



**CURTIN UNIVERSITY
PROJECT DELIVERY GUIDELINES**

**AUDIOVISUAL GUIDELINES
PART 3 – INTERFACE AND
PROGRAMMING STANDARDS
000315**



Curtin University

TEACHING, LEARNING AND MEETING SPACES

ABSTRACT

The purpose of this document is to clearly define the audiovisual system user interface and programming standards for teaching, learning and meeting spaces at Curtin University.

Details of revisions			
Level	Details	Date	Initial
1	<i>Original document created from Audio Visual Standards Part 3 - Interface and Programming Standards (v0.6)</i>	<i>Nov-16</i>	<i>RPS</i>
2	<i>Incorporated updates from the Global Code 2.x project</i>	<i>Mar-18</i>	<i>IRC</i>
3	<i>Incorporated updates from the Global Code 3.x project</i>	<i>May-19</i>	<i>IRC</i>
3	<i>Inclusion of wording to allow departures from the existing guideline</i>	<i>Nov-19</i>	<i>RPS</i>

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Audiovisual Standards Part 3 - Interface and Programming Standards

Audiovisual Standards

Part 1: Room and System Standards

Part 2: Technical Design Standards

Part 3: Interface and Programming

Part 4: Detailed Design Specifications

Part 5: Project Processes

Part 6: Guidelines for Design and Build

Part 7: Design Calculators, Tools and Resources

1 INTRODUCTION

1.1 DOCUMENT BRIEF

This Project Delivery Guidelines document defines a standard user interface together with standardised programming for the four types of Curtin AV systems.

There will be a single standardised code base for systems with AMX keypad controller (Type 1) and AMX touch panels and controllers (Type2, Type 3 and Type 4) programmed with the AMX Netlinx application.

Section 2 describes Curtin expectations for the quality of work by AV contractors, warranty and intellectual property.

Section 3 describes the user interface for AV systems that will allow a common user experience – the same look, feel and operation of audiovisual and IT equipment – across rooms on all of the University’s campuses.

Section 4 describes the functional requirements for the standardised control system code where variation in functionality between system types and room options is configured using a central management service. The requirements for remote monitoring are also described.

The Project Delivery Guidelines have been prepared in consultation with Curtin University subject matter experts and stakeholders. It is recognised that the subject matter of Guidelines will not always be suitable for all project elements and departures from the Guidelines may be required or desirable. Departures from Guidelines must be agreed upon in consultation with the relevant University Guideline subject matter expert. Departures must be recorded in a project register and recorded and reviewed in the Project Control Group meeting minutes under its own meeting agenda item “Project Delivery Guideline Departures”. Where the University subject matter expert identifies that a departure adds ongoing value to the University, the subject matter expert will update the relevant Guideline.

The definitions that apply to this document are listed in the Glossary of Terms in Appendix A.

1.2 DOCUMENT ACCESS

All Curtin IT Services staff and contracted personnel are provided access to this document.

Designers, installers and contractors must ensure they have the most current version of all standards prior to engaging in any work.

The most recent version of this document can be found on the web at:
<https://properties.curtin.edu.au/workingwithus/>.

1.3 RELATED DOCUMENTS

This document is closely related to AV Standards Part 4 – Detailed Design Specifications, which describes the four types of Curtin standard AV systems.

1.4 ROLES AND RESPONSIBILITIES

Table 1: Roles and Responsibilities

Role	Responsibility
AV Standards Manager	Owner of this document. Maintains currency and approvals through document control and versioning.
AV Operations Manager	Ensures that the functional requirements described in this document meet the needs of all classrooms and meeting spaces at Curtin.
AV Project Staff	Use and recommend improvements to AV system code and configuration files described in this document.
AV Consultant	Designs all possible Curtin venues based on the interface and standardised code described herein.
Integrator or Programmer	Uses the user interface descriptions and functional requirements to develop and/or modify the standardised code for Curtin's AV systems. Any forms of customisation must be approved by the University in writing.

2 EXPECTATION

2.1 WORK

AV Integrators must carry out all work to a high standard in a professional manner using competent and experienced personnel who shall be properly certified and supervised. All work must comply with Australian standards, University standards and industry best practices for AV and ICT.

An AMX programming certification (ACE-P) is required for any programmer producing code for Curtin AV systems.

2.2 WARRANTY

Programming code will not be accepted by the University unless:

- it is fully warranted for commercial use in Australia
- it is well supported in Australia with technical support for maintenance during the defects and liability period and future maintenance requirement i.e. equipment upgrades. Future maintenance works will be conducted at market rates.

All programming shall be warranted for a period of at least 12 months from the date of practical completion unless otherwise specified.

2.3 INTELLECTUAL PROPERTY

All programming source codes, including GUI files, will be the property of Curtin University, and must be provided to the University at practical completion. The University must be advised of any changes made to code as part of fault rectification or remedial works. A revised copy of the code must be included as part of this advice.

3 INTERFACE

All Curtin University push button and touch panel interfaces shall conform to the descriptions contained in this section. Any changes to the button layouts, graphical user interface (GUI) or other forms of customisation must be approved by the University in writing.

3.1 PUSH-BUTTON INTERFACE

The standard push-button (or keypad) interface shall have a layout conforming to **Figure 1**. The functionality of each button is described in **Table 2**.



Figure 1: Push Button Layout

Table 2: Push-button Functionality

Button	Function	Notes
POWER ON	Turn system on	<ul style="list-style-type: none"> • Wake up or power all relevant devices • Button illuminated when system is ON • (System with projector) Button illumination is to flash until projector has warmed up
POWER OFF	Turn system off	<ul style="list-style-type: none"> • Turn off all relevant devices • Button illuminated when system is OFF • (System with projector) Button illumination is to flash until projector has cooled down
PC	Select PC video as source for display device	<ul style="list-style-type: none"> • Audio is embedded in HDMI signal from PC • Button illuminated while PC is selected as source
HDMI	Select laptop/HDMI video as source for display device	<ul style="list-style-type: none"> • Audio is embedded in HDMI signal from source • Button illuminated while HDMI is selected as source
WIRELESS	Select wireless gateway video as source for display device	<ul style="list-style-type: none"> • Audio is embedded in HDMI signal from wireless gateway • Button illuminated while WIRELESS is selected as source
DOC CAM (if fitted, otherwise alternative or blank)	Select the document camera (or other device) as source for display device	<ul style="list-style-type: none"> • Button illuminated while DOC CAM is selected as source
DVD (if fitted, otherwise alternative or blank)	Select the DVD media player (or other device) as source for display device	<ul style="list-style-type: none"> • Audio is embedded in HDMI signal from media player • Button illuminated while DVD is selected as source
PICTURE BLANK	Set the display device to show a black image	<ul style="list-style-type: none"> • Button illumination is to flash until another source is selected
VOL KNOB - ROTATE	Decrease/increase system audio level	<ul style="list-style-type: none"> • Decrease/increase audio in equal increments for each LED level
VOL KNOB - PUSH	Mute system audio (toggle)	<ul style="list-style-type: none"> • Audio is muted/unmuted using knob as a toggle

3.2 TOUCH PANEL INTERFACE

The standard Curtin graphical user interface for touch panels includes the general layout, buttons, graphics, animations and backgrounds described in this section. The figures in this section typically show the layout for a 10" touch panel with notes about the 7" layout where appropriate.

3.2.1 HOME SCREEN

The home screen is displayed when the venue AV system is powered down as shown in

Figure 2.

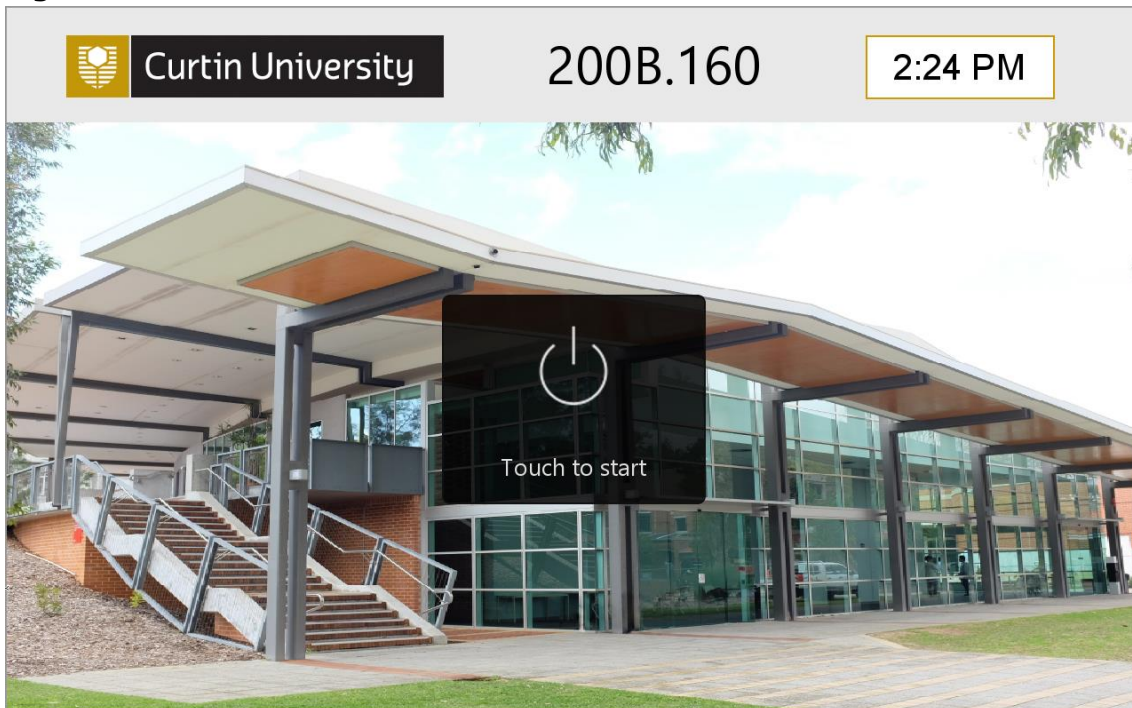


Figure 2: Home Screen

3.2.2 WARM-UP AND COOL-DOWN SCREENS

The warm-up and cool-down screens are shown when the venue AV system is powering up or powering down respectively (**Figure 3**).

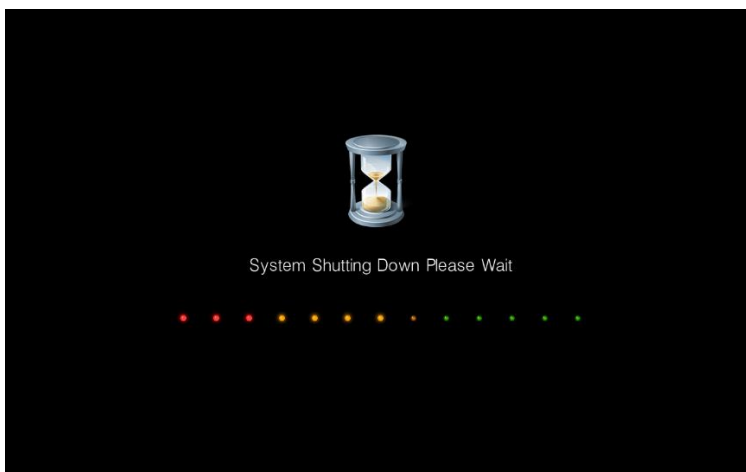
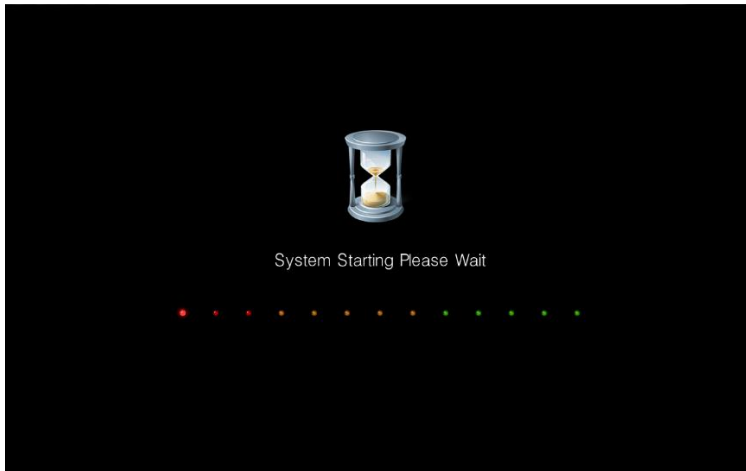


Figure 3: Warm-up and Cool-down Delay Timer Screens

3.2.3 QUICK SETUP

There are a number of common venue configurations on the [Quick Setup](#) pop-up window, with a sample shown in **Figure 4**. The user can quickly configure the venue to a known state for mode of operation by clicking on a button. Some room types will include slider controls for room joining and other alternative display options.

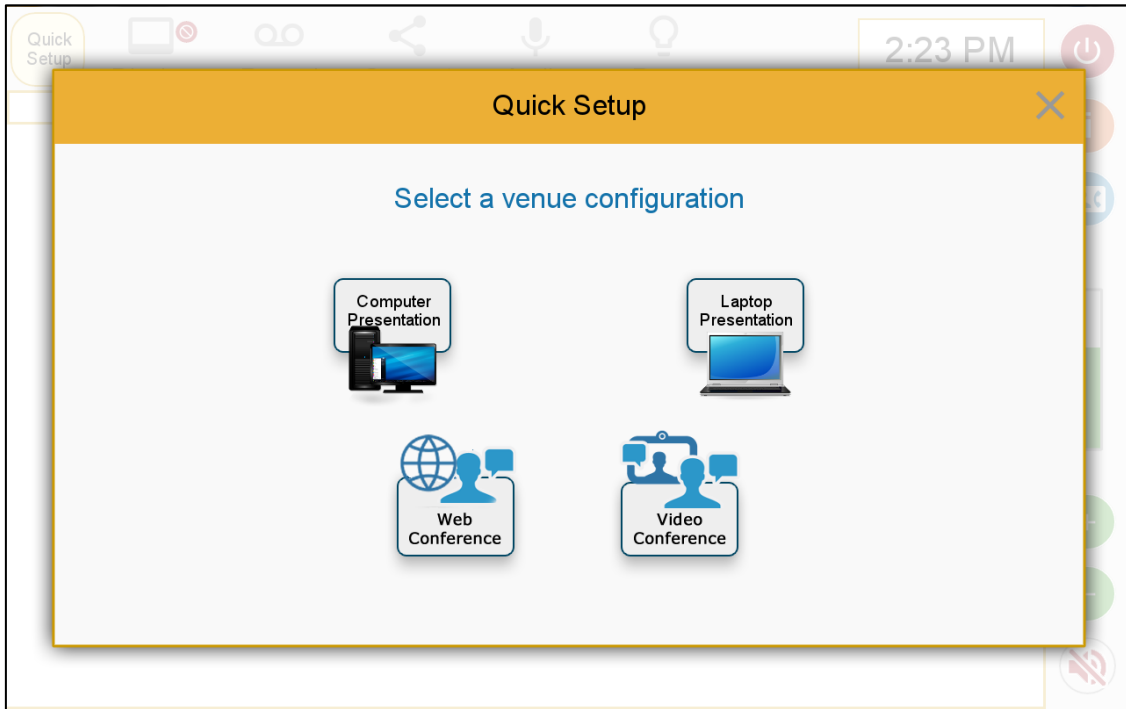


Figure 4: Quick Setup Pop-up Window

3.2.4 DISPLAY TAB

The Display tab provides the status and controls for the source inputs that are available to show on the venue's displays.

3.2.4.1 Single Source Venues

The Display tab for venues that are able show only a single source at a time is shown in **Figure 5**. A source button (e.g. Computer) is pressed to cause that source to appear on the single (called 'primary') display. In some venues this may be a mirrored display group. The number of available sources is configurable per venue, with the source buttons wrapping to a second line if necessary.

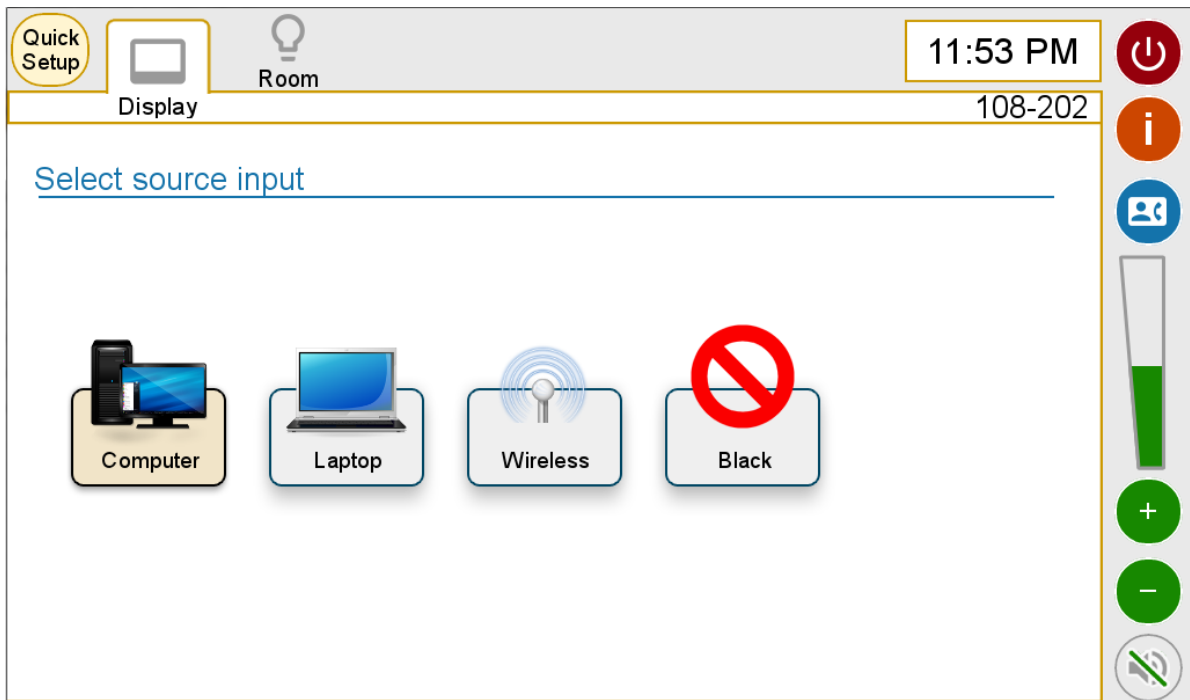


Figure 5: Display Tab for Venues with Primary Display Group Only

3.2.4.2 Dual or Multiple Source Venues

The Display tab for venues that are able to show two different sources at a time is shown in **Figure 6**. The display group should be selected before the source button. If the Primary option is highlighted then the selected source will appear on the screens of the 'primary' display group (e.g. Computer). Similarly, if the Secondary option is selected then that source will appear on the screens of the 'secondary' display group (e.g. Laptop). If the All Displays option is selected then that source will display on all screens.

The numbered blue jewels indicate which source is being displayed on the primary and secondary display groups. The number of available sources is configurable per venue, with the source buttons wrapping to a second line if necessary. The Primary icon includes the words "Recorded on iLecture" only if the capability exists in the venue.

