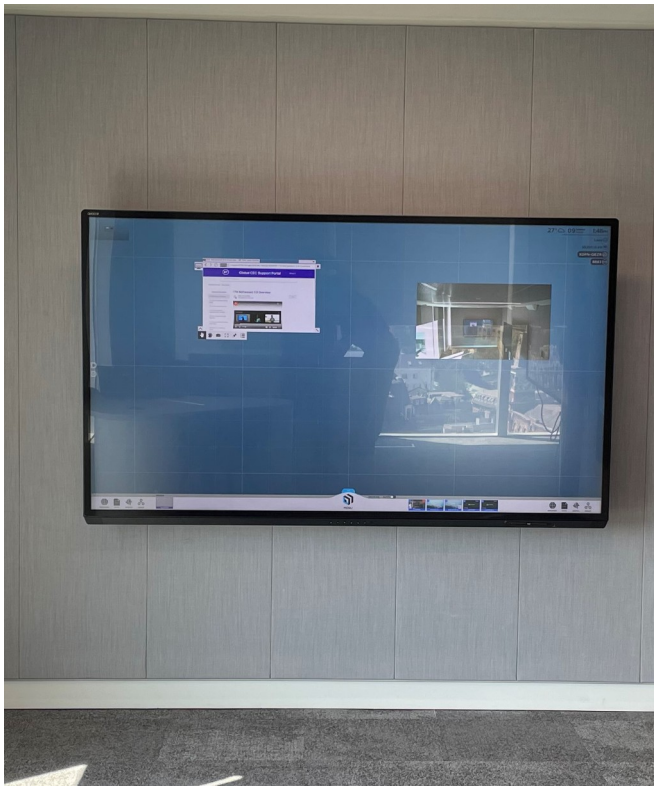
- the KVM is located in the cupboard and has two USB dongles attached
- **DO NOT REMOVE or MOVE either USB dongles**
- the first USB dongle for the wireless keyboard and are specific to each room.
- the second USB is a dummy HDMI Monitor and is essential for the KVM to work.

The KVM is located behind the display



2. Laptops

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- these units are housed in the legs of tables, with HDMI cables presented in the cable management boxes on the top of the tables.
- there are HDMI adaptors for
  - Mini Display Port
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  - USB Type C

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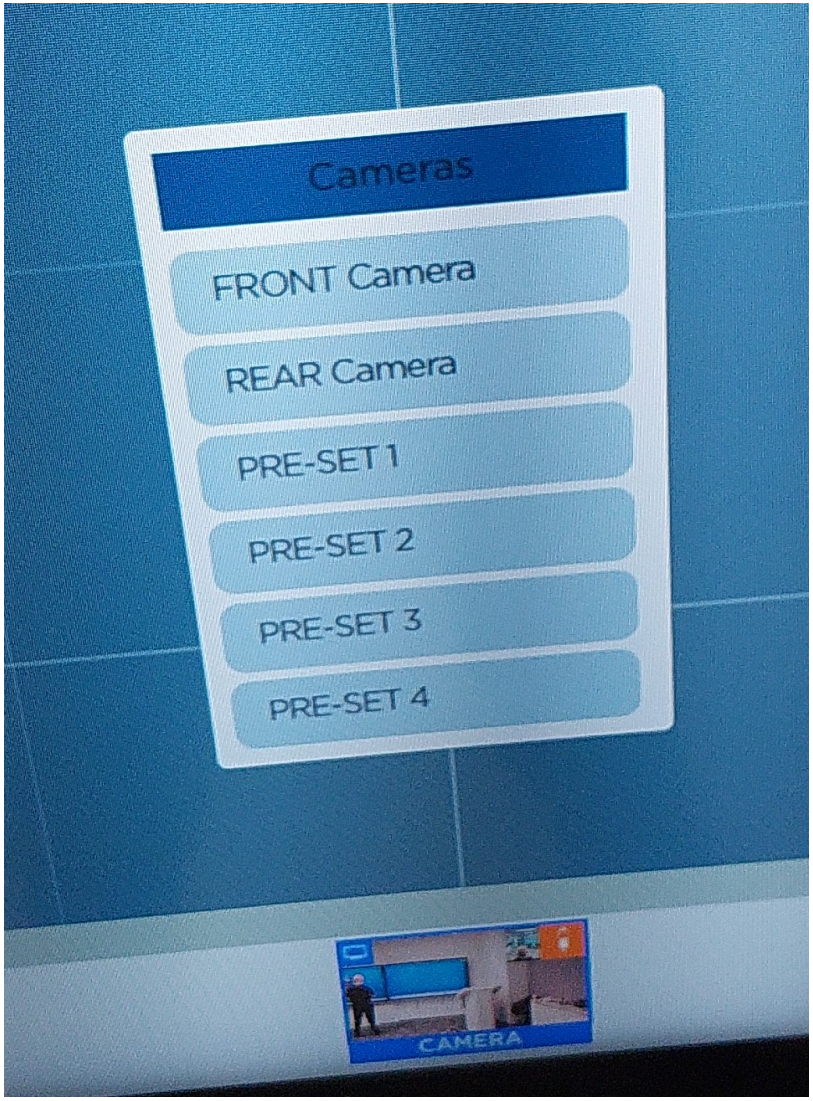
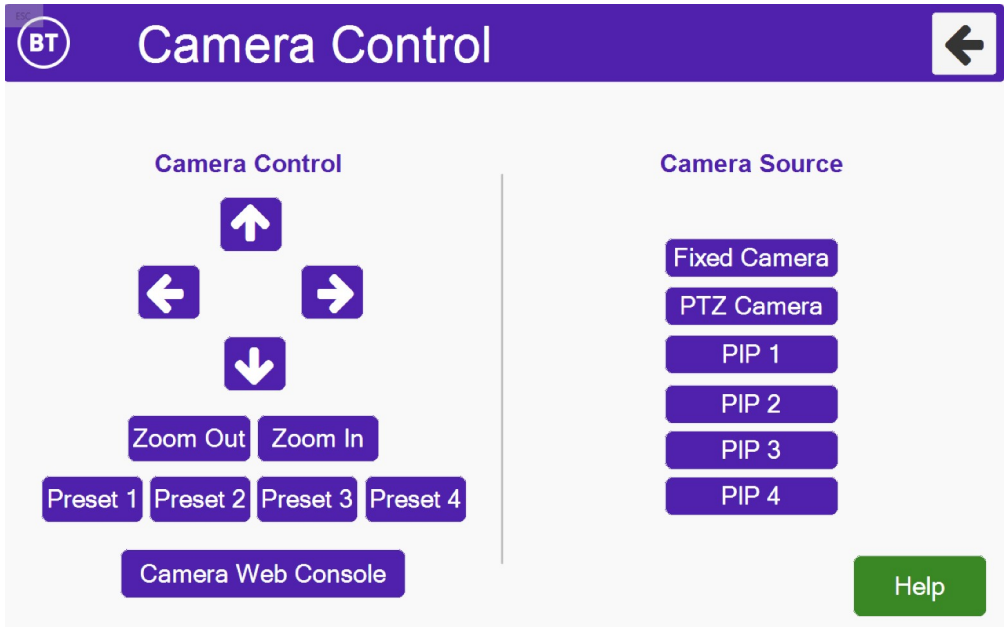
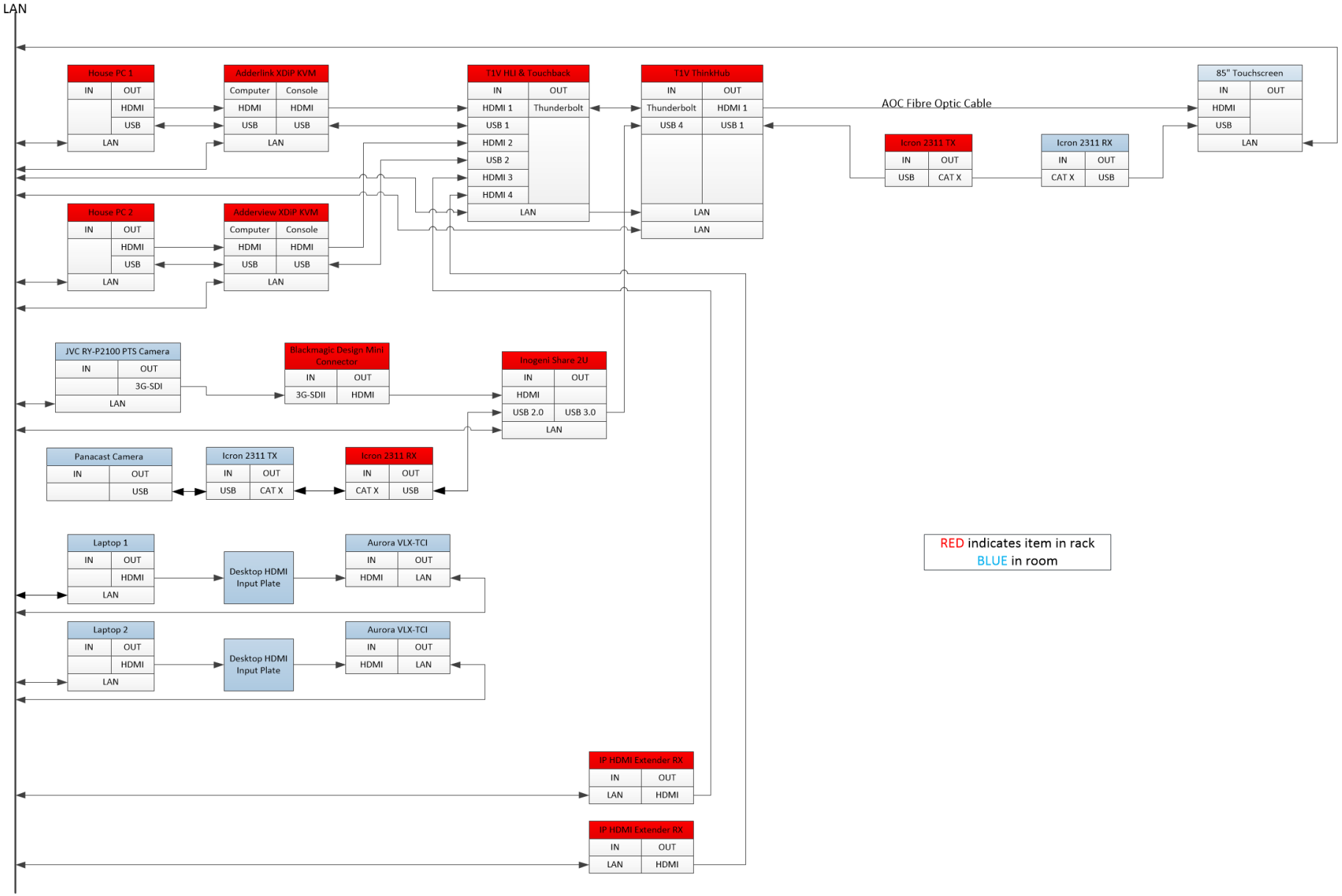


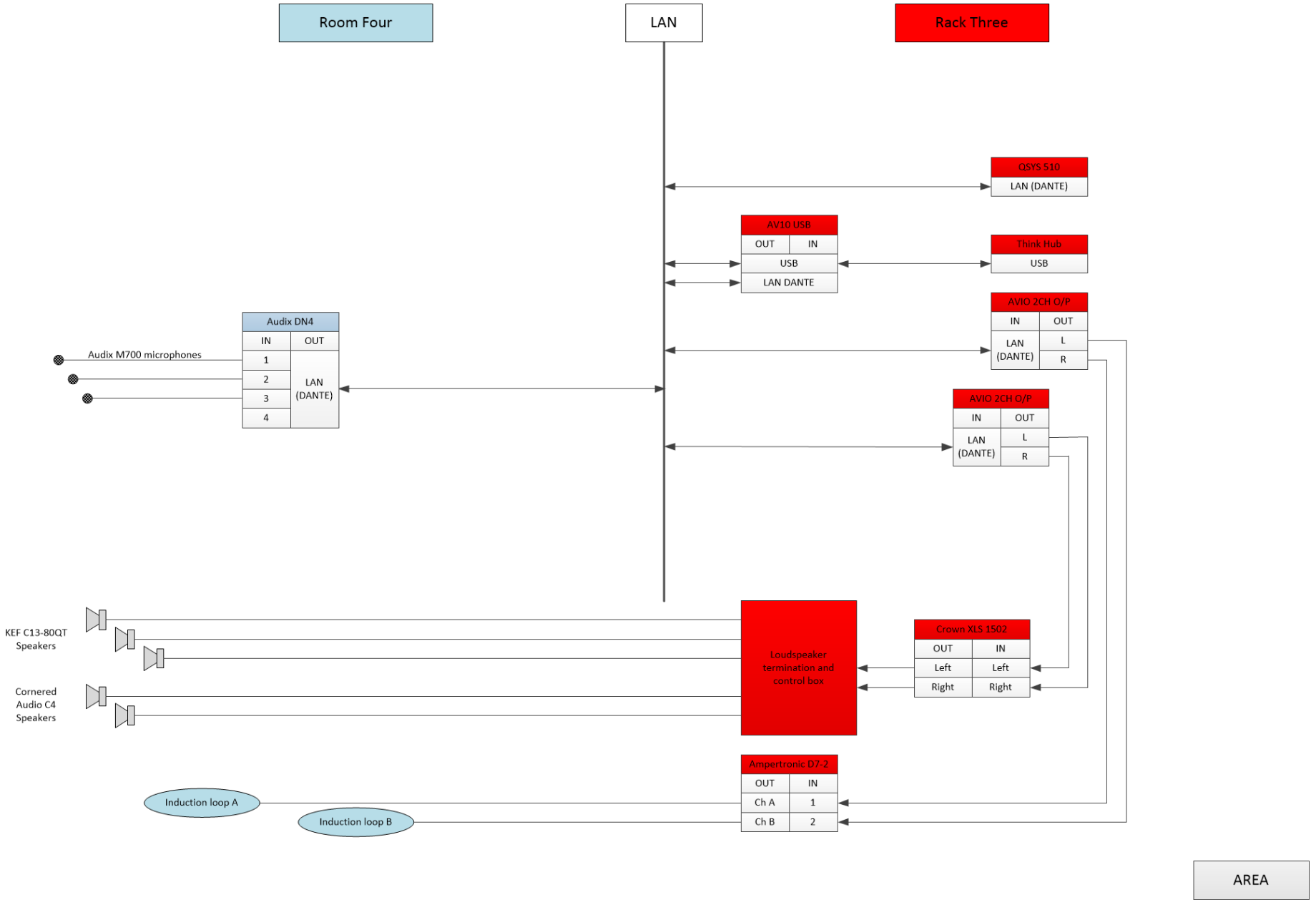


8.4 Room Schematic

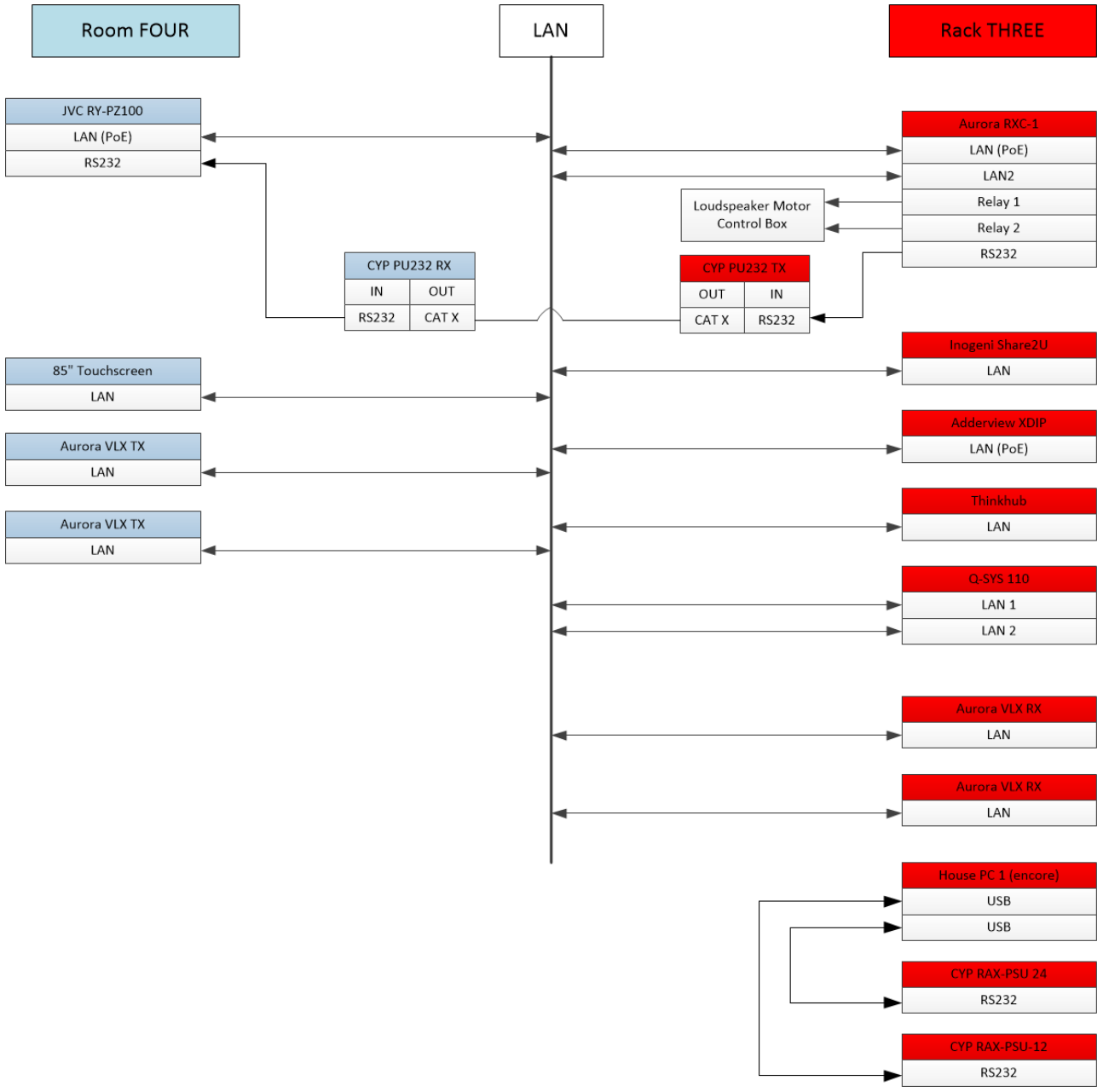
8.4.1 Video



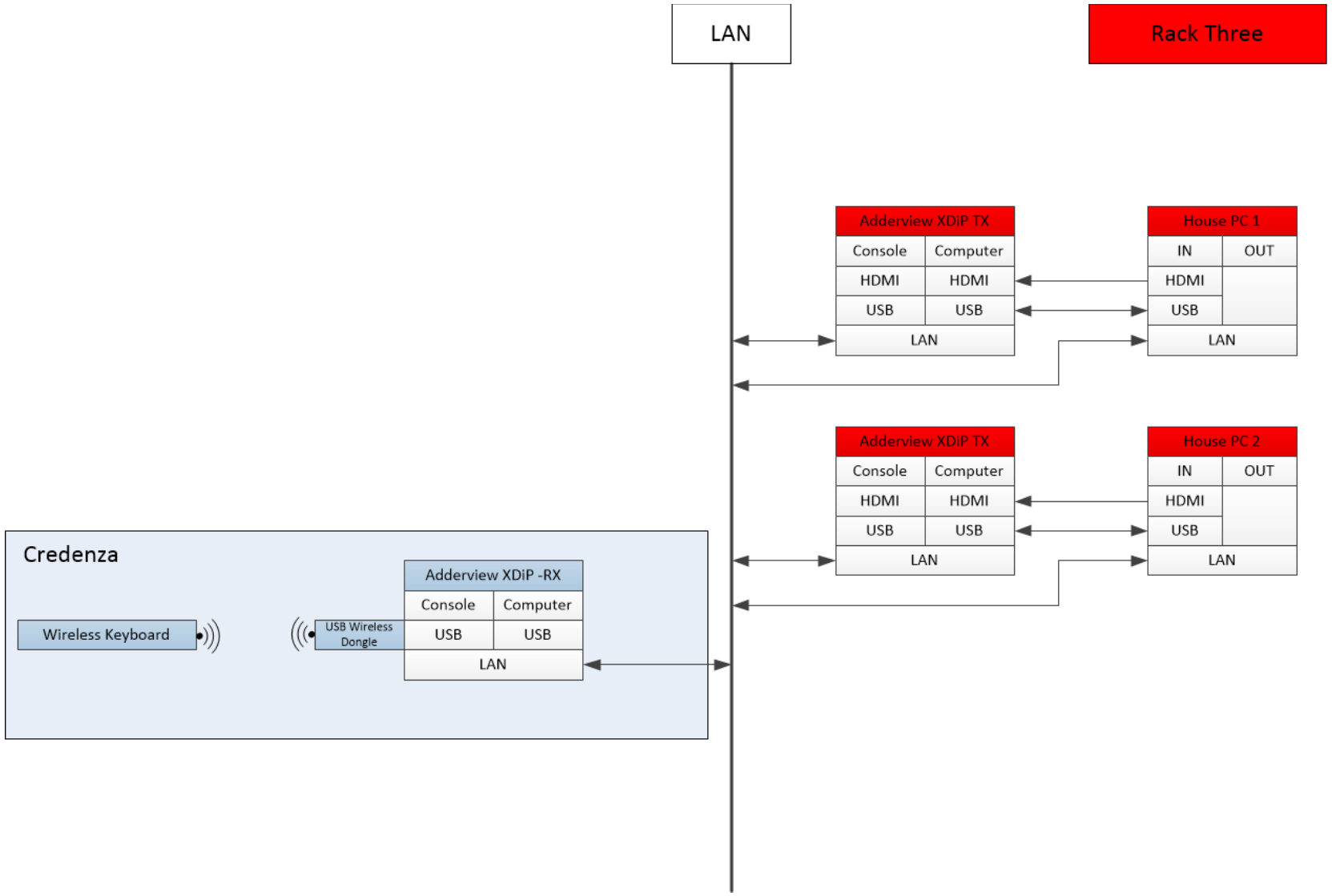
8.4.2 Audio


Room Four
LAN
Rack Three
QSYS 510
LAN (DANTE)
AV10 USB
OUT
IN
USB
LAN DANTE
Think Hub
USB
AVIO 2CH O/P
IN
OUT
LAN (DANTE)
L
R
Audix DN4
IN
OUT
1
2
3
4
LAN (DANTE)
Audix M700 microphones
AVIO 2CH O/P
IN
OUT
LAN (DANTE)
L
R
KEF C13-80QT Speakers
Cornered Audio C4 Speakers
Loudspeaker termination and control box
Crown XLS 1502
OUT
IN
Left
Left
Right
Right
Ampertronic D7-2
OUT
IN
Ch A
1
Ch B
2
Induction loop A
Induction loop B
AREA

8.4.3 Control


Room FOUR
LAN
Rack THREE
JVC RY-PZ100
LAN (PoE)
RS232
CYP PU232 RX
IN
OUT
RS232
CAT X
CYP PU232 TX
OUT
IN
CAT X
RS232
Loudspeaker Motor Control Box
Aurora RXC-1
LAN (PoE)
LAN2
Relay 1
Relay 2
RS232
85" Touchscreen
LAN
Aurora VLX TX
LAN
Aurora VLX TX
LAN
Inogeni Share2U
LAN
Adderview XDIP
LAN (PoE)
Thinkhub
LAN
Q-SYS 110
LAN 1
LAN 2
Aurora VLX RX
LAN
Aurora VLX RX
LAN
House PC 1 (encore)
USB
USB
CYP RAX-PSU 24
RS232
CYP RAX-PSU-12
RS232

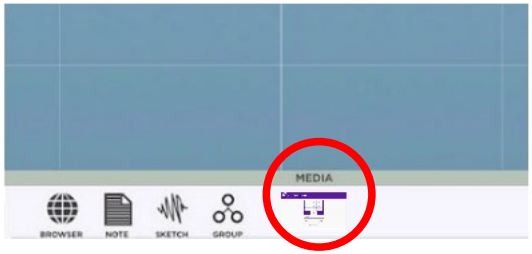
8.4.4 KVM


LAN
Rack Three
Adderview XDiP TX
Console
Computer
HDMI
HDMI
USB
USB
LAN
House PC 1
IN
OUT
HDMI
USB
LAN
Adderview XDiP TX
Console
Computer
HDMI
HDMI
USB
USB
LAN
House PC 2
IN
OUT
HDMI
USB
LAN
Credenza
Wireless Keyboard
USB Wireless Dongle
Adderview XDiP -RX
Console
Computer
USB
USB
LAN

9 Support

9.1 Web Portal

Everyday control is provided by the Thinkhub however, should you encounter any issues then we have created a web portal that is always available on the Thinkhubs media tray to provide 1st line support and diagnostics.

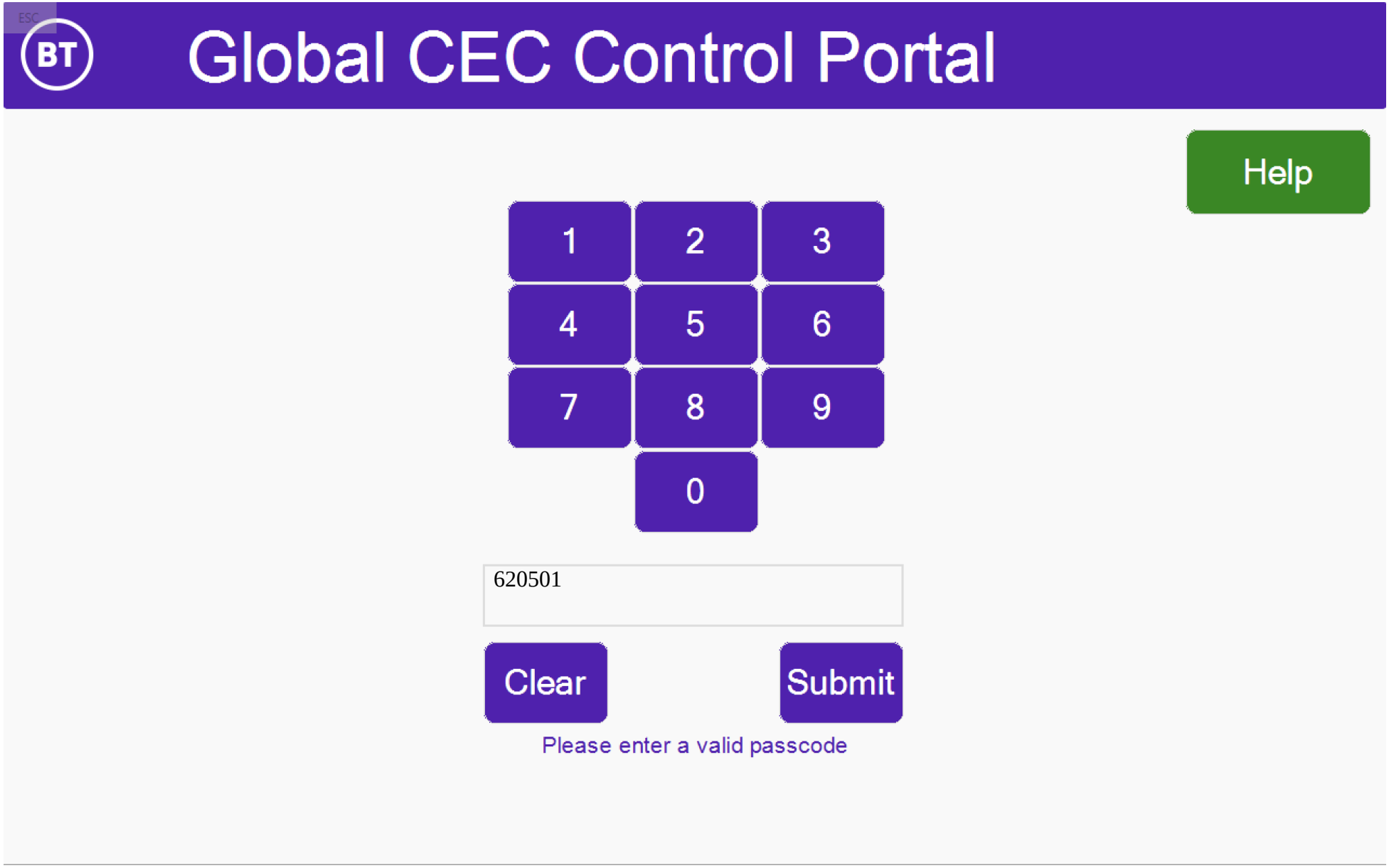


If you want to reboot a devices or force a display input to the right HDMI source, it also provides duplicate control of external Thinkhub control for example camera control.