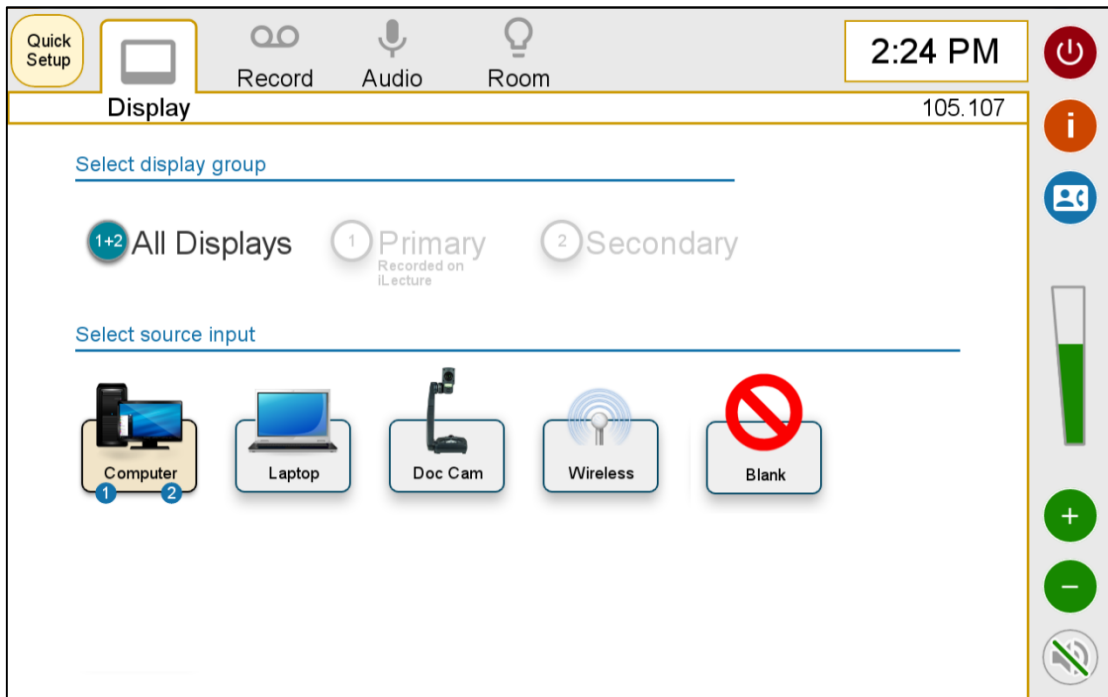


Figure 6: Display Tab for Venues with Primary and Secondary Display Groups

The Display tab for venues able to show three sources simultaneously will have an additional option labelled Tertiary in the display group section.

In any case, if one or more of the displays is set to Blank then a red jewel appears on the Display tab to indicate that a source is deliberately not being presented.

3.2.4.3 Control of Sources

When a source is controllable from the touch panel, then a control 'cog' icon appears next to the source when it is active and routed. When this icon is pressed a pop-up window appears showing the available controls for that source (e.g. the document camera controls as shown in **Figure 7**).

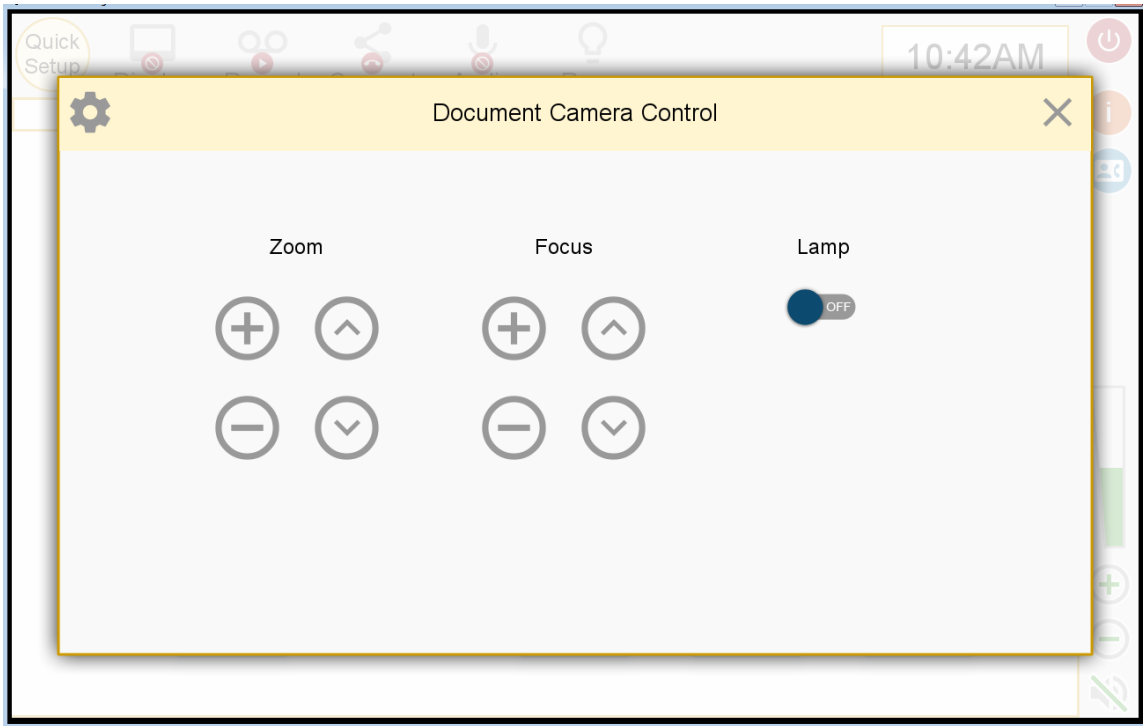


Figure 7: Document Camera Controls Pop-up Window

3.2.5 RECORD TAB

The Record tab provides the status and controls relating to the lecture recording system used by the University.

When the status of the recording system is 'Inactive', the controls are greyed out as shown in **Figure 8**. Text is provided as a reminder to schedule recordings or create ad hoc recordings on the venue computer, with information on how to do this provided when the Information button is pressed.

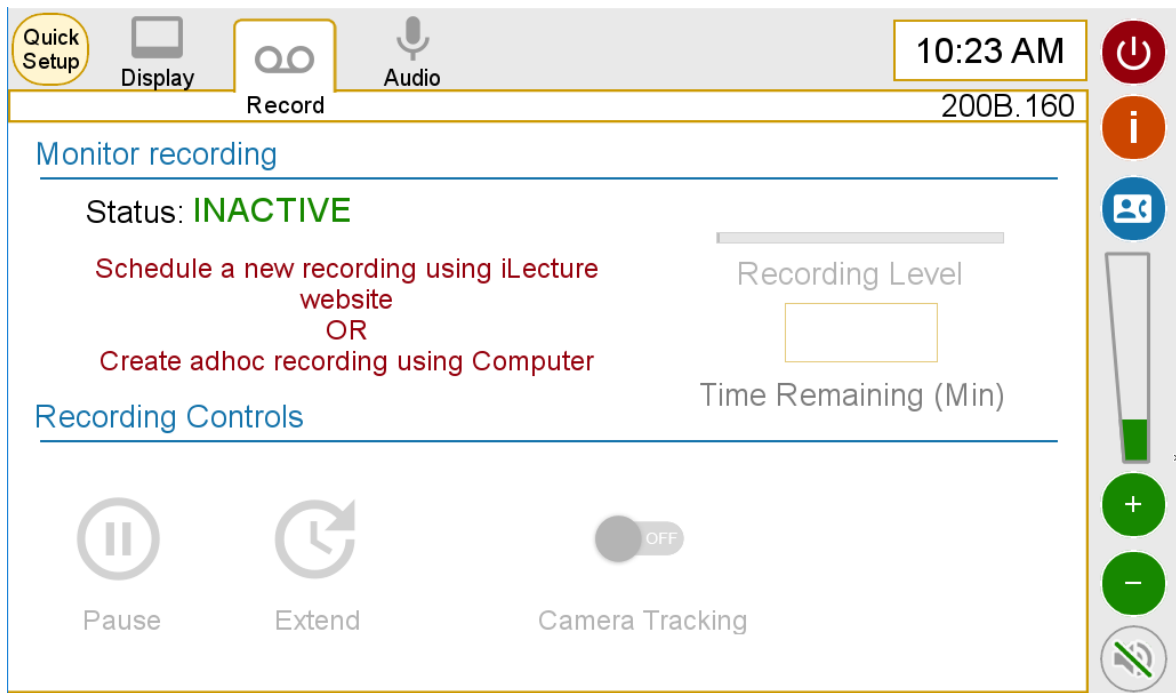


Figure 8: Record Tab When Status is 'Inactive'

When the status of the recording system is 'Pending', the Title, Schedule and Time to Start indicators become active as shown in **Figure 9**.

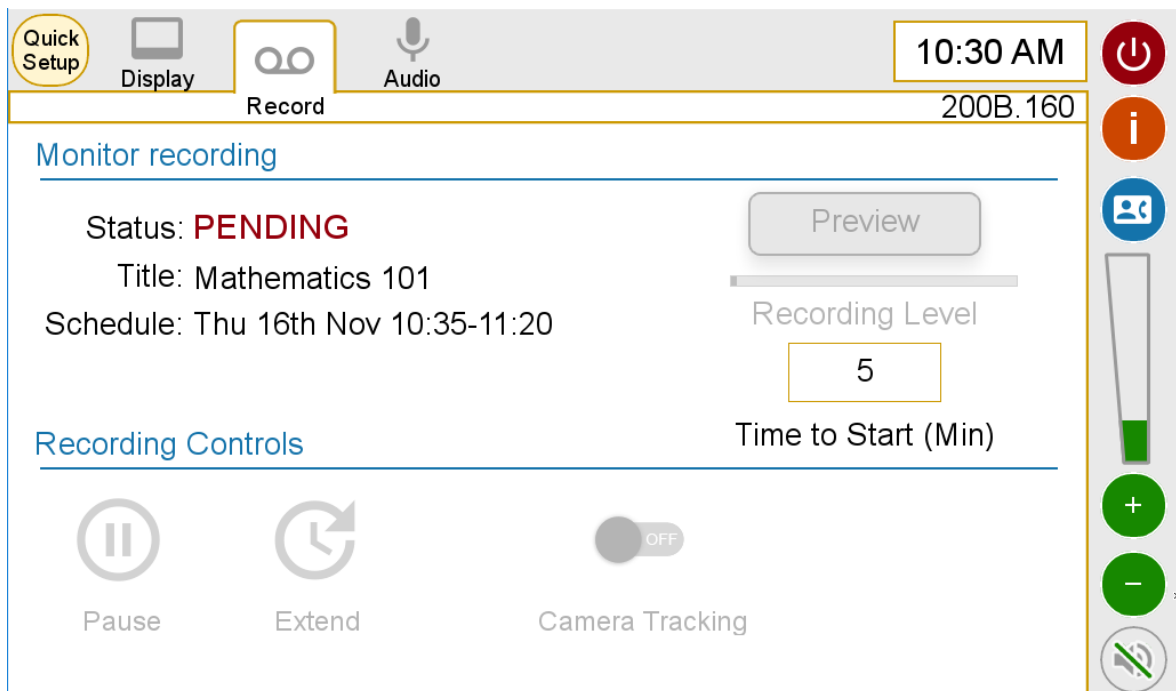


Figure 9: Record Tab When Status is 'Pending'

When the status of the recording system is 'Recording', the Time Remaining indicator replaces the Time to Start indicator. The Preview, Recording Level and Time Remaining indicators are active and all of the controls become available, as shown in

Figure 10. The red jewel on the Record tab indicates 'Recording' status even when another tab becomes active. The recording system controls include:

- Pause button to cause the recording appliance to pause and not capture any video or audio content. When pressed, the text of this button changes to "Please wait ..." and the button greys out until the recording appliance has completed the pause request. The button then changes to a Resume button.
- Extend button to cause the recording appliance to extend the current recording schedule by an extra five minutes per press (up until the start of the next scheduled recording). When pressed, the text of this button changes to "Please wait ..." and the button greys out until the recording appliance has completed the extend request.
- Camera Tracking slider to turn the tracking of the presenter camera on or off.
- (optional) Audience Microphones Mute button to turn the audience microphone(s) to mute or unmute.

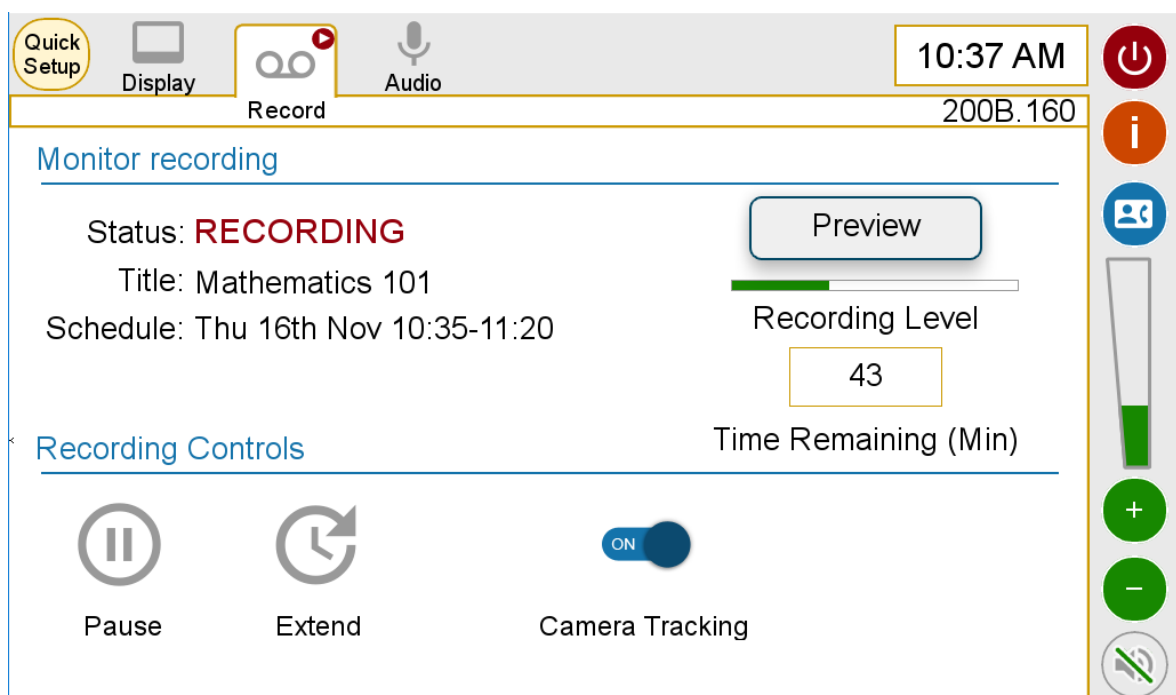


Figure 10: Record Tab When Status is 'Recording'

When the status of the recording system is 'Paused' all the indicators remain active and all of the controls stay available, as shown in **Figure 11**. The orange jewel on the Record tab indicates 'Paused' status even when another tab becomes active. The recording controls have changed to include:

- Resume button to cause the recording appliance to resume capture of any video or audio content. When pressed, the text of this button changes to "Please wait ..." and the button greys out until the recording appliance has completed the resume request. The button then changes to a Pause button.

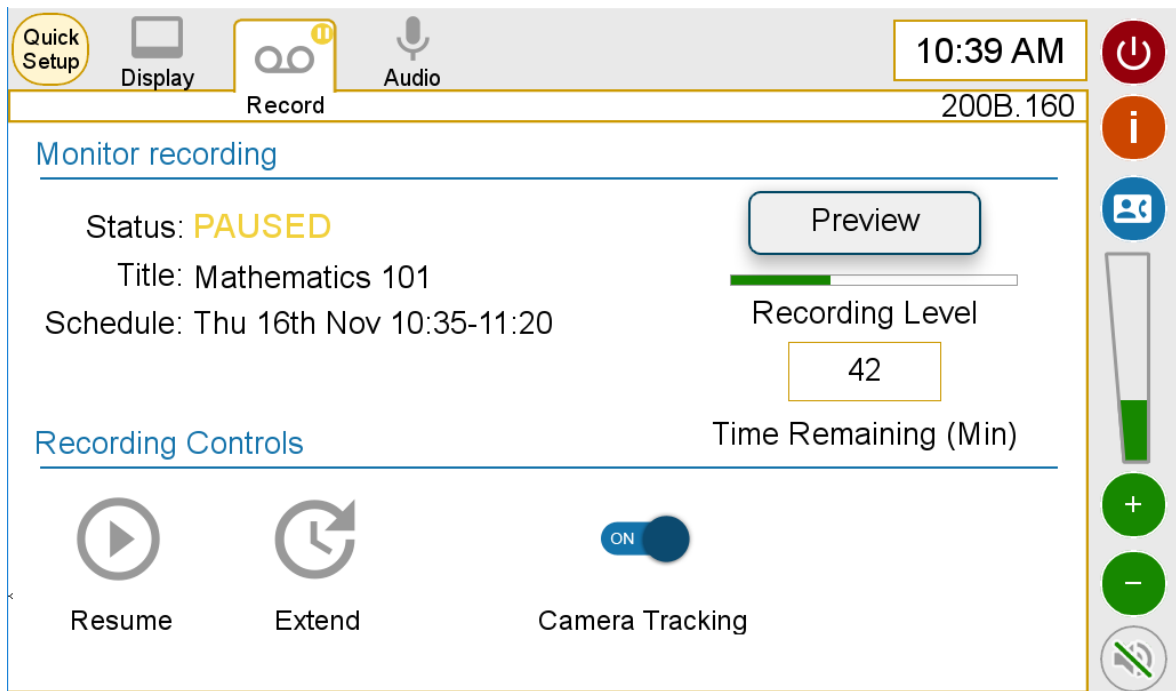


Figure 11: Record Tab When Status is 'Paused'

When the Preview button is pressed, a pop-up window titled 'Recording Preview' appears that shows snapshots of the live images and audio from the lecture recording device as shown in **Figure 12**.

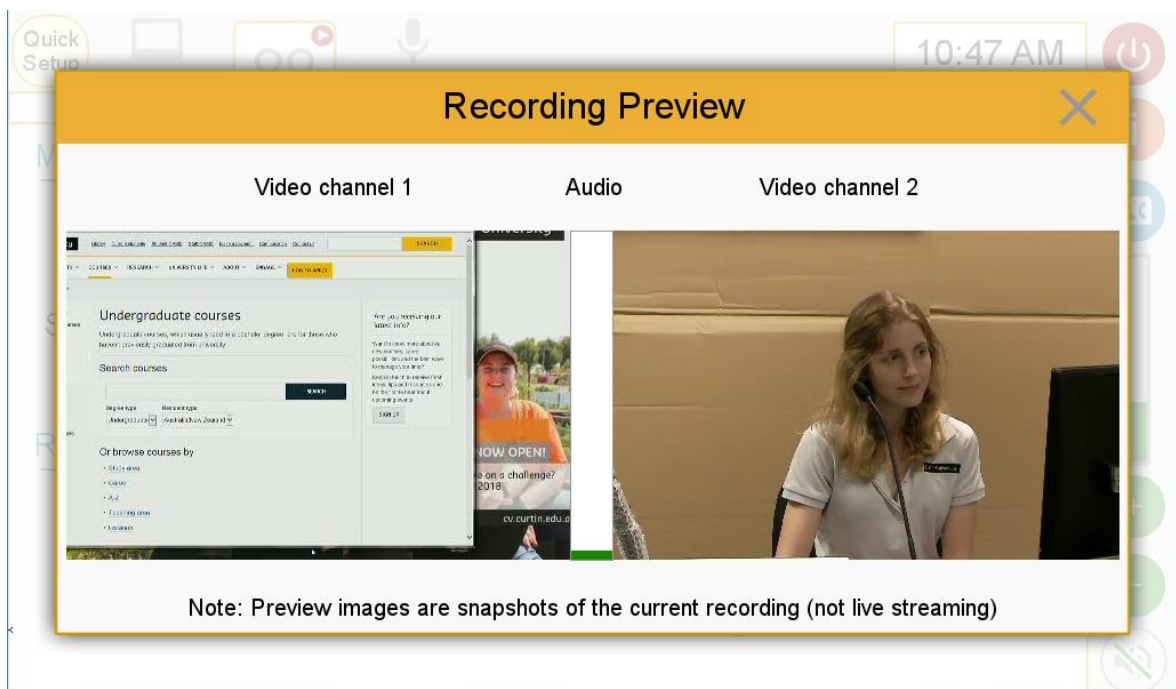


Figure 12: Recording Preview Pop-up Window

3.2.6 CONNECT TAB

The Connect tab is used for extending the physical venue into the virtual realm by including other participants through web conferencing or videoconferencing.

3.2.6.1 Web Conferencing Only

The Connect tab for venues that are fitted only with simple camera and microphone arrangements connected to the venue computer using an AV bridge is shown in **Figure 13**. For such venues with 'Web Conference Only' functionality, the WebEx application (or similar) is started on the venue computer separate from the touch panel. Text is provided to this effect, with further information provided when the Information button is pressed.

The Presenter Camera is the default source to be displayed through the AV Bridge (i.e. web conference participant video). PTZ controls and presets are included on this tab if required. Any other available cameras selected on this page (e.g. Audience Camera) replaces the video connection to the AV Bridge.

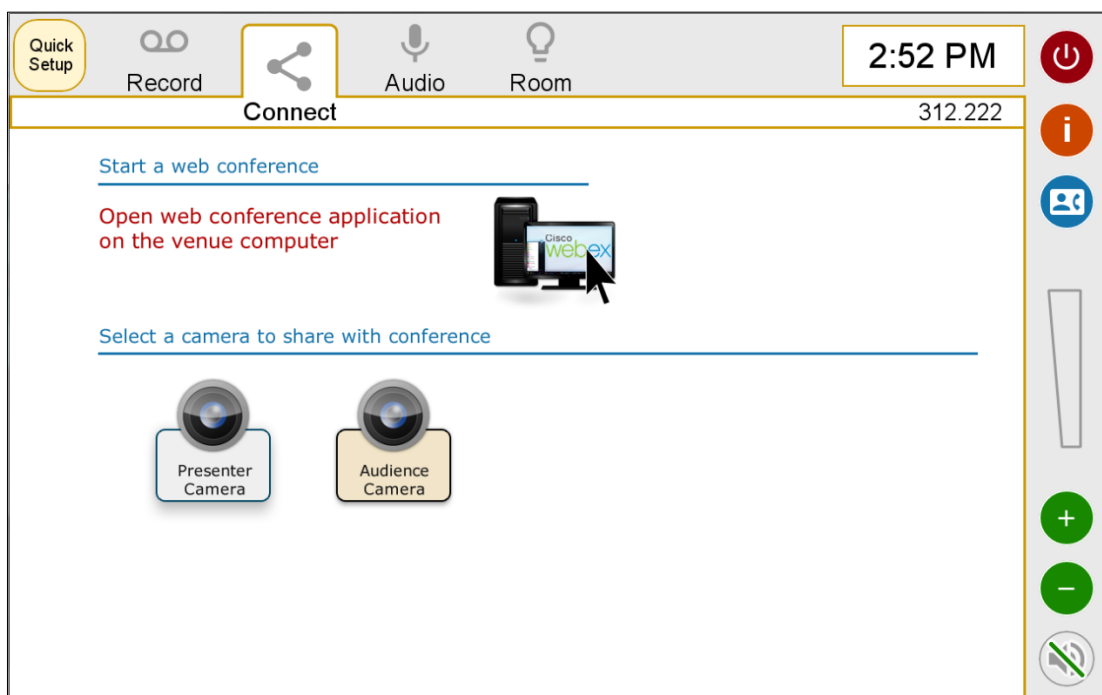


Figure 13: Connect Tab for Venues with Web Conference Only

3.2.6.2 Web Conferencing using Videoconference Facilities

The Connect tab for venues that are fitted with videoconference facilities, including multiple camera and microphone arrangements, is shown in **Figure 14**.

When the Share Content button is selected, the 'source input' options are shown for sharing content with the conference through the videoconference content channel. Clicking the source input once will enable the share, clicking again will disable the share. The default is that no source is selected. Note that the venue computer is not in this list as it is already connected to the Web conference.

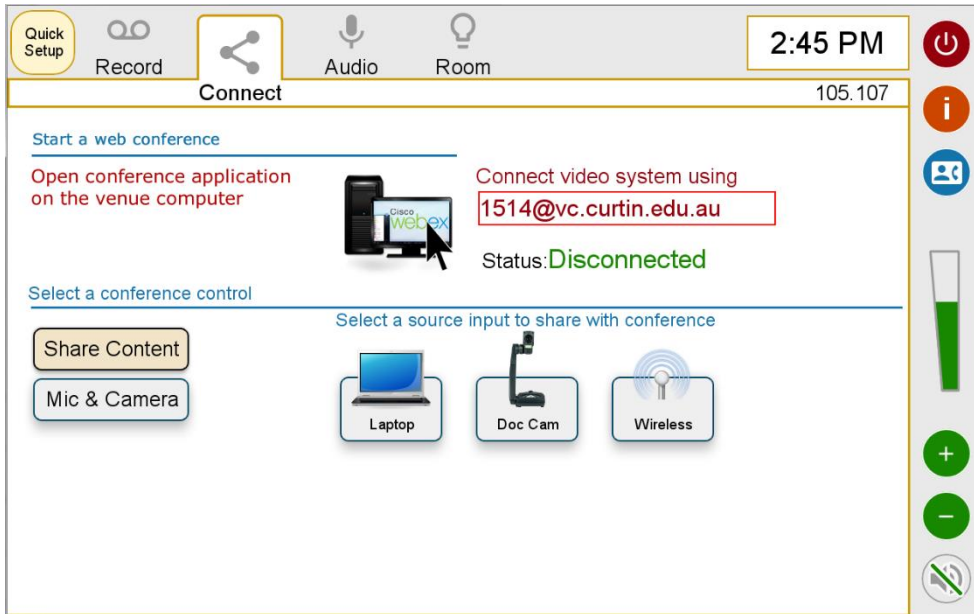


Figure 14: Web Share Content using Videoconference Facilities

When the Mic & Camera button is selected, the options for controlling the microphone and camera features are shown in **Figure 15**. The microphone and camera settings are venue-dependent and may include turning Presenter Camera Tracking on or off, All Microphones Mute, and Audience Microphones Mute.

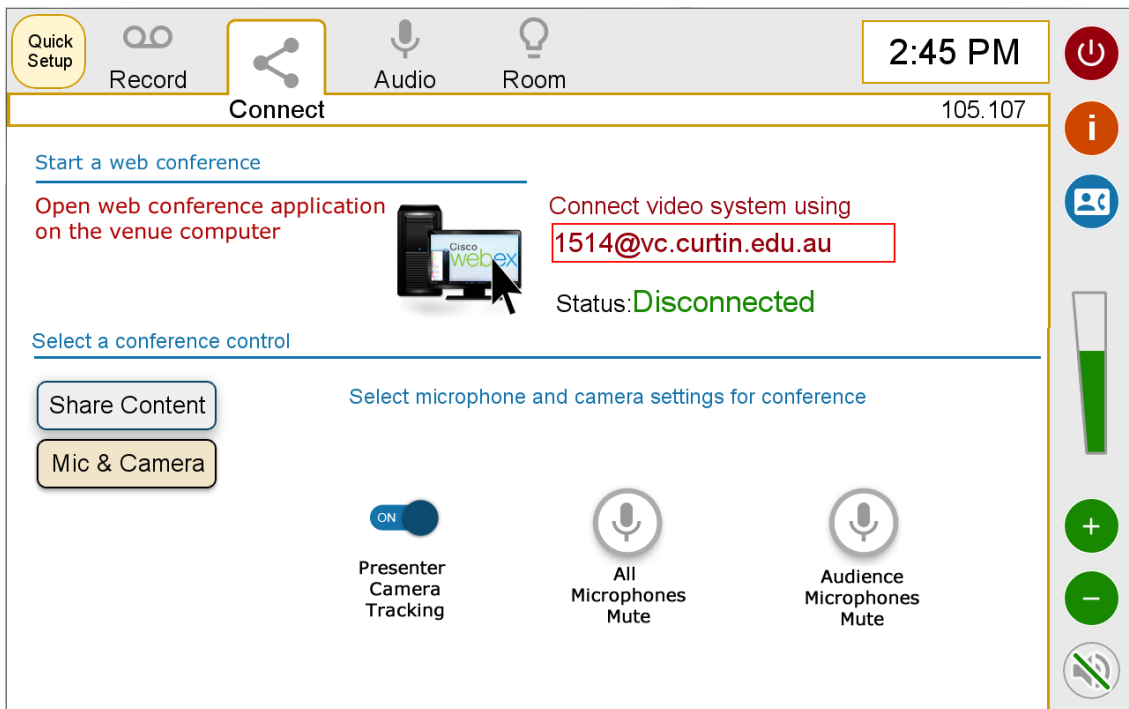


Figure 15: Web Mic and Camera using Videoconference Facilities

3.2.6.3 Videoconference

The Connect tab when videoconference is the selected conference type is shown in **Figure 16**. Under the 'Start a video conference' heading are the Address field, Status and Place/End Call button. A red jewel appears on the Connect tab to indicate when the venue is in a call.

When the Share Content button is selected, the 'source input' options are shown for sharing content with the conference. Clicking the source input once will enable the share, clicking again will disable the share. There is no default source for content.

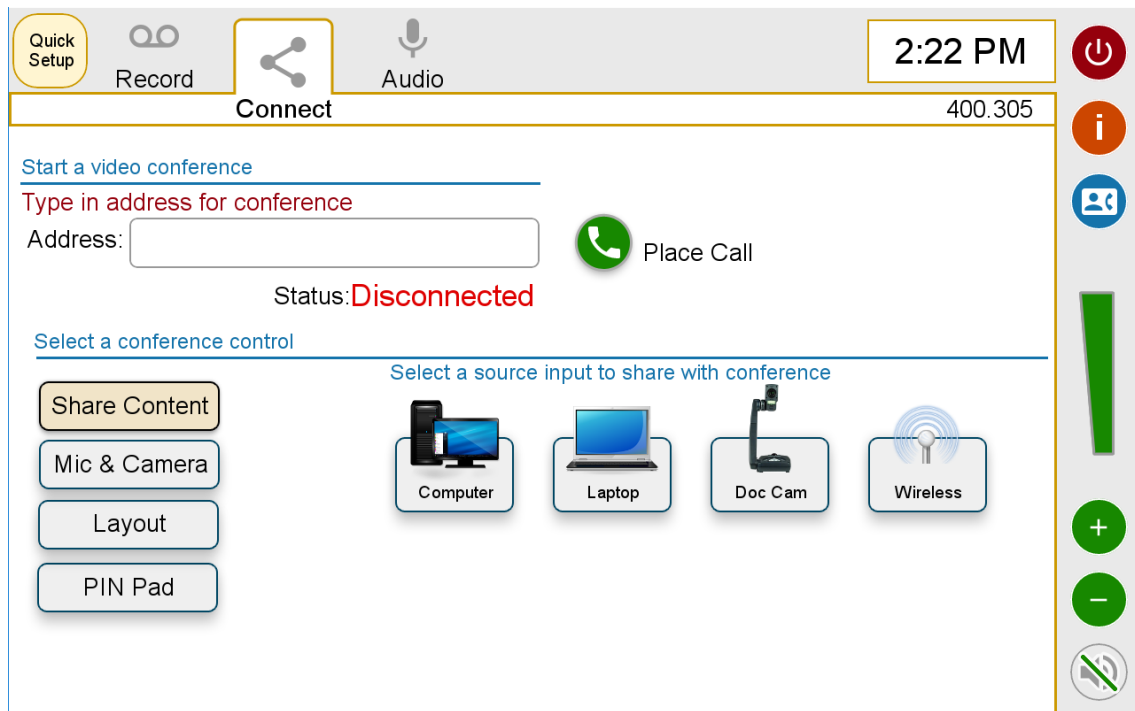


Figure 16: Connect Tab for Venues with Videoconference - Share Content

When the Mic & Camera button is selected, the options for controlling the microphone and camera features are shown as in **Figure 17**. The microphone and camera settings are venue-dependent and may include turning Presenter Camera Tracking* on or off, Show Self View on or off, All Microphones Mute, and Audience Microphones Mute*.

* These buttons are linked to the identically named buttons on the Record tab.

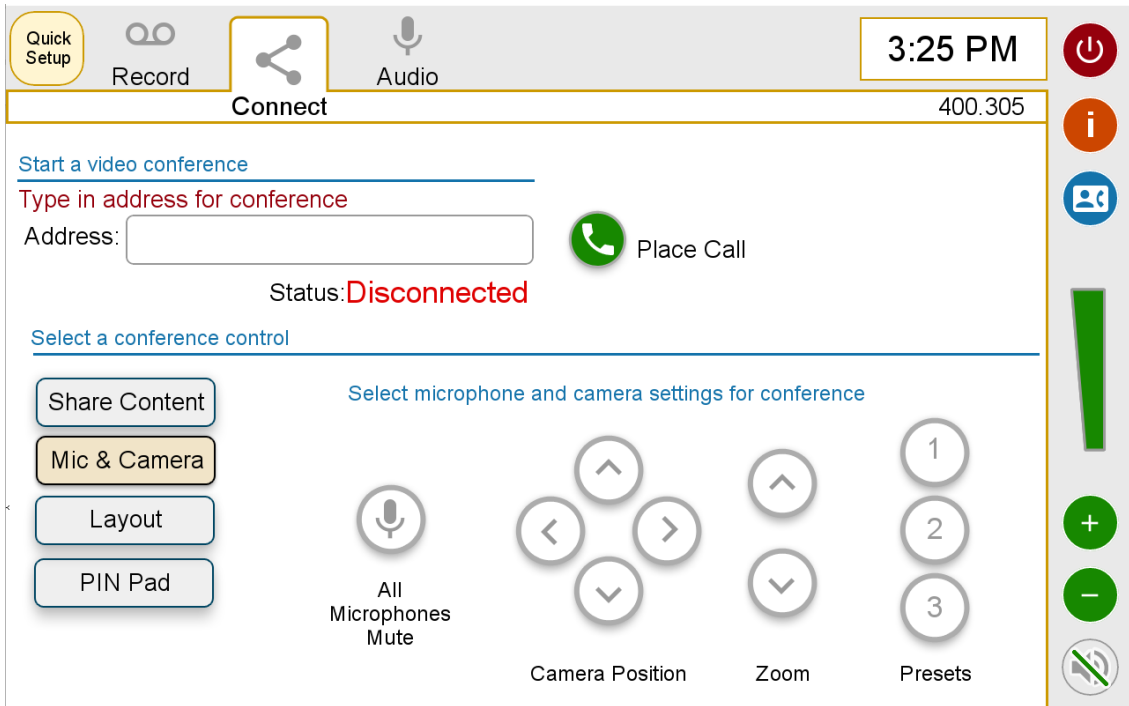


Figure 17: Connect Tab for Venues with Videoconference – Mic and Camera

When the Address field or the Place Call button is clicked, a full-screen keyboard pops up to allow an entry to be typed in the Address field, as shown in **Figure 18**.

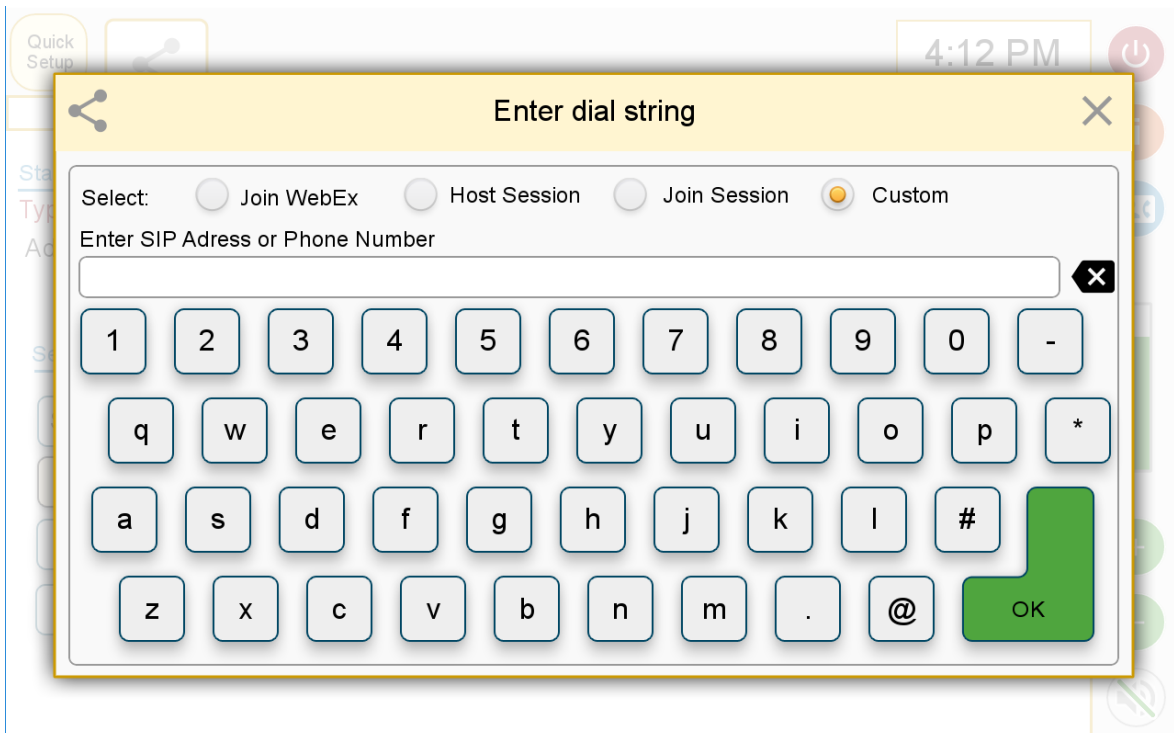


Figure 18: Videoconference Pop-up Keyboard

When the Layout button is selected a Modify Conference Layout button becomes available, as shown in **Figure 19**.

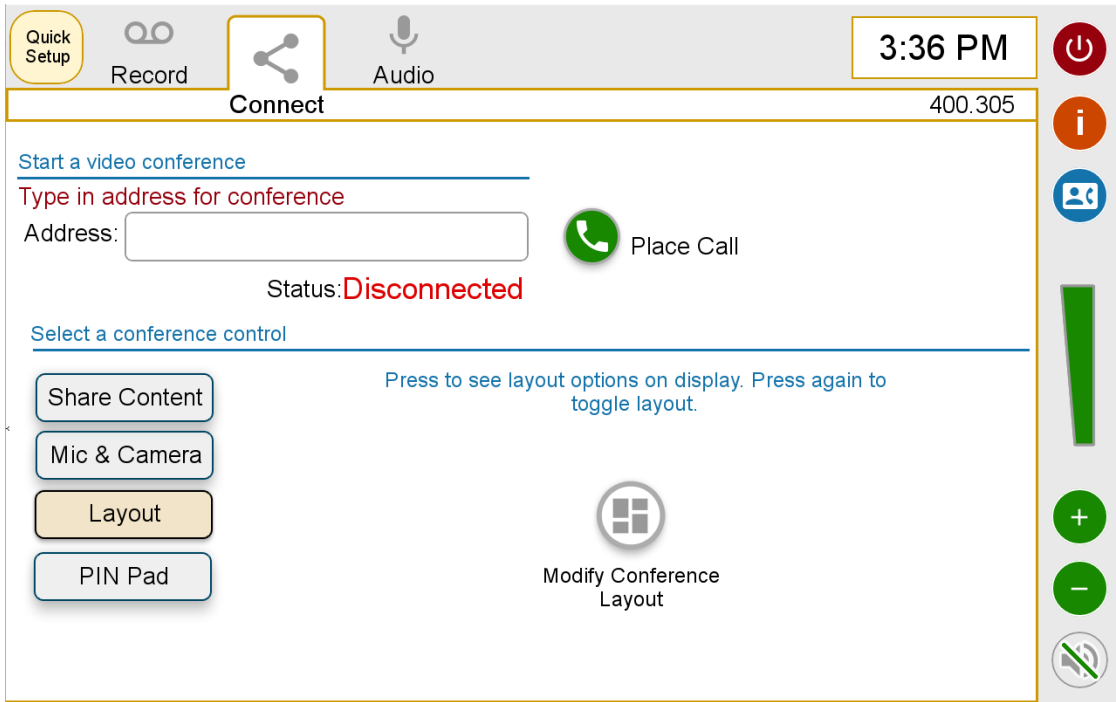


Figure 19: Videoconference Layout

When the PIN Pad button is selected a numeric keyboard becomes available, as shown in **Figure 20**.