It is also possible to access this portal from any device on the CEC network at the following address's

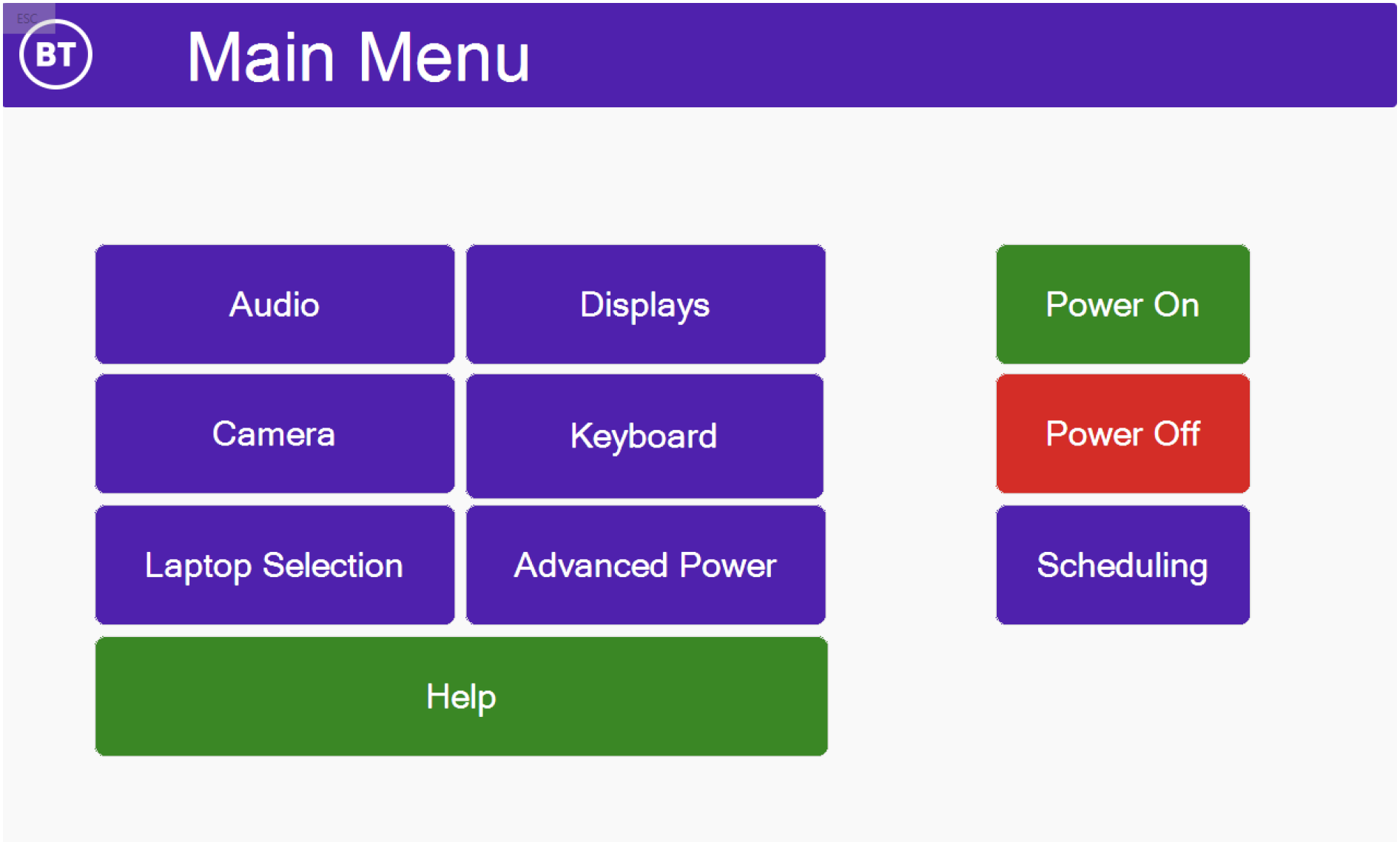
Room	Portal address
Zephyr	http://10.100.15.18/Interface/
Notus	http://10.100.15.41/Interface/
Eurus	http://10.100.15.62/Interface/
Luna	http://10.100.15.78/Interface/
Password	620501

9.1.1 Password



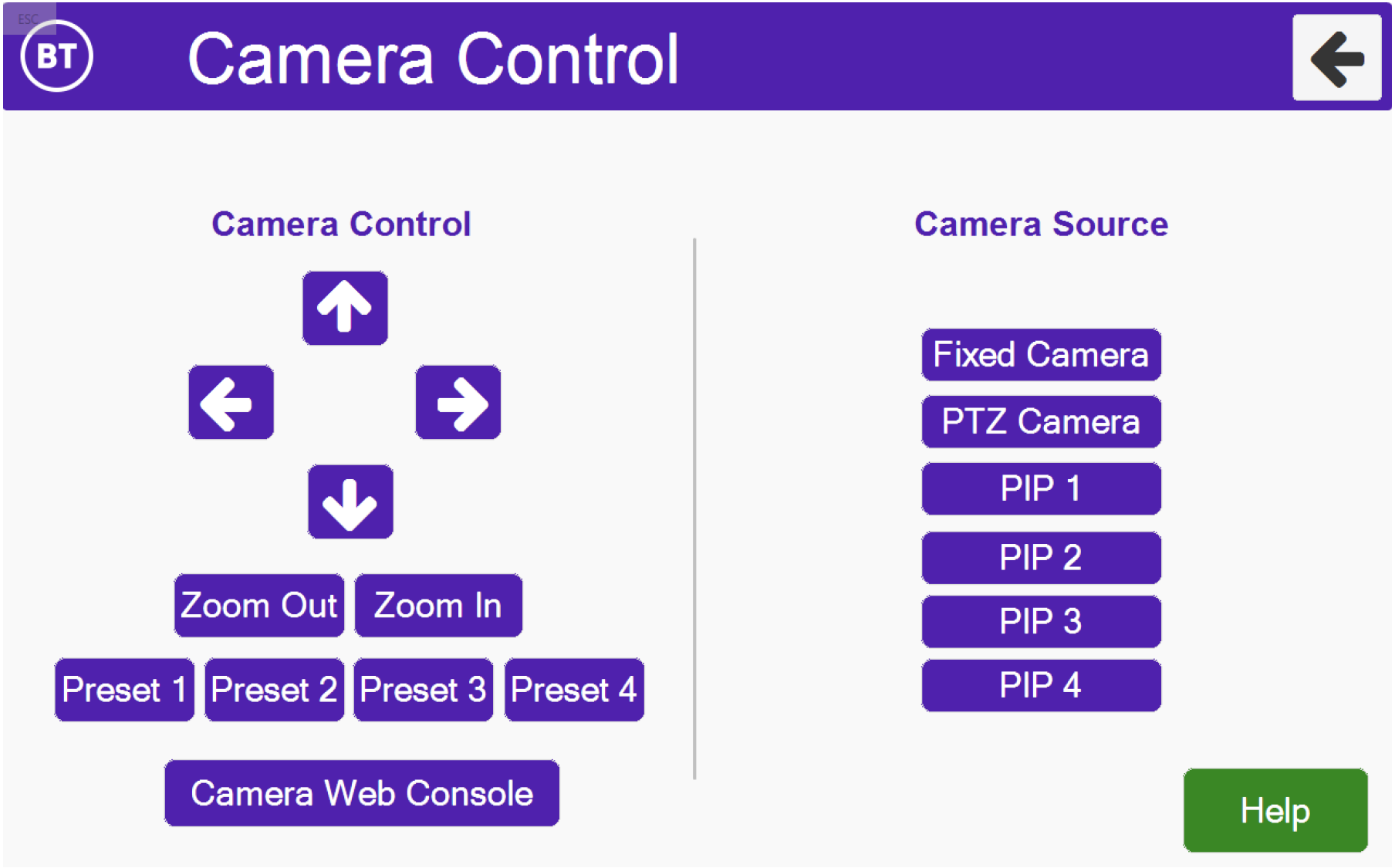
9.1.2 Help

The support desk can be accessed via the help button, see section 9.2 for details

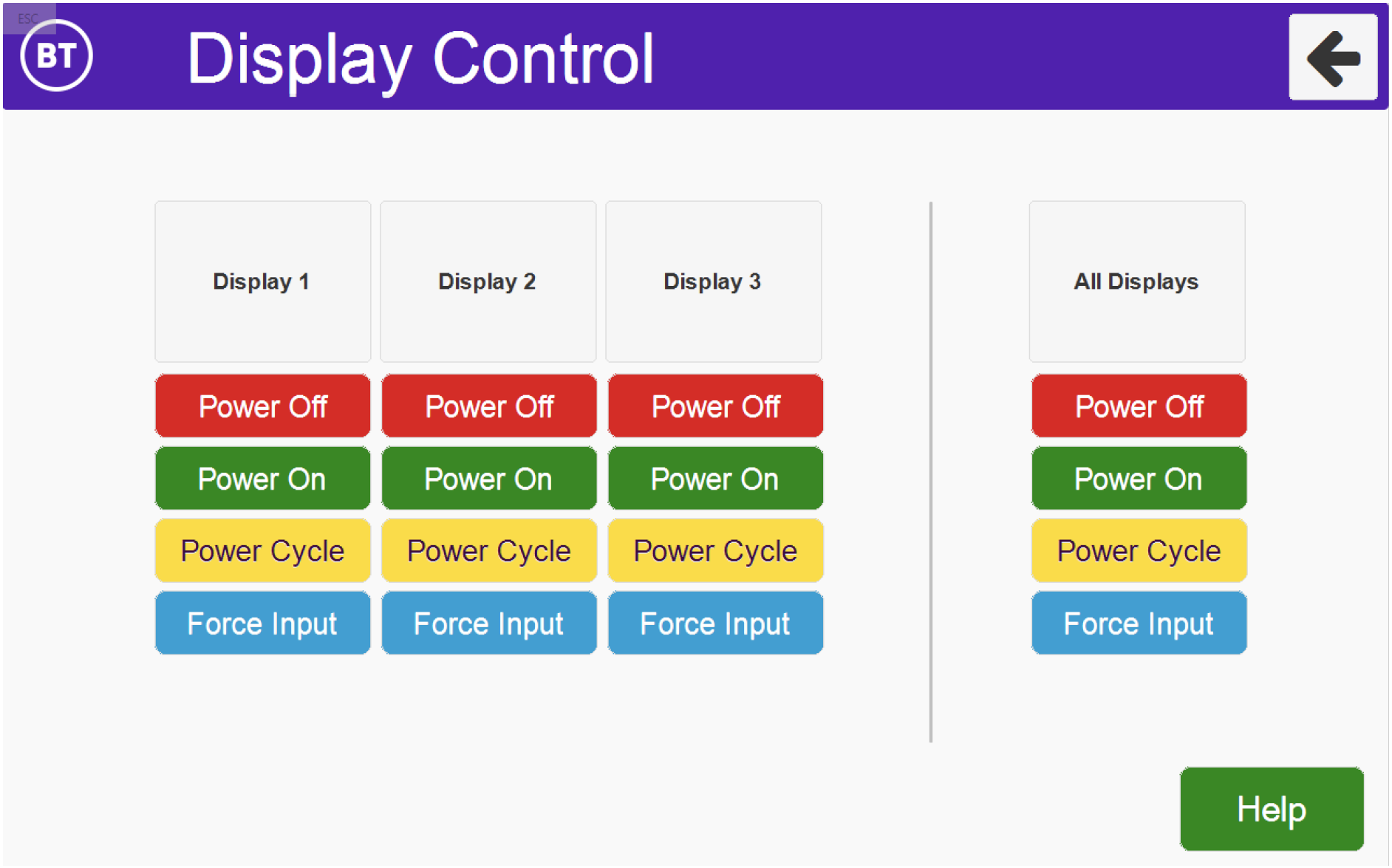


9.1.3 Camera control

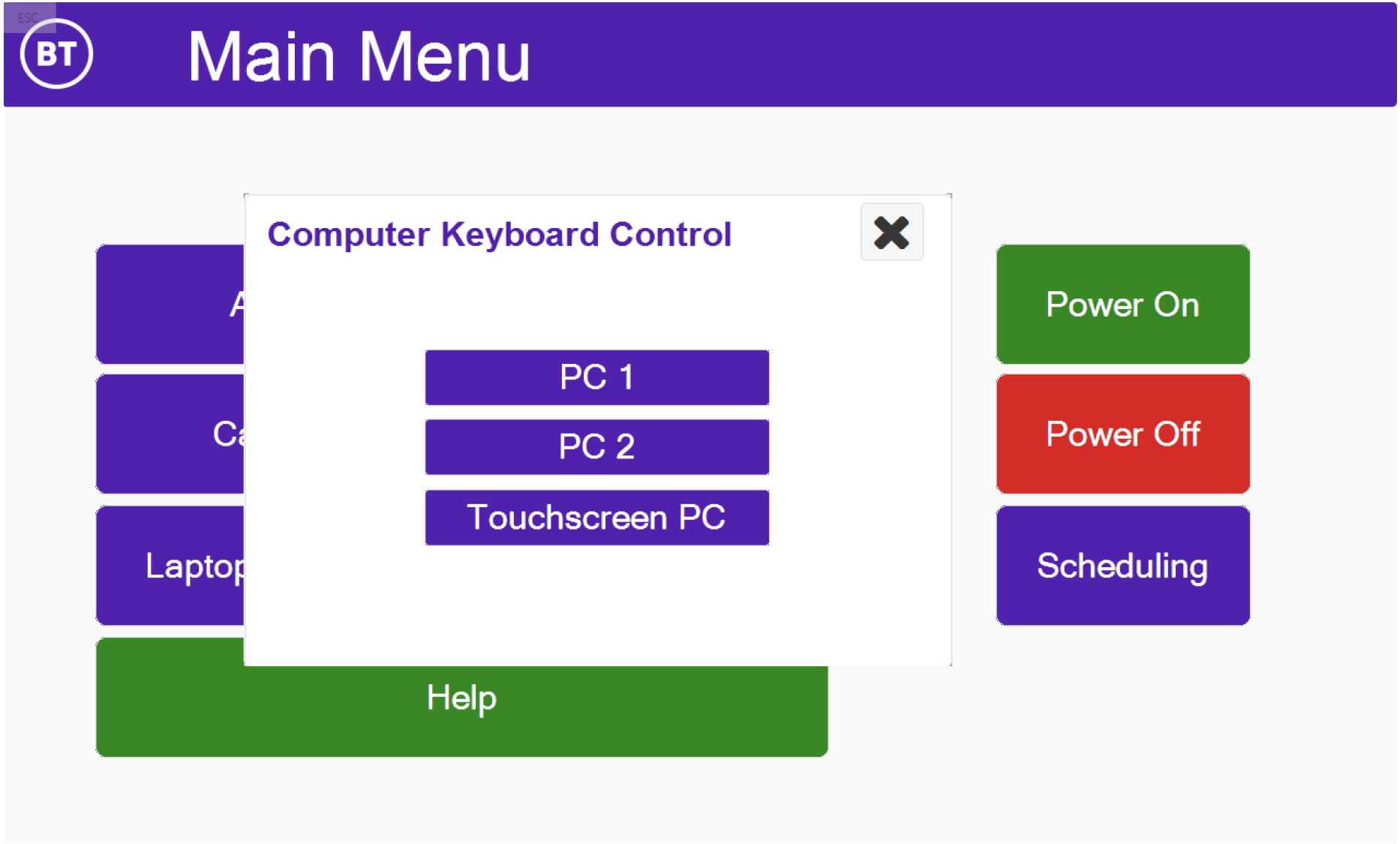
This provides two functions, firstly it duplicates the control that is normally available from the Thinkhub and secondarily it provides access to the PTZ web console for changing the camera presets follow the notes in appendix 9 when setting presets up.