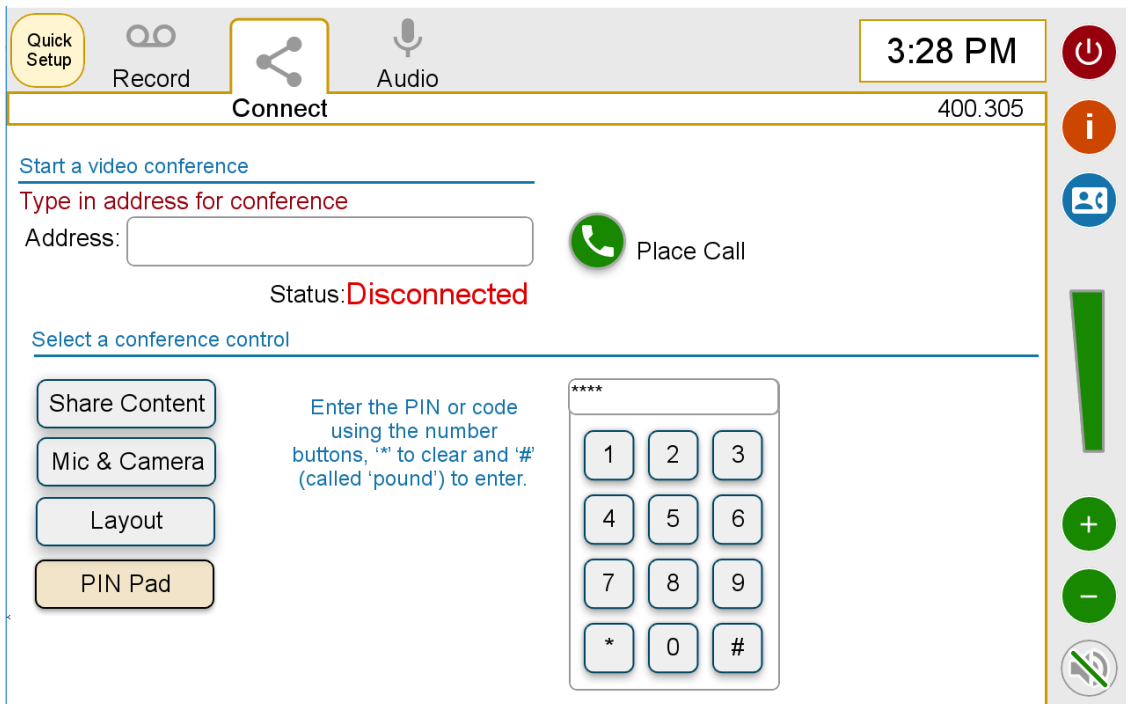


Figure 20: Videoconference PIN Pad

3.2.7 AUDIO TAB

The Audio tab shows the microphone controls to mute or adjust levels, as shown in **Figure 21**. Each microphone has up and down and mute buttons. A red 'jewel' appears on the Audio tab if any of the microphones have been muted.

An optional Voice Lift slider may be placed on the Audio tab to control this functionality in venues so fitted.

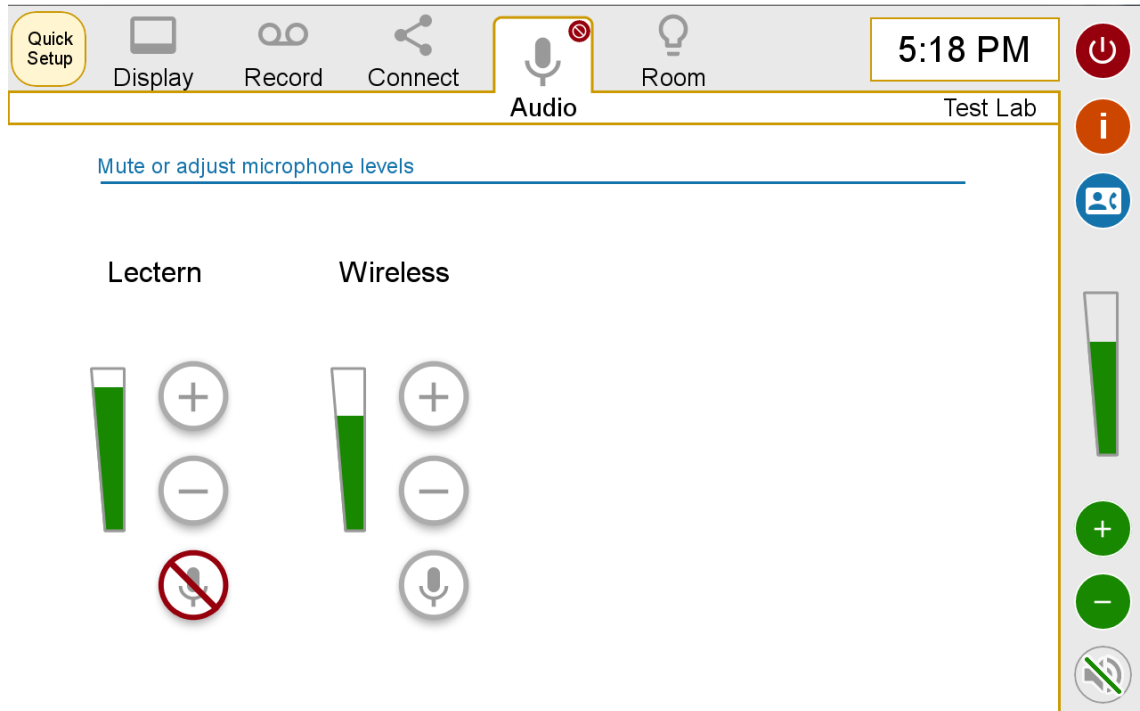


Figure 21: Audio Tab

3.2.8 ROOM TAB

The Room tab shows the venue controls to adjust lighting levels, blinds etc., as shown in **Figure 22**. The lighting can be adjusted using the Lighting Mode buttons or Custom Lighting controls. Blinds can be adjusted using the up, down and stop buttons for each blind set.

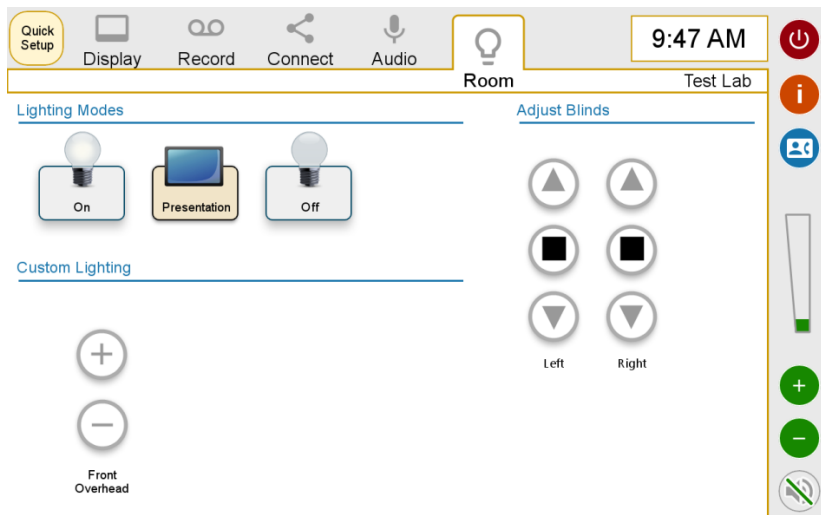


Figure 22: Room Tab

3.2.9 CLOCK AND VENUE NAME

The Clock and Venue Name are always in view when the system is powered down (see the home screen in **Figure 2**) or in operation (on the top right of touch panel, as shown in **Figure 23**). The time on the clock is shown in 12-hour time format and the venue name is provided in BBB.RRR format where BBB is the building number and RRR is the room number.

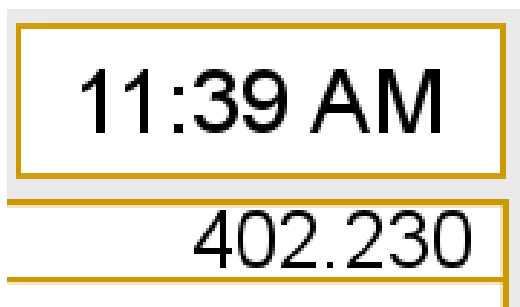


Figure 23: Clock and Venue Name

3.2.10 SHUTDOWN BUTTON

The Shutdown button is always available on the top right of the touch panel, as shown in **Figure 24**. When the Shutdown button is pressed a confirmation pop-up window appears, as shown in **Figure 25**. A similar pop-up window appears when the *Shutdown Time* or *Inactivity Shutdown Delay* is reached. In this case, the first line of text is replaced with "This system is about to shut down automatically", includes a countdown timer and shows only a Cancel button.



Figure 24: Shutdown, Information and Support Buttons

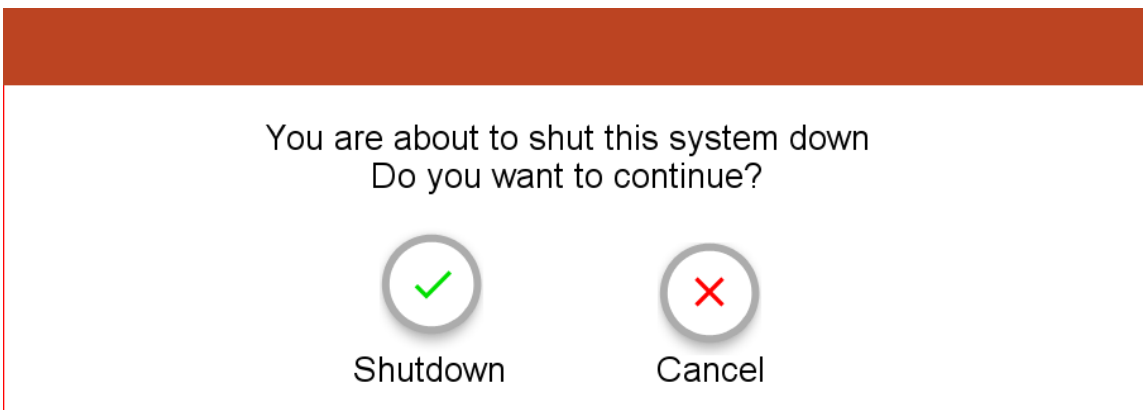


Figure 25: Shutdown Confirmation Pop-up Window

3.2.11 INFORMATION BUTTON

The Information button is always available on the top right of the touch panel, as shown in **Figure 24**. When the Information button is pressed, the touch panel converts to an 'Information Mode', where the whole panel has an orange border, panel elements are greyed out, and question mark icons appear, as shown in **Figure 26**. For each press on the question mark icon a pop-up window appears with relevant support information. An example pop-up window for the Record tab is shown in **Figure 27**.

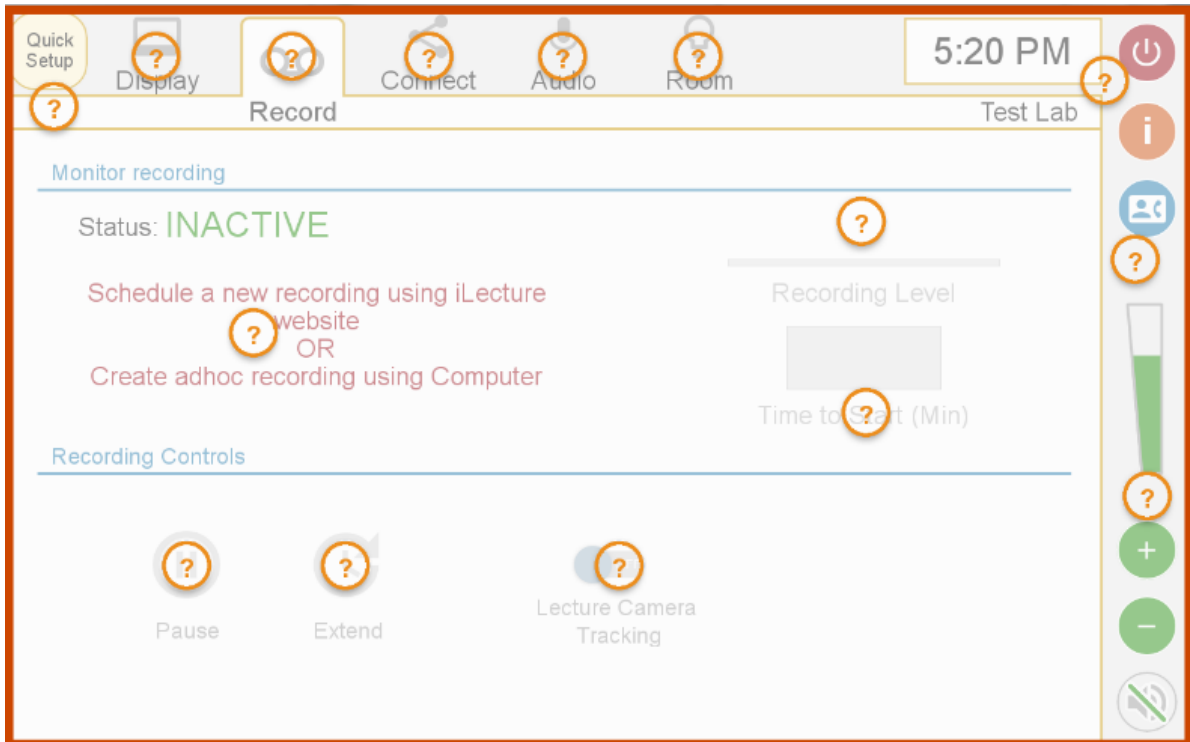


Figure 26: Information Mode for Record Tab

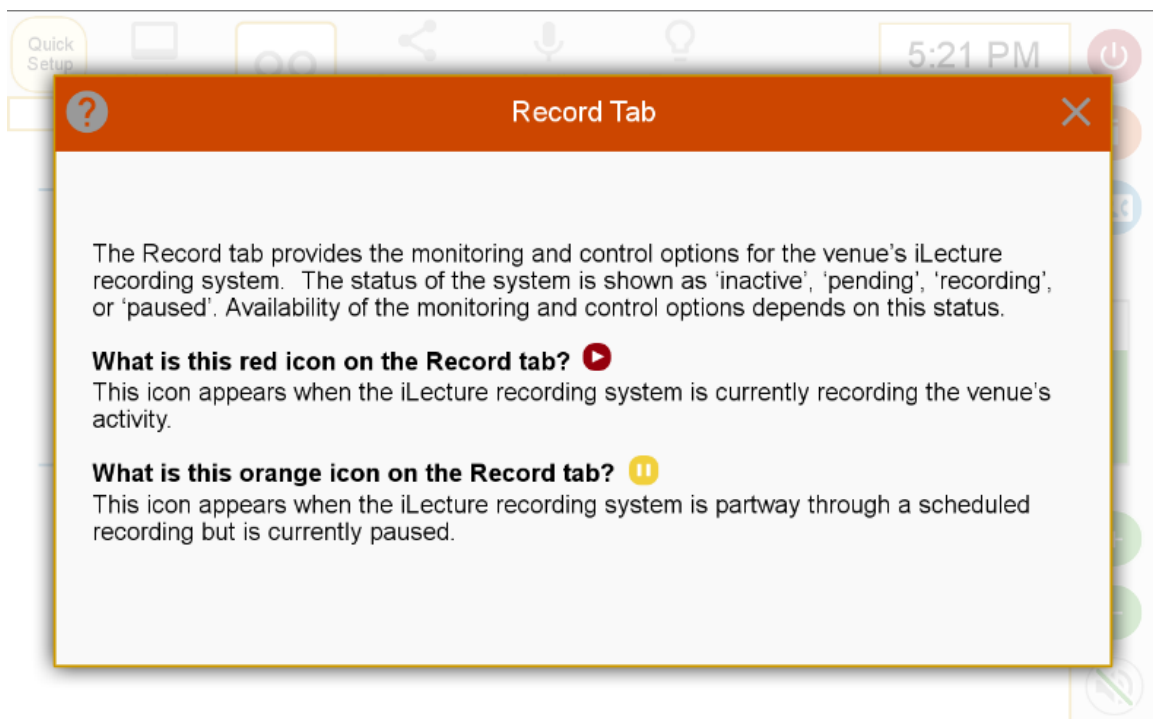


Figure 27: Help for Record Tab

3.2.12 SUPPORT BUTTON

The Support button is always available on the top right of the touch panel, as shown in **Figure 24**. When the Support button is pressed a confirmation pop-up window appears, as shown in **Figure 28**.

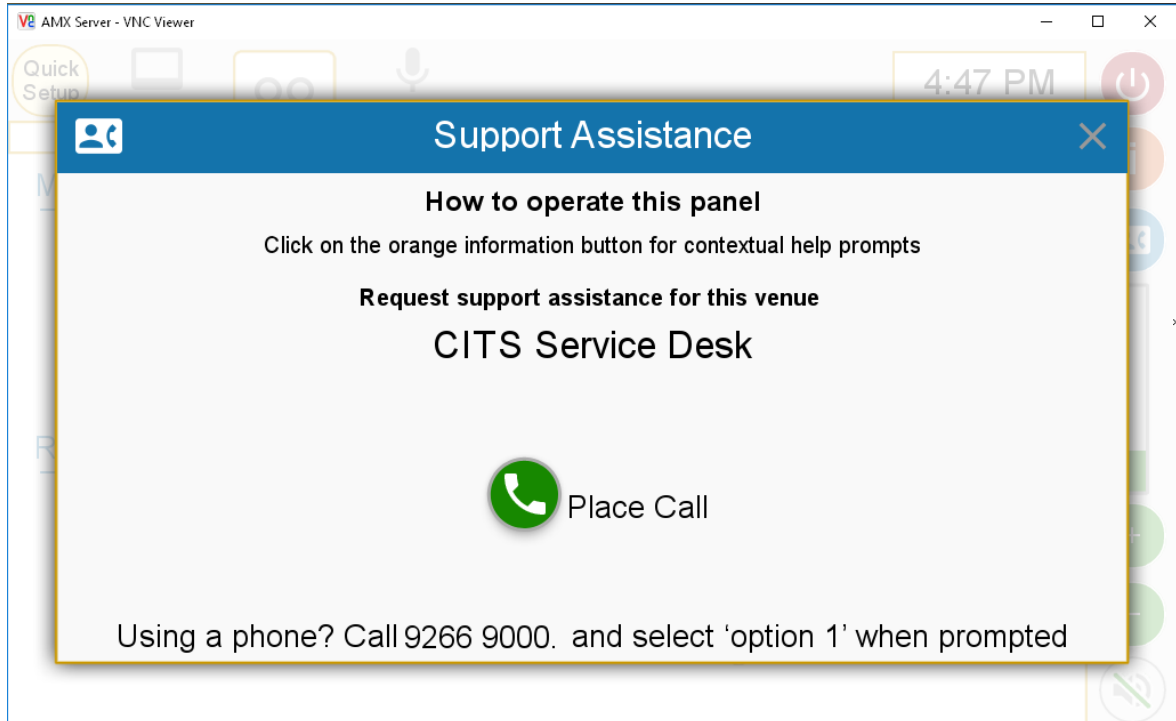


Figure 28: Support Assistance Pop-up Window

3.2.13 VOLUME CONTROL

The volume controls are always available on the right hand side of the touch panel. These volume controls affect all sources of audio for the venue speakers such as microphones, Room PC and other sources. The level is increased or decreased using the '+' and '-' buttons and is muted with the mute button as shown in **Figure 29**.