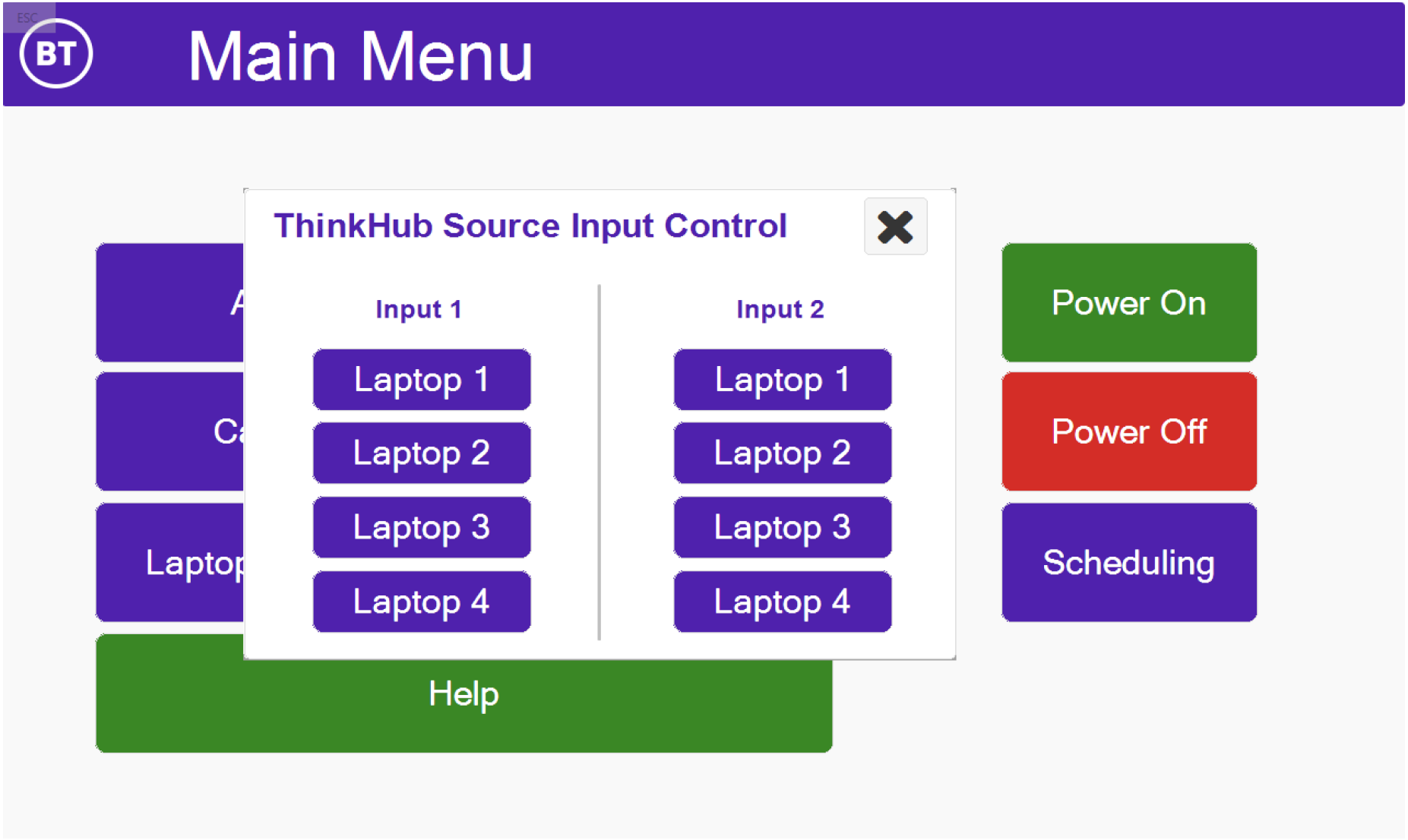
9.1.4 Display Control



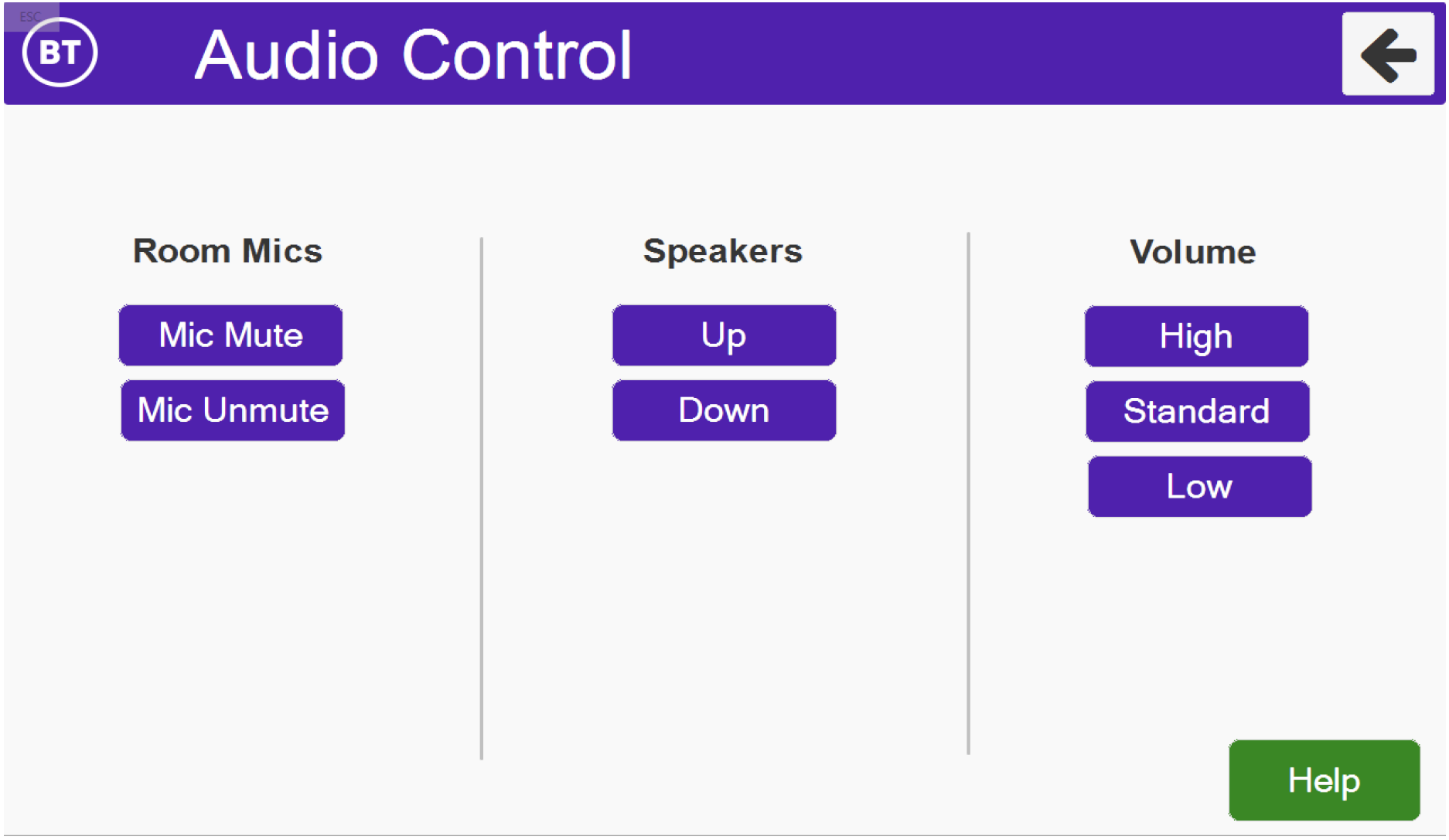
9.1.5 Keyboard control



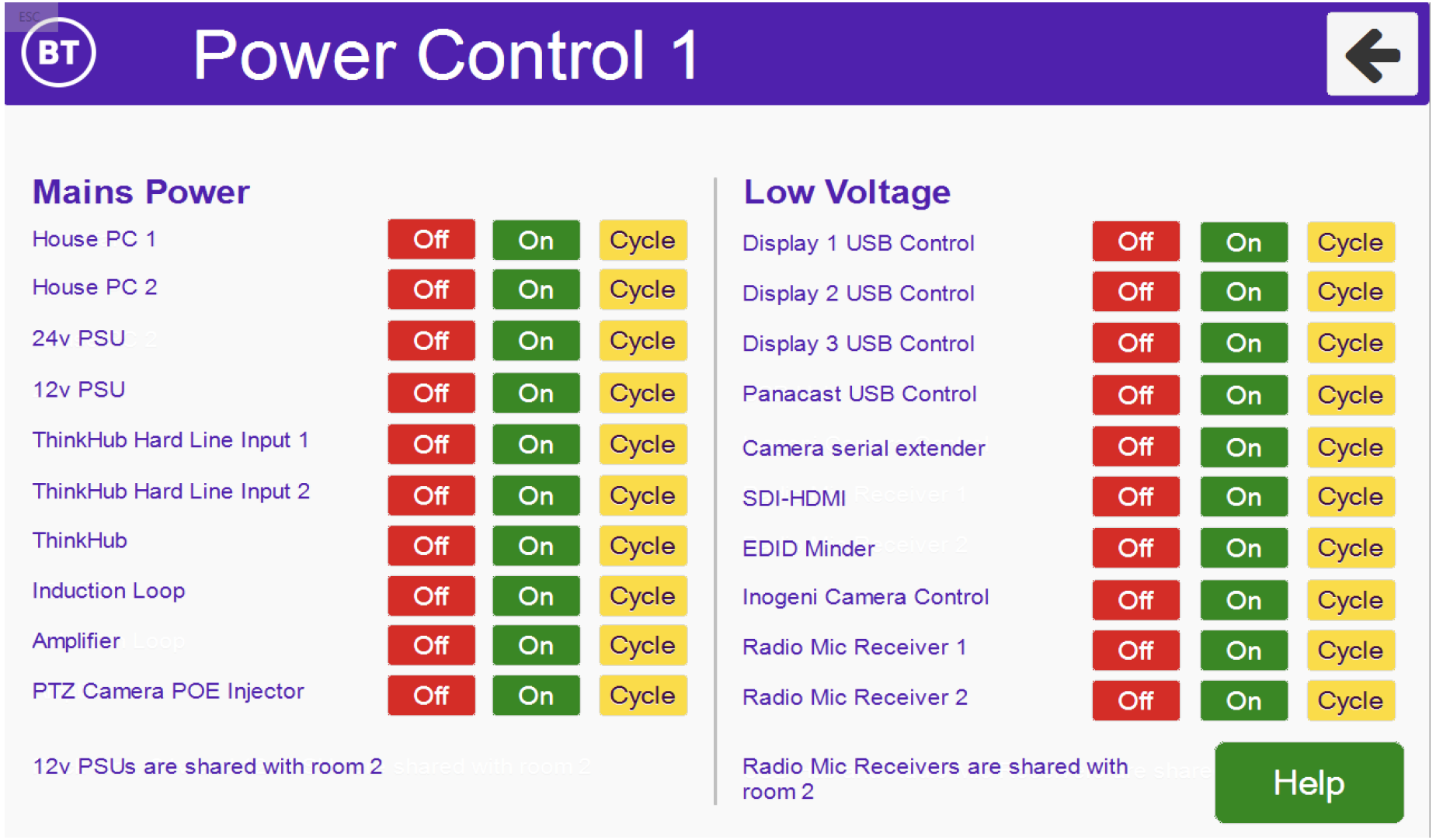
9.1.6 Laptop input selection



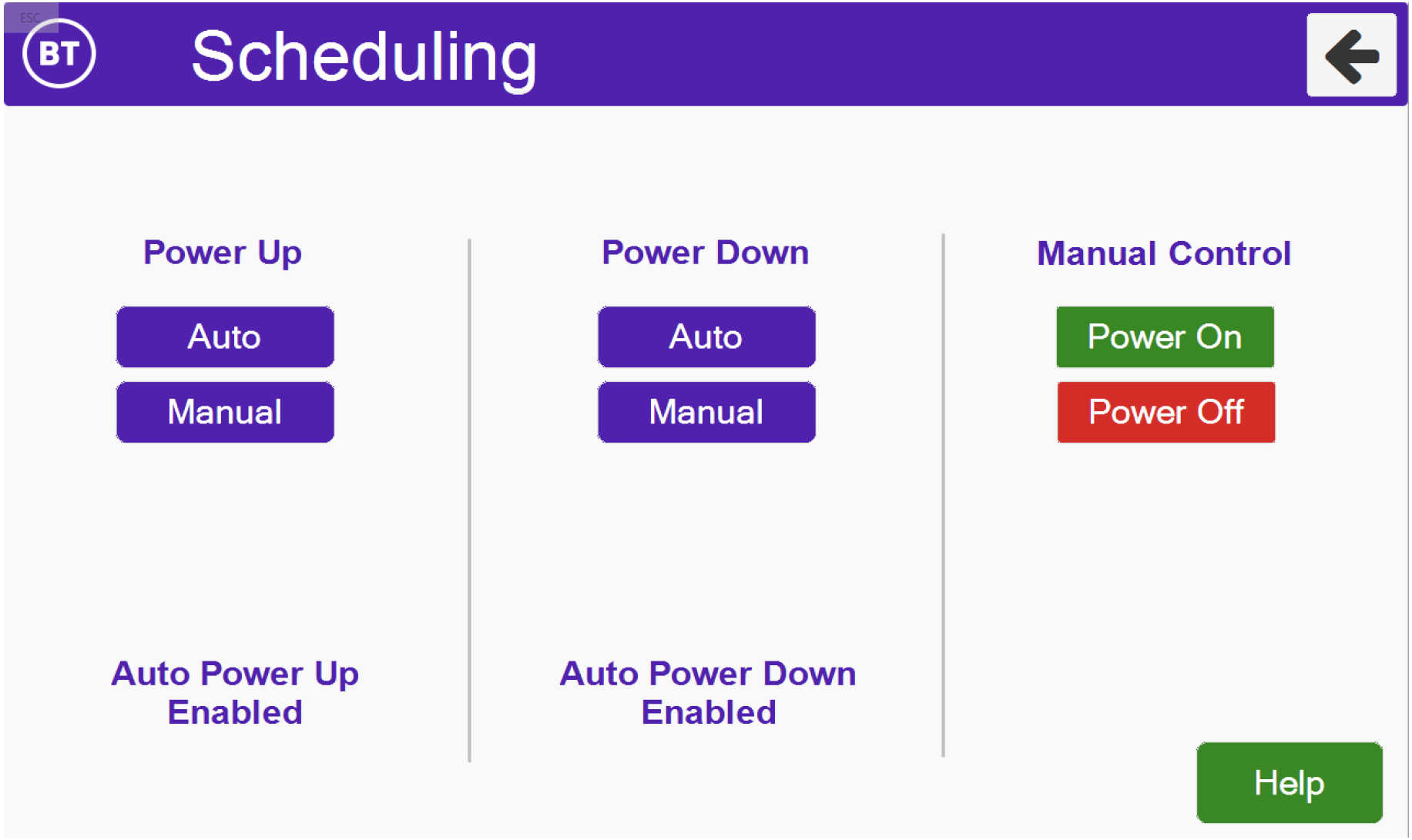
9.1.7 Audio control



9.1.8 Advanced power control



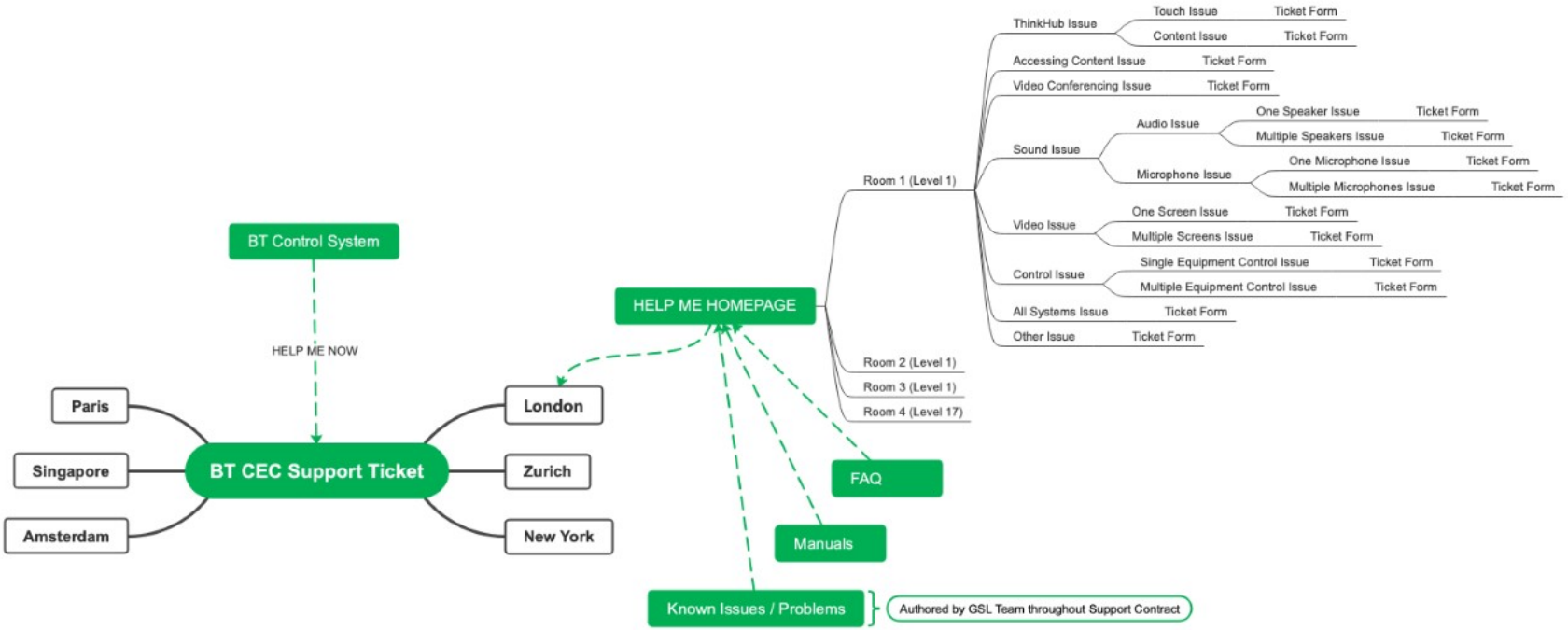
9.1.9 Power schedule control



9.2 Help desk support

Quatreus back the help desk function off to our support partners Ground Support Labs (GSL), we have worked together over many years and across multiple projects to provide custom support packages designed to meet our customers needs.

A summary of this support package is laid out below, for the full SLA agreement contact richard.edwards@quatreus.com



GROUND SUPPORT
LABS

9.2.1 About This Proposal

Ground Support Labs are pleased to present this proposal to support the new BT Customer Experience Centre at BT Centre in Aldgate, London. We believe that our proposal offers to BT a compelling suite of value-added elements that offer to BT industry leading support performance and that we are able to demonstrate a fundamental understanding of the needs of BT through the following core elements of our proposal;

- We understand the nature of Customer Experience Centre's and Customer Showcases, and the importance of attaining the **highest levels of operational availability**. We further understand the role of the BT Sales / Showcase team and how to work with them at 1st line support to achieve rapid workarounds or fixes to reduce the impact of technology problems on BT demonstrations as much as possible.
- We understand the importance of having an intimate knowledge of the systems, configurations and capabilities of the technologies that are used in the CEC. We do not propose a service package that assigns nameless technicians or contractors to study schematics and documents to troubleshoot at 1st or 2nd line… rather we propose a package that **dedicates technology experts to the provision of service** and starts during the commissioning phase of the installation to ensure the highest levels of knowledge and training are imparted into our team before practical completion and handover from the Installation team to the client (and to GSL).
- We understand the importance of tracking performance of the CEC and the operational performance of the technologies. We have therefore built into our proposal a process for **Quarterly Reviews** on-site at the BT Centre to discuss the Metrics, KPIs and Performance of the Service Provision and the Reliability of the Systems. We have built the attendance of Quatreus (specifically Roger Cornish) and GSL leadership into our proposal to support these Quarterly Reviews.
- Recognising the important relationships that exist between BT and Quatreus (specifically Roger Cornish), **we have built 2nd line support by Roger Cornish into the heart of our proposal** so that we can offer the highest levels of technical knowledge relating to the systems at BT Centre.

9.2.2 About Us

We are a group of industry professionals with over 50 years' experience in deploying and supporting technology for some of the most prestigious brands and corporations in the world.

We have a proven track record of deploying and supporting over £50M of technology in over 45 countries for retail, corporate, government, automotive and other verticals.

We are proud to have maintained incredibly strong & long term (10+ years) relationship with our key customers and prospects.

We not only understand how technology is deployed and supported domestically, but how to provide the "one stop shop" all over the world so brands and corporations don't need to deal with multiple vendors with differing platforms and terms in different regions.

We are a full service team dedicated to partnership with our customers.

Client Relations

Experienced team; dedicated personal account partner, solution design engineering, technical expertise

Sourcing Solutions

Global supplier network, distribution, negotiated pricing, for all aspects of the project

Project Management

Dedicated senior project manager; start-to-finish scope; all the details; engineering, technical, logistics, onsite supervision

NOC Services

Global 24/7 support; speedy resolutions; client portal, multi-lingual GSL agents; global field network of technicians

Our team has enjoyed a successful relationship with the Quatreus team over a number of years and have worked together on many successful projects and contracts.

9.2.3 About You

Ground Support Labs understands that the most important thing for BT Centre CEC is uptime, performance, and reliability of the systems. We understand that your goals are to have confidence that the rooms, facilities and systems within BT Centre will be operational when they are needed.

We understand, therefore, that the performance of the Service and Maintenance activities should be aligned with these goals, and not, for the sake of it, with any arbitrary Service Level Agreement. Our commitment, therefore is to offer performance that exceeds the terms of the Service Level Agreement in the pursuit of maximizing your uptime, performance and reliability of the systems.

To achieve this, we offer the elements that we know are important to you;

- **A personal, human, and consistent approach from our technical team**. We will not provide this service by outsourcing, sub-contracting or dispatching freelance technicians. You will be able to speak to us directly by Mobile Phone, WhatsApp, Landline, Email, Self-help Portal – and, importantly, in person. We will not hide behind automated telephone systems or faceless Service Desks.
- **The highest levels of technical expertise**. We recognise that BT Centre was designed, and installed by other 3rd parties, and that the credibility and confidence in those 3rd parties is important to you. We have, therefore built support from Quatreus (specifically Roger Cornish) into our proposal to offer 2nd line support. This base expertise offers the very best resolution times, and with the intimate knowledge of the systems and their nuances, it offers unparalleled opportunity for workarounds to be implemented to get systems back up and running as quickly as possible.
- Our team thrive on performing custom integrations and bespoke customer experiences. In relation to this proposal we are recommending **an integration between the BT CEC Control Systems and our Service NOC** to provide an effective Self-Help Portal for the BT Showcase team. The specific functionalities of this integration are subject to a deeper level of discovery, but expected to include;
    - HELP NOW button on the CEC master control panel
    - Ability to raise a support ticket and initiate a live conversation with the GSL Support Team directly from the CEC master control panel
    - Ability to view Guide Articles from our Service NOC to learn about common workarounds, open issues, known problems and fixes to common problems
    - Ability to view open Support Requests (Incidents) directly on the CEC master control panel and to track actions and resolutions

9.2.4 Summary of cover

Commencement Date:	Q4 2021
Length of Contract:	One year auto-renewing unless terminated
Telephone Support:	Provided – sociable hours from 7am to 10pm 07578 198302
Ticketing System:	Provided – reportable and traceable incidents via dedicated email address; BT@gsl.support
Self-help Portal:	Provided – customer ticket monitoring via dedicated customer portal; https://BT.gsl.support
Remote Support:	Provided – unlimited remote telephone, email and 'remote connection' support within two working hours (depending upon severity), and unlimited workshop labour included for repairs (subject to feasibility)
On-site Support:	Provided – unlimited on-site support for new incidents usually next business day (depending upon severity)
Preventative Maintenance:	Provided – quarterly PM visit (4)
Quarterly Reviews:	Provided – incident and service performance reviews (4)
T1V Collaboration:	Backed off support provided by Quatreus. GSL will liaise directly with T1V on any issues and provide on-site support to their technicians as required
Loan Equipment:	Provided - subject to availability
Spare Parts:	Provided - included up to £300

9.2.5 Commercials

Please see contract or contact richard.edwards@quatreus.com for details

Where we are asked to carry out works or services outside the terms or scope of those included, there will be charges.

9.2.6 Service agreement

9.2.6.1 Telephone Support

Telephone support will be provided in both the UK and in North America using Helpdesk answering services. In addition, Ground Support Labs offers the personal service of Mobile phone support on +44 (0)7578 198302 to key Ground Support Labs personnel during reasonable social hours – typically 7am to 10pm GMT.

9.2.6.2 Self Help Portal

A Self Help Support portal will be provided at url https://BT.gsl.support so that key customer contacts can raise, view, monitor and contribute to information contained in Service Tickets.

9.2.6.3 Remote Support

Remote Support will be provided using resources with the highest levels of expertise depending upon the systems identified as problematic. This will include Remote Support from Roger Cornish, as well as the global team of Ground Support Labs, and any other manufacturers as required. ALL attempts at remote support will be attended by technicians intimately familiar with the specific systems in use. Email support can be provided through BT@gsl.support

9.2.6.4 On-site Support

On Site support will be provided to investigate and resolve incidents after telephone and remote support has been attempted and deemed unsuccessful, or if Remote Support can be more effective with an attending technician. Ground Support Labs will offer continuity of key technical resource for On-site support, including Roger Cornish if required.

9.2.6.5 Preventative Maintenance

Preventative Maintenance will be provided quarterly to perform visual inspection of all systems and to produce a log of any issues and recommendations arising.

9.2.6.6 Quarterly Reviews

Quarterly Reviews will be attended, either in person or virtually, to review Service Performance against customer goals. Both Incident and Problem analysis will be provided for discussion at the reviews together with recommendations and matters arising.

9.2.6.7 T1V Collaboration

Support will be provided at first line by Ground Support Labs, and at second line by T1V. All patches and updates that are considered business critical and product support are included in this proposal.

9.2.7 Customer scope

The BT CEC at Aldgate consists of systems spread across FOUR rooms with equipment distributed across those four rooms as well as three centrally positioned AV Racks as described in the following in this O&M document.

9.2.8 Service scope

The following Services are covered by this Agreement;

- Single source, single point of accountability for all Service Impacting Incidents relating to the BT Centre CEC at Aldgate, London.
- Provision of ticketed Incident Management platform (Zendesk)
- Manned telephone support
- Monitored email support
- Remote assistance using remote connection
- Facilitation of 3rd Line telephone/remote assistance/Onsite assistance from Quatreus (Roger Cornish)
- Facilitation of 3rd Line telephone/remote assistance from manufacturers
- Planned or Emergency Onsite assistance in business hours
- Liaison with manufacturers for repair/replace of items under warranty
- Liaison with manufacturers and application of critical security or functionality updates that are specifically recommended by manufacturers (does not include periodic updates)
- De-installation/Re-installation of equipment repaired/replaced under warranty
- Provision of Quarterly Service Metrics and Performance measures
- Preventative Maintenance visits held in conjunction with Quarterly Reviews
- Quarterly Service Reviews (held physically or virtually at customer site in London)

9.2.9 Customer requirements

Customer responsibilities and/or requirements in support of this Agreement include:

- Payment for all support costs at the agreed interval due annually in advance
- Initiating all service requests by email, telephone or self-help portal
- Reasonable availability of customer representative(s) when resolving a service-related incident or request
- User login/profiles for equipment portals/sessions
- Network provisioning for Remote connections for remote support
- Attendance at quarterly service reviews
- Induction and Access for Ground Support Labs Service Engineer

9.2.10 Service assumptions

Assumptions related to in-scope services and/or components include:

- On-site visits resulting from user error or untrained users may incur additional costs
- On-site visits resulting from recurring issues where out of warranty equipment has been recommended to be replaced may incur additional costs
- Repair/Replace service is limited to the extent of the support from manufacturers of equipment
- Installation of replacement equipment that is a newer or alternative model to the original, or that may require (re-)design of systems may incur additional costs
- Service provider cannot be held responsible for guaranteed fix times where manufacturer support or replacement is required
- Changes to services will be communicated and documented to all stakeholders

9.2.11 Service management

Effective support of in-scope services is a result of maintaining consistent service levels. The following sections provide relevant details on service availability, monitoring of in-scope services and related components.

9.2.12 Service requests

In support of services outlined in this Agreement, the Service Provider will respond to service-related incidents and/or requests submitted by the Customer within the following time frames

- 0-2 hours (during business hours) for issues classified as **High** priority.
- Within 48 hours for issues classified as **Medium** priority.
- Within 5 working days for issues classified as **Low** priority.
- Remote assistance will be provided in-line with the above timescales dependent on the priority of the support request.

Where;

High Priority means Full Outage of system(s), not able to run customer sessions

Medium Priority means Part Outage of system(s), able to run part of customer sessions

Low Priority means Small Outage of system(s), able to run customer sessions

9.2.13 Continuous service improvements

In support of services outlined in this Agreement, the Service Provider, Customer and Stakeholders will convene quarterly to discuss service level performance, recommendations arising and any required changes to service provision that enhances business operations for the customer.

Appendix 1 - Serial Numbers

1.1 Zephyr

Item	Location	Serial Number
Audio		
QSC Core 510i DSP	Rack 3	C112100c5
Audix M70WD Microphone	Site	3221228061
Audix M70WD Microphone	Site	3221088241
Audix M70WD Microphone	Site	3221228010
Audix M70WD Microphone	Site	3221228015
Audix M70WD Microphone	Site	3221088113
Audix M70WD Microphone	Site	3221228103
Audix M70WD Microphone	Site	3221228147
Audix M70WD Microphone	Site	3221088107
Audix DN4 Microphone Interface	Site	188080016
Audix DN4 Microphone Interface	Site	188080048
Kef Ci3 80QT motorized ceiling speaker	Site	U038022609N22N2G
Kef Ci3 80QT motorized ceiling speaker	Site	U038022606N22N2G
Kef Ci3 80QT motorized ceiling speaker	Site	U038022182N15N2G

Kef Ci3 80QT motorized ceiling speaker	Site	U038022166N15N2G
Kef Ci3 80QT motorized ceiling speaker	Site	U038022249N15N2G
Kef Ci3 80QT motorized ceiling speaker	Site	U038022247N15N2G
Audinate ADP-USB-AU-2x2 AVIO Adaptor	Rack 1	DIOUSB-AU-52E032
Audinate ADP-DAO-AU-0x2 AVIO Adaptor	Rack 1	DA02-A2-5261B3
Audinate ADP-DAI-AU 1x0 AVIO Adaptor	Rack 1	DAI1-AU-52A11D
Ampetronic D7-2 Dante Induction loop driver	Rack 1	J200303
Crown XLS1502 Amplifier	Rack 1	8501639343
Sennheiser Radio Microphone Receiver 1	Rack 1	1066104285
Sennheiser Radio Microphone Receiver 2	Rack 1	1066104291
Video		
JVC KC-PZ100 PTZ camera	Site	9640160
Jabra PanaCast Camera	Site	229918277
Blackmagic Design HD-SDI to HDMI	Rack 1	8947375
Inogeni Share2U	Rack 1	SUM201019
T1V ThinkHub TH-1169	Rack 1	F5kGN015NRN
Aurora VLX-TC1-CF	Rack 1	19060437
Aurora VLX-TC1-CF	Rack 1	19060376
Aurora VLX-TC1-CF	Site	1906036

Aurora VLX-TC1-CF	Site	17380261
Aurora VLX-TC1-CF	Site	17380259
Aurora VLX-TC1-CF	Site	17380257
AdderView XDIP KVM	Rack 1	2201A0319875
AdderView XDIP KVM	Rack 1	2201A0319892
AdderView XDIP KVM	Site	2201A0319877
AdderView XDIP KVM	Site	2201A0319889
Icron 2311	Rack 1	F34960/1
Icron 2311	Rack 1	F34910/1
Icron 2311	Rack 1	F34882/3
Icron 2311	Rack 1	F34906/7
85” Touch Display 1	Site	048515D210054
85” Touch Display 2	Site	048515D210035
85” Touch Display 3	Site	048515D210018
Control		
Aurora RXC-1	Rack 1	A2117-0011
Lectern NUC	Site	8CC14639C

1.2 Notus

Item	Location	Serial Number
Audio		
Audix M70WD Microphone	Site	3221228119
Audix M70WD Microphone	Site	3221228198
Audix M70WD Microphone	Site	3221228063
Audix M70WD Microphone	Site	3221088092
Audix M70WD Microphone	Site	3221088091
Audix M70WD Microphone	Site	3221228183
Audix M70WD Microphone	Site	3221228111
Audix M70WD Microphone	Site	3221228131
Audix DN4 Microphone Interface	Site	199030002
Audix DN4 Microphone Interface	Site	199030008
Kef Ci3 80QT motorized ceiling speaker	Site	U038022699N22N2G
Kef Ci3 80QT motorized ceiling speaker	Site	U038022713N22N2G
Kef Ci3 80QT motorized ceiling speaker	Site	U038022252N15N2G
Kef Ci3 80QT motorized ceiling speaker	Site	U038022285N15N2G
Kef Ci3 80QT motorized ceiling speaker	Site	U038022293N15N2G
Kef Ci3 80QT motorized ceiling speaker	Site	U038022285N15N2G

Audinate ADP-USB-AU-2x2 AVIO Adaptor	Rack 1	DIOSB-AU-52E044
Audinate ADP-DAO-AU-0x2 AVIO Adaptor	Rack 1	DAO2-A3-52CF3D
Audinate ADP-DAI-AU 1x0 AVIO Adaptor	Rack 1	DAI1-AU-52A11C
Ampetronic D7-2 Dante Induction loop driver	Rack 1	J200307
Crown XLS1502 Amplifier	Rack 1	8501639311
Video		
JVC KC-PZ100 PTZ camera	Site	9640158
Jabra PanaCast Camera	Site	239015525
Blackmagic Design HD-SDI to HDMI Convertor	Rack 1	8947454
Inogeni Share2U	Rack 1	SUM201027
T1V ThinkHub th-1170	Rack 1	F5KGQ00FN5RN
Aurora VLX-TC1-CF	Rack 1	19060494
Aurora VLX-TC1-CF	Rack 1	19060367
Aurora VLX-TC1-CF	Site	19060374
Aurora VLX-TC1-CF	Site	17380283
Aurora VLX-TC1-CF	Site	17380107
Aurora VLX-TC1-CF	Site	19060350
AdderView XDIP KVM	Rack 1	2201A0319894

AdderView XDIP KVM	Rack 1	2201A0319891
AdderView XDIP KVM	Site	2201A0319890
AdderView XDIP KVM	Site	2201A0319876
Icron 2311	Rack 1	F34930/31
Icron 2311	Rack 1	F34956/57
Icron 2311	Rack 1	F34908/9
Icron 2311	Rack 1	F34896/7
85” Touch Display 1	Site	048515D210068
85” Touch Display 2	Site	048515D210074
85” Touch Display 3	Site	048515D210064
Control		
Aurora RXC-1	Rack 1	A2117-0002
Lectern NUC	Site	8CC14639FZ

1.3 Eurus

Item	Location	Serial Number
Audio		
Audix M70WD Microphone	Site	3221228113
Audix M70WD Microphone	Site	3221228195
Audix M70WD Microphone	Site	3221228101
Audix M70WD Microphone	Site	3221228139
Audix DN4 Microphone Interface	Site	188080054
Kef Ci3 80QT motorized ceiling speaker	Site	U038022704N22N2G
Kef Ci3 80QT motorized ceiling speaker	Site	U038022649N22N2G
Kef Ci3 80QT motorized ceiling speaker	Site	U038022628N22N2G
Kef Ci3 80QT motorized ceiling speaker	Site	U038022705N22N2G
Audinate ADP-USB-AU-2x2 AVIO Adaptor	Rack 2	DIOUSB-AU-52E062
Audinate ADP-DAO-AU-0x2 AVIO Adaptor	Rack 2	DAO2-A3-52CEE6
Ampetronic D7-2 Dante Induction loop driver	Rack 2	J200326
Crown XLS1002 Amplifier	Rack 2	8501449038

Video		
JVC KC-PZ100 PTZ camera	Site	10640212
Jabra PanaCast Camera	Site	239015670
Blackmagic Design HD-SDI to HDMI Convertor	Rack 2	8947363
Inogeni Share2U	Rack 2	SUM135109
T1V ThinkHub TH-1171	Rack 2	F5kGN01CN5RN
Aurora VLX-TC1-CF	Rack 2	19060366
Aurora VLX-TC1-CF	Rack 2	19060381
Aurora VLX-TC1-CF	Site	19060371
Aurora VLX-TC1-CF	Site	19060361
Aurora VLX-TC1-CF	Site	19060095
Aurora VLX-TC1-CF	Site	19060378
AdderView XDIP KVM	Rack 2	2201A0319874
AdderView XDIP KVM	Rack 2	2201A0319893
AdderView XDIP KVM	Site	2201A0319897
Icron 2311	Rack 2	F34954/55
Icron 2311	Rack 2	F34962/63
Icron 2311	Rack 2	F34918/19
85” Touch Display 1	Site	048515D210077

85” Touch Display 2	Site	048515D210073
Control		
Aurora RXC-1	Rack 2	2023-0028

1.4 Luna

Item	Location	Serial Number
Audio		
Audix M70WD Microphone	Site	321926229
Audix M70WD Microphone	Site	3221228139
Audix M70WD Microphone	Site	3221228127
Audix M70WD Microphone	Site	3221228151
Audix DN4 Microphone Interface	Site	199030009
Kef Ci3 80QT motorized ceiling speaker	Site	U038022718N22N2G
Kef Ci3 80QT motorized ceiling speaker	Site	U038022277N15N2G
Kef Ci3 80QT motorized ceiling speaker	Site	U038022298N15N2G
Cornered Audio C4 Loudspeaker	Site	004998
Cornered Audio C4 Loudspeaker	Site	004997
Audinate ADP-USB-AU-2x2 AVIO Adaptor	Rack 3	DIOUSB-AU-52E098
Audinate ADP-DAO-AU-0x2 AVIO Adaptor	Rack 3	DAO2-A3-52CEC0
Ampetronic D7-2 Dante Induction loop driver	Rack 3	J200300
Crown XLS1502 Amplifier	Rack 3	8501613408
Video		

JVC KC-PZ100 PTZ camera	Site	9640177
Jabra PanaCast Camera	Site	229918424
Blackmagic Design HD-SDI to HDMI Convertor	Rack 3	8947376
Inogeni Share2U	Rack 3	SUM140138
T1V ThinkHub TH-1172	Rack 3	F5KGN014N5RN
Additional Internal USB card for TH	Rack 3	A00944041038069
Aurora VLX-TC1-CF	Rack 3	19060385
Aurora VLX-TC1-CF	Rack 3	19060453
Aurora VLX-TC1-CF	Site	17380603
Aurora VLX-TC1-CF	Site	17380593
AdderView XDIP KVM	Rack 3	2201A0319895
AdderView XDIP KVM	Rack 3	2201A0319873
AdderView XDIP KVM	Site	2201A09896
Icron 2311	Rack 3	F34940/1
Icron 2311	Rack 3	F34947/8
85” Touch Display 1	Site	048515d210006
Control		
Aurora RXC-1	Rack 3	

Appendix 2 - Dante and AvoIP IP requirements

We created this form, to ensure that both our general assumptions and specific requirements are correct.

These have been confirmed by BT 01/06/2022 that the final requirements have been enabled.

The system has subsequently been tested and both Dante and Laptop multi-casting are working. The table is here as a reference should any network changes occur that may interfere with the normal operation of either the Audio or Laptop video.

General switch/LAN assumptions

Item	✔
Min. 1Gb per port	
Nonblocking backplane	
Min. Layer 2	
IGMPv2 implementation	
IGMPv2 snooping enabled	
IGMPv2 querier enabled	
Fast-leave enabled	
10Gb inter switch uplink Note there are a max. of 6no. Laptops on L01 that are transmitted between switches, each requiring a Max. 1Gb, although typical average for 1920x1080 (1080p) HD resolution requires an average of 133Mbps	
Uplink configured for support multicast traffic	
Port based QoS	

The Demo room audio is IP based using Dante protocol, below are the specific requirements for Dante.

Please use this form to confirm the requirements below, inc. IP address, ports are available for Dante on local switches in AV rack 1, 2 (L01) and rack 3 (L17)

No.	Item	Values	✔	Comments
1	All devices are DHCP	see IP table		
2	IGMPv3/v2 is used to assist with multicast management on mixed-use networks.	Enable		
3	DiffServ QoS, used on mixed-use networks. It must be configured with strict priority. Note that the QoS could be re-marked, provided that the PTP packets still receive high priority	See note 1		**This has not been implement as BT state that there is sufficient bandwidth for QoS not to be required**
4	Multicast	UDP port 4321		
5	Unicast	Ports 14336 - 14600.		Unicast is not used in this system, but may be implemented for test purposes so is here for completeness
6	mDNS and DNS-SD for discovery and enumeration of other Dante devices	224.0.0.251:5353		
7	Precision Time Protocol (PTP) for time synchronization.	224.0.1.129 - 224.0.1.132 ports 319/320.		
8	PTP logging	239.254.3.3:9998		
9	Dante-specific monitoring traffic on multicast addresses	224.0.0.230 - 224.0.0.233:8700-8708		
10	Energy Efficient Ethernet	Disable		

Laptop connectivity in the Demo rooms is IP based solution using Aurora VLX transceivers, using a 1Gb network to achieve visually lossless video with only 1.5 Frame Latency, below are the specific requirements.

Please use this form to confirm the requirements below inc. IP address, ports are available for AVoIP on local switch in AV rack rack 3 (L17) and between the floor boxes in Demo rooms 1,2 and 3 on L01 and the AV rack 1, 2 (L01)

No.	Item	Values	✓	Comments
1	All devices are fixed IP address	See IP table		
2	IGMP Snooping	Enable		
3	Filter/Drop Unregistered Multicast Traffic	Enable		
4	Unregistered Multicast Flooding	Disable		
5	Filter Unregistered Multicast	Enable		
6	IGMP Query	Enable		In most instances, a single network switch is selected by address to act as the IGMP querier; however, if multiple switches are configured as queriers, the switch with the lowest numerical IP address on the network is typically the default.
7	IGMP Version	2		
8	FASTLEAVE	Enabled for each port where an Aurora devices is connected		
9	Jumbo/MTU Packets	Enable Packet of 8192 or better		
10	Multicast	Room 1: 0101 = 255.0.101.001 0102 = 255.0.101.002 0103 = 225.0.101.003 0104 = 225.0.101.004		Device number = Multicast stream

		Room 2: 0201 = 255.0.102.001 0202 = 255.0.102.002 0203 = 225.0.102.003 0204 = 225.0.102.004 Room 3: 0301 = 255.0.103.001 0302 = 255.0.103.002 0303 = 225.0.103.003 0304 = 225.0.103.004 Room 4: 0401 = 255.0.104.001 0402 = 255.0.104.002		
11	QoS	Enable the highest priority on IGMP multicast traffic		

Notes

1 DiffServ QoS, It must be configured with strict priority. The QoS could be re-marked, provided that the PTP packets still receive high priority

Priority	Usage	DSCP Label	Hex	Decimal	Binary
High	Time critical PTP events	CS7	0x38	56	111000
Medium	Audio, PTP	EF	0x2E	46	101110
Low	(reserved)	CS1	0x08	8	001000
None	Other traffic	BestEffort	0x00	0	000000

Appendix 3 – T1V Network requirements and security

This section is confidential and is not to be shared without permission of T1V outside of BT, Quatreus or GSL

3.1 Network requirements for AirConnect (now T1V App)

3.1.1 General

AirConnect is a mobile application that enables wireless device sharing to ThinkHub or ViewHub from a user's laptop, tablet, or smartphone.

This is a mirroring technology that allows the user to share anything on their screen to a window on the ThinkHub Canvas or directly to the ViewHub display.

- Supports Mac OS, iOS, Windows, Android, and Linux devices
- ThinkHub and laptops can be on different subnets within your network
- For wireless screen mirroring, one ThinkHub can receive multiple connections using a single name
- Available for free download to all ThinkHub/ViewHub customers (t1v.com/airconnect)

AirConnect has two modes: Direct Mode and World Mode.

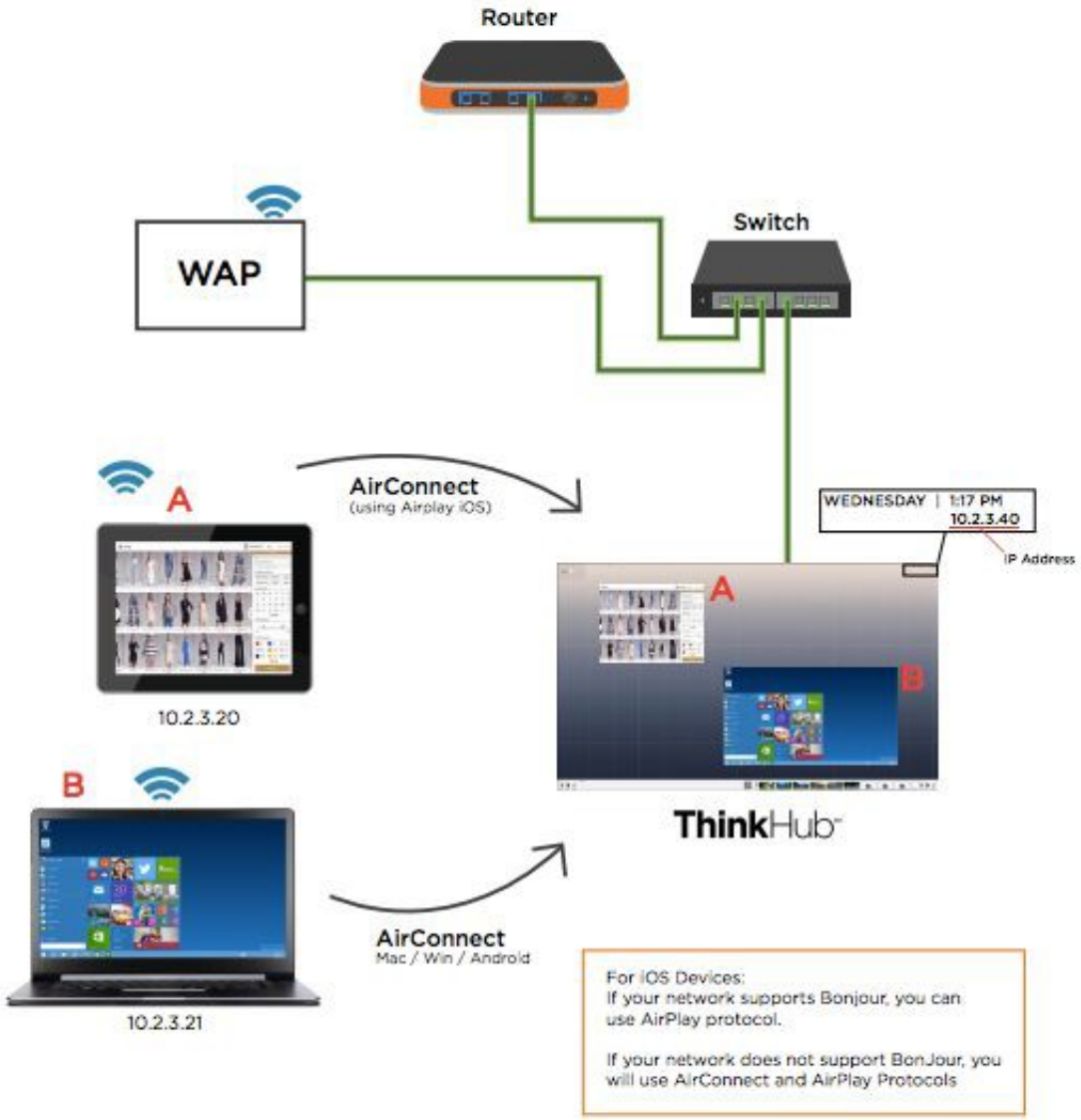
3.1.2 Direct mode

In Direct Mode, the user's laptop or handheld device must have a route on the network to talk directly to the ThinkHub/ViewHub computer.

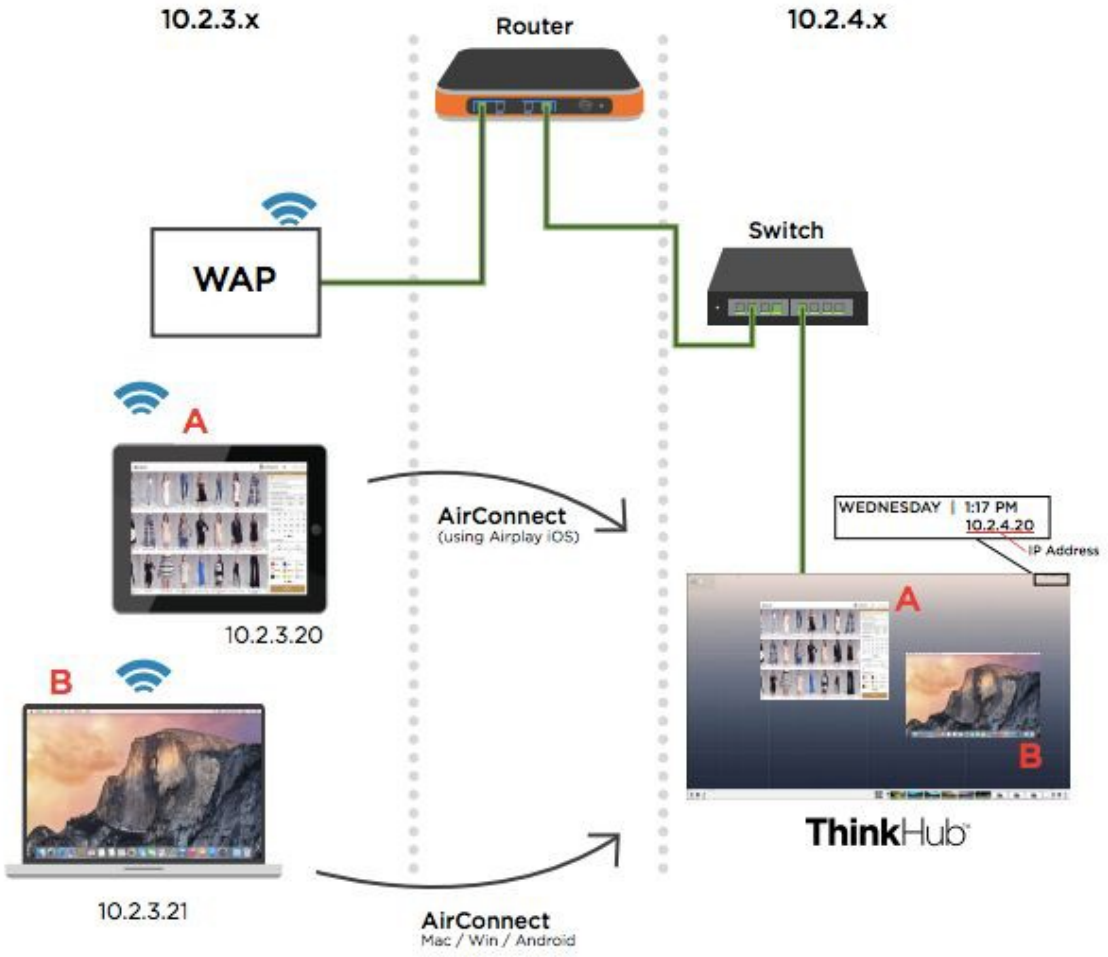
- Compatible with a single subnet and/or multiple subnets

- Use Direct Mode if the ThinkHub/ViewHub device and all user devices are on the same network

Direct Mode - single subnet



Direct Mode - multi subnet



3.1.3 World mode

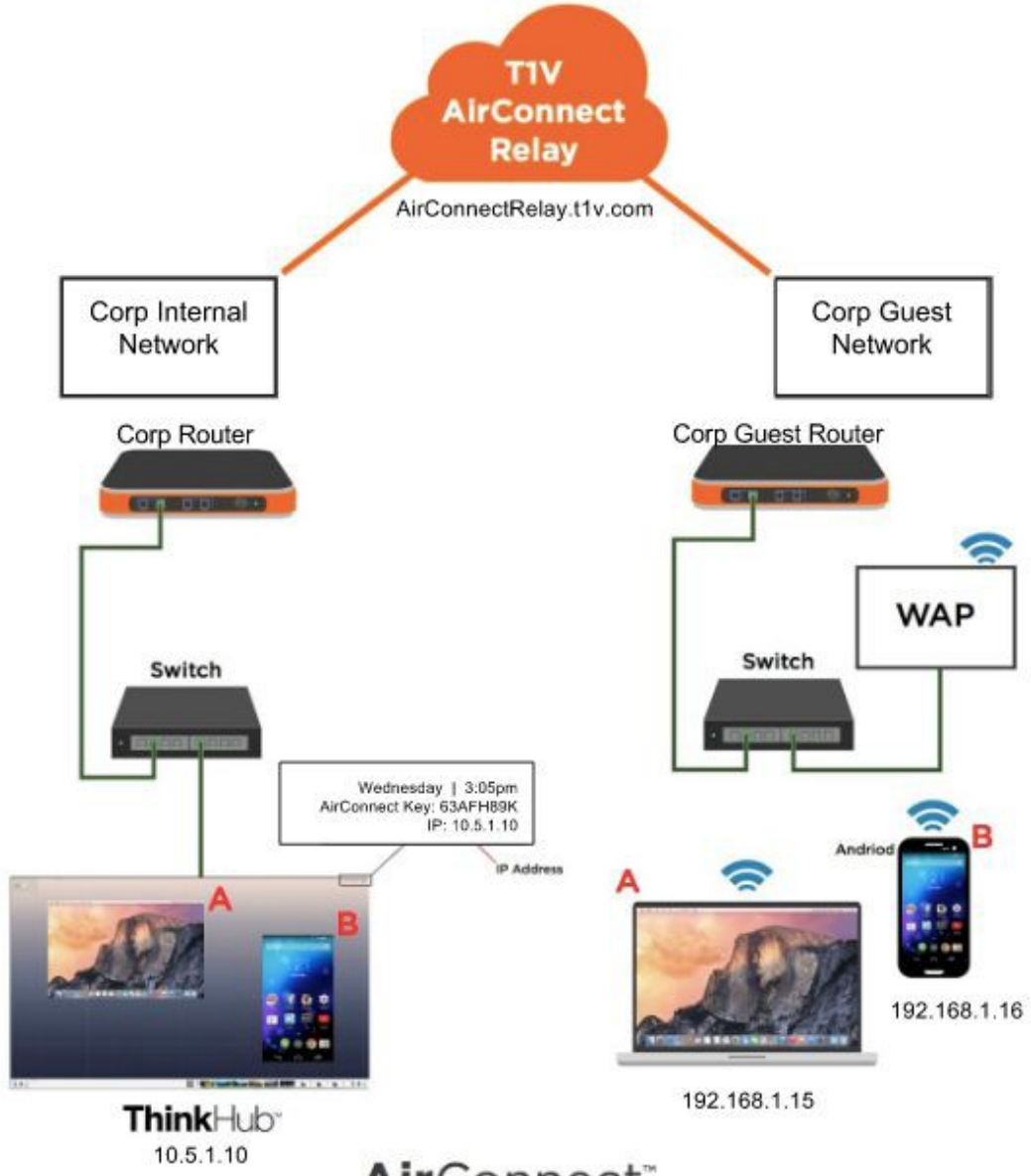
In some situations where Direct Mode is not possible, typically due to the network architecture or security constraints placed on the network, T1V has developed World Mode.

In World Mode, the device running the AirConnect app and ThinkHub only require outbound connections to the T1V AirConnect server. All traffic to this server is encrypted from both devices. A diagram of the architecture is shown below. The user will run the AirConnect app from their device and simply enter the AirConnect Key displayed on the ThinkHub screen. Then, after an optional password is entered, the device will begin streaming to the ThinkHub screen.

On MacOSX and Windows, if required, the application can be downloaded and executed on the fly without any installation.

Use World Mode if:

- ThinkHub is on the corporate network but you want to allow users on the corporate guest network to mirror their screen to the ThinkHub/ViewHub device
- ThinkHub/ViewHub is on your internal corporate network and a laptop user wants to mirror their screen from outside your network - AirConnect supports this capability from anywhere in the world, even from a cellular network
- ThinkHub/ViewHub is located on a separate isolated VLAN and employees want to mirror their laptop from the corporate network (even remote users working from home)


T1V
AirConnect
Relay
AirConnectRelay.t1v.com
Corp Internal
Network
Corp Guest
Network
Corp Router
Corp Guest Router
WAP
Switch
Switch
Wednesday | 3:05pm
AirConnect Key: 63AFH89K
IP: 10.5.1.10
IP Address
A
B
A
B
Andriod
ThinkHub
10.5.1.10
192.168.1.15
192.168.1.16
AirConnect
World Mode

3.1.4 AirConnect hosts and ports

From	To	Comment	Port	Protocol
mobile devices	ThinkHub	AirConnect Direct - Control	5100, 9001	tcp
mobile devices	ThinkHub	AirConnect Direct - Stream data	50,000-65,000	udp
mobile device (iOS)	ThinkHub	AirConnect Direct - AirPlay	7000 - 7004	tcp
mobile device (iOS)	ThinkHub	AirConnect Direct - AirPlay time sync	7011	tcp/udp
mobile device (iOS)	ThinkHub	AirConnect Direct - AirPlay Events	7100-7105	tcp
mobile device (iOS)	ThinkHub	AirConnect Direct - AirPlay AirTunes	5000 - 5004	tcp
mobile device (iOS)	ThinkHub	AirConnect Direct - AirPlay Audio Handler	6009 - 6057	udp
mobile device (iOS)	ThinkHub	AirConnect Direct - AirPlay Audio Handler	49152 - 49162	tcp
mobile device (iOS)	ThinkHub	AirConnect Direct - AirPlay Stream data	40,000 - 60,000	udp
mobile devices, ThinkHub	AirConnectControl.t1v.com	AirConnect World Mode - Control	5672 and (5671 or 443 or 80)	tcp
mobile devices, ThinkHub	AirConnectRelay.t1v.com	AirConnect World Mode - Stream data	3478	tcp/udp

3.2 Network requirements for remote access

3.2.1 General

T1V has developed several methods to allow T1V to access machines for remote maintenance. These methods have been developed to minimize the impact on a customer's internal network. In most cases simply placing your purchased T1V computer on your vendor VLAN will allow our support team to communicate with the T1V computer. No inbound port forwarding is required, nor is an external IP address required.

In some situations, a customer will decide to put the T1V computer on its own external IP address. In this situation, T1V would still require the computer to be behind a firewall to limit connection attempts from the internet. If you cannot provide this, please let your T1V sales contact or project manager know that you would like T1V to provide this.

3.2.2 Remote access protocols

Below is a list of protocols used by T1V to remotely manage machines. Ideally, T1V would like all of the below protocols supported once the computer is installed on your network.

T1V – TMQ – Message Queue protocol

Outbound connection to tmq2.t1v.com and tmq-mm.t1v.com on port 5671

- This is a proprietary message queuing protocol that allows T1V to send and receive messages to the machine in the field
- Port 5671 must have a direct outbound connection, no relay or proxy
- Note: port 443 or 80 can be used in place of 5671

T1V Device Check-in / Content and Software updates

Outbound connection to media.t1visions.com on port 443

Outbound connection to cil.t1visions.com on port 443

Reporting

Outbound connection to Reporting.t1visions.com port 443

Log uploading

Outbound connection to s3.amazon.com port 443

Screen sharing and SSH tunnel

Outbound connection to jump.t1v.com port 443 (protocol inspection turned off - this is SSH protocol traffic over 443, not https protocol)

3.3 Security - AirConnect + ThinkHub MultiSite

All AirConnect and ThinkHub MultiSite data is encrypted.

When using AirConnect to stream devices to ThinkHub, or when engaged in a ThinkHub MultiSite session with two or more ThinkHub devices, all data is encrypted.

3.3.1 AirConnect direct mode

If you are using AirConnect in Direct Mode, all data stays inside your network, and all data is encrypted.

3.3.2 AirConnect world mode

When using AirConnect World Mode, data between an off-site device and an on-site ThinkHub is relayed through T1V's relay server. In this situation, the AirConnect data is encrypted with a random key that only the two endpoints know (T1V doesn't even know it). So even when it goes through the World mode server, the world mode server is only relaying encrypted data, and no decryption occurs in the cloud. For additional security, the random key changes multiple times throughout the exchange.

This is a feature that can be disabled as needed.

3.3.3 AirConnect access

AirConnect Access allows users to view and control the ThinkHub Canvas from a mobile device.

Both of these features can be disabled separately as needed. What's more, the ThinkHub devices houses an AirConnect Access Control Panel, so in-room meeting participants can control remote user permissions.

3.3.4 ThinkHub MultiSite - Enterprise

ThinkHub MultiSite is an Add-On module that allows two or more ThinkHubs to communicate with one another in real time. With ThinkHub MultiSite Enterprise, all data stays inside your network between ThinkHubs, and all data is encrypted.

3.3.5 ThinkHub MultiSite - SMB

ThinkHub MultiSite is an Add-On module that allows two or more ThinkHubs to communicate with one another in real time. With ThinkHub MultiSite SMB, all data is encrypted from both devices.

No data is ever stored on the MultiSite server. It is only used to relay data between sites.

3.3.6 Remote support and administration service

T1V has a remote support and administration service. This feature can be enabled and disabled by the customer as needed.

3.3.7 ThinkHub file saving and storage

All ThinkHub sessions can be saved to a file system and have an optional password for additional protection.

3.3.8 OS updates and security patches

T1V manages all OS updates and security patches for ThinkHub/ViewHub devices.

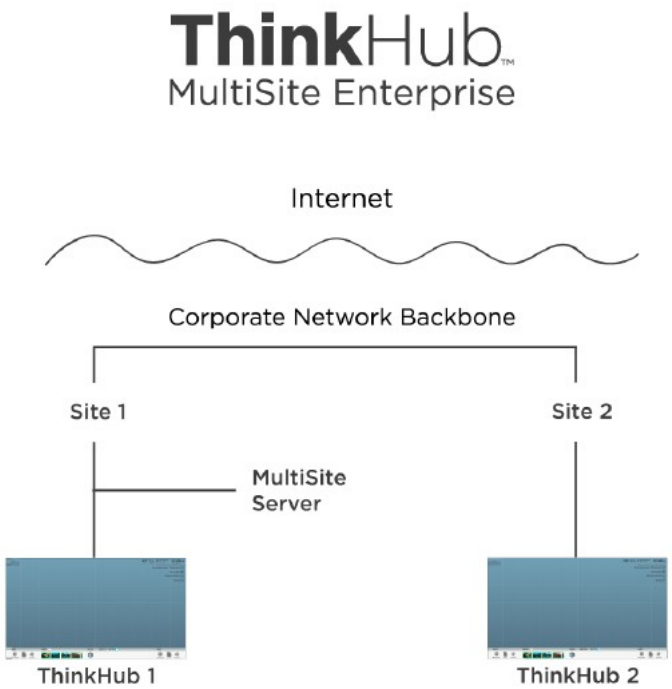
3.4 ThinkHub MultiSite network architecture

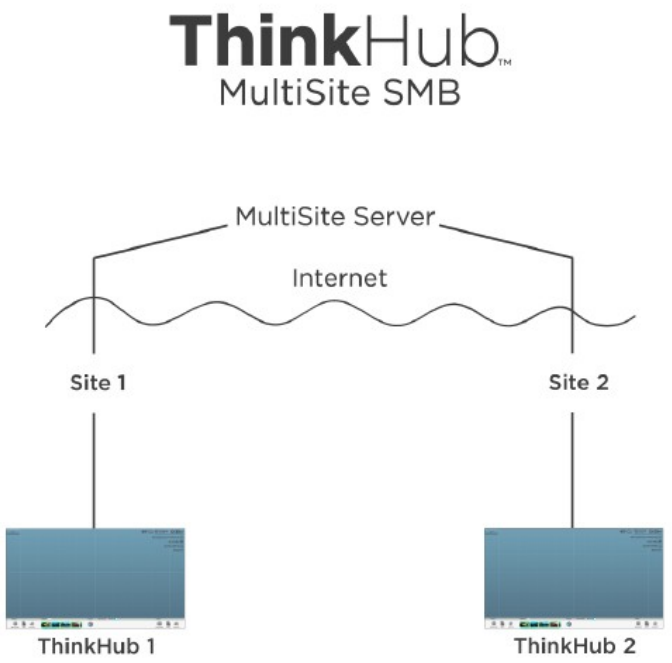
MultiSite is an add-on module distributed by T1V that provides real-time, remote collaboration sessions anything that happens on one Canvas is mirrored to the others. Any site connected to the shared session can utilize any display configuration.

MultiSite has two options: (1) Enterprise and (2) SMB. In the Enterprise option, the connected devices must be on the same internal network which keeps all data on that network. For companies without this infrastructure between their sites, T1V has developed the SMB option.

3.4.1 ThinkHub MultiSite enterprise

With MultiSite Enterprise, all ThinkHub devices and the ThinkHub MultiSite Server are connected to the corporate backbone. This allows all ThinkHub sites to communicate with one another under the security of the corporate network. In addition, all traffic between ThinkHub devices is encrypted. No data is ever stored on the MultiSite server.





3.4.2 ThinkHub MultiSite SMB

In SMB, the MultiSite devices connect to each other through outbound connections to the T1V MultiSite server. All traffic to this server is encrypted from both devices. No data is ever stored on the MultiSite server. It is only used to relay data between sites.