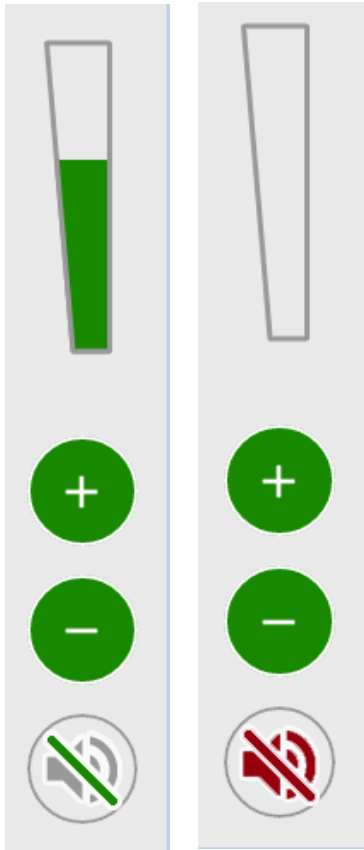


Figure 29: Audio Controls - Normal (left) and Muted (right)

3.2.14 ROOM JOIN

MASTER-SINGLE SLAVE OVERFLOW

When rooms are joinable in a master-slave (or simple overflow) configuration, then the enable slide appears in the Quick Setup pop-up window of the master venue, as shown in **Figure 30**.

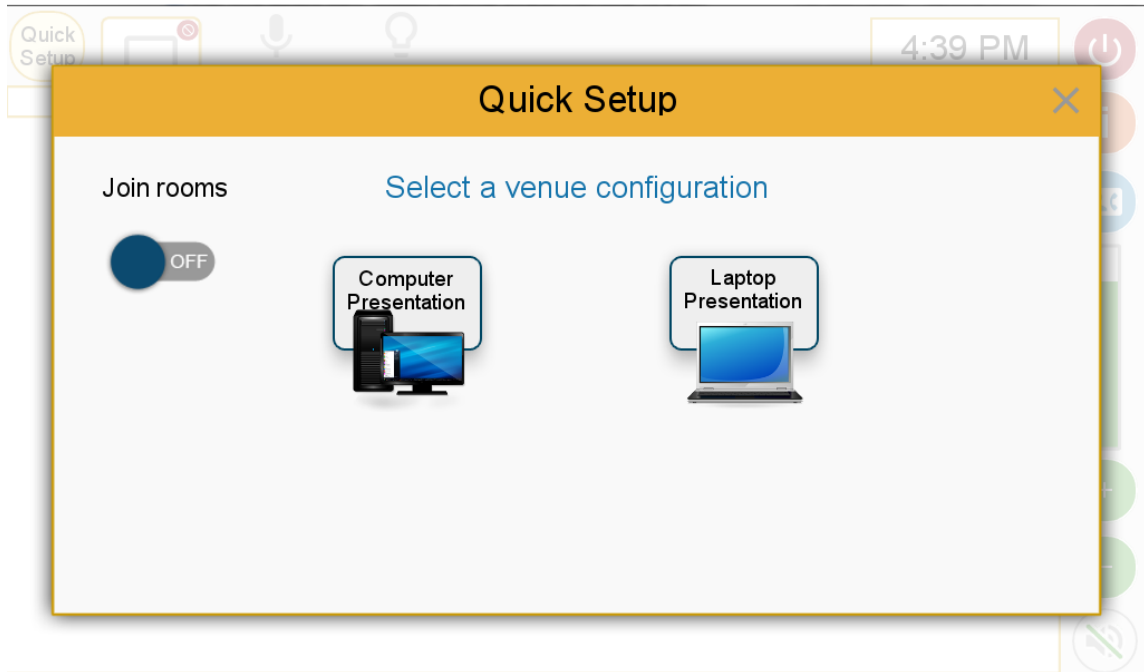


Figure 30: Room Join Enable for Master

When a room join is enabled, a pop-up window appears on the touch panel of the slave venue, as shown in **Figure 31**.

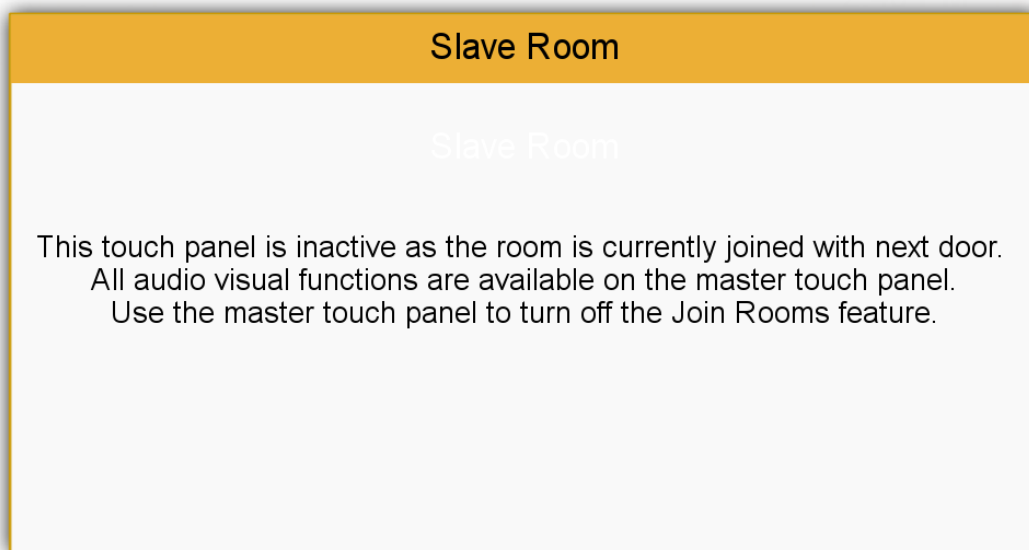


Figure 31: Room Join for Slave Venue

MASTER–MULTIPLE SLAVE OVERFLOW

In this configuration when the AV system in one venue becomes the 'master' to the one or more other venues, then multiple enable slides appears in the Quick Setup pop-up window of the master venue, as shown in **Figure 32**. The sources of the slave venue(s) are made available for selection in the master (**Figure 33**). When a room

join is enabled, a pop-up window appears on the touch panel of the slave venue, similar to that shown in **Figure 31**.

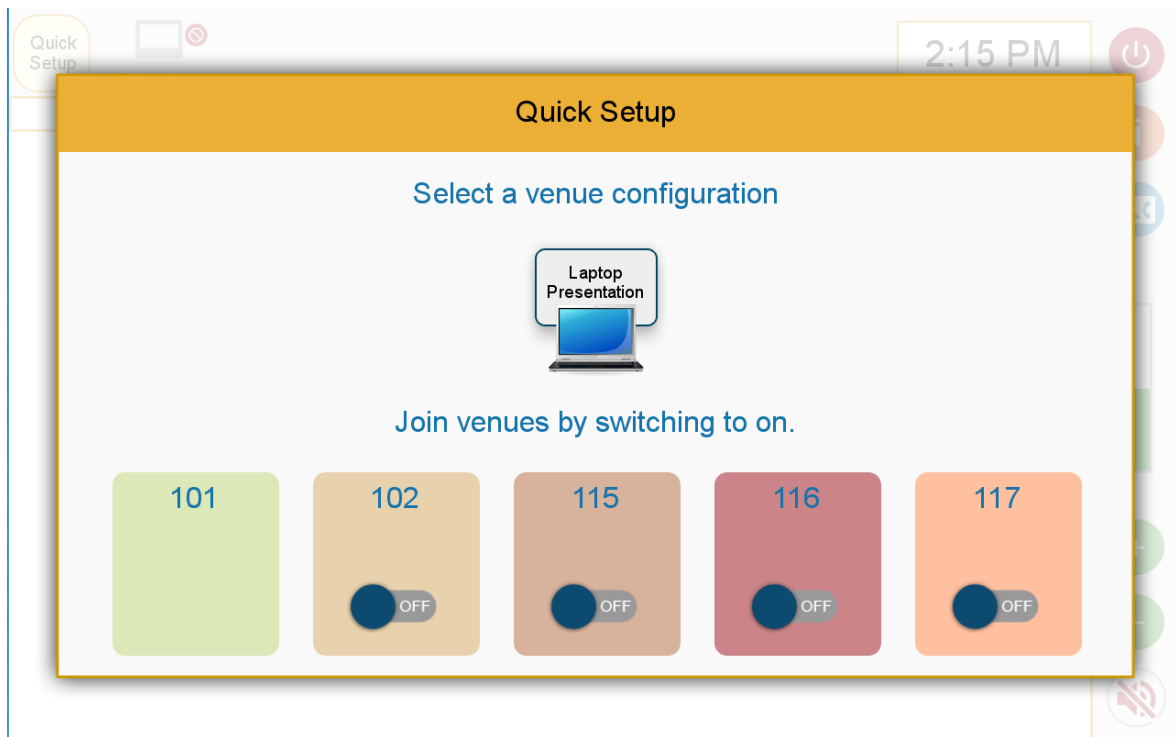


Figure 32: Room Join Enable for Master with Multiple Slaves



Figure 33: Sources from Slaves Shown in Master

SHARED CONNECTION

In this configuration there is two-way communication between two or more venues, similar to videoconferencing. The selection of this mode of operation is made on the Quick Setup pop-up window as shown in **Figure 34**. The list of slave venues to join

are selected in the master venue as shown in **Figure 35**. A slave venue with an active connection will have a touch panel look similar to **Figure 36**.

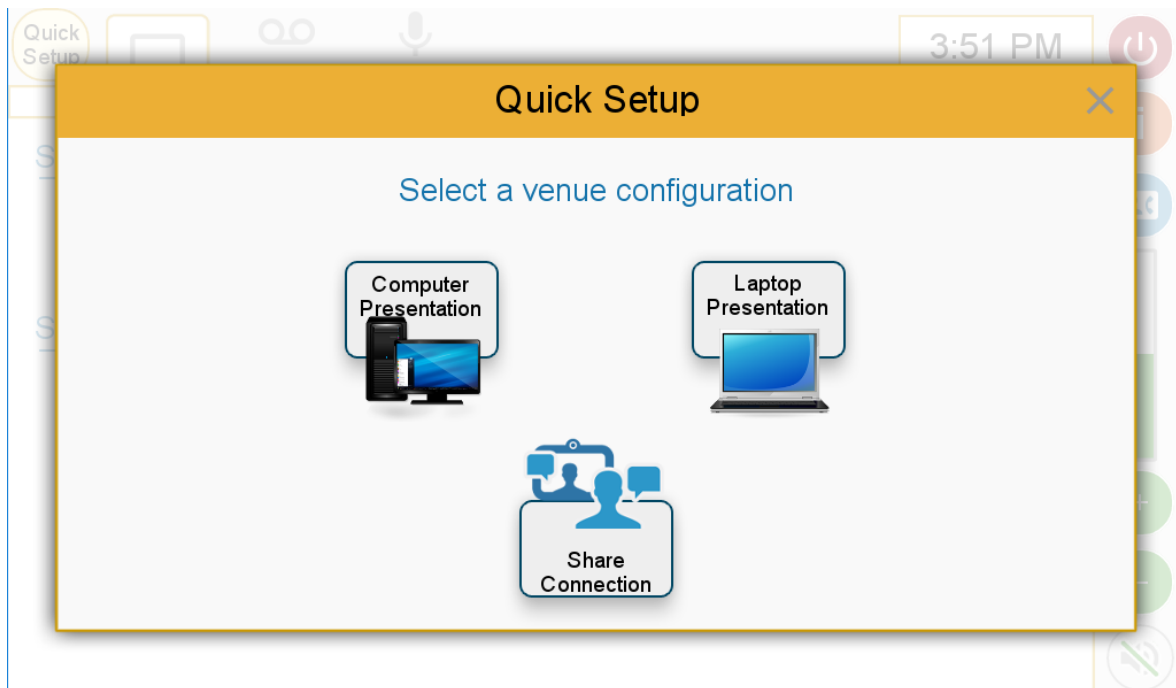


Figure 34: Share Connection on Quick Setup

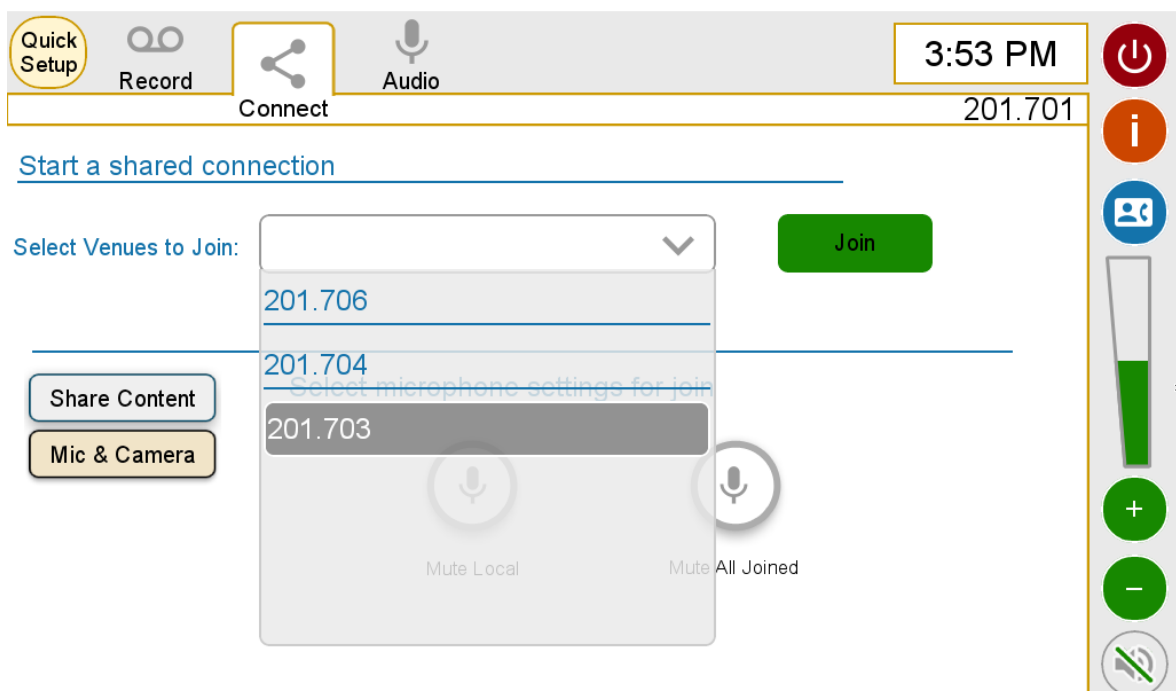


Figure 35: Selecting Slaves from Master in a Shared Connection

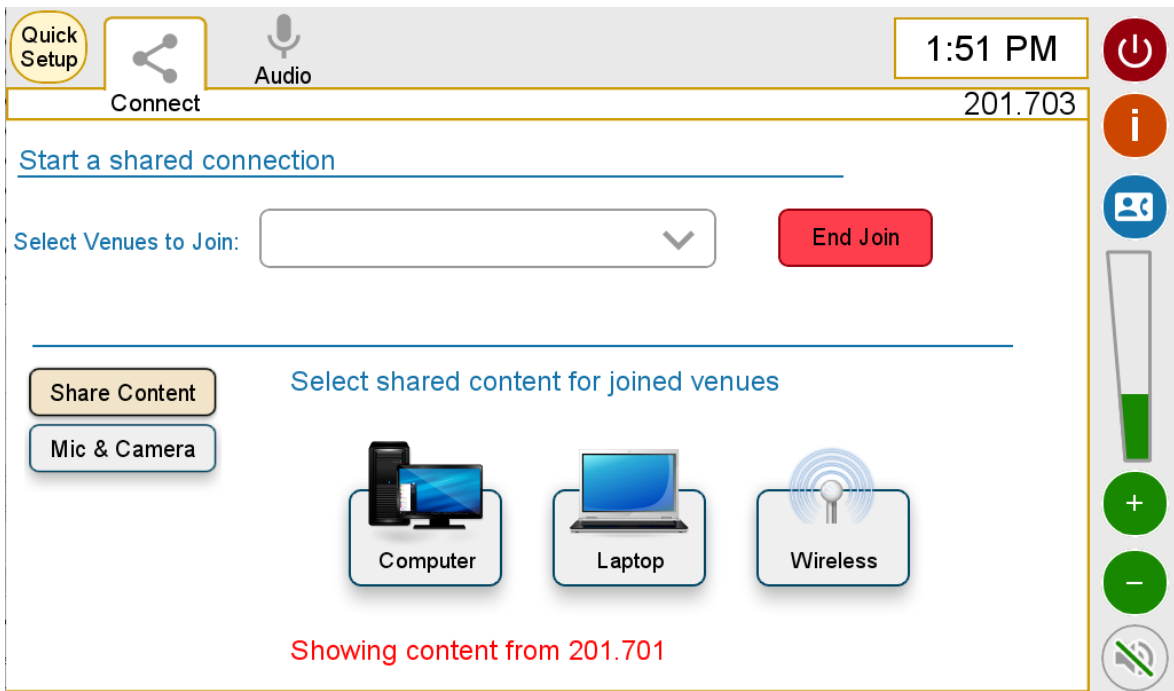


Figure 36: Slave in a Shared Connection

3.2.15 ACCEPT A CALL

Depending upon venue configuration, a pop-up window may appear to allow the venue user to accept or reject an incoming call to the videoconference system, as shown in **Figure 37**.

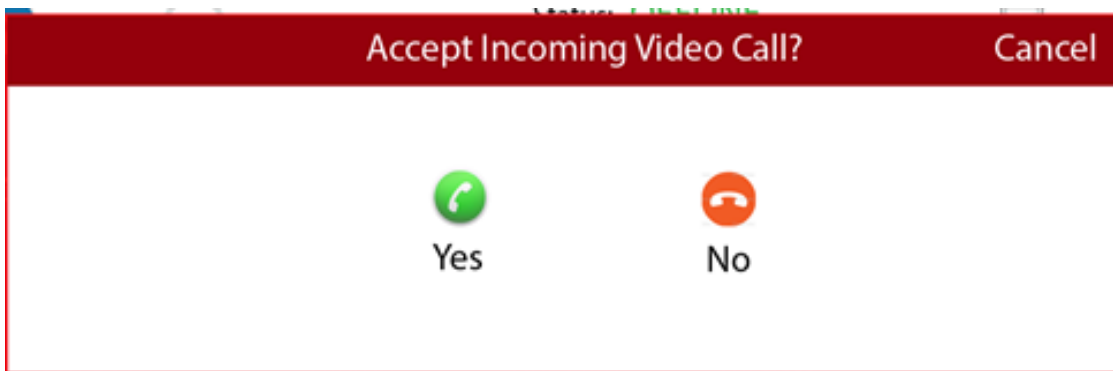


Figure 37: Accept Incoming Video Call

3.2.16 PIN ACCESS

When pin access is required, a popup window like **Figure 38** will be used to enter a 4-digit code.