3.4.3 ThinkHub MultiSite hosts and ports

3.4.3.1 Enterprise

SOURCE	DESTINATION	PORT	PROTOCOL
ThinkHub device	MultiSite server (static IP)	5672	TCP
ThinkHub device	ThinkHub device	50,000 - 65,000	UDP

3.4.3.2 SMB

SOURCE	DESTINATION	PORT	PROTOCOL
ThinkHub device	MultiSite server (multisite.t1v.com)	5671 or 443 or 80	TCP
ThinkHub device	AirConnectRelay.t1v.com	3478 or 80	TCP/UDP

3.5 Bandwidth requirements

This is the bandwidth required between any two ThinkHubs in a MultiSite session:

Minimum Bandwidth : 25Mb/s (both directions)

Maximum Bandwidth : 3Mb/s (both directions) x number of live streams

Note: live streams include laptops (AirConnect Feeds), hardline inputs, cameras, and web browsers

Appendix 4 - IP Table

Audio Visual Clients Subnet 10.100.15.0/24

MAC Address	IP Address/VLAN (subnet when DHCP assigned, actual ip when permanently assigned (via DHCP)	Device Owner (also identifies contact for support)	Device Description	Usage (Location)	Entry number (Identifies subnet size)	PoE Required	Static IP Required
	10.100.15.1	CEC (support via Quatreus)	Gateway		1		
F8:DC:7A:70:53:96	10.100.15.2	CEC (support via Quatreus)	Inogeni Share2U	Room 1	2	NO	YES
E4:50:EB:BA:43:A3	10.100.15.3	CEC (support via Quatreus)	T1V ThinkHub TH-1169	Room 1	3	NO	YES
00:11:02:F3:39:84	10.100.15.4	CEC (support via Quatreus)	Aurora VLX-TC1-CF	Room 1	4	YES	YES
00:11:02:F3:39:0A	10.100.15.5	CEC (support via Quatreus)	Aurora VLX-TC1-CF	Room 1	5	YES	YES
00:11:02:F1:01:88	10.100.15.6	CEC (support via Quatreus)	Aurora VLX-TC1-CF	Room 1	6	YES	YES
00:11:02:F1:01:90	10.100.15.7	CEC (support via Quatreus)	Aurora VLX-TC1-CF	Room 1	7	YES	YES
00:11:02:F1:01:8C	10.100.15.8	CEC (support via Quatreus)	Aurora VLX-TC1-CF	Room 1	8	YES	YES
00:11:02:F3:38:F0	10.100.15.9	CEC (support via Quatreus)	Aurora VLX-TC1-CF	Room 1	9	YES	YES
00:0F:58:09:51:19	10.100.15.10	CEC (support via Quatreus)	AdderView XDIP KVM	Room 1	10	YES	YES
00:0F:58:09:51:2A	10.100.15.11	CEC (support via Quatreus)	AdderView XDIP KVM	Room 1	11	YES	YES
00:0F:58:09:51:1B	10.100.15.12	CEC (support via Quatreus)	AdderView XDIP KVM	Room 1	12	YES	YES
00:0F:58:09:51:27	10.100.15.13	CEC (support via Quatreus)	AdderView XDIP KVM	Room 1	13	YES	YES
	10.100.15.14	CEC (support via Quatreus)		Room 1	14	NO	YES
00:1F:B6:52:09:67	10.100.15.15	CEC (support via Quatreus)	85” Touch Display 1	Room 1	15	NO	YES
00:1F:B6:52:09:16	10.100.15.16	CEC (support via Quatreus)	85” Touch Display 2	Room 1	16	NO	YES
00:1F:B6:52:08:EE	10.100.15.17	CEC (support via Quatreus)	85” Touch Display 3	Room 1	17	NO	YES
00:11:02:60:01:1A	10.100.15.18	CEC (support via Quatreus)	Aurora RXC-1 (LAN1)	Room 1	18	YES	YES
E0:DA:DC:09:91:67	10.100.15.19	CEC (support via Quatreus)	JVC KC-PZ100 PTZ camera	Room 1	19	NO	YES
00:19:32:01:3D:AD	10.100.15.20	CEC (support via Quatreus)	GUDE 8221 PDU	Room 1	20	NO	YES
F8:22:85:01:32:86	10.100.15.21	CEC (support via Quatreus)	CYP RAX 12V (shared with room 2)	Room 1	21	NO	YES
F8:22:85:01:8D:FB	10.100.15.22	CEC (support via Quatreus)	CYP RAX 24V (LHS)	Room 1	22	NO	YES
E0:70:EA:B7:51:96	10.100.15.23	CEC (support via Quatreus)	Lectern NUC	Room 1	23	NO	NO
E0:DA:DC:09:91:6A	10.100.15.24	CEC (support via Quatreus)	JVC KC-PZ100 PTZ camera	Room 2	24	YES	YES
F8:DC:7A:70:53:49	10.100.15.25	CEC (support via Quatreus)	Inogeni Share2U	Room 2	25	NO	YES
E4:50:EB:B9:88:1C	10.100.15.26	CEC (support via Quatreus)	T1V ThinkHub th-1170	Room 2	26	NO	YES
00:11:02:F3:39:F6	10.100.15.27	CEC (support via Quatreus)	Aurora VLX-TC1-CF	Room 2	27	YES	YES
00:11:02:F3:38:F8	10.100.15.28	CEC (support via Quatreus)	Aurora VLX-TC1-CF	Room 2	28	YES	YES
00:11:02:F3:39:06	10.100.15.29	CEC (support via Quatreus)	Aurora VLX-TC1-CF	Room 2	29	YES	YES

00:11:02:F1:01:BC	10.100.15.30	CEC (support via Quatreus)	Aurora VLX-TC1-CF	Room 2	30	YES	YES
00:11:02:F1:00:5C	10.100.15.31	CEC (support via Quatreus)	Aurora VLX-TC1-CF	Room 2	31	YES	YES
00:11:02:F3:38:D6	10.100.15.32	CEC (support via Quatreus)	Aurora VLX-TC1-CF	Room 2	32	YES	YES
00:0F:58:09:51:2C	10.100.15.33	CEC (support via Quatreus)	AdderView XDIP KVM	Room 2	33	YES	YES
00:0F:58:09:51:29	10.100.15.34	CEC (support via Quatreus)	AdderView XDIP KVM	Room 2	34	YES	YES
00:0F:58:09:51:28	10.100.15.35	CEC (support via Quatreus)	AdderView XDIP KVM	Room 2	35	YES	YES
00:0F:58:09:51:1A	10.100.15.36	CEC (support via Quatreus)	AdderView XDIP KVM	Room 2	36	YES	YES
	10.100.15.37	CEC (support via Quatreus)		Room 2	37	NO	YES
00:1F:B6:52:09:A7	10.100.15.38	CEC (support via Quatreus)	85” Touch Display 1	Room 2	38	NO	YES
00:1F:B6:52:09:D6	10.100.15.39	CEC (support via Quatreus)	85” Touch Display 2	Room 2	39	NO	YES
00:1F:B6:52:09:C8	10.100.15.40	CEC (support via Quatreus)	85” Touch Display 3	Room 2	40	NO	YES
00:11:02:60:01:11	10.100.15.41	CEC (support via Quatreus)	Aurora RXC-1 (LAN1)	Room 2	41	YES	YES
	10.100.15.42	CEC (support via Quatreus)		Room 2	42	NO	YES
00:19:32:01:45:77	10.100.15.43	CEC (support via Quatreus)	GUDE 8221 PDU	Room 2	43	NO	YES
	10.100.15.44	CEC (support via Quatreus)	CYP RAX 12V (shared with room 2)	Room 2	44	NO	YES
F8:22:85:01:8B:11	10.100.15.45	CEC (support via Quatreus)	CYP RAX 24V (LHS)	Room 2	45	NO	YES
E0:70:EA:B7:50:A8	10.100.15.46	CEC (support via Quatreus)	Lectern NUC	Room 2	46	NO	NO
00:60:74:06:91:14	10.100.15.47	CEC (support via Quatreus)	QSC Core 510i DSP	Room 3	47	NO	YES
E0:DA:DC:09:91:96	10.100.15.48	CEC (support via Quatreus)	JVC KC-PZ100 PTZ camera	Room 3	48	YES	YES
F8:DC:7A:61:B6:18	10.100.15.49	CEC (support via Quatreus)	Inogeni Share2U	Room 3	49	NO	YES
E4:50:EB:B9:BA:5C	10.100.15.50	CEC (support via Quatreus)	T1V ThinkHub TH-1171	Room 3	50	NO	YES
00:11:02:F3:38:F6	10.100.15.51	CEC (support via Quatreus)	Aurora VLX-TC1-CF	Room 3	51	YES	YES
00:11:02:F3:39:14	10.100.15.52	CEC (support via Quatreus)	Aurora VLX-TC1-CF	Room 3	52	YES	YES
00:11:02:F3:39:00	10.100.15.53	CEC (support via Quatreus)	Aurora VLX-TC1-CF	Room 3	53	YES	YES
00:11:02:F3:38:EC	10.100.15.54	CEC (support via Quatreus)	Aurora VLX-TC1-CF	Room 3	54	YES	YES
00:11:02:F3:36:D8	10.100.15.55	CEC (support via Quatreus)	Aurora VLX-TC1-CF	Room 3	55	YES	YES
00:11:02:F3:39:0E	10.100.15.56	CEC (support via Quatreus)	Aurora VLX-TC1-CF	Room 3	56	YES	YES
00:0F:58:09:51:18	10.100.15.57	CEC (support via Quatreus)	AdderView XDIP KVM	Room 3	57	YES	YES
00:0F:58:09:51:2B	10.100.15.58	CEC (support via Quatreus)	AdderView XDIP KVM	Room 3	58	YES	YES
00:0F:58:09:51:2F	10.100.15.59	CEC (support via Quatreus)	AdderView XDIP KVM	Room 3	59	YES	YES
00:1F:B6:52:09:66	10.100.15.60	CEC (support via Quatreus)	85” Touch Display 1	Room 3	60	NO	YES
00:1F:B6:52:09:12	10.100.15.61	CEC (support via Quatreus)	85” Touch Display 2	Room 3	61	NO	YES
00:11:02:60:00:E3	10.100.15.62	CEC (support via Quatreus)	Aurora RXC-1 (LAN1)	Room 3	62	YES	YES
	10.100.15.63	CEC (support via Quatreus)		Room 3	63	NO	YES
00:19:32:01:3D:AC	10.100.15.64	CEC (support via Quatreus)	GUDE 8221 PDU	Room 3	64	NO	YES
F8:22:85:01:32:87	10.100.15.65	CEC (support via Quatreus)	CYP RAX 12V	Room 3	65	NO	YES
F8:22:85:01:8B:10	10.100.15.66	CEC (support via Quatreus)	CYP RAX 24V	Room 3	66	NO	YES
E0:DA:DC:09:91:75	10.100.15.67	CEC (support via Quatreus)	JVC KC-PZ100 PTZ camera	Room 4	67	YES	YES
F8:DC:7A:70:52:61	10.100.15.68	CEC (support via Quatreus)	Inogeni Share2U	Room 4	68	NO	YES

E4:50:EB:BB:69:55	10.100.15.69	CEC (support via Quatreus)	T1V ThinkHub TH-1172	Room 4	69	NO	YES
00:11:02:F3:39:1C	10.100.15.70	CEC (support via Quatreus)	Aurora VLX-TC1-CF	Room 4	70	YES	YES
00:11:02:F3:39:A4	10.100.15.71	CEC (support via Quatreus)	Aurora VLX-TC1-CF	Room 4	71	YES	YES
00:11:02:F1:04:3C	10.100.15.72	CEC (support via Quatreus)	Aurora VLX-TC1-CF	Room 4	72	YES	YES
00:11:02:F1:04:28	10.100.15.73	CEC (support via Quatreus)	Aurora VLX-TC1-CF	Room 4	73	YES	YES
00:0F:58:09:51:2D	10.100.15.74	CEC (support via Quatreus)	AdderView XDIP KVM	Room 4	74	YES	YES
00:0F:58:09:51:17	10.100.15.75	CEC (support via Quatreus)	AdderView XDIP KVM	Room 4	75	YES	YES
00:0F:58:09:51:2E	10.100.15.76	CEC (support via Quatreus)	AdderView XDIP KVM	Room 4	76	YES	YES
00:60:74:06:29:8D	10.100.15.77	CEC (support via Quatreus)	QSC Core 110	Room 4	77	NO	YES
00:11:02:60:01:1B	10.100.15.78	CEC (support via Quatreus)	Aurora RXC-1 (LAN1)	Room 4	78	YES	YES
	10.100.15.79	CEC (support via Quatreus)	Aurora RXC-1 (LAN2)	Room 4	79	NO	YES
00:19:32:01:45:75	10.100.15.80	CEC (support via Quatreus)	PDU	Room 4	80	NO	YES
F8:22:85:01:32:82	10.100.15.81	CEC (support via Quatreus)	CYP RAX 12V	Room 4	81	NO	YES
F8:22:85:01:8D:FA	10.100.15.82	CEC (support via Quatreus)	CYP RAX 24V	Room 4	82	NO	YES
00:1F:B6:52:09:15	10.100.15.83	CEC (support via Quatreus)	85” Touch Display 1	Room 4	83	NO	YES
00:1D:C1:94:23:2B	10.100.15.84	CEC (support via Quatreus)	Audix DN4 Microphone Interface	Room 1	84	YES	NO
00:1D:C1:94:23:3C	10.100.15.85	CEC (support via Quatreus)	Audix DN4 Microphone Interface	Room 1	85	YES	NO
00:1D:C1:52:E0:32	10.100.15.86	CEC (support via Quatreus)	Audinate ADP-USB-AU-2x2 AVIO Adaptor	Room 1	86	YES	NO
00:1D:C1:52:61:B3	10.100.15.87	CEC (support via Quatreus)	Audinate ADP-DAO-AU-0x2 AVIO Adaptor	Room 1	87	YES	NO
	10.100.15.88	CEC (support via Quatreus)	Audinate ADP-DAO-AU-0x1 AVIO Adaptor	Room 1	88	YES	NO
00:1D:C1:52:A1:1D	10.100.15.89	CEC (support via Quatreus)	Audinate ADP-DAI-AU 1x0 AVIO Adaptor	Room 1	89	YES	NO
00:1D:C1:84:F7:0B	10.100.15.90	CEC (support via Quatreus)	Ampetronic D7-2 Dante Induction loop driver	Room 1	90	NO	NO
00:1D:C1:94:23:63	10.100.15.91	CEC (support via Quatreus)	Audix DN4 Microphone Interface	Room 2	91	YES	NO
00:1D:C1:94:21:CD	10.100.15.92	CEC (support via Quatreus)	Audix DN4 Microphone Interface	Room 2	92	YES	NO
00:1D:C1:52:E0:44	10.100.15.93	CEC (support via Quatreus)	Audinate ADP-USB-AU-2x2 AVIO Adaptor	Room 2	93	YES	NO
00:1D:C1:52:CF:3D	10.100.15.94	CEC (support via Quatreus)	Audinate ADP-DAO-AU-0x2 AVIO Adaptor	Room 2	94	YES	NO
	10.100.15.95	CEC (support via Quatreus)	Audinate ADP-DAO-AU-0x1 AVIO Adaptor	Room 2	95	YES	NO
00:1D:C1:52:A1:1C	10.100.15.96	CEC (support via Quatreus)	Audinate ADP-DAI-AU 1x0 AVIO Adaptor	Room 2	96	YES	NO
00:1D:C1:84:F7:07	10.100.15.97	CEC (support via Quatreus)	Ampetronic D7-2 Dante Induction loop driver	Room 2	97	NO	NO
00:1D:C1:94:1F:D0	10.100.15.98	CEC (support via Quatreus)	Audix DN4 Microphone Interface	Room 3	98	YES	NO
00:1D:C1:52:E0:62	10.100.15.99	CEC (support via Quatreus)	Audinate ADP-USB-AU-2x2 AVIO Adaptor	Room 3	99	YES	NO
00:1D:C1:52:CE:E6	10.100.15.100	CEC (support via Quatreus)	Audinate ADP-DAO-AU-0x2 AVIO Adaptor	Room 3	100	YES	NO
	10.100.15.101	CEC (support via Quatreus)	Audinate ADP-DAO-AU-0x1 AVIO Adaptor	Room 3	101	YES	NO
	10.100.15.102	CEC (support via Quatreus)	Audinate ADP-DAI-AU 1x0 AVIO Adaptor	Room 3	102	YES	NO
00:1D:C1:84:0B:77	10.100.15.103	CEC (support via Quatreus)	Ampetronic D7-2 Dante Induction loop driver	Room 3	103	NO	NO
00:1D:C1:94:23:61	10.100.15.104	CEC (support via Quatreus)	Audix DN4 Microphone Interface	Room 4	104	YES	NO
00:1D:C1:52:E0:38	10.100.15.105	CEC (support via Quatreus)	Audinate ADP-USB-AU-2x2 AVIO Adaptor	Room 4	105	YES	NO
00:1D:C1:52:CE:C0	10.100.15.106	CEC (support via Quatreus)	Audinate ADP-DAO-AU-0x2 AVIO Adaptor	Room 4	106	YES	NO
	10.100.15.107	CEC (support via Quatreus)	Audinate ADP-DAO-AU-0x1 AVIO Adaptor	Room 4	107	YES	NO

	10.100.15.108	CEC (support via Quatreus)	Audinate ADP-DAI-AU 1x0 AVIO Adaptor	Room 4	108	YES	NO
00:1D:C1:84:F7:49	10.100.15.109	CEC (support via Quatreus)	Ampetronic D7-2 Dante Induction loop driver	Room 4	109	NO	NO
00:60:74:06:29:8C	10.100.15.111	CEC (support via Quatreus)	QSC Core 110 - Alt NIC	Room 4	110	NO	YES

Appendix 5 – Network cable identification

We have used colour coded network patch cables to identify the signal types.

Colour	Function
RED	Power over Ethernet (PoE)
BLUE	Dante Audio
GREY	Standard network
YELLOW	Non LAN network cables, for example a USB extender over CATx cable

Our site infrastructure cable is CAT6A and is ICE blue in colour.

In order to identify its function we have used colour coded rubber sleeves at the connector end.

Some of these cables made have two identifying sleeves to indicate for example that it is both Dante and PoE.

Appendix 6 – Cable Schedule

6.1 Zephyr

Cable Number	Cable Type	Function	From	To
100	CAT6A Patch	LAN for 85” display	85” display 1	143
101	CAT6A Patch	LAN for 85” display	85” display 2	145
102	CAT6A Patch	LAN for 85” display	85” display 3	146
103	CAT6A Patch	LAN for 32” display	32” display	Local LAN socket
104	CAT6A Patch	LAN for NUC	NUC	Local LAN socket
105	CAT6A Patch	KVM control For NUC	Adderview XDIP mounted in room	Local LAN socket
106	CAT6A Patch	KVM control For Wireless Keyboard	Adderview XDIP mounted in room	165
107	CAT6A Patch	Laptop video	Aurora VLX mounted on table	Local LAN socket
108	CAT6A Patch	Laptop video	Aurora VLX mounted on table	Local LAN socket
109	CAT6A Patch	Laptop video	Aurora VLX mounted on table	Local LAN socket
110	CAT6A Patch	Laptop video	Aurora VLX mounted on table	Local LAN socket
111	CAT6A Patch	Microphone audio	Microphone 1	Audix DN4
112	CAT6A Patch	Microphone audio	Microphone 2	Audix DN4
113	CAT6A Patch	Microphone audio	Microphone 3	Audix DN4
114	CAT6A Patch	Microphone audio	Microphone 4	Audix DN4
115	CAT6A Site	Microphone audio	Audix DN4	LAN patch in rack
116	CAT6A Patch	Microphone audio	Microphone 5	Audix DN4
117	CAT6A Patch	Microphone audio	Microphone 6	Audix DN4
118	CAT6A Patch	Microphone audio	Microphone 7	Audix DN4
119	CAT6A Patch	Microphone audio	Microphone 8	Audix DN4
120	CAT6A Site	Microphone audio	Audix DN4	LAN patch in rack
121	CAT6A Site	USB for 85” display 1	Icron extender in RAK600 frame in rack	Icron extender behind 85” display
122	CAT6A Site	USB for 85” display 2	Icron extender in RAK600 frame in rack	Icron extender behind 85” display
123	CAT6A Site	USB for 85” display 3	Icron extender in RAK600 frame in rack	Icron extender behind 85” display
124	CAT6A Site	USB for Panacast Camera	Icron extender in RAK600 frame in rack	Icron extender behind 85” display
125	CAT6A Site	LAN for JVC PTZ camera	JVC PTZ camera	LAN patch in rack
126	CAT6A Site	RS232 for JVC PTZ camera	CYP PU232 RX located near to camera	CYP PU232 in RAK600 Frame in rack
127	HDMI Fibre	HDMI for 85” display 1	T1V ThinkHub in rack	85” display 1
128	HDMI Fibre	HDMI for 85” display 2	T1V ThinkHub in rack	85” display 2
129	HDMI Fibre	HDMI for 85” display 3	T1V ThinkHub in rack	85” display 3
130	HD-SDI	Video for JVC PTZ camera	JVC PTZ camera	Blackmagic Convertor in RAK600 Frame in rack

131	YY Cable	Power and Audio for Loudspeaker 1	Loudspeaker power and termination box	Loudspeaker 1
132	YY Cable	Power and Audio for Loudspeaker 2	Loudspeaker power and termination box	Loudspeaker 2
133	YY Cable	Power and Audio for Loudspeaker 3	Loudspeaker power and termination box	Loudspeaker 3
134	YY Cable	Power and Audio for Loudspeaker 4	Loudspeaker power and termination box	Loudspeaker 4
135	YY Cable	Power and Audio for Loudspeaker 5	Loudspeaker power and termination box	Loudspeaker 5
136	YY Cable	Power and Audio for Loudspeaker 6	Loudspeaker power and termination box	Loudspeaker 6
137	Twisted 2.5mm	Induction Loop 1	Loop foil tape	Induction loop amplifier in rack
138	Twisted 2.5mm	Induction Loop 2	Loop foil tape	Induction loop amplifier in rack
139	4 core	Speaker control	Aurora RXC-1	Loudspeaker control box

6.1.1 Lectern Connectivity

- Cables 104,105
- these can be connected to any floor box.
- each floor box is equipped with four network ports.
- however, the **RED** KVM network cable 105 MUST be connected to either of the two lowest number ports to ensure they receive PoE.

6.1.2 KVM Connectivity

- the **RED** Cable 106 for the wireless keyboard KVM MUST NOT be disconnected from port 165

6.1.3 Laptop Connectivity

- Cables 107,108,109,110
- laptops can be connected to any floor box, via the labelled **RED** network cables.
- each floor box is equipped with four network ports.
- however, the Laptop extenders MUST be connected to either of the two lowest number ports to ensure they receive PoE.

6.2 Notus

Cable Number	Cable Type	Function	From	To
200	CAT6A Patch	LAN for 85” display	85” display 1	139
201	CAT6A Patch	LAN for 85” display	85” display 2	140
202	CAT6A Patch	LAN for 85” display	85” display 3	141
203	CAT6A Patch	LAN for 32” display	32” display	Local LAN socket
204	CAT6A Patch	LAN for NUC	NUC	Local LAN socket
205	CAT6A Patch	KVM control For NUC	Adderview XDIP mounted in room	Local LAN socket
206	CAT6A Patch	KVM control For Wireless Keyboard	Adderview XDIP mounted in room	109
207	CAT6A Patch	Laptop video	Aurora VLX mounted on table	Local LAN socket
208	CAT6A Patch	Laptop video	Aurora VLX mounted on table	Local LAN socket
209	CAT6A Patch	Laptop video	Aurora VLX mounted on table	Local LAN socket
210	CAT6A Patch	Laptop video	Aurora VLX mounted on table	Local LAN socket
211	CAT6A Patch	Microphone audio	Microphone 1	Audix DN4
212	CAT6A Patch	Microphone audio	Microphone 2	Audix DN4
213	CAT6A Patch	Microphone audio	Microphone 3	Audix DN4
214	CAT6A Patch	Microphone audio	Microphone 4	Audix DN4
215	CAT6A Site	Microphone audio	Audix DN4	LAN patch in rack
216	CAT6A Patch	Microphone audio	Microphone 5	Audix DN4
217	CAT6A Patch	Microphone audio	Microphone 6	Audix DN4
218	CAT6A Patch	Microphone audio	Microphone 7	Audix DN4
219	CAT6A Patch	Microphone audio	Microphone 8	Audix DN4
220	CAT6A Site	Microphone audio	Audix DN4	LAN patch in rack
221	CAT6A Site	USB for 85” display 1	Icron extender in RAK600 frame in rack	Icron extender behind 85” display
222	CAT6A Site	USB for 85” display 2	Icron extender in RAK600 frame in rack	Icron extender behind 85” display
223	CAT6A Site	USB for 85” display 3	Icron extender in RAK600 frame in rack	Icron extender behind 85” display
224	CAT6A Site	USB for Panacast Camera	Icron extender in RAK600 frame in rack	Icron extender behind 85” display
225	CAT6A Site	LAN for JVC PTZ camera	JVC PTZ camera	LAN patch in rack
226	CAT6A Site	RS232 for JVC PTZ camera	CYP PU232 RX located near to camera	CYP PU232 in RAK600 Frame in rack
227	HDMI Fibre	HDMI for 85” display 1	T1V ThinkHub in rack	85” display 1
228	HDMI Fibre	HDMI for 85” display 2	T1V ThinkHub in rack	85” display 2
229	HDMI Fibre	HDMI for 85” display 3	T1V ThinkHub in rack	85” display 3
230	HD-SDI	Video for JVC PTZ camera	JVC PTZ camera	Blackmagic Convertor in RAK600 Frame in rack

231	YY Cable	Power and Audio for Loudspeaker 1	Loudspeaker power and termination box	Loudspeaker 1
232	YY Cable	Power and Audio for Loudspeaker 2	Loudspeaker power and termination box	Loudspeaker 2
233	YY Cable	Power and Audio for Loudspeaker 3	Loudspeaker power and termination box	Loudspeaker 3
234	YY Cable	Power and Audio for Loudspeaker 4	Loudspeaker power and termination box	Loudspeaker 4
235	YY Cable	Power and Audio for Loudspeaker 5	Loudspeaker power and termination box	Loudspeaker 5
236	YY Cable	Power and Audio for Loudspeaker 6	Loudspeaker power and termination box	Loudspeaker 6
237	Twisted 2.5mm	Induction Loop 1	Loop foil tape	Induction loop amplifier in rack
238	Twisted 2.5mm	Induction Loop 2	Loop foil tape	Induction loop amplifier in rack
239	4 core	Speaker control	Aurora RXC-1	Loudspeaker control box

6.2.1 Lectern Connectivity

- Cables 204,205
- these can be connected to any floor box.
- each floor box is equipped with four network ports.
- however, the **RED** KVM network cable 205 MUST be connected to either of the two lowest number ports to ensure they receive PoE.

6.2.2 KVM Connectivity

- the **RED** Cable 206 for the wireless keyboard KVM MUST NOT be disconnected from port 109

6.2.3 Laptop Connectivity

- Cables 207,208,209,210
- laptops can be connected to any floor box, via the labelled **RED** network cables.
- each floor box is equipped with four network ports.
- however, the Laptop extenders MUST be connected to either of the two lowest number ports to ensure they receive PoE.

6.3 Eurus

Cable Number	Cable Type	Function	From	To
300	CAT6A Patch	LAN for 85” display	85” display 1	091
301	CAT6A Patch	LAN for 85” display	85” display 2	092
302	CAT6A Patch	KVM control For Wireless Keyboard	Adderview XDIP mounted in room	085
303	CAT6A Patch	Laptop video	Aurora VLX mounted on table	Local LAN socket
304	CAT6A Patch	Laptop video	Aurora VLX mounted on table	Local LAN socket
305	CAT6A Patch	Laptop video	Aurora VLX mounted on table	Local LAN socket
306	CAT6A Patch	Laptop video	Aurora VLX mounted on table	Local LAN socket
307	CAT6A Patch	Microphone audio	Microphone 1	Audix DN4
308	CAT6A Patch	Microphone audio	Microphone 2	Audix DN4
309	CAT6A Patch	Microphone audio	Microphone 3	Audix DN4
310	CAT6A Patch	Microphone audio	Microphone 4	Audix DN4
311	CAT6A Site	Microphone audio	Audix DN4	LAN patch in rack
312	CAT6A Site	USB for 85” display 1	Icron extender in RAK600 frame in rack	Icron extender behind 85” display
313	CAT6A Site	USB for 85” display 2	Icron extender in RAK600 frame in rack	Icron extender behind 85” display
314	CAT6A Site	USB for Panacast Camera	Icron extender in RAK600 frame in rack	Icron extender behind 85” display
315	CAT6A Site	LAN for JVC PTZ camera	JVC PTZ camera	LAN patch in rack
316	CAT6A Site	RS232 for JVC PTZ camera	CYP PU232 RX located near to camera	CYP PU232 in RAK600 Frame in rack
317	HDMI Fibre	HDMI for 85” display 1	T1V ThinkHub in rack	85” display 1
318	HDMI Fibre	HDMI for 85” display 2	T1V ThinkHub in rack	85” display 2
319	HD-SDI	Video for JVC PTZ camera	JVC PTZ camera	Blackmagic Convertor in RAK600 Frame in rack
320	YY Cable	Power and Audio for Loudspeaker 1	Loudspeaker power and termination box	Loudspeaker 1
321	YY Cable	Power and Audio for Loudspeaker 2	Loudspeaker power and termination box	Loudspeaker 2
322	YY Cable	Power and Audio for Loudspeaker 3	Loudspeaker power and termination box	Loudspeaker 3
323	YY Cable	Power and Audio for Loudspeaker 4	Loudspeaker power and termination box	Loudspeaker 4
324	Twisted 2.5mm	Induction Loop 1	Loop foil tape	Induction loop amplifier in rack
325	Twisted 2.5mm	Induction Loop 2	Loop foil tape	Induction loop amplifier in rack
326	4 core	Speaker control	Aurora RXC-1	Loudspeaker control box

6.2.1 KVM Connectivity

- the **RED** KVM network cable 302 for the wireless keyboard KVM MUST NOT be disconnected from port 085

6.2.3 Laptop Connectivity

- Cables 303,304,305,306
- laptops can be connected to any floor box, via the labelled **RED** network cables.
- each floor box is equipped with four network ports.
- however, the Laptop extenders MUST be connected to either of the two lowest number ports to ensure they receive PoE

6.4 Luna

Cable Number	Cable Type	Function	From	To
400	CAT6A Patch	LAN for 85" display	85" display 1	
401	CAT6A Patch	KVM control For Wireless Keyboard	Adderview XDIP mounted in room	
402	CAT6A Patch	Laptop video	Aurora VLX mounted on table	Local LAN socket
403	CAT6A Patch	Laptop video	Aurora VLX mounted on table	Local LAN socket
404	CAT6A Patch	Microphone audio	Microphone 1	Audix DN4
405	CAT6A Patch	Microphone audio	Microphone 2	Audix DN4
406	CAT6A Patch	Microphone audio	Microphone 3	Audix DN4
407	CAT6A Site	Microphone audio	Audix DN4	LAN patch in rack
408	CAT6A Site	USB for 85" display 1	Icron extender in RAK600 frame in rack	Icron extender behind 85" display
409	CAT6A Site	USB for Panacast Camera	Icron extender in RAK600 frame in rack	Icron extender behind 85" display
410	CAT6A Site	LAN for JVC PTZ camera	JVC PTZ camera	LAN patch in rack
411	CAT6A Site	RS232 for JVC PTZ camera	CYP PU232 RX located near to camera	CYP PU232 in RAK600 Frame in rack
412	HDMI Fibre	HDMI for 85" display 1	T1V ThinkHub in rack	85" display 1
413	HD-SDI	Video for JVC PTZ camera	JVC PTZ camera	Blackmagic Convertor in RAK600 Frame in rack
414	YY Cable	Power and Audio for Loudspeaker 1	Loudspeaker power and termination box	Loudspeaker 1
415	YY Cable	Power and Audio for Loudspeaker 2	Loudspeaker power and termination box	Loudspeaker 2
416	YY Cable	Power and Audio for Loudspeaker 3	Loudspeaker power and termination box	Loudspeaker 3
417	YY Cable	Power and Audio for Loudspeaker 4	Loudspeaker power and termination box	Loudspeaker 4
418	YY Cable	Power and Audio for Loudspeaker 5	Loudspeaker power and termination box	Loudspeaker 5
419	YY Cable	Power and Audio for Loudspeaker 6	Loudspeaker power and termination box	Loudspeaker 6
420	Twisted 2.5mm	Induction Loop 1	Loop foil tape	Induction loop amplifier in rack
421	Twisted 2.5mm	Induction Loop 2	Loop foil tape	Induction loop amplifier in rack

6.4.1 KVM Connectivity

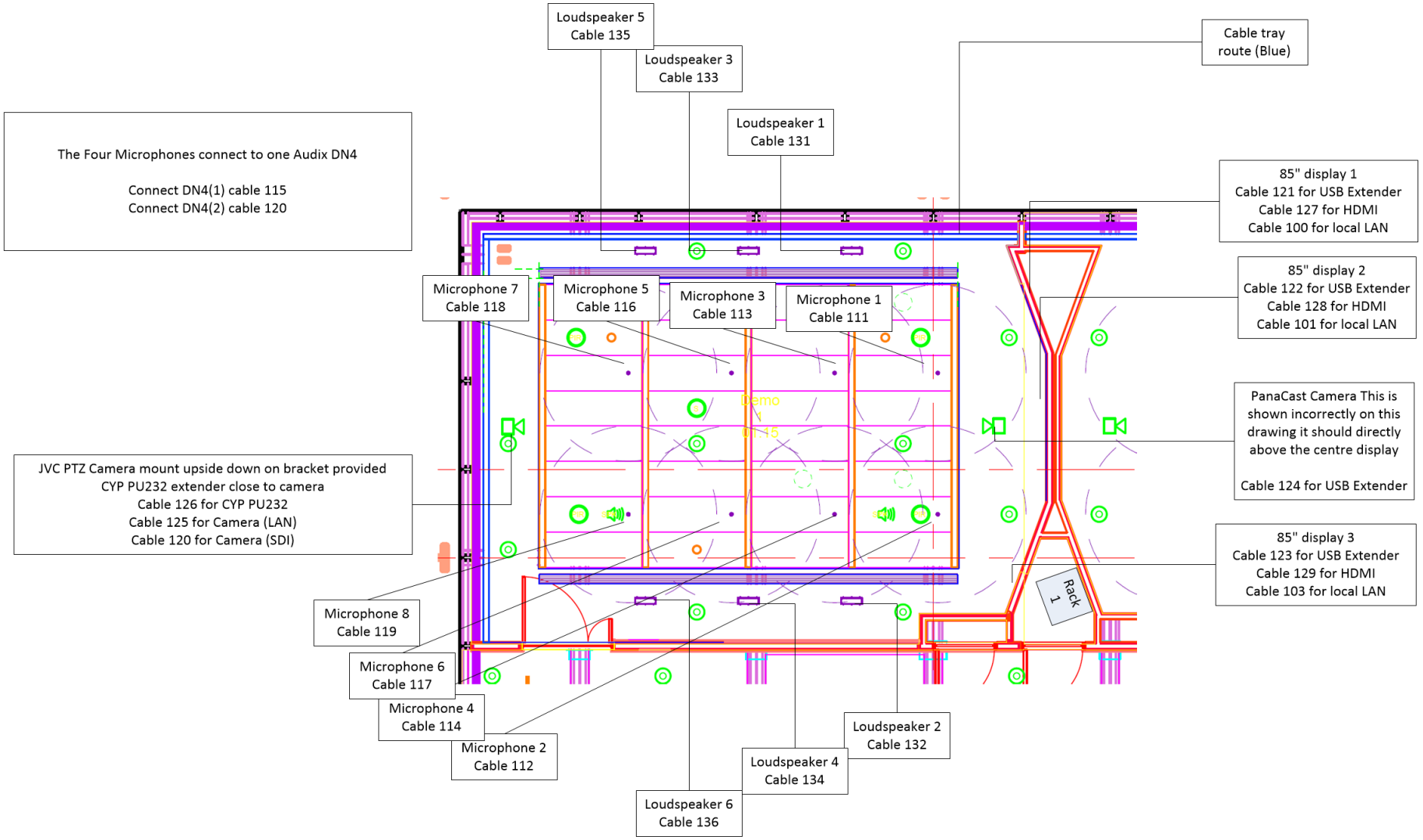
- the **RED** KVM network cable 302 for the wireless keyboard KVM MUST NOT be disconnected from port **XXX**

6.4.3 Laptop Connectivity

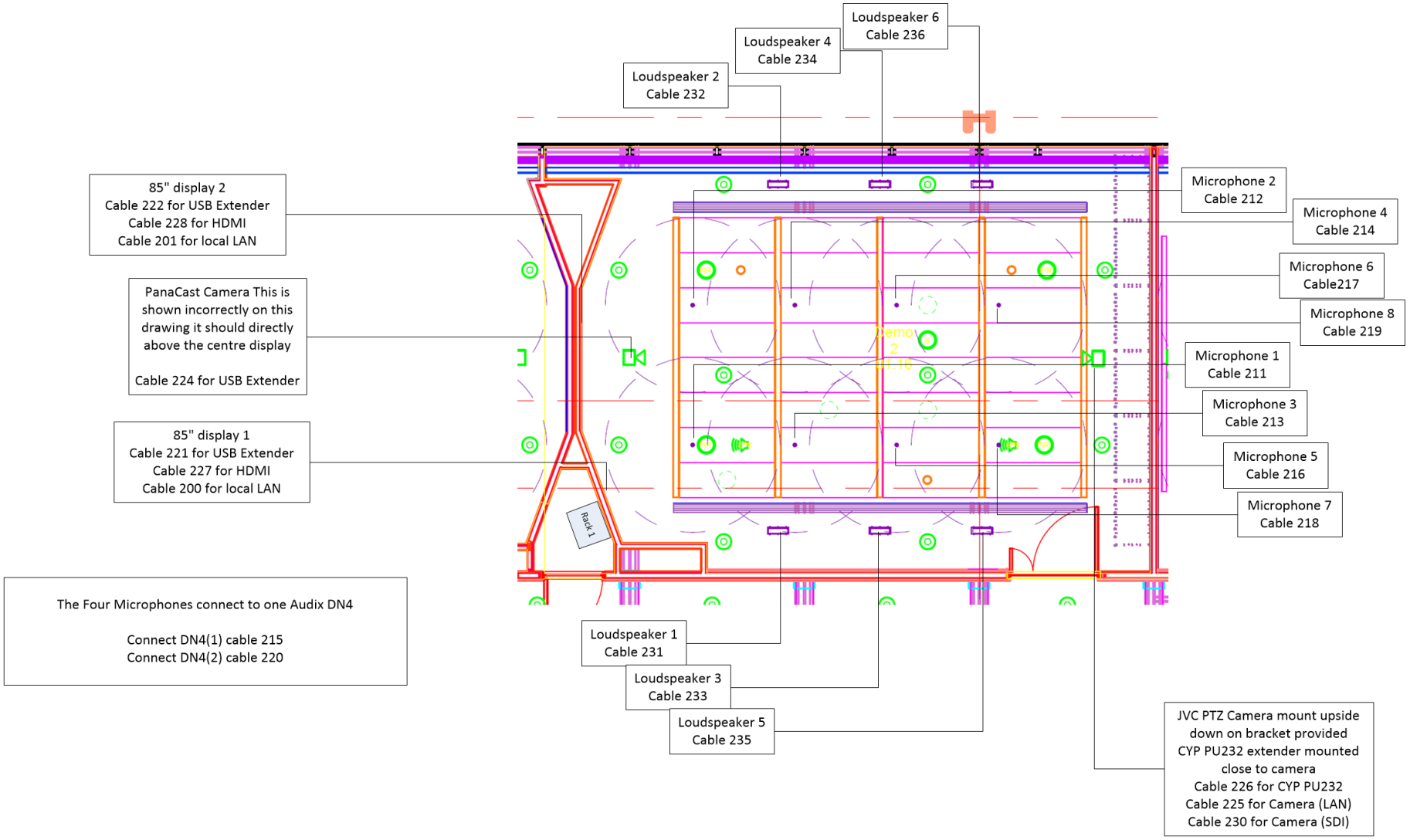
- Cables 303,304,305,306
- laptops can be connected to any floor box, via the labelled **RED** network cables.
- each floor box is equipped with four network ports.
- however, the Laptop extenders MUST be connected to either of the two lowest number ports to ensure they receive PoE

Appendix 7 – Space plans

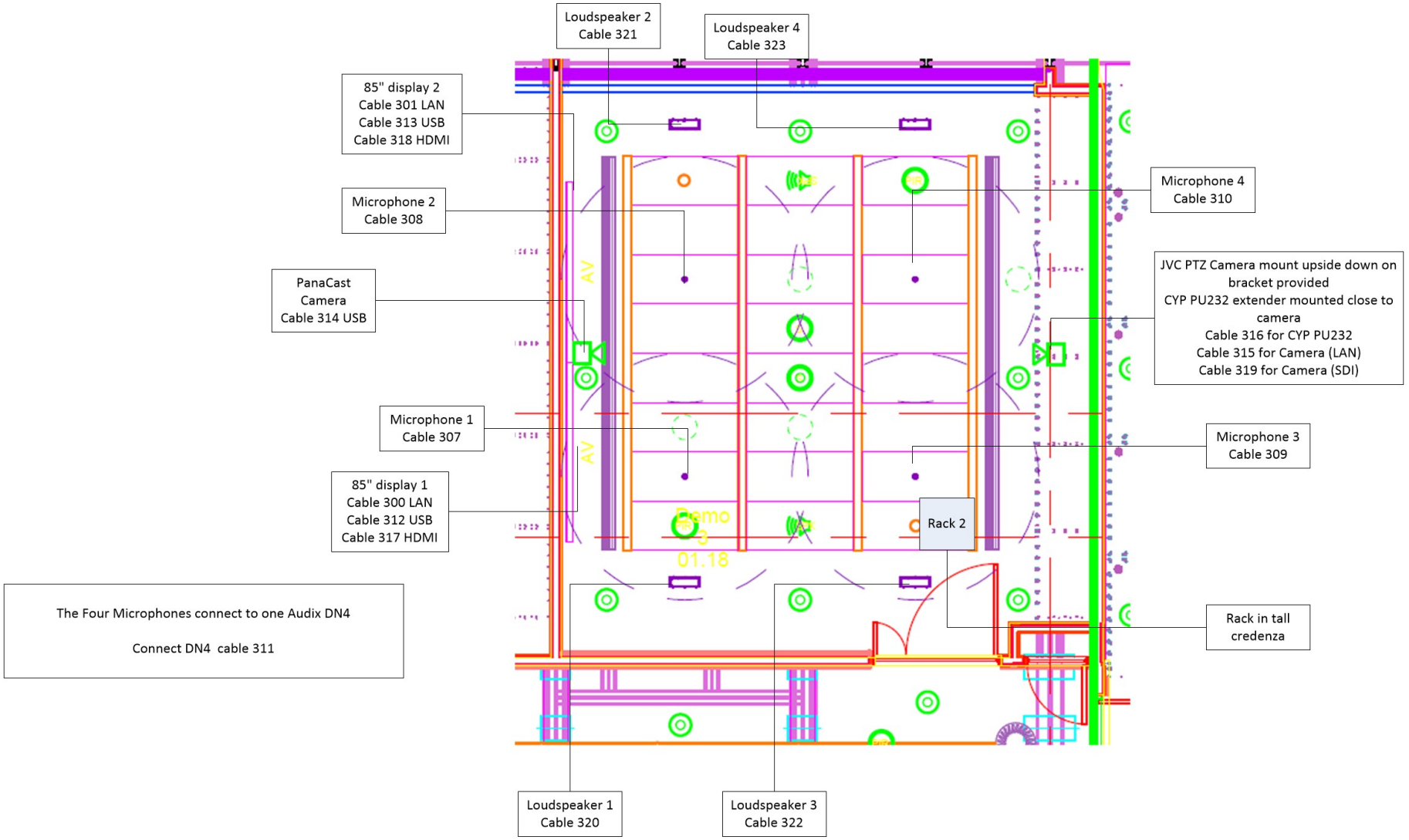
7.1 Zephyr



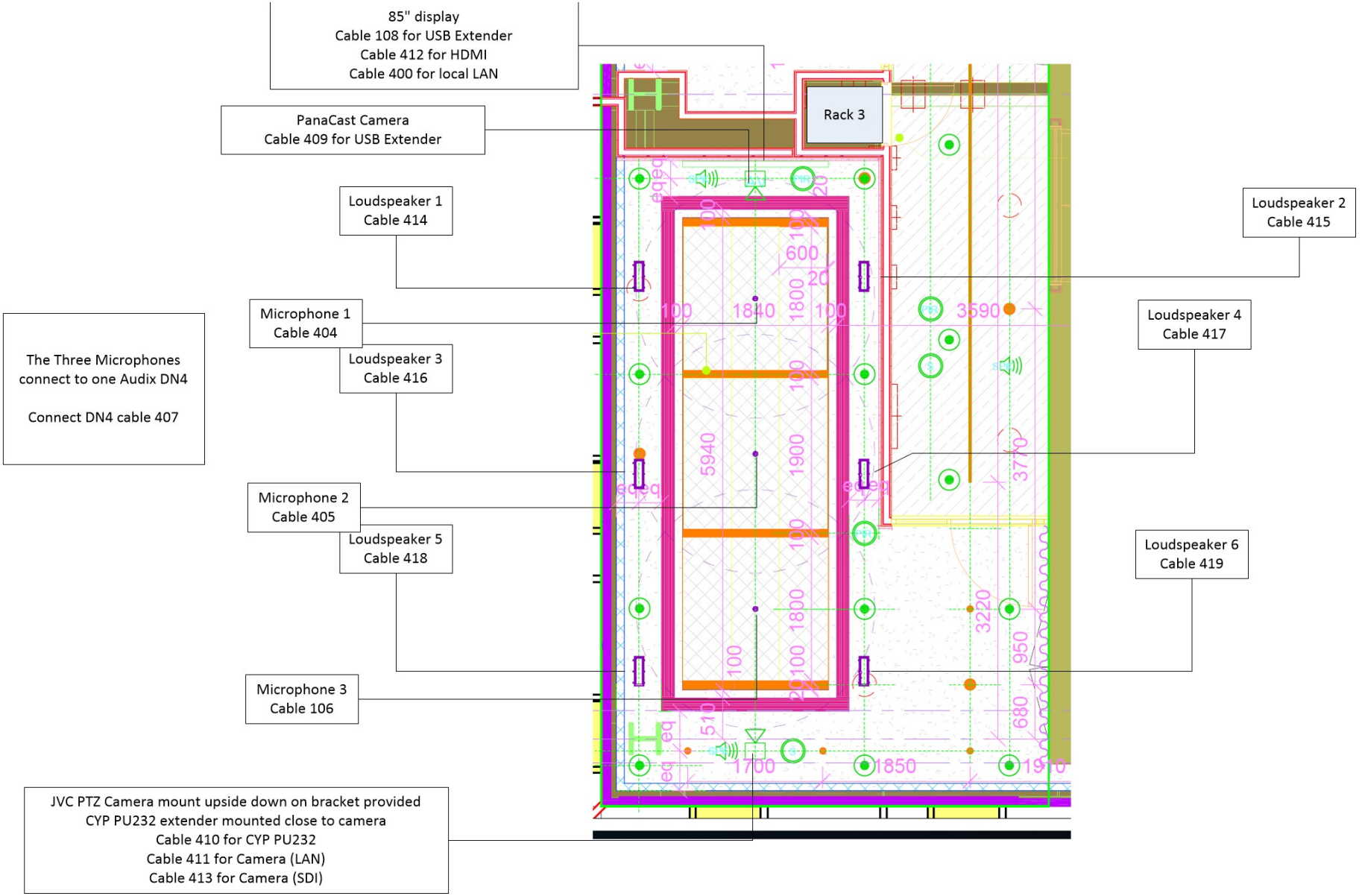
7.2 Notus


Loudspeaker 6
Cable 236
Loudspeaker 4
Cable 234
Loudspeaker 2
Cable 232
85" display 2
Cable 222 for USB Extender
Cable 228 for HDMI
Cable 201 for local LAN
PanaCast Camera This is shown incorrectly on this drawing it should directly above the centre display
Cable 224 for USB Extender
85" display 1
Cable 221 for USB Extender
Cable 227 for HDMI
Cable 200 for local LAN
Microphone 2
Cable 212
Microphone 4
Cable 214
Microphone 6
Cable217
Microphone 8
Cable 219
Microphone 1
Cable 211
Microphone 3
Cable 213
Microphone 5
Cable 216
Microphone 7
Cable 218
Demo 2
Rack 1
The Four Microphones connect to one Audix DN4
Connect DN4(1) cable 215
Connect DN4(2) cable 220
Loudspeaker 1
Cable 231
Loudspeaker 3
Cable 233
Loudspeaker 5
Cable 235
JVC PTZ Camera mount upside down on bracket provided
CYP PU232 extender mounted close to camera
Cable 226 for CYP PU232
Cable 225 for Camera (LAN)
Cable 230 for Camera (SDI)

7.3 Eurus


Loudspeaker 2
Cable 321
Loudspeaker 4
Cable 323
85" display 2
Cable 301 LAN
Cable 313 USB
Cable 318 HDMI
Microphone 2
Cable 308
PanaCast
Camera
Cable 314 USB
Microphone 1
Cable 307
85" display 1
Cable 300 LAN
Cable 312 USB
Cable 317 HDMI
Microphone 4
Cable 310
JVC PTZ Camera mount upside down on bracket provided
CYP PU232 extender mounted close to camera
Cable 316 for CYP PU232
Cable 315 for Camera (LAN)
Cable 319 for Camera (SDI)
Microphone 3
Cable 309
Rack 2
Rack in tall credenza
Loudspeaker 1
Cable 320
Loudspeaker 3
Cable 322
The Four Microphones connect to one Audix DN4
Connect DN4 cable 311

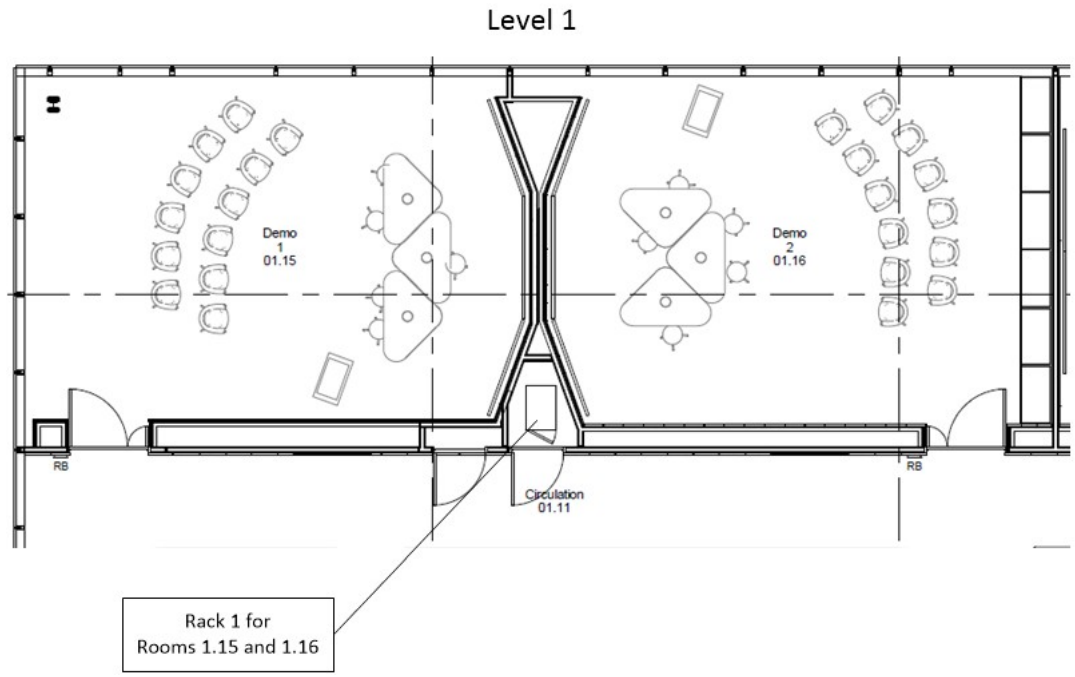
7.4 Luna


85" display
Cable 108 for USB Extender
Cable 412 for HDMI
Cable 400 for local LAN
PanaCast Camera
Cable 409 for USB Extender
Rack 3
Loudspeaker 1
Cable 414
Loudspeaker 2
Cable 415
Microphone 1
Cable 404
Loudspeaker 3
Cable 416
Loudspeaker 4
Cable 417
The Three Microphones
connect to one Audix DN4
Connect DN4 cable 407
Microphone 2
Cable 405
Loudspeaker 5
Cable 418
Loudspeaker 6
Cable 419
Microphone 3
Cable 106
JVC PTZ Camera mount upside down on bracket provided
CYP PU232 extender mounted close to camera
Cable 410 for CYP PU232
Cable 411 for Camera (LAN)
Cable 413 for Camera (SDI)

Appendix 8 – AV equipment rack

8.1 Locations

8.1.1 Rack 1



8.1.2 Rack room 1 power

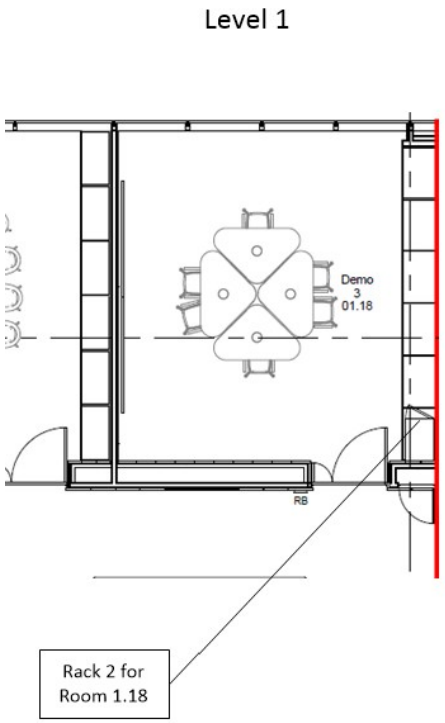
The power for both rack 1 and associated equipment is found on the rear wall of rack room 1.

The top two 16A power rack 1 PDU’s

The middle two single 13A sockets power the loudspeaker control boxes for room 1 and 2

The bottom right hand side twin 13A socket is the power for BT’s network switch.

8.1.3 Rack 2



Rack 2 is located in Eurus in the cupboard at the rear of the room behind the entrance door.

The rack can be pulled out and rotated by 45 degrees for servicing.

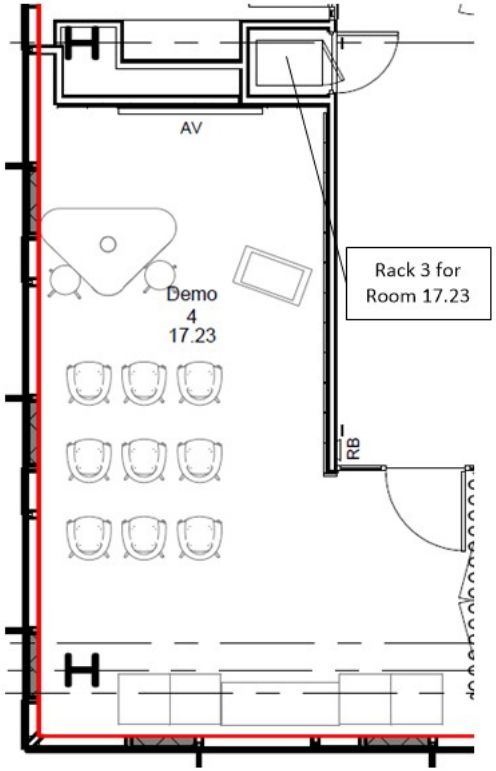
8.1.4 Rack room 2 power

Rack 2 power on the right hand side of rack

BT Network Switch and Loudspeaker control box power at rear of of rack

8.1.5 Rack 3

Level 17



This rack can be removed from the cupboard using the extension rails identified in the photo. There are two 50” rails and a upstand, the rails mount onto the front of the rack with four screws and the rails rest on the upstand mounted on the floor furtherest away from the rack as shown in the diagram

8.1.6 Rack room 3 power

The power for this rack is provided by a PDU located at the bottom of the rack and is feed from a 16A socket under the floor.

However, the rack can be isolated by removing the incoming 16A power socket to this PDU.

There are rear mounted 13A sockets on the rear of the PDU to power BT network switch and the loudspeaker control box mounted at the top of the rack.

These 13A sockets can be isolated by individual MCB’s for each circuit.