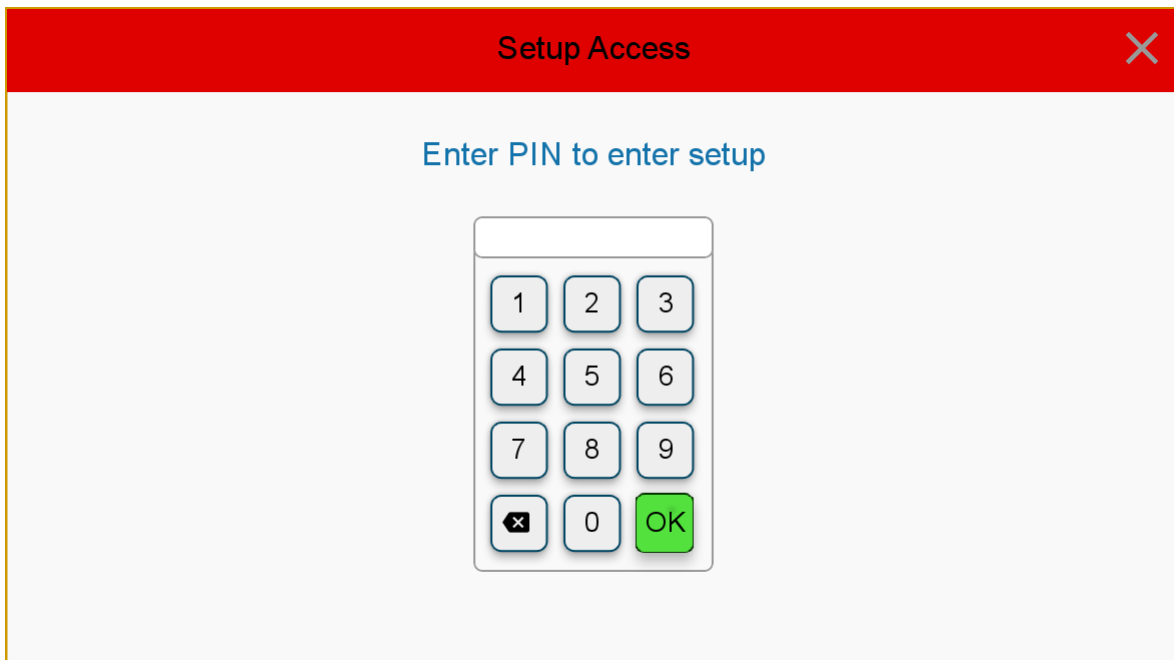


Figure 38: Pin Access Pop-up Window

3.2.17 TECHNICIAN'S PAGES

The technician's pages are a password-protected set of pages for venue configuration and settings. The Venue Name is used as the gateway to the technician pages (push and hold for >3s).

An example for the Touch Panel tab is shown in **Figure 39** and for the Environment, including the Event panel, in **Figure 40**.

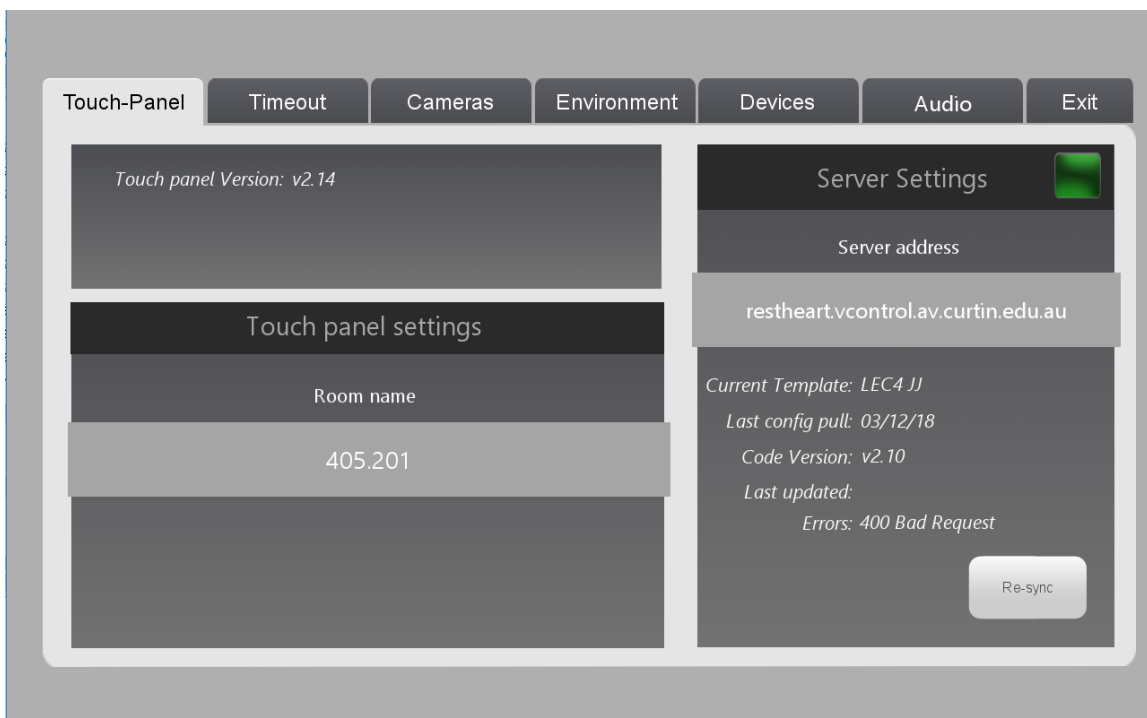


Figure 39: Technician Pages – Touch Panel Tab

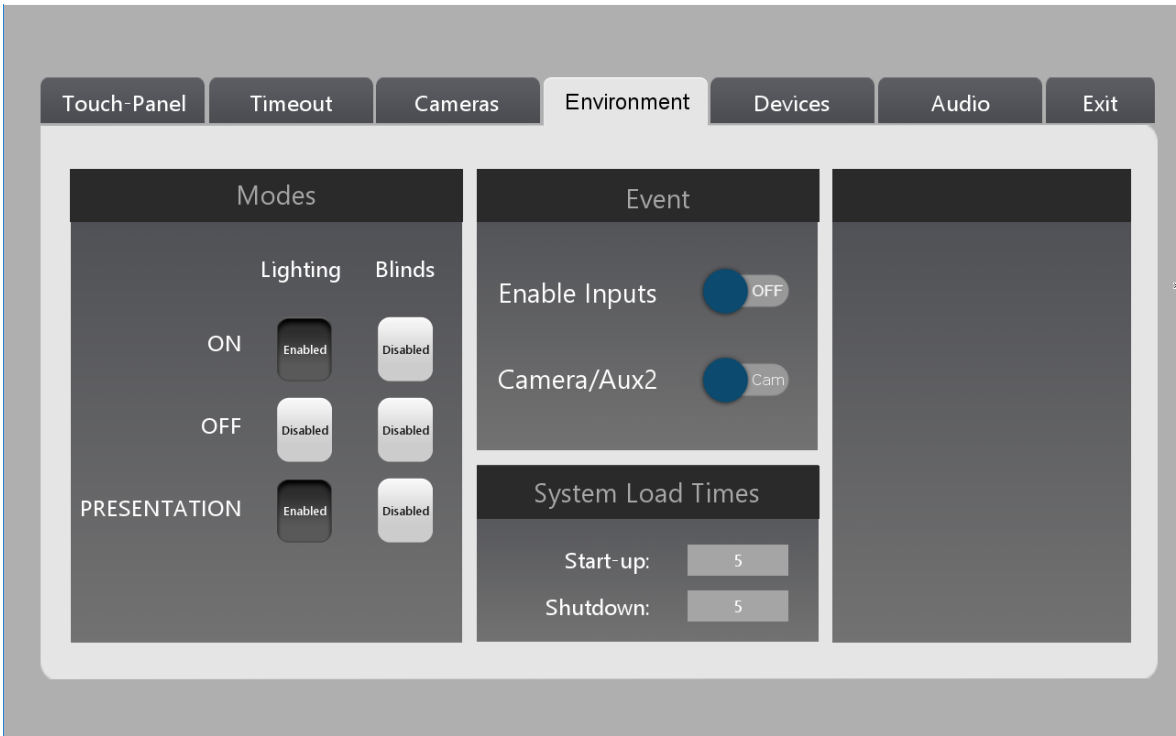


Figure 40: Technician Pages - Environment Tab

4 PROGRAMMING

All audiovisual control system code at Curtin University shall conform to the descriptions contained in this section. Any changes to the functional requirements, use of standard inputs and outputs, or other forms of customisation must be approved by the Curtin AV project team in writing.

4.1 OVERVIEW

Curtin University aspires towards a standardised and global control system code base, with variation in functionality between system types and room options being configured with a central management service.

4.2 FUNCTIONAL REQUIREMENTS

In the following functional requirements, any configuration parameters as described in Section 4.5, are shown in square brackets e.g. [Warmup Time].

4.2.1 START-UP SEQUENCE

KEYPAD

1. Push the POWER ON button to begin the start-up sequence (**Figure 1**).
2. Wake up or power on all necessary devices.
3. POWER ON button illumination is to flash until the configured [Warmup Time] has elapsed, and then stay lit while the system is on.
4. Configure the system in the most common mode – presentation from venue Computer without board lights, microphones (if fitted) and program audio enabled and set at default levels.

TOUCH PANEL

Brush touch panel to wake up from sleep mode. Where fitted with proximity sensors, configure to wake up on detection.

1. **Figure 2**).
2. Wake up or power on all necessary devices.
3. Show the warm-up screen (**Figure 3**) until the configured [Warmup Time] has elapsed. This screen includes a dynamic indication of the progress towards completion of the warm-up cycle.
4. Finish the start-up sequence on the Quick Setup pop-up window (**Figure 4**).

4.2.2 SHUTDOWN SEQUENCE

KEYPAD

1. To begin the shutdown sequence:
 - a. Push the POWER OFF button (**Figure 1**); or
 - b. [Auto Shutdown Time] is reached; or
 - c. [Inactivity Shutdown Delay] is reached.
2. Power off display and peripheral devices.

3. POWER OFF button illumination is to flash until the configured [Cooldown Time] has elapsed, and then stay lit while the system is off.

TOUCH PANEL

1. To begin the shutdown sequence:
 - a. Push the Shutdown button (**Figure 24**); or
 - b. [Auto Shutdown Time] is reached; or
 - c. [Inactivity Shutdown Delay] is reached.
2. To confirm the shutdown sequence:
 - a. If Shutdown button was pushed – show the Shutdown Confirmation pop-up window (**Figure 25**). If the Shutdown button is pressed, continue with the shutdown sequence. If the Cancel button is pressed, close the Shutdown Confirmation window and return to the touch panel with no change.
 - b. If [Auto Shutdown Time] or [Inactivity Shutdown Delay] is reached – show the Timer Shutdown Confirmation pop-up window including a 5-minute countdown timer. Sound a repeating beep on the touch panel. If the Cancel button is not pressed within 5 minutes, continue with the shutdown sequence. If the Cancel button is pressed, close the window and return to the touch panel with no change.
3. Power off all displays and peripheral devices. For a system with lecture recording leave the lecture capture appliance on with routing from the iSmart camera, computer video and boundary/lectern audio.
4. Show the cooldown screen until the [Cooldown Time] has elapsed. This screen includes a dynamic indication of the progress towards completion of the cooldown cycle (**Figure 3**).
5. Finish the shutdown sequence on the Home Screen (**Figure 2**).

4.2.3 STATUS INFORMATION

KEYPAD

1. The POWER ON button is illuminated when the system is ON.
2. The POWER OFF button is illuminated when the system is OFF.
3. The button corresponding to the currently active presentation source is illuminated (e.g. PC).
4. Show the approximate volume on the 7-LED level.

TOUCH PANEL

1. Show Venue Location in the form BBB.RRR (**Figure 23**).
2. Show Time of Day, derived from the Curtin internal time server.
3. Show which Presentation Source is currently being displayed:
 - a. For systems with only Primary display group, highlight the selected source button (**Figure 5**).
 - b. For systems with Primary and Secondary display groups, highlight the selected source button, also show a blue jewel labelled '1' for the source

- selected for the Primary display group and a blue jewel labelled '2' for the Secondary display group (**Figure 6**).
- c. Similarly for systems with more than two display groups.
 4. Show a red jewel with a mute symbol on the Display tab when any display group has a Black source selected.
 5. Provide lecture recording status using a metaphor similar to separate lectern-mounted status light (**Figure 8 - Figure 11**):
 - a. Status = INACTIVE (written in Green);
 - b. Status = PENDING (written in Red, flashing). Scheduled start for a recording in less than 5 minutes;
 - c. Status = RECORDING (written in Red). Also show a red jewel with a play symbol on the Record tab. Start flashing the word RECORDING and the red jewel when recording due to finish in less than 1 minute;
 - d. Status = PAUSED (written in Orange, flashing). Also show a flashing orange jewel with a pause symbol on the Record tab.
 6. Show a Preview button.
 7. Show Recording Level on an audio level bar indicator.
 8. Show a Time to Start indication (in minutes) for pending scheduled recordings (**Figure 9**).
 9. Show a Time Remaining indication (in minutes) for current recordings (**Figure 10**).
 10. Show the tracking status (ON/OFF) of the presenter camera on the Record and Connect tabs.
 11. Show the status of the All Microphone Mute option on the Connect tab.
 12. Show the status of the Audience Microphone Mute option on the Record and Connect tabs.
 13. Provide videoconference status of the connected state (**Figure 16**):
 - a. Status = DISCONNECTED (written in Green);
 - b. Status = CONNECTED (written in Red). Also show a red jewel with a phone symbol on the Connect tab;
 - c. Show the currently active address in the Address field.
 14. Show which camera is selected in 'Web Conference Only' venues where more than one camera is fitted (**Figure 13**).
 15. Show which presentation source is currently being shared within videoconference (**Figure 16**).
 16. Show whether 'self view' is enabled with videoconference (**Figure 17**).
 17. Show the current input level for each microphone on an audio level bar meter. Indicate when the microphone has been muted with a red 'X'. Also show a red jewel with a red 'X' symbol on the Audio tab if any microphones are muted (**Figure 21**).
 18. Show the current lighting mode on the Room tab (**Figure 22**).
 19. Show the current venue volume on an audio level bar indicator. Indicate when the volume has been muted with a red 'X' (**Figure 29**).

4.2.4 QUICK SETUP

1. Provide a Quick Setup button, available at all times, that when pressed opens a pop-up window titled "Quick Setup".

2. The Quick Setup window contains a number of common venue configurations (**Figure 4**), used to place the AV system into one of the following modes:
 - a. **Presentation Mode**
 - i. Computer Presentation icon – set the Primary display group (and Secondary if available) to show the Computer. Hide the Connect tab. Set the Lighting Mode to Presentation. Set audio to default levels. Flip to the Record tab, if available, otherwise to the Display tab.
 - ii. Laptop Presentation icon – set the Primary display group (and Secondary if available) to show the Laptop (HDMI cable). Hide the Connect tab. Set the Lighting Mode to Presentation. Set audio to default levels. Flip to the Record tab, if available, otherwise to the Display tab.
 - b. **Web Conference Mode**
Web Conference icon – set the Primary display group to show the Computer. If a videoconference unit is available, set the Secondary display group to 'video channel', otherwise show the Computer. Set the Lighting Mode to Presentation. Set audio to default levels. Hide the Display tab. Flip to the Connect tab with the Web Conference layout (**Figure 13** or **Figure 14**). Set Presenter Camera Tracking to on. Set All Microphones Mute to off. Set Audience Microphones Mute to on.
 - c. **Videoconference Mode**
Video Conference icon – set the Primary display group to show 'content channel' of the videoconference unit. Set the Secondary display group to 'video channel' of the videoconference unit. Hide the Display tab. Set the Lighting Mode to Videoconference. Set audio to default levels. Flip to the Connect tab with the Videoconference layout (**Figure 15**). Set Presenter Camera Tracking to on. Set All Microphones Mute to off. Set Audience Microphones Mute to on.
 - d. **Critical Incident**
Critical Incident icon – set the Primary display group to show the Computer. Set the Secondary display group to 'video channel' of the videoconference unit. Show the Display tab. Set the Lighting Mode to Videoconference. Set audio to default levels. Flip to the Connect tab with the Videoconference layout (**Figure 15**). Set Presenter Camera Tracking to on. Set All Microphones Mute to off. Set Audience Microphones Mute to on.
3. The Quick Setup window may also contain, depending on the room type, a slider or other similar controls to configure mode features such as:
 - a. Room joining (see Section 4.2.20);
 - b. Display size (for rooms with video wall)

4.2.5 SOURCE PRESENTATION

1. The user is able to select a primary image, to show on the Primary display group, from a range of available presentation sources including (venue-dependent):
 - a. venue computer
 - b. laptop computer or other BYOD with HDMI interface
 - c. laptop/tablet/smartphone with wireless capability
 - d. document camera

- e. presenter and/or audience (web conference) camera
 - f. video system – content
 - g. video system – video (people)
 - h. resident media player (e.g. Blu-ray)
 - i. television tuner.
2. The user is able to select the secondary image (to show on the Secondary display set) from a range of available presentation sources, and similarly for other display sets.
 3. The user is able to display a blank image on the primary and/or other display sets (i.e. turn off some/all displayed images). A motorised screen will retract for projector screens with hidden whiteboards.

4.2.6 DISPLAY SETS

1. The system can be configured to include one or more projectors/FPDs in the Primary display set.
2. The system can be configured to include one or more projectors/FPDs in the Secondary display set.
3. The system can be configured to include one or more student pods in the Tertiary display set.

4.2.7 SOURCE CONTROL

The following presentation sources must be controllable from a pop-up window on the touch panel (e.g. **Figure 7**):

1. Document Camera – show Zoom In/Out, Auto Focus and Lamp buttons.
2. Resident media player – show the transport control buttons as per the player (e.g. Play, Pause, Stop, Menu).
3. Television tuner – show the channel change buttons.

4.2.8 LECTURE RECORDING

The control functionality for lecture recording is described below (see **Figure 8 – Figure 11**):

1. Pause button – causes the Lecture Recording appliance to pause and not capture any video or audio content. When pressed, the text for this button changes to “Please wait ...” and the button greys out until the recording appliance has completed the pause request. The button then changes to a Resume button.
2. Resume button – causes the Lecture Recording appliance to resume from a paused state. When pressed, the text for this button changes to “Please wait ...” and the button greys out until the recording appliance has completed the resume request. The button then changes to a Pause button.
3. Extend button – causes the Lecture Recording appliance to extend the current recording schedule by an extra five minutes per click (up until the start of the next scheduled recording). When pressed, the text for this button changes to “Please wait ...” and the button greys out until the recording appliance has

completed the extend request. Success of the request is indicated by an increase in the Time Remaining indicator by five minutes.