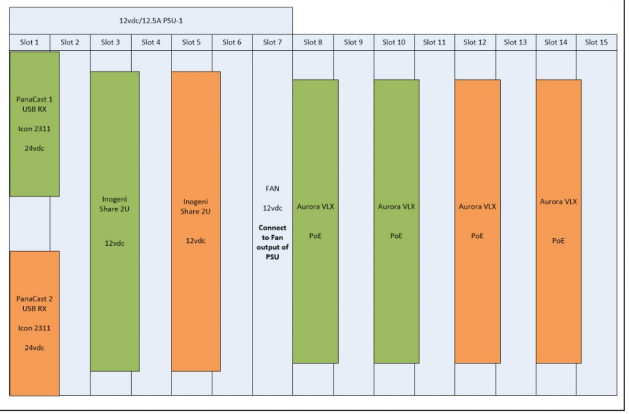
8.2 Rack 1 layout

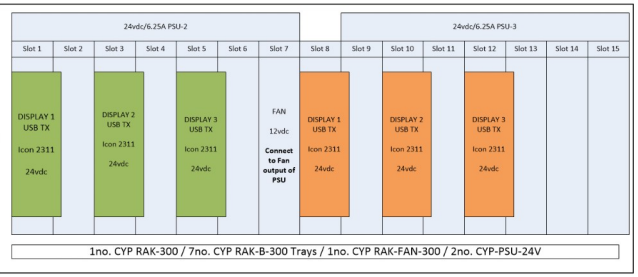
Colour Key	ROOM 1	ROOM 2

1	Network Patch	
2	Cable Management – Brush Strip	
3		
1	Gude 8221 PDU-1	
2	Gude 8221 PDU-2	
3	Aurora RXC-1	Aurora RXC-1
4	Adderview XDIP	Adderview XDIP
5	PC 1	PC 2
6		
7	Vent Panel	
8	Adderview XDIP	Adderview XDIP
9	PC 3	PC 4
10		
11	CYP RAK-600	
12		
13		
14		
15		
16		
17	CYP RAK-300	
18		
19		
20	1U sliding tray	
21	T1V HLI - 1	
22		
23		
24	T1V ThinkHub - 1	
25		
26		
27		
28		
29	T1V HLI - 2	
30		
31		
32	T1V ThinkHub - 2	
33		
34		
35		
36		
37	Vent Panel	
38	Sennheiser Radio Microphone Receivers	
39	Vent Panel	
40	Ampetronics C10-2D Loop Driver	
41	Ampetronics C10-2D Loop Driver	
42	Vent Panel	
43	Crown XLS1502 Amplifier	
44		
45	Crown XLS1502 Amplifier	
46		

Customer Supplied to be fitted on site

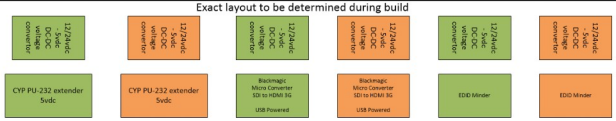
1no. CYP RAK-600 / 7no. CYP RAK-B-Trays / 1no. CYP RAK-FAN-600 / 1no. CYP-RAK-PSU-12V



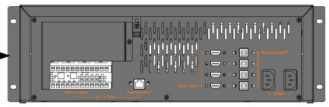


1no. CYP RAK-300 / 7no. CYP RAK-B-300 Trays / 1no. CYP RAK-FAN-300 / 2no. CYP-PSU-24V

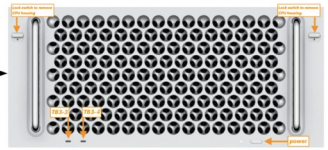
Exact layout to be determined during build



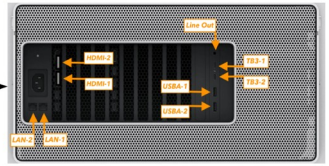
T1V HLI – rear view



T1V ThinkHub – Front view



T1V ThinkHub – Rear view

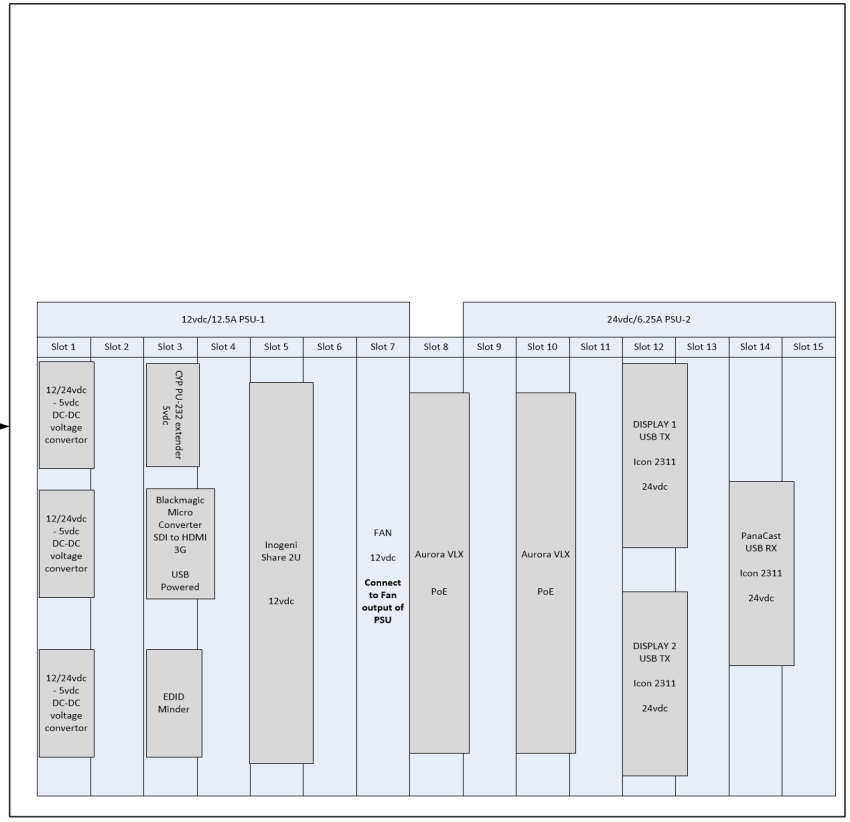


8.2.1 Rack 1 Sub Frames

Note the 2no. CYP RS232 extenders have been moved from the tray to the last position in the 3U frame

8.3 Rack 2 layout

1	GUDE 8221 PDU	
2	Network Patch	
3	Cable Management – Brush Strip	
4	Aurora RXC-1	Blank
5	Adderview XDIP	Adderview XDIP
6	PC 1	PC 2
7		
8	Vent	
9	CYP RAK-600	
10		
11		
12		
13		
14		
15	T1V HLI	
16		
17		
18	T1V ThinkHub	
19		
20		
21		
22		
23	Vent	
24	QSC QSYS Core 510i	
25		
26	Vent	
27	Ampetronics C10-2D Loop Driver	
28	Crown XLS1002 Amplifier	
29		

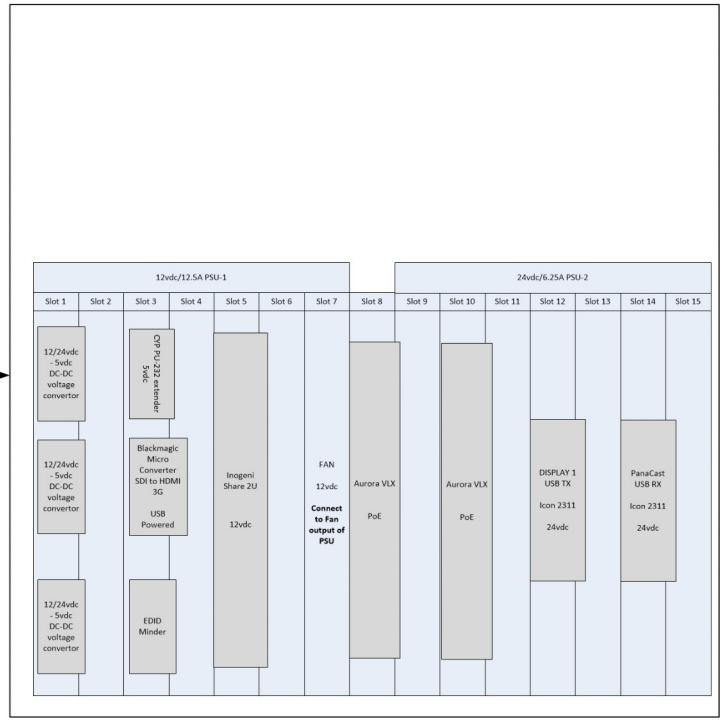


8.3.1 Rack 2 Sub Frame

Note the EDID minder has been moved from slot 3 to slot 7 and all three USB extenders are in slot 14

8.4 Rack 3 layout

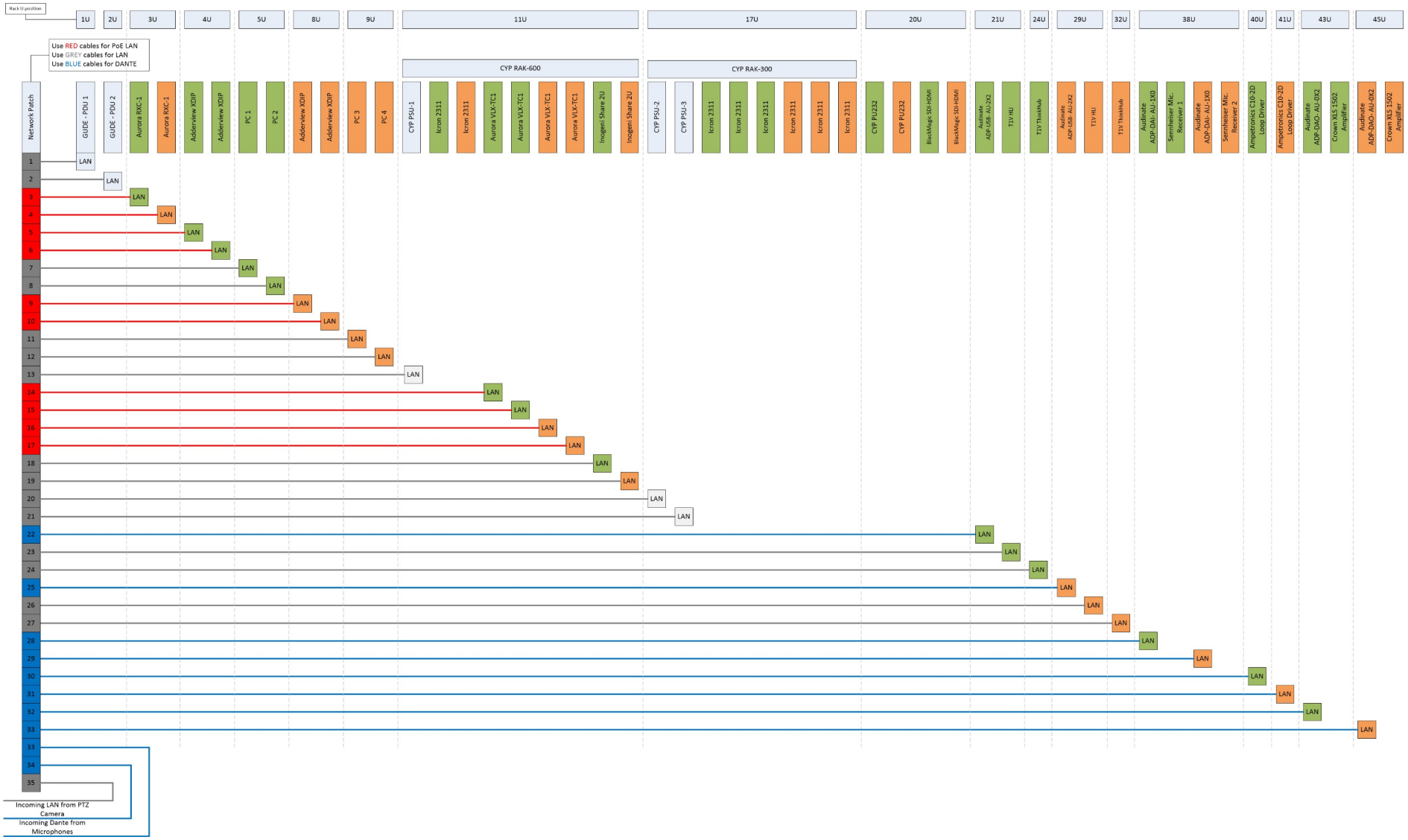
1	GUDE 8221 PDU	
2	Loudspeaker power and termination box	
3		
4		
5		
6		
7	QSC QSYS Core 110i	
8	Vent	
9	Aurora RXC-1	Blank
10	Adderview XDIP	Adderview XDIP
11	PC 1	PC 1
12		
13	Vent	
14	CYP RAK-600	
15		
16		
17		
18		
19		
20	T1V MS Server	
21		
22	Vent	
23	T1V HLI	
24		
25		
26	T1V ThinkHub	
27		
28		
29		
30		
31	BT Network Switch	
32	Network Patch	
33	Cable Management – Brush Strip	
34	Network Patch	
35	Cable Management – Brush Strip	
36	Network Patch	
37	Cable Management – Brush Strip	
38	Vent	
39	Ampetronics C10-2D Loop Driver	
40	Crown XLS1502 Amplifier	
41		
42		
43		



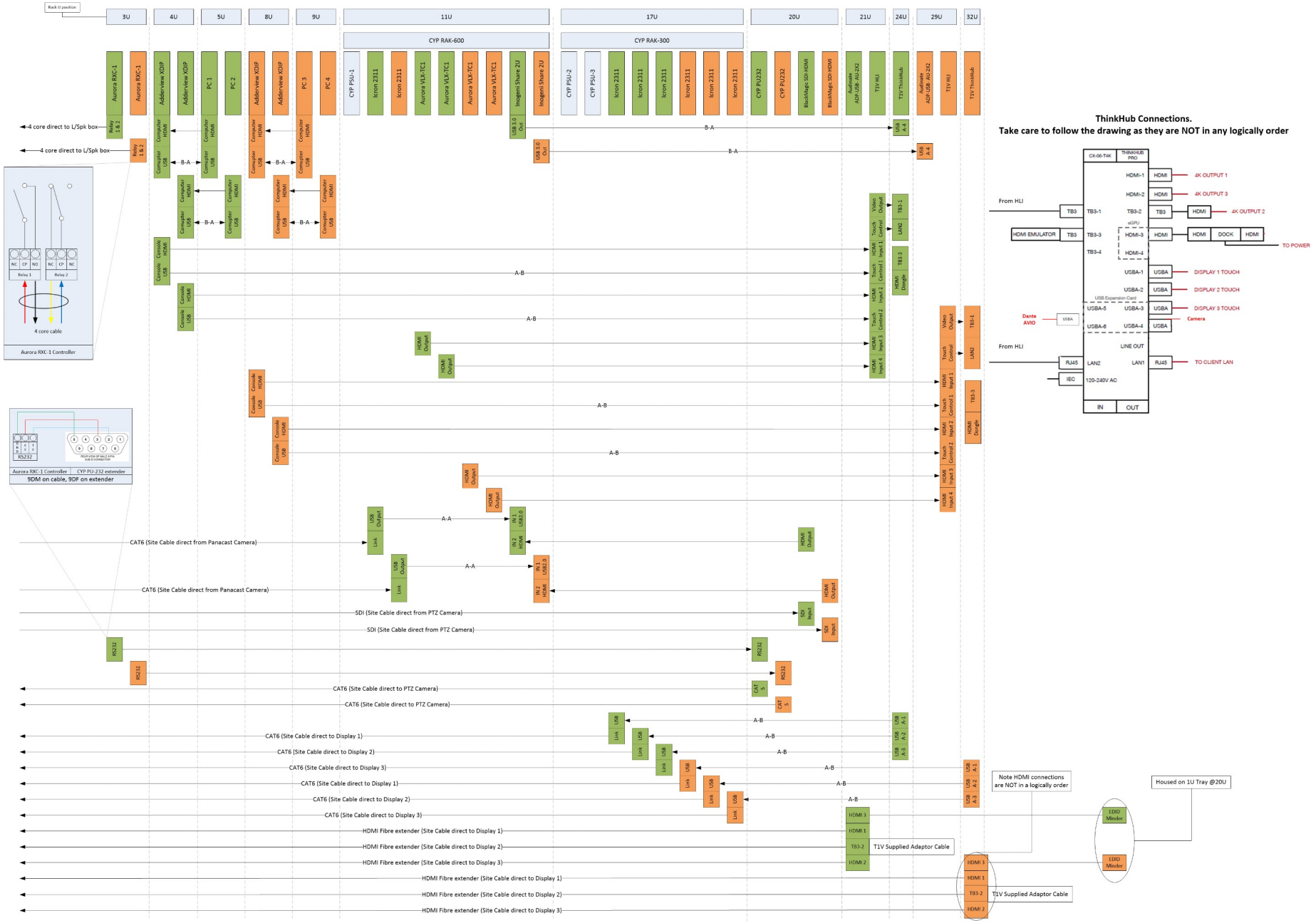
8.3.1 Rack 3 Sub Frame

Note the EDID minder has been moved from slot 3 to slot 7 and all three USB extenders are in slot 14

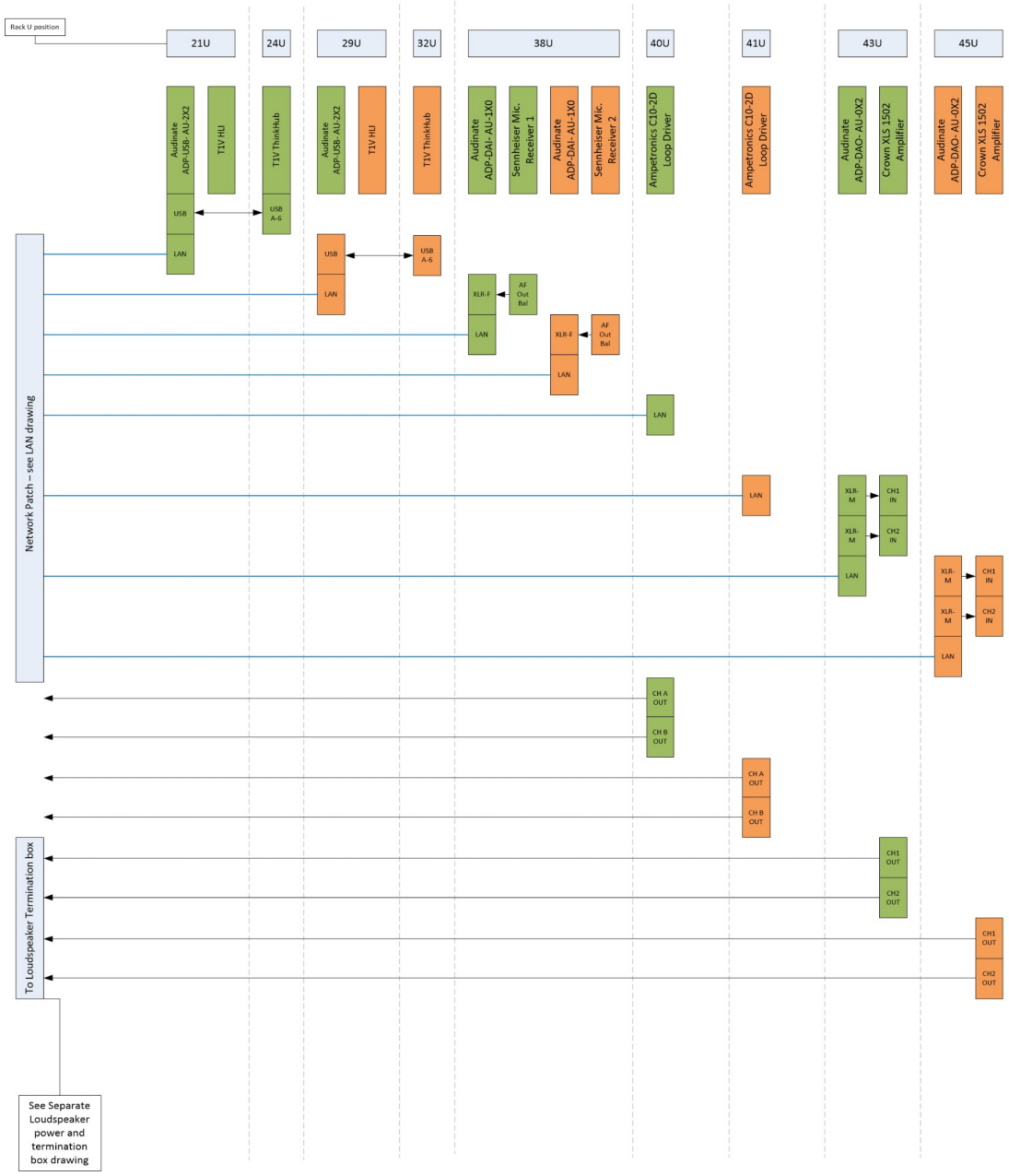
8.5 Rack 1 LAN wiring

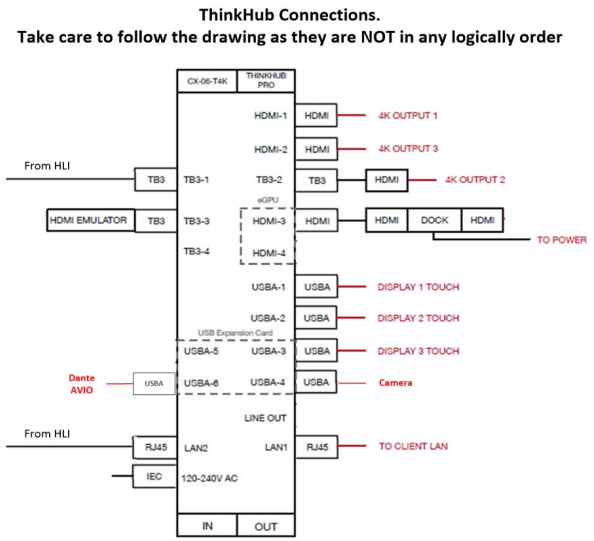


8.5 Rack 1 Video and control wiring

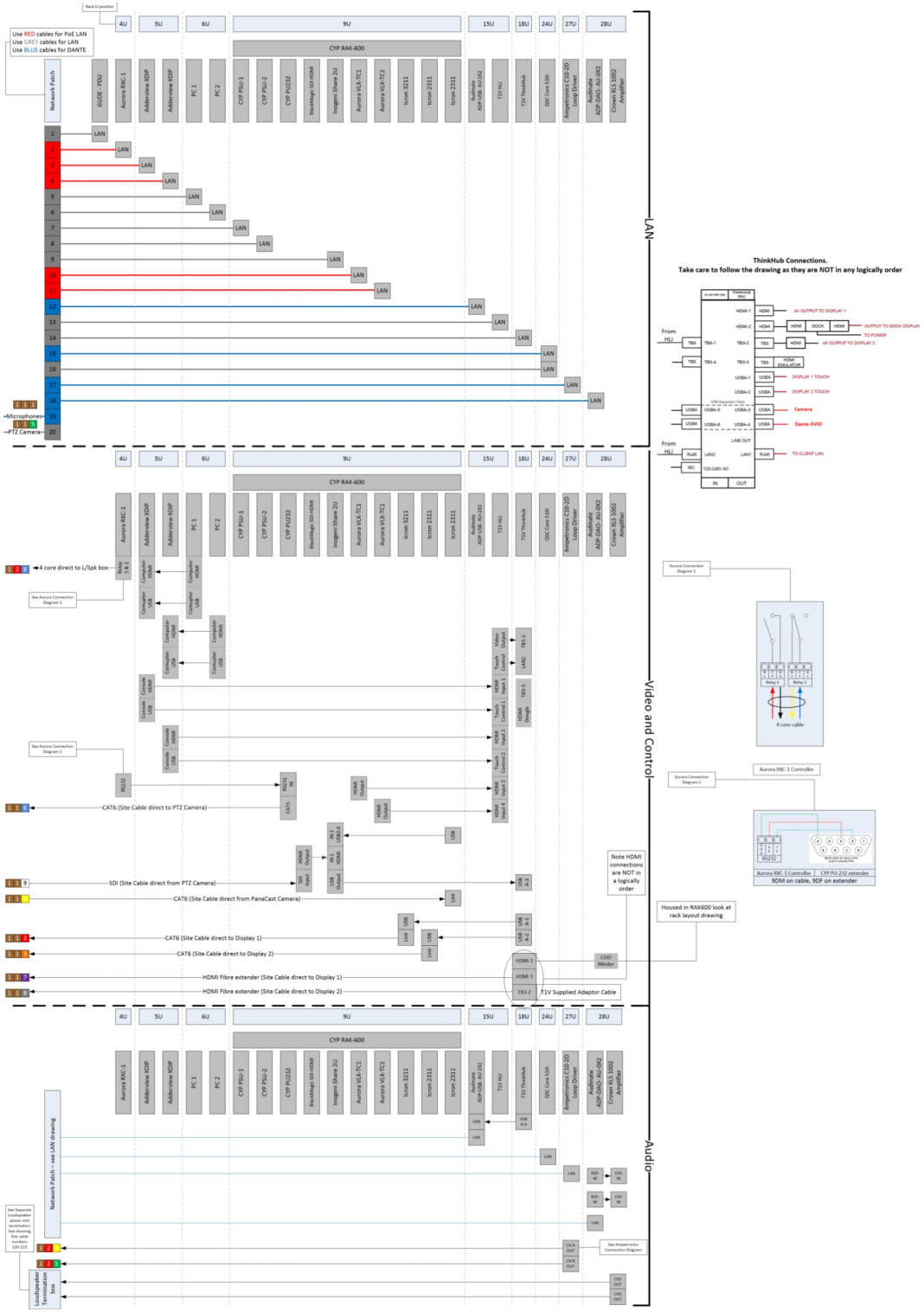


8.6 Rack 1 audio wiring

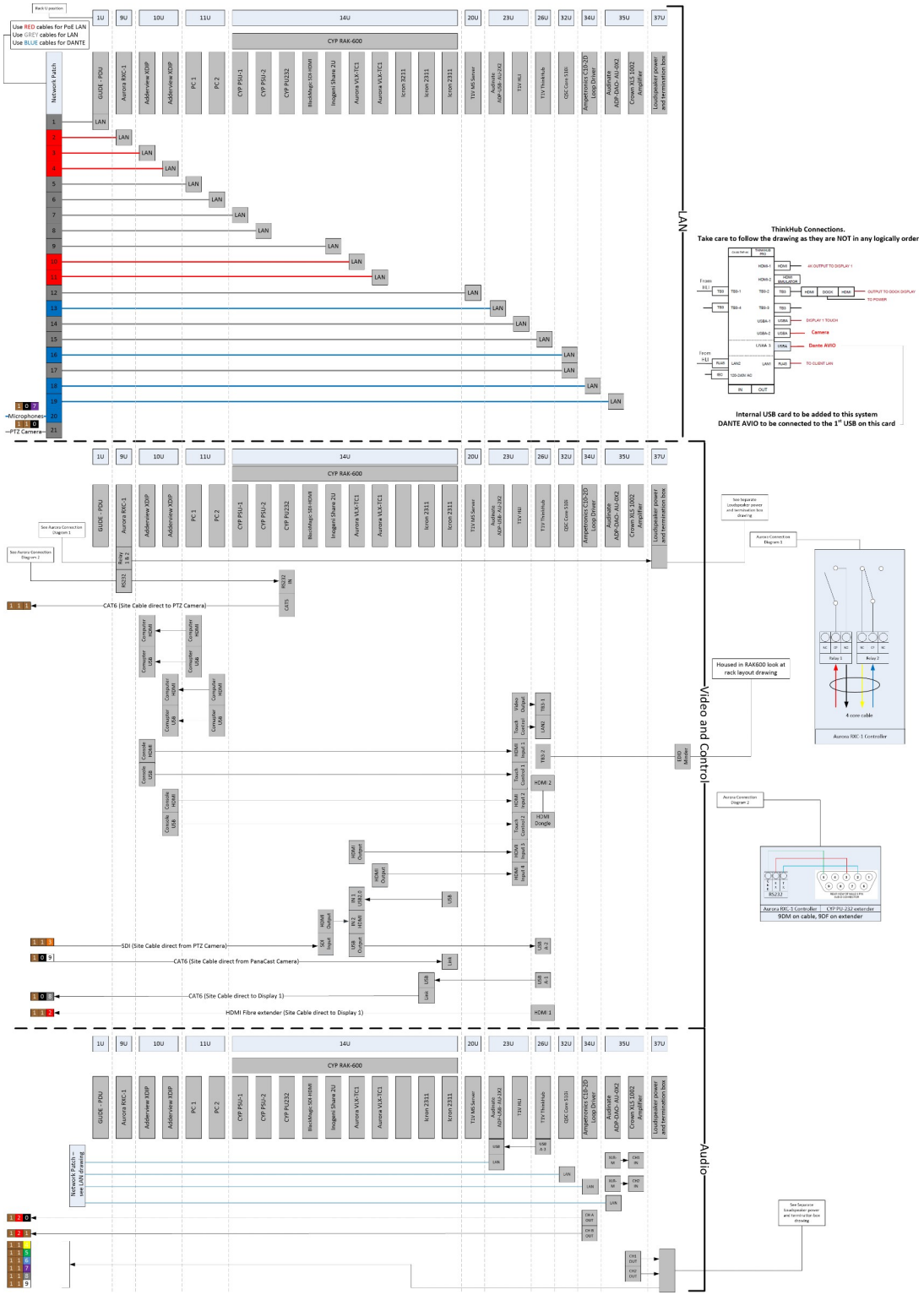




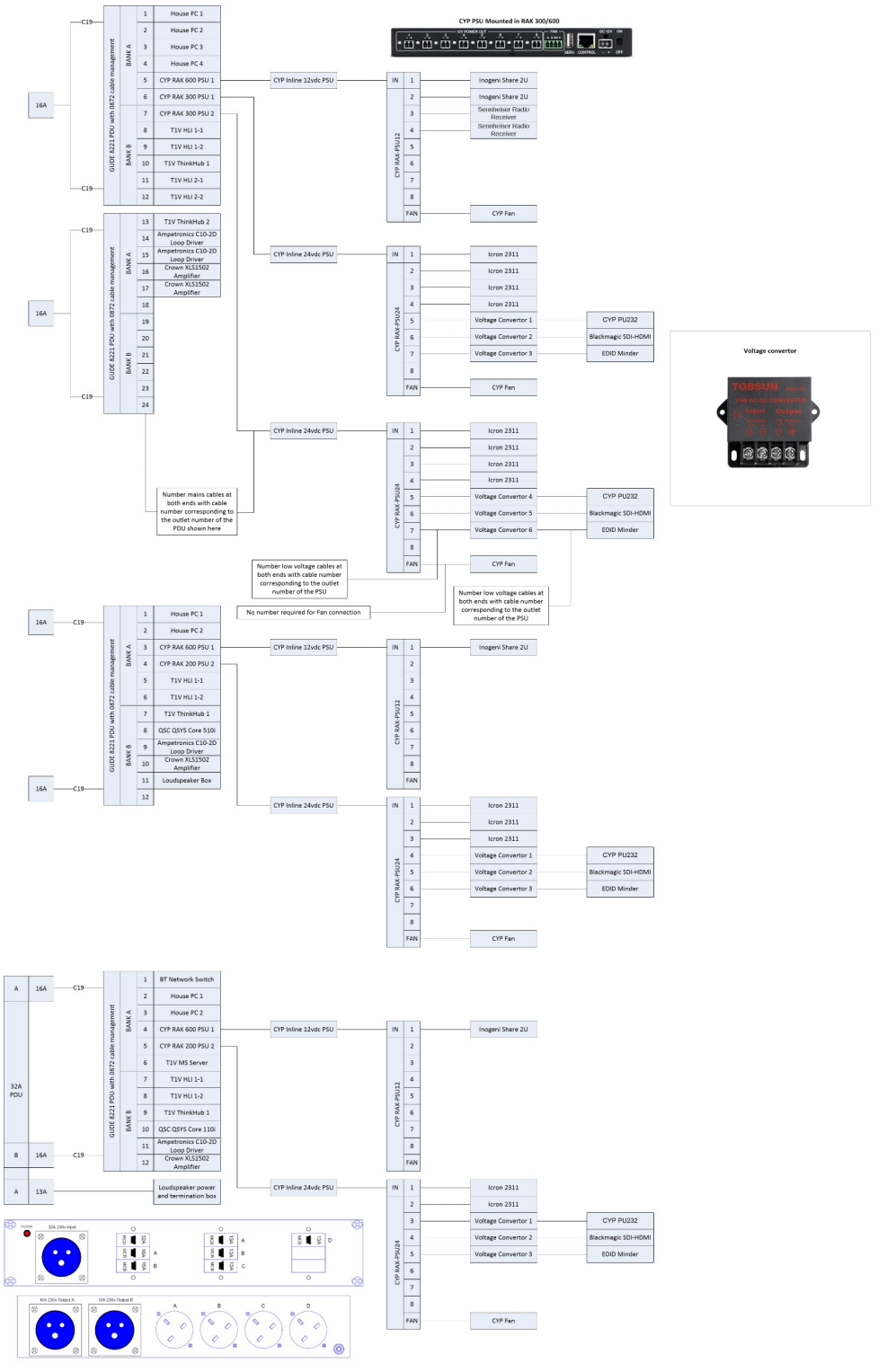
8.7 Rack 2 wiring



8.8 Rack 3 wiring



8.9 Rack power distribution



8.10 Rack power distribution as built amendments

Rack 1 – Room 1 - 24v PSU – EDID Minder connected to output 8 not 7 (7 is empty)