4. Time to Start – provides a countdown of the number of minutes to the next recording, starting from when the Lecture Recording appliance enters a PENDING state (five minutes).
5. Time Remaining - provides a countdown of the number of minutes remaining in the current recording.
6. Status – a status message indicates the current status of the lecture capture appliance (INACTIVE, MONITORING, PENDING, RECORDING, PAUSED). The title and scheduled start time for the pending and current recording is provided as text.
7. Recording Level – this level meter should reflect the audio activity of the current recording.
8. Preview – click to show a pop-up window containing video snapshots and audio level meter of live recording (see **Figure 12**).
9. Camera Tracking – click to change the tracking status of the Presenter Camera. When not recording, or otherwise needed, the AV system should change the tracking functionality of the camera should be OFF.
10. Audience Microphones Mute – click to change the mute status of the audience microphones (ceiling or pod tables).

The audio switching for lecture recording is described below:

1. The mixed audio of sources for the Primary and Secondary display groups and microphones is switched to the Lecture Recording appliance.

4.2.9 WEB CONFERENCE

In the 'Web Conference Only' configuration, an AV bridge is connected to a USB input of the Computer to provide the video and audio capabilities for the venue into the WebEx application.

The WebEx software application is initiated on the venue computer with Call Using Computer selected within the Audio and Video Connection pop-up window. The speaker and microphone settings should show 'AV Bridge' as selected. The video connection setting should have 'AV Bridge' selected.

The functionality of the system is described below (see **Figure 13**):

1. Primary Display Set – the venue Computer is always connected to the Primary display set.
2. Secondary Display Set (if available) – is blank until a 'non-camera' venue source is selected to share with the conference. Show this source on the Secondary display set.
3. Presenter Camera – provides the input to the AV Bridge by default. The USB output of the AV Bridge provides the local 'participant' view within the WebEx application on the venue Computer.
4. Audience Camera (if available) – can be connected as an alternate camera for the AV Bridge. In this case it will replace the 'participant' view within the WebEx application.

5. Presentation material (e.g. PowerPoint) – must be shared via the WebEx application on the venue Computer to be viewed equally by local and remote participants.

4.2.10 WEB CONFERENCING USING VIDEOCONFERENCE FACILITIES

In this configuration the videoconference facilities are used to provide the video and audio capabilities for the venue into the WebEx application.

The WebEx software application is initiated on the venue computer with Call My Video System selected within the Audio and Video Connection pop-up window. The video address is entered using the information provided on the touch panel before clicking the Connect Audio and Video button.

The functionality of the system is described below (see **Figure 14**):

1. Status – the status of the videoconference system is provided as OFFLINE (in green) or IN A CALL (in red). Also shows a red jewel with a phone symbol on the Connect tab when in a call.
2. Start a Video Conference – text is provided to indicate that the WebEx application needs to be started on the venue Computer. The SIP address of the videoconference system is provided.
3. Primary Display Set – the venue Computer is always connected to the Primary display set.
4. Secondary Display Set – the 'video' channel of the videoconference unit is connected to the Secondary display set.
5. Audience Camera – (aka web conference camera) provides an input to the videoconference unit. Audio-based switching logic enables this camera when the lecturer microphone (Revolabs) is muted or has no audio input.
6. Presenter Camera – provides an input to the videoconference unit. Audio-based switching logic enables this camera when the lecturer microphone (Revolabs) is active and has audio input.
7. Content Sharing – when a venue source is selected (e.g. Laptop), this source will be shared as the venue's 'screen' within the WebEx application.
8. Microphone and Camera Controls (see **Figure 15**) – the microphone and camera controls are venue-dependent and may include Mute All Microphones, Mute Audience Microphones and turn Camera Tracking on or off, which operate as described by their title. When not in an active conference, or otherwise needed, the tracking functionality of the camera should be OFF.
9. Presentation material (e.g. PowerPoint) – must be shared via the WebEx application on the venue Computer to be viewed equally by local and remote participants.

4.2.11 VIDEOCONFERENCE

In this configuration, the videoconference facilities are generally used to connect directly to another videoconference-enabled venue.

The functionality of the system is described below (see **Figure 16**):

1. Connection Type – the option is provided to select Videoconference as the connection type.
2. Status – the status of the videoconference system is provided as Disconnected (in green) or Connected (in red). Also shows a red jewel with a phone symbol on the Connect tab when in a call.
3. Address – A keyboard pop-up window should appear when the blank address field or the Place Call button is touched. The address field provides enough string length for full domain of a SIP address to be entered.
4. Place Call (see **Figure 18**) – provides a keyboard to enter a telephone number or SIP address and initiate a VC call.
5. PIN Pad (see **Figure 20**) – provides a separate keypad for DTMF. Provide a clear button (`*`) and an enter button (`#`).
6. Layout (see **Figure 19**) – toggle through available layouts for display of conference participants.
7. End Call – provides the ability to close a VC call.
8. Content Sharing – provides the ability to select a venue source to send to the 'far end'.
9. Microphone and Camera Controls (see **Figure 17**) – the microphone and camera controls are venue-dependent and may include Presenter Camera Tracking (on or off), Show Self View (on or off), All Microphones Mute, and Audience Microphones Mute, which generally operate as described by their title. Venues with a manually controlled PTZ camera should show camera controls (Pan, Tilt, Zoom, Presets) on this page. The purpose of the 'self view' switch is visually described in **Table 9**. When not in an active conference, or otherwise needed, the tracking functionality of the camera should be OFF.
10. Auto Answer – the default should be OFF in a meeting room where privacy is important. In this case a pop-up window should appear asking whether the occupants want to accept the incoming video call (see **Figure 37**). If the incoming call is accepted the pop-up window should disappear and the AV system change to Connect mode. The default should be ON in classrooms where the VC codec may be dialled for scheduling automation purposes.

The functionality of the call initiation and disconnection sequences are described below (see **Figure 18**).

If the Status is 'Disconnected':

1. Click either the Address field or the Place Call icon → keyboard window pops up.
2. On the keyboard window:
 - a. Select the session type (described below). Type in an address relevant for that type and click OK → keyboard window is closed. VC call is initiated:
 - i. Join WebEx – The address of the WebEx room must be entered.
 - ii. Host Session – The 'session ID' can be any string of three or more characters. This ID must be provided to participants who would like to join this videoconference session. Participants not in Curtin venues will need to type the full dial string manually, e.g. 'join.mysessionid@vc.curtin.edu.au'.

- iii. Join Session - The 'session ID' should have been provided by the host to participants who would like to join this videoconference session, e.g. 'mysessionid'.
 - iv. Custom – The full SIP address of the other videoconference system or bridge must be entered, including the '@' symbol which appears on the keyboard.
 - b. Leave the address blank and click OK → keyboard window is closed.
 - c. The cancel X symbol is clicked → address field is made blank, keyboard window is closed.
3. If VC call is successful, Place Call icon is replaced by End Call icon, Status is changed to 'Connected'.

If the Status is 'Connected':

- 1. On the Connect tab
 - a. Click the Address field → no action.
 - b. Click End Call icon → VC call is closed.
- 2. If VC is successfully closed, Address field is made blank, End Call icon is replaced by Place Call icon, and Status is changed to 'Disconnected'.

4.2.12 VENUE AUDIO FUNCTIONS

KEYPAD

- 1. Volume Knob (Rotate) – Decreases/increases audio in equal increments for each LED level.
- 2. Volume Knob (Push) – Audio is muted/unmuted using the knob as a toggle.

TOUCH PANEL

- 1. Venue audio selection – the program audio in the venue is mixed from currently displayed sources.
- 2. Venue volume level (see **Figure 29**) – all 'program' audio (i.e. not microphones) is controlled by the operation of up/down arrow buttons that:
 - a. increase/decrease audio in five per cent increments for every push
 - b. increase/decrease audio in ten per cent increments per second when the button is held.
 - c. When the volume level is at its lowest, the volume is muted and the Mute button is highlighted.
- 3. Venue volume mute – full program audio mute when the mute button is pushed. The volume is returned to previous level when the button is pushed a second time.
- 4. Microphone input level (see **Figure 21**) – for each available 'presenter' microphone (lapel, lectern, handheld), the level into the room and hearing augmentation systems (not iLecture) is controlled by the operation of corresponding up/down arrow buttons that:
 - a. increase/decrease audio in five per cent increments for every push
 - b. increase/decrease audio in ten per cent increments per second when the button is held.

- c. When the volume level is at its lowest, the volume is muted and the Mute button is highlighted.
- 5. Microphone mute – for each available ‘presenter’ microphone (lapel, lectern, handheld), the level into the room and hearing augmentation systems is muted when the corresponding mute button is pushed. The level is returned to the previous level when the button is pushed a second time.
- 6. (optional) Voice lift – a slider to turn this audio functionality ON or OFF. Voice lift enables occupants in large venues to hear conversations at the far end via graduated amplification.
- 7. Lecture Recording level – the levels for the lecture recording microphones (ceiling, boundary and student array) are set in the technician pages and not available on the Audio tab of the touch panel.
- 8. All audio outputs into the venue are muted when AV system is off.

4.2.13 ROOM CONTROL

1. Lighting - provide the following lighting presets (as available per venue – generally a, c and e):
 - a. All On
 - i. board lights 100 per cent
 - ii. presentation zone 100 per cent
 - iii. audience zone 100 per cent.
 - b. Board Writing
 - i. board lights 100 per cent
 - ii. presentation zone 100 per cent (light on presenter > 150 lux)
 - iii. audience zone dimmed (light at student level = 320 lux min)
 - c. Presentation
 - i. board lights 0 per cent
 - ii. presentation zone dimmed (light on presenter = 150 lux)
 - iii. audience zone dimmed (light at student level = 150 lux min)
 - d. Videoconference
 - i. board lights 0 per cent
 - ii. presentation zone 100 per cent (light on presenter > 150 lux)
 - iii. audience zone 100 per cent
 - e. All Off
 - i. board lights 0 per cent
 - ii. presentation zone 0 per cent
 - iii. audience zone 0 per cent
 - iv. aisle BCA minimum
 - f. Custom (per venue lighting configuration)
 - i. board lights selectable
 - ii. presentation zone selectable
 - iii. audience zone selectable.
2. Blinds and curtains – provide the following controls for each blind (or curtain) set:
 - a. Up (or Open)
 - b. Down (or Close)
 - c. Stop.

- Motorised screen – automatic with system start-up and shutdown. For a motorised screen over a whiteboard, configure also to raise when a Black source is selected for the relevant projector.

4.2.14 VIDEO ROUTING

The following tables illustrate the required video routing for display and recording for the various venue types in 'Display' and 'Connect' modes, where:

- Far end (remote venue/participants) has a red background
- Near end audience (local venue/participants) has a yellow background
- Near end presenter has a blue background
- Content (shared screen, application or venue source) has a green or purple background
- Mute (no image showing) has a black background
- PIP = picture-in-picture
- iLecture 1 = Primary input to recording unit, typically configured as a 'content' channel with medium resolution (e.g. 720p).
- iLecture 2 = Secondary input to recording unit, typically configured as a 'video' channel with medium resolution (e.g. 720p).

Table 3: Meeting Room with Web Connect Only (Single Screen) - Video Routing for Display and Recording




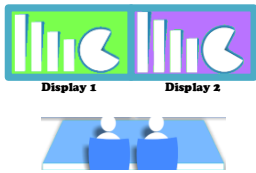


Display	Connect	
Presentation Only	Conference Only	Content Sharing
 <p>Display 1 – Venue Source (PC) Can select laptop, wireless presentation, TV, or mute.</p>	 <p>Display 1 - WebEx (PC) 'Last speaking' participant (red) can be shown full screen (if user selected).</p>	 <p>Display 1 - WebEx (PC) PC shared app (green) can be shown full screen (if user selected).</p>

Table 4: Meeting Room with Web Connect Using VC (Dual Screen, Same Size) - Video Routing for Display and Recording

Display	Connect	
Presentation Only	Conference Only	Content Sharing
 <p>Display 1 – Venue Source (PC) Can select laptop, wireless presentation, TV or mute.</p>	 <p>Display 1 - WebEx (PC) Use participant list and other WebEx functionality.</p> <p>Display 2 - Far End (VC)</p>	 <p>Display 1 - WebEx (PC) PC shared app (green) can be shown full screen (if user selected).</p>

Display	Connect	
Presentation Only	Conference Only	Content Sharing
Display 2 – Venue Source (Other) Can select same (default) or different venue source, or mute	Remote participants shown via 'video' stream. Local participants as PIP.	Display 2 - Far End (VC) Remote participants shown via 'video' stream. Local participants as PIP.

Table 5: Meeting Room with VC Connect (Dual Screen, Same Size) - Video Routing for Display and Recording

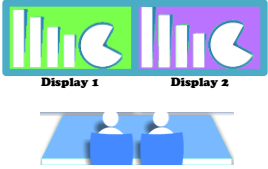
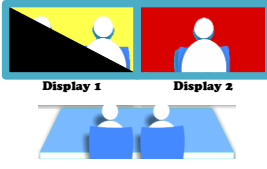

Display	Connect	
Presentation Only	Conference Only	Content Sharing
 <p>Display 1 – Venue Source (PC) Can select laptop, wireless presentation, TV, or mute.</p> <p>Display 2 – Venue Source (Mute) Can select same (default) or different venue source, or mute.</p>	 <p>Display 1 – Near End (VC) or Mute Local camera display for setup purposes. Can be muted on touch panel.</p> <p>Display 2 - Far End (VC) Remote participants shown via 'video' stream.</p>	 <p>Display 1 – Content (VC) Shared venue source shown via 'content' stream.</p> <p>Display 2 - Far End (VC) Remote participants shown via 'video' stream. Local participants as PIP.</p>

Table 6: Meeting Room with VC Connect (Dual Screen, Different Sizes) - Video Routing for Display and Recording

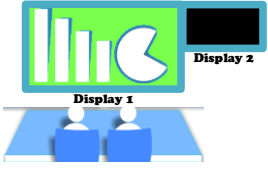
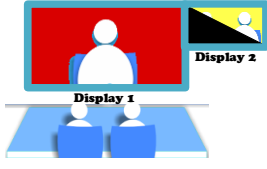
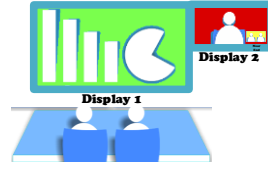
Display	Connect	
Presentation Only	Conference Only	Content Sharing
 <p>Display 1 – Venue Source (PC) Can select laptop, wireless presentation, TV or mute.</p> <p>Display 2 – Venue Source (Mute) Can select same or different venue source, or mute (default).</p>	 <p>Display 1 - Far End (VC) Remote participants shown via 'video' stream.</p> <p>Display 2 – Near End (VC) or Mute Local camera display for setup purposes. Can be muted. Note: Swapping of Display 1 and 2 compared to above configuration.</p>	 <p>Display 1 – Content (VC) Shared venue source shown via 'content' stream.</p> <p>Display 2 - Far End (VC) Remote participants shown via 'video' stream. Local participants as PIP.</p>

Table 7: Critical Incident Room (Three Screens) - Video Routing for Display and Recording

Display	Connect	
Presentation Only	Conference Only	Content Sharing
<p>Display 1 – As above.</p> <p>Display 2 – As above</p> <p>Display 3 – Venue Source (Other)</p> <p>Can select same or different venue source, or muted (default).</p>	<p>Display 1 – As above.</p> <p>Display 2 – As above</p> <p>Display 3 – Venue Source (Other)</p> <p>Can select same or different venue source, or muted (default).</p>	<p>Display 1 – As above.</p> <p>Display 2 – As above</p> <p>Display 3 – Venue Source (Other)</p> <p>Can select same or different venue source, or muted (default).</p>

Table 8: Classroom with Web Connect Only (Single Screen) - Video Routing for Display and Recording

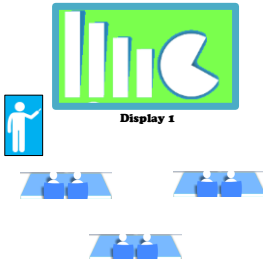
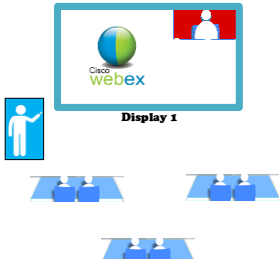


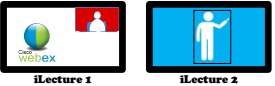

Display	Connect	
Presentation Only	Conference Only	Content Sharing
 <p>Display 1 – Venue Source (PC)</p> <p>Can select laptop, wireless presentation, TV or mute.</p>	 <p>Display 1 - WebEX (PC)</p> <p>“Last speaking” participant (red) can be shown full screen (if user selected).</p> <p>Note: Some venues allow manual selection of student camera as view of local participants.</p>	 <p>Display 1 - WebEx (PC)</p> <p>PC shared app (green) can be shown full screen (if user selected).</p>
 <p>iLecture 1 – Venue Source (Display 1)</p> <p>iLecture 2 – Presenter Camera</p>	 <p>iLecture 1 – WebEx (PC)</p> <p>iLecture 2 – Presenter Camera</p> <p>Some venues allow manual selection of audience camera as view of local participants.</p>	 <p>iLecture 1 – Display 1</p> <p>iLecture 2 – Presenter Camera</p> <p>Some venues allow manual selection of audience camera as view of local participants.</p>

Table 9: Classroom with VC Connect (Dual Front Screen and Rear) - Video Routing for Display and Recording

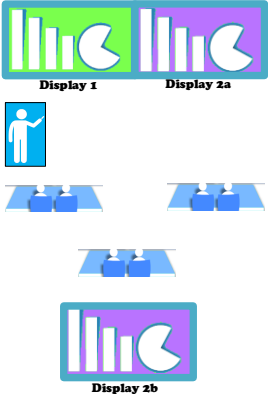
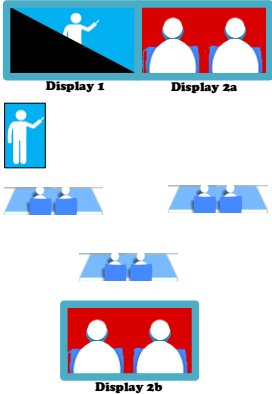
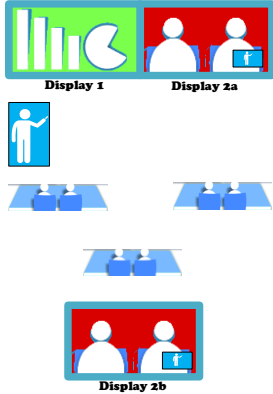




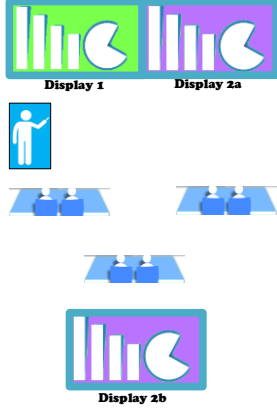
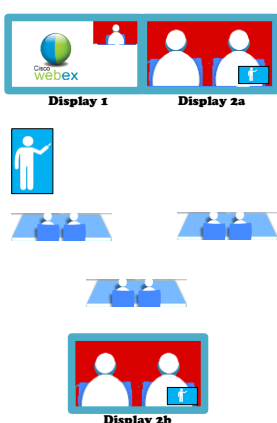
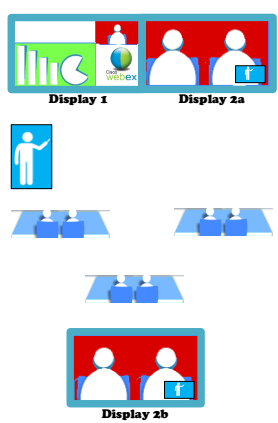