Rack 1 – Rooms 1&2- 12v PSU – Output 5 drives rack fan (always on)

Rack 1 – 2nd Gude Mains PDU:

Channel 18 - Room 1 Cam POE

Channel 19 – Room 2 Cam POE

Channel 20 – Supplying permanent power to spare cable loomed into rack and marked as 18

Rack 2 – Room 3 – 24v PSU Outputs:

1: Empty

2: Touch 1

3: Touch 2

4: Webcam USB

5: PTZ Serial

6: SDI/HDMI

7: EDID

8: Empty

Rack 3 – Room 4 – 12v PSU Outputs:

1: Inogeni

2: Rack fans

Rack 3 – Room 4 – 24v PSU Outputs:

1: Webcam USB

2: Touch

3: PTZ Serial

4: SDI/HDMI

5: EDID Minder

Encore Serial Port Allocation (racks 1, 2 & 3):

CYP 12v – Port 6

CYP 24v – Port 5

CVP 24v (Rack 1 – Room 2) – Port 4 (room 2 24v CYP is driven from room 1 PC)

Appendix 9 – JVC PTZ camera

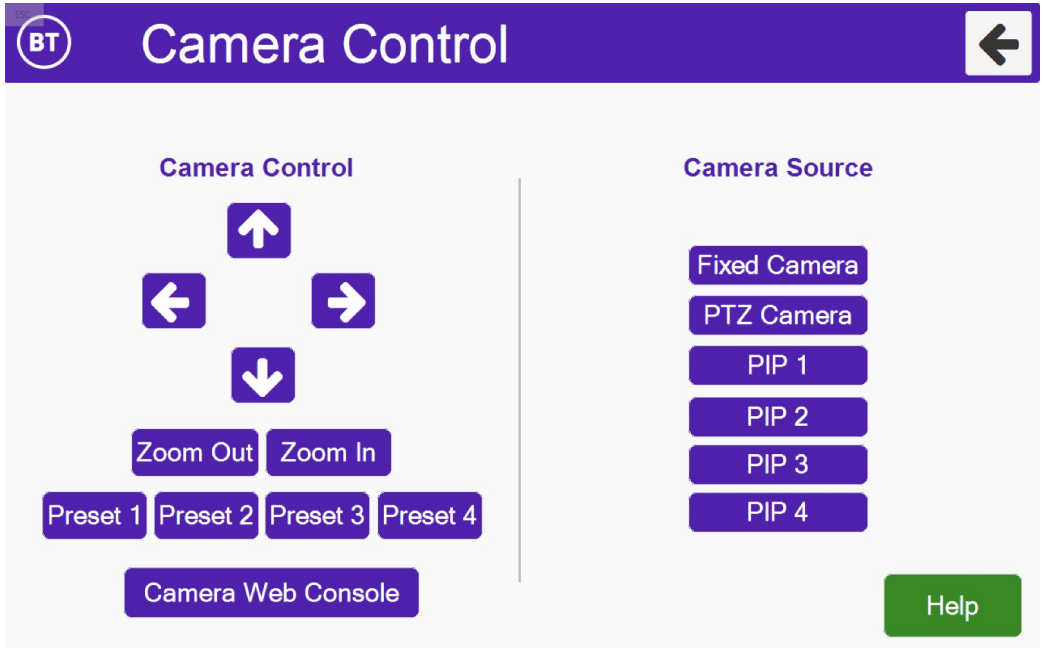
9.1 Service notes

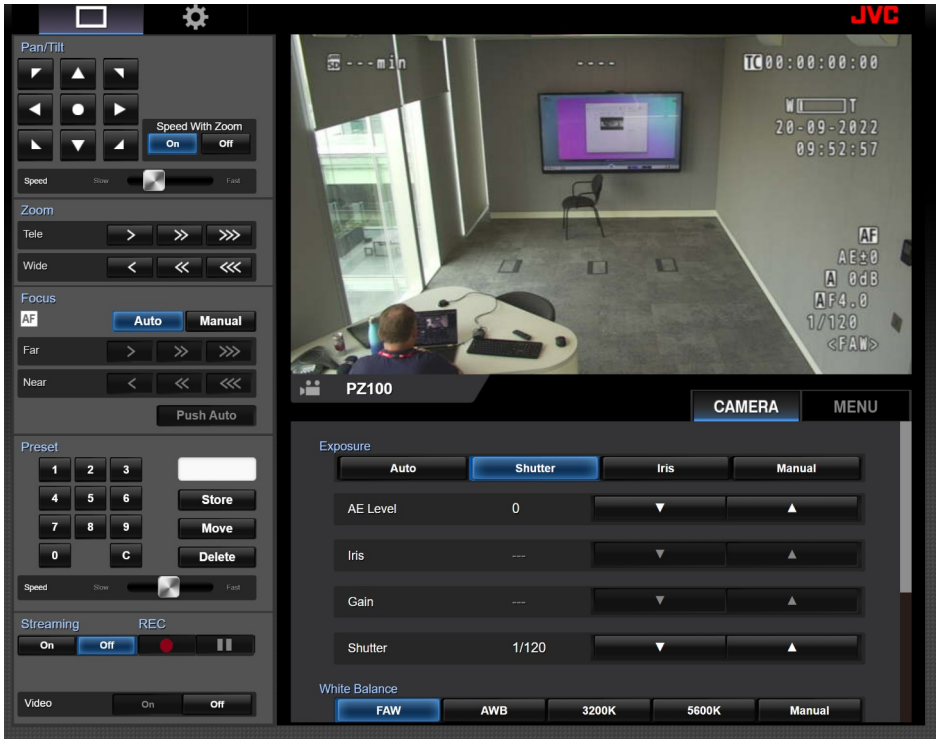
Should the JVC cameras be removed, replaced, lose their setting or new presets stored then the following items need to be configured.

Item	Comments
Shutter Speed	To be set to 1/12 to avoid screen flicker, this needs to be set and stored with presets.
Frame Rate	To be set to 1080/25p
Camera ID	DIP switches to be set for ID 1
RS232 control	To be set on DIP switches for 9600
Aurora control	Should the Aurora controller ever be swapped out the RS232 port will need to be set to 9600, this can be done via the Aurora web portal see Appendix 12

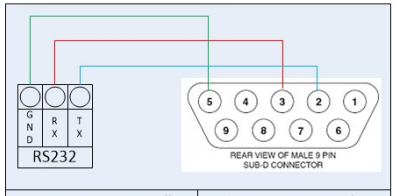
9.2 JVC PTZ camera control portal

The camera control portal can be opened via the Camera control page on the Support portal, click on the Cameras Web Console to open the JVC control portal were you can change the camera preset that are selected on the ThinkHub





9.3 Connectivity

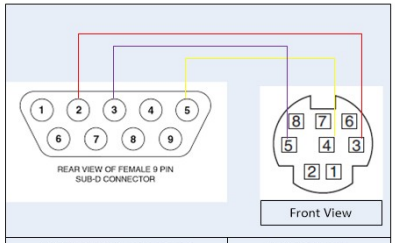


Aurora RXC-1 Controller	CYP PU-232 extender
9DM on cable, 9DF on extender	

9 D Type Pin Out	
PIN	SIGNAL
1	DCD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

8pin mini DIN Pin Out

RS-232C IN	
Pin Number	Signal Name
1	DTR_IN
2	DSR_IN
3	TXD_IN
4	GND
5	RXD_IN
6	GND
7	IR_OUT
8	IR_OUT

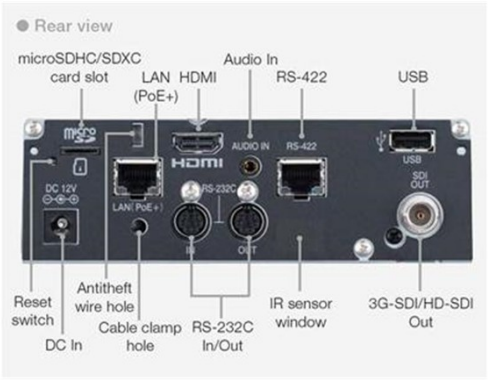


CYP PU-232 extender	JVC Camera
9DM on extender, 9DF on cable	
Use CPC premade 8pin mini DIN to bare end cable	

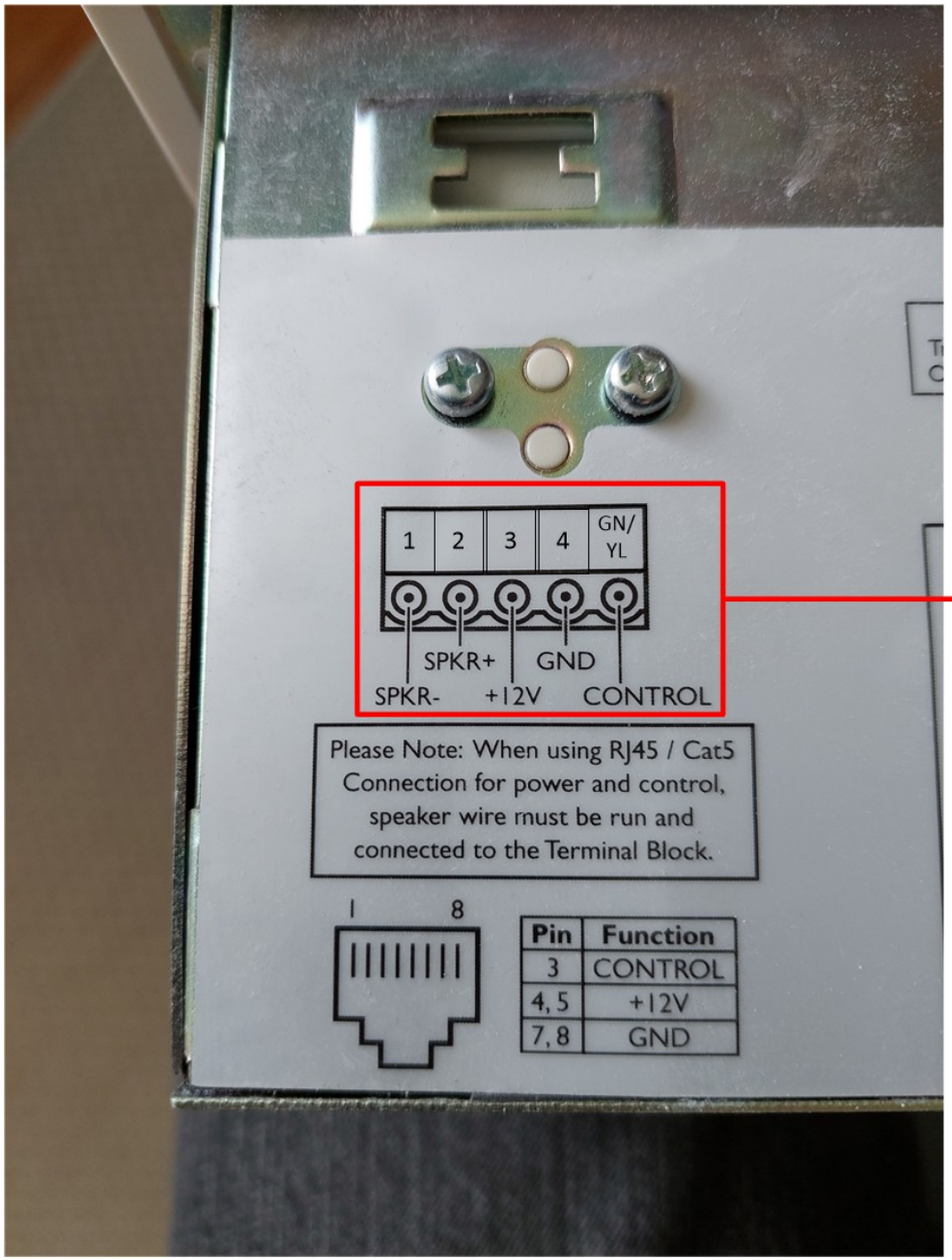
CPC colour code for 8pin mini DIN

Pin	Colour
1	Black
2	White
3	Red
4	Yellow
5	Violet
6	Blue
7	Green
8	Brown

Check that this colour pin out is still correct. CPC changes suppliers and sometime the colours are changed



Appendix 10 – Loudspeaker termination

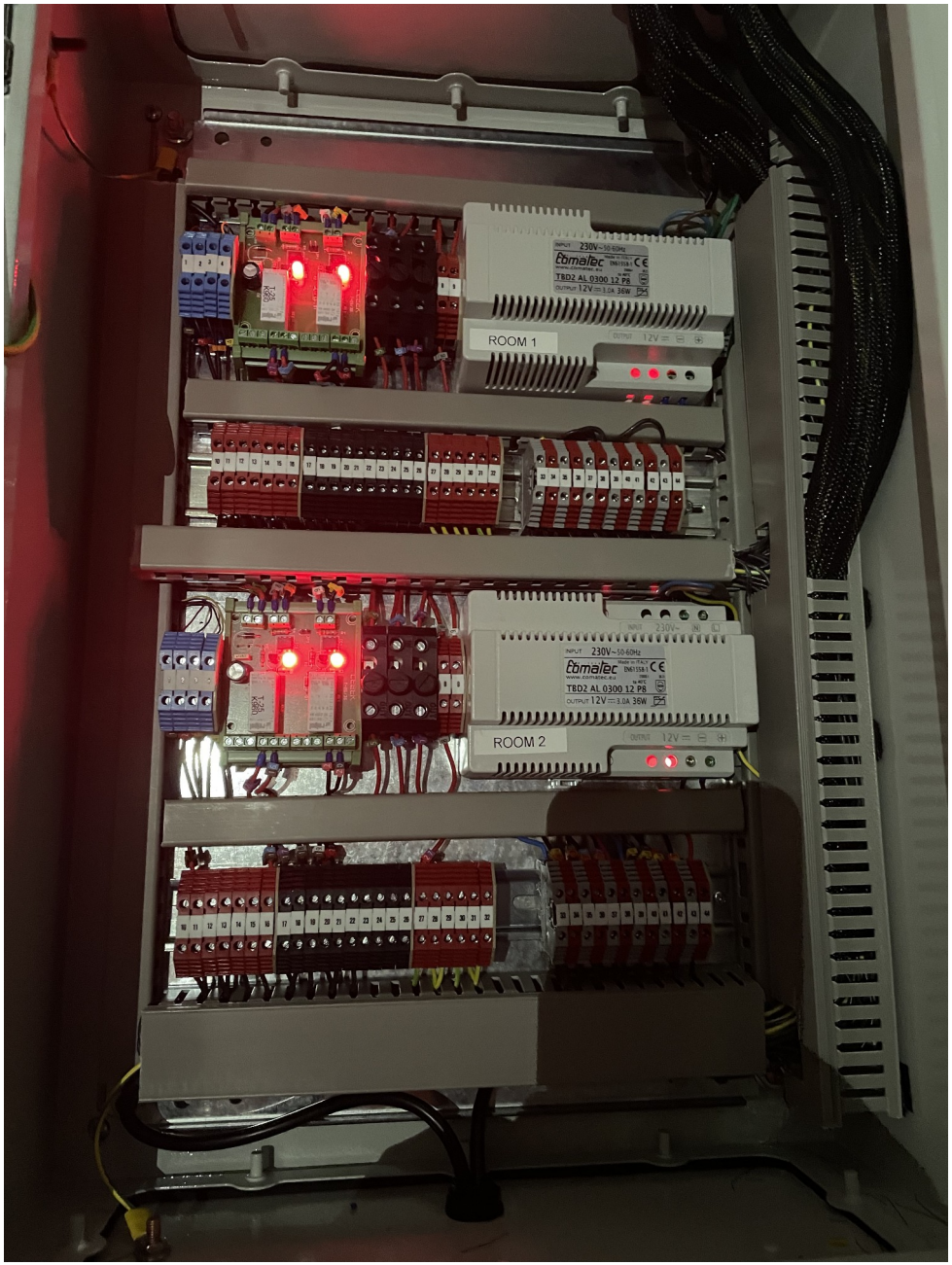


The loudspeakers have been connected with 5 core YY cable. The cores of the YY cable are identified 1-4 + GN/YL and are terminated as follows at the KEF loudspeakers.
On L17 there are 2no. Cornered Audio Loudspeakers which are connected using just core 1 and 2 of the YY cable.

Appendix 11– Loudspeaker termination and motor power control

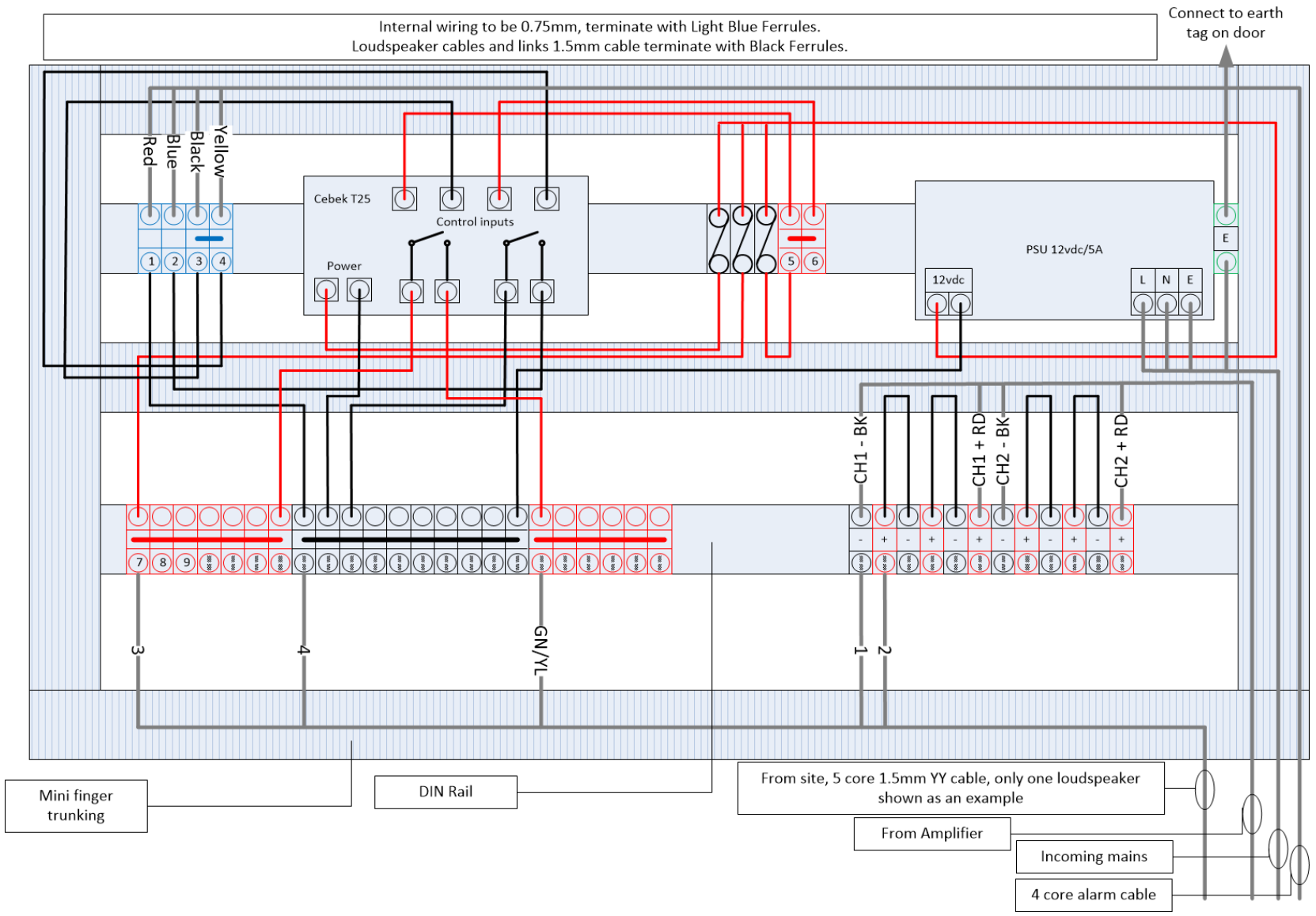
For Zephyr and Notus the loudspeaker motor control is combined into one enclosure but are completely separate and powered via two separate 13A sockets located below the enclosure. BOTH should be isolated before working inside this enclosure. See section 8.1.1

This enclosure is located on the rear wall of rack room 1 located between Zephyr and Notus.



For Eurus, the loudspeaker motor control box is located on the rear wall of rack cupboard 2 to the right hand side of of the equipment rack. Power is supplied via a 13A socket located below the enclosure.

For Luna, the loudspeaker motor control box is located at the top of rack 3, power is via a 13A socket on the rear of the racks PDU located at the bottom of the rack


Internal wiring to be 0.75mm, terminate with Light Blue Ferrules.
Loudspeaker cables and links 1.5mm cable terminate with Black Ferrules.
Connect to earth tag on door
Red
Blue
Black
Yellow
Cebek T25
Control inputs
Power
PSU 12vdc/5A
12vdc
L
N
E
CH1 - BK
CH1 + RD
CH2 - BK
CH2 + RD
3
4
GN/YL
1
2
Mini finger trunking
DIN Rail
From site, 5 core 1.5mm YY cable, only one loudspeaker shown as an example
From Amplifier
Incoming mains
4 core alarm cable

Appendix 11.1 – Loudspeaker motor control fuse ratings

Left to right on above drawing

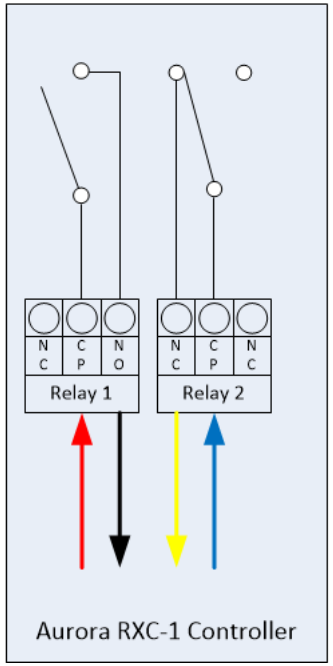
1. 500mA supply for Cebek T25 relay module power
2. 3A supply for loudspeaker motors
3. 500mA supply for Cebek T25 relay module trigger inputs

Spare fuses have been taped to the inside of the enclosure doors

In case of motor failure the loudspeakers will work normally in the closed position.

Appendix 11.2 – Control system for loudspeaker motor control

Aurora RXC-1 Controller in AV Rack



There is a self latching circuit, relay 1 in the Aurora operates the relay in the loudspeaker PSU box to operate the motorised loudspeakers. The loop through relay 2 in the Aurora holds the circuit closed until relay 2 opened to close the motorised loudspeakers.

Appendix 11.3 – Loudspeaker serial/parallel connections

The loudspeakers are connected in series and terminated in the loudspeaker control box.

Appendix 12 – Aurora control system

The Aurora setup web portal for each systems is available at the following address's

Room	Portal address
Zephyr	http://10.100.15.18/setup
Notus	http://10.100.15.41/setup
Eurus	http://10.100.15.62/setup
Aura	http://10.100.15.78/setup
User Name	admin
Password	admin

If an Aurora has been swapped out or a factory reset carried then the default web portal address is 192.168.1.100/setup.

User Name and Password shown in table above.

After a replacement or factory rest the control code will need to be uploaded, this can be found on Zephyr House PC1 (rack1) under the Quatreus desktop folder.

Appendix 13– KVM hot keys

There is a KVM located in each room on the 1st floor they are in the credenza and on the 4th floor behind the display.

Additionally there is a KVM in the lecterns in Zephyr and Notus.

The KVM provides keyboard access to the House PC's in each room and the Lectern PC in Zephyr and Notus

- the KVM has two USB dongles attached
- **DO NOT REMOVE or MOVE either USB dongles**
- the first USB dongle for the wireless keyboard and are specific to each room.
- the second USB is a dummy HDMI Monitor and is essential for the KVM to work.

There are keyboard shortcuts to access each of the PC

- CTRL + ALT + 1 for House PC 1
- CTRL + ALT + 2 for House PC 2
- CTRL + ALT + 3 for Lectern PC (Zephyr and Notus only)

Appendix 14 - How to create URL bookmarks for the media tray

Links to web addresses can be displayed in ThinkHub using a specially formatted file.

The file will appear in the media tray, tap or drag the icon onto the canvas where it will open a new web browser that will display the given web address.

The format for this kind of link is JSON, but you can use any text editor to easily create this file.

First, start any text editor on your computer.

To create a link to a web address like https://t1v.com, just enter the line:

{"url" : "https://www.t1v.com"}

and save the file with a name and the extension .weburl.

Note that you must save the file in text format, make sure that the text editor doesn't add a .txt extension to the file name.

For those using Apple's text editor, you need to select the menu item Format->"Make Plain Text" in order to convert the file to text format.

Place this file into the default ThinkHub media path, and it will show up in the media tray.

Note: the path must be a full path example: /Users/t1user/Desktop/folder/folder

Thumbnails:

ThinkHub will try to automatically download a snapshot of the web page to show as a thumbnail image.

If you would like to show a different thumbnail image, or in cases where ThinkHub cannot download a snapshot, add a "thumbnailImageName" entry to the JSON file:

{"url": "http://www.t1visions.com", "thumbnailImageName" : "/Local/Pictures/myimage.png"}