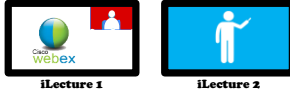

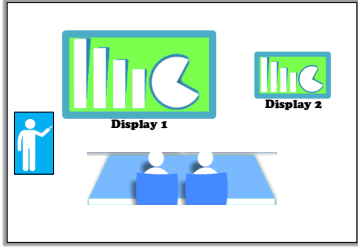
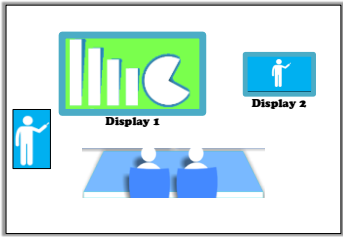
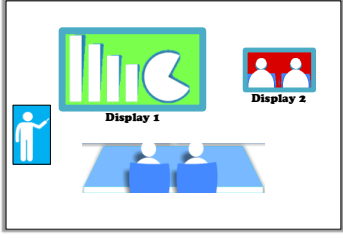
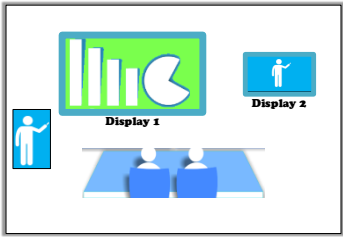
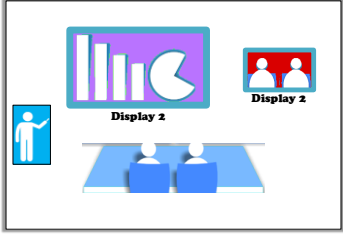
Display	Connect	
Presentation Only	Conference Only	Content Sharing
 <p>Display 1 – Venue Source (PC) Can select laptop, wireless presentation, document camera or mute.</p> <p>Display 2a/b – Venue Source (PC) Can select same or different venue source.</p>	 <p>Display 1 – Near End (VC) or Mute Local camera display for setup purposes. Can be muted.</p> <p>Display 2a/b – Far End (VC) Remote participants shown via 'video' stream.</p> <p>Note: Some venues allow voice activated selection of audience camera as view of local participants.</p>	 <p>Display 1 – Content (VC) Shared venue source shown via 'content' stream.</p> <p>Display 2a/b – Far End (VC) Remote participants shown via 'video' stream. Local participants as PIP.</p>
<p>For Display 1 = Display 2</p>  <p>iLecture 1 – Venue Source (Display 1)</p> <p>iLecture 2 – Presenter Camera</p> <p>For Display 1 ≠ Display 2</p>  <p>iLecture 1 – Venue Source (Display 1)</p> <p>iLecture 2 – Venue Source (Display 2)</p>	 <p>iLecture 1 – Far End (Display 2)</p> <p>iLecture 2 – Presenter Camera Some venues allow voice activated selection of audience camera as alternative view of local participants.</p>	 <p>iLecture 1 – Venue Source (Display 1)</p> <p>iLecture 2 – Presenter Camera Some venues allow voice activated selection of audience camera as alternative view of local participants.</p>

Table 10: Classroom with Web Connect Using VC (Dual Front Screen and Rear) - Video Routing for Display and Recording

Display	Connect	
Presentation Only	Conference Only	Content Sharing
 <p>Display 1 – Venue Source (PC) Can select laptop, wireless presentation, document camera or mute.</p> <p>Display 2a/b – Venue Source (Other) Can select same or different venue source.</p>	 <p>Display 1 - WebEx (PC) Use participant list and other WebEx functionality.</p> <p>Display 2a/b - Far End (VC) Remote participants shown via 'video' stream. Local participants as PIP.</p> <p>Note: Some venues allow voice activated of student camera as view of local participants.</p>	 <p>Display 1 - WebEx (PC) PC shared app (green) can be shown full screen (if user selected).</p> <p>Display 2a/b - Far End (VC) Remote participants shown via 'video' stream. Local participants as PIP.</p>
<p>For Display 1 = Display 2</p>  <p>iLecture 1 – Venue Source (Display 1)</p> <p>iLecture 2 – Presenter Camera</p> <p>For Display 1 ≠ Display 2</p>  <p>iLecture 1 – Venue Source (Display 1)</p> <p>iLecture 2 – Venue Source (Display 2)</p>	 <p>iLecture 1 – WebEx (PC)</p> <p>iLecture 2 – Presenter Camera Some venues allow voice activated selection of audience camera as alternative view of local participants.</p>	 <p>iLecture 1 – WebEx (PC)</p> <p>iLecture 2 – Presenter Camera Some venues allow voice activated selection of audience camera as alternative view of local participants.</p>

Note: In a classroom with two display screens at the front of the venue, Display 1 should be closest to lectern/AVIP for easy access by the lecturer.

Table 11: Shared Connection - Video Routing for Display

Display	Connect	
	Presentation Only	Connection Only
 <p>Display 1 & 2 – Venue Source (PC) Can select laptop, wireless presentation, TV, or mute.</p>	<p>Master Speaking</p>  <p>Display 1 – 'Master' Source Display 2 – Selected 'Master' Camera</p> <p>Slave Speaking</p>  <p>Display 1 – 'Master' Source Display 2 – 'Slave' Camera</p>	<p>Master Sharing</p>  <p>Display 1 – 'Master' Source Display 2 – Selected 'Master' Camera</p> <p>Slave Sharing</p>  <p>Display 1 – 'Slave' Source Display 2 – 'Slave' Camera</p>

4.2.15 AUDIO ROUTING AND LEVELS

ROUTING INPUTS TO OUTPUTS

Table 12: Audio Routing

Routing	Output	Public Address	Hearing Augmentation	Lecture Recording Appliance	AV Bridge	Codec
Input		All 3 DSP defaults	All 3 DSP defaults	All 3 DSP defaults	All 3 DSP defaults	All 3 DSP defaults
Microphone – Boundary or Ceiling	All 3 DSP defaults HPF Ducker (lapel reference)			→	→	→

Microphone – Lapel	All 3 DSP defaults 1+2 sum Logic HPF	→	→	→	→	→
Microphone – Audience Grid	All 3 DSP defaults Gated auto mixer – nom 1			→	→	→
Program	Limiter Threshold default only	→	→	→	→	→
Codec	Limiter Threshold default only	→	→	→	→	

DSP DEFAULTS:

- 3-band Parametric EQ
- Comp 4:1 Threshold = 15dB
- Limiter Threshold = 5dB.

LEVELS

1. audio signals arriving at the DSP must not clip but need to be 'warm'
2. room tuned to eliminate problematic frequencies
3. fader levels:
 - a. top – source volumes and microphone inputs are loud but 'safe' (no feedback or overload danger to system)
 - b. default level (75 per cent) – best level of source volume and microphone inputs for the venue
 - c. bottom – mute audible sound.

MUTING

1. The 'presenter' microphone (lapel, lectern, handheld) should remain muted through to front-of-house speakers when the AV system is OFF.
2. Each available 'presenter' microphone (lapel, lectern, handheld) should remain unmuted through to the Lecture Recording appliance when the AV system is OFF. This ensures that scheduled recording audio is not missed.
3. The Audience Mute button on the Record tab should be OFF by default.

4.2.16 CAMERA TRACKING

1. The tracking for the Presenter Camera should be turned ON when the following occurs:
 - a. 'Presentation' mode was selected on Quick Setup AND iLecture recording has a status other than 'INACTIVE' AND the Record tab 'Presenter Camera Tracking' icon shows ON.
 - b. 'Web conference' mode was selected on Quick Setup AND the Connect tab 'Presenter Camera Tracking' icon shows ON.
 - c. 'Video Conference' mode is selected on Quick Setup AND the Connect tab 'Presenter Camera Tracking' icon shows ON.
2. The tracking for the Presenter Camera should be turned OFF when the following occurs:
 - a. 'Presentation' mode was selected on Quick Setup AND iLecture recording has a status of 'INACTIVE'.
 - b. the 'Presenter Camera Tracking' icon shows OFF on the Connect or Record tabs.
 - c. AV system is turned off.
3. For venues with a pressure mat, the tracking for the Presenter Camera should be turned OFF and 'lectern' preset is called when the pressure mat is activated. Tracking is to be turned back ON when pressure mat is no longer activated, after a suitable delay to prevent multiple triggers causing rapid camera motion.

4.2.17 SCREEN SHARING

SOFTWARE APPLICATION

1. Provide instructions on how to share screens using the software application installed on the resident computer and student pod computers.

HARDWARE STREAMING

1. Share one pod computer to venue – the user is able to select one from the range of student pod computers to show on the Primary display set.
2. Share venue source to all pod computers – the user is able to select an image from a range of available presentation sources to show on the Tertiary display set (configured to include all pod computers).
3. Share one pod to all pod computers – the user is able to select an image from the range of student pod computers to show on the Tertiary display set.

4.2.18 INFORMATION MODE

1. For each Navigational tab (e.g. Display) – when the Information button is pressed, the screen converts to an 'Information Mode' where the whole panel has an orange border, panel elements are greyed out, and question mark icons appear next to elements that have information pop-ups available. To exit the Information Mode, either click the Information button again or anywhere on the screen that is a question mark icon.

2. For each Question Mark icon – when the question mark icon is pressed, a pop-up window appears with relevant support information.
3. Pop-up Information Window – when the cancel button is selected the Information Window closes and the touch panel returns to normal mode.

The text and imagery for the information pop-up window is provided in Audiovisual Standards Part 7 – Resource 5.

4.2.19 SUPPORT ASSISTANCE

1. Support Information – when the Support button is pressed, it provide a pop-up window displaying information about how to obtain support assistance.
2. (Future) Support Call – provides a button to use the SIP telephone functionality of the touch panel to call the CITS Service Desk directly.

The text and imagery for the Support Assistance pop-up window is provided in **Figure 28**.

4.2.20 ROOM JOIN

MASTER–SINGLE SLAVE OVERFLOW

1. Master Room – provides an option to enable the venue as a master for a simple overflow arrangement into a slave venue (see **Figure 30**). In this configuration the slave venue mirrors the display groups and audio of the master.
2. Slave Room – when joined, shows a message on the touch panel that all control is currently provided on the master (see **Figure 31**).

MASTER–MULTIPLE SLAVE OVERFLOW

1. Master Room – provides an option to select one or more slaves in a simple overflow arrangement with the master (see **Figure 32**). In this configuration the slave venue mirrors the display and audio of the master. In addition, the sources from the slave venues are also available in the master venue (see **Figure 33**).
2. Slave Room – when joined, shows a message on the touch panel that all control is currently provided on the master (see **Figure 31**).

SHARED CONNECTION

1. Master room provides an option on the Quick Select pop-up window to the 'Share Connection' mode (see **Figure 34**).
2. Show a drop-down list on the master to select one or more slaves in a two-way communication arrangement (**Figure 35**). When the **Join** button is clicked:
 - a. If other AV system(s) are OFF, then turn ON in 'Share' mode
 - b. Otherwise, ask for permission to join with "Accept incoming request to share" pop-up on other touch panel(s). The pop-up remains active for 60 seconds and if not declined then accept the join and quick setup to 'Share' mode (this allows for set-up of the share from a single venue).

3. Mic and Camera
 - a. There are two options for muting of microphones – ‘mute local’ and ‘mute all joined’. The ‘mute local’ will only mute the local microphone (others can’t hear us, but we can hear them). The ‘mute all joined’ turns on/off the two-way communication. These mute controls are linked and turn on/off accordingly (see examples in table below)
 - b. This functionality could be extended to include mute and unmute of the video feed from presenter cameras.
4. Share Content

The selection of the shared content is via the source icons on any of the touch panels in the current Share group. The last selected source is shared across all venues. If local then the source is highlighted. If not local then a message appears which indicates the venue currently active (see **Figure 36**).
5. Any venue can exit the Share group by clicking the **End Join** button (or selecting a different mode using Quick Setup). There must be at least two venues in a Share Group so when the second to last venues leaves the Group, the remaining venue is also removed.
6. If the originating venue exits the Share group using the **End Join** button, then all venues are removed (this allows for removal of the share from a single venue).

4.2.21 VENUE CONFIGURATION

Each AV control system is to be loaded with the same universal code. Venue options and configuration are to be read into the code from a separate configuration file. The required elements of the configuration file are described in Section 4.5.

One of the configurations, called ‘Room Type’, is used to select features to be enabled for specific venues:

- Type 1 – standard classroom, e.g. LEC01
- Type 2 – standard classroom, e.g. LEC02
- Type 3 – standard classroom, e.g. LEC03, CLB01
- Type 4 – standard classroom, e.g. CLB04
- Meeting Room – standard meeting room, e.g. MET01
- Meeting Room Small – two display (large/small) meeting room
- Meeting Room Large – two display (large/large) meeting room
- Event Space – open foyer, e.g. MET04
- Moot Court – e.g. P05.207
- Critical – critical incident, e.g. 100.322
- Lab – shared overflow spaces with smart glasses
- Stadium- e.g. B111
- Shared Rooms – shared spaces with two-way communications
- Management Decision Headquarters – e.g. 408.1504
- Alternate Display Mode – variable size video wall
- PBL Room – problem-based learning, e.g. B410.

4.2.22 SECOND TOUCH PANEL

A second touch panel is required in selected venues, which needs to synchronise with the primary touch panel. In some cases this second touch panel needs to be mobile (e.g. wireless tablet).

4.2.23 PIN ACCESS ON TOUCH PANEL

Some venues require PIN access to the touch panel to prevent unauthorised changes. Once the PIN has been entered on a pop-up window (**see Figure 38**), access should be provided to the touch panel for five minutes. To reactivate the PIN access before this timeout, it is required to press and hold the Shutdown button.

4.2.24 TECHNICIAN PAGES

A set of technician pages must be provided with PIN password access restriction in place. The Venue Name is used as the gateway to the technician pages (push and hold for > 3s). The PIN password is requested in a pop-up dialog box.

The following tabs are to be provided with controls and buttons as described:

1. Touch Panel (see **Figure 39**)
 - a. Touch panel version
 - b. Room name
 - c. Server setting - address of the configuration server and information about the last configuration pull.
2. Timeout
 - a. Time remaining – since the last panel action or motion detection
 - b. Shutdown time – time to automatically shut down the system (in 24-hour format)
 - c. PIR timeout – amount of time (in minutes) from last PIR activity to beginning automatic shutdown sequence.
3. Cameras
 - a. Cameras – selection of camera for configuration
 - b. Control – iris, focus, pan/tilt, zoom, tracking
 - c. Presets – selection and setting of preset positions.
4. Environment
 - a. Modes – selection of mode responses for lighting and blinds (ON, OFF, and PRESENTATION)
 - b. Event – reconfigures the touch panel and switching for Events inputs (see **Figure 40**)
 - i. Enable inputs – No change to touch panel or switching until enabled
 - ii. Camera/Aux2
In the 'Camera' position, 'Aux' appears as a new source icon on the Display tab and a new share icon on the Connect tab. The camera feed from the 'Camera/Aux2' event input replaces that of the venue's Presenter camera.
In the 'Aux2' position, 'Aux2' also appears as a new source icon on the Display tab and a new share icon on the Connect tab.

5. Devices – access to monitoring information for devices
 - a. Displays
 - b. Codec
 - c. DSP
 - d. Switcher
 - e. iLecture – configuration and monitor the iLecture appliance
 - i. server address
 - ii. server username and password
 - iii. appliance temperature
 - iv. audio input level (left and right).
6. Audio – default values for audio amplification with controls for up/down and store:
 - a. Start-up (FOH) – program, lapel and lectern mic
 - b. Record Send Levels – program, lapel and boundary mic, AV bridge.

4.3 NON-FUNCTIONAL REQUIREMENTS

4.3.1 DESIGN PRINCIPLES

The interface and control system code must adhere to the following design principles:

- self-documenting
- simple and intuitive
- hidden but available complexity
- disability accessible
- configurable per venue
- scalable for screen sizes from 7" to 12" touch panels, iPad and browser (PC widescreen).

4.3.2 RESPONSIVENESS

1. Speed of start-up sequence – the time required for the start-up sequence for a venue is to be as short as possible.
2. Accuracy of status information – the status provided about the venue functionality needs to be timely (e.g. lecture recording paused).

4.3.3 SECURITY

The interface, AV control system and configuration files must be secure from access by unauthorised users, including external parties using internet protocols.

4.3.4 ACCESSIBILITY

The interface and AV control system must be accessible by Curtin AV support staff from outside the venue.

4.3.5 DISASTER RECOVERY

The interface graphics files, AV control system source code and configuration files must be backed up on a regular basis. These backups must be able to be used to provide a timely recovery of a venue by Curtin AV support staff.

4.3.6 COMPLIANCE AND REGULATORY

To the greatest extent possible, the interface is usable by all people, without the need for adaptation of a specialised design.

4.3.7 DOCUMENTATION AND TRAINING

Documentation and training related to use of the software, customisation and administration must be provided to Curtin AV support staff.

4.4 STANDARD INPUTS AND OUTPUTS

Please refer to AV Standards Part 4 – Detailed Design Specifications for the standard connections for devices for AV System Type 2–4. The following table provides guidance to the relevant sections.

Table 13: Standard Inputs and Outputs References

AV System	Controller	AV Switcher	Audio DSP
Type 2	Table 8	Table 9	N/A
Type 3	Table 12	Table 13	N/A
Type 4	Table 16	Table 17	Table 18

4.5 CONFIGURATION DATABASE

The following list outlines the required items for the external database to be used to configure each individual venue (where %% denotes comments).

VENUE SETTINGS

Room name

Phone extension

SYSTEM SETTINGS

Venue type

Code version

Host (controller) address

Admin password
PIN Access password
PIN Access enable

ACTIVITY SETTINGS

Auto shutdown enable
Auto shutdown delay
Inactivity enable
Inactivity delay
Default source
Warmup time
Cooldown time

HELP SETTINGS

Tech support number
Error report enable
Error report message

INPUT – SOURCES

Source 1 enable
Source 1 name
Source 1 type (<PC, Camera, TV, ...>)
Source 1 transport type (<HDMI, DVI, Streaming, ...>)
Source 1 video input (<matrix input>)
Source 1 audio input (<matrix input>)
%% **add the following information if source is controllable** %%
Source 1 manufacturer (<depends on source type>)
Source 1 control type (<RS-232, IR, IP...>)
Source 1 hostname/IP address
Source 1 driver file
%% **repeat for Source 2, 3, 4, 5, 6, 7, 8** %%

OUTPUTS – VIDEO

Display 1 enable
Display 1 name
Display 1 type (<LCD, Projector, iLecture, ...>)

Display 1 transport type (<Receiver, HDBaseT, HDMI...>)
Display 1 input (<matrix output>)
Display 2 display group (<Display Group name>)
%% **add the following information if display is controllable** %%
Display 1 manufacturer (<depends on display type>)
Display 1 control type (<RS-232, IR, IP...>)
Display 1 hostname/IP address
Display 1 driver file
%% **add the following if display has associated controllable screen** %%
Display 1 screen control (<RS-232, IR, IP, Relay...>)
Display 1 screen hostname/IP address/relay
%% **repeat for Display 2, 3, 4, 5, 6, 7, 8, ... , 32** %%

OUTPUTS – AUDIO

Audio 1 enable
Audio 1 name
Audio 1 type (<Amp, VC, Hearing Loop, ...>)
Audio 1 input (<matrix output>)
Audio 1 follow (<Display Name>)

DISPLAY GROUPS

Display Group 1 enable
Display Group 1 name
Display Group 1 default source
%% **repeat for Display Group 2, 3, 4, 5, 6, 7, 8** %%

VC DISPLAY GROUPS

VC Display Group 1 enable
VC Display Group 1 name
%% **repeat for VC Display Group 2, 3, 4** %%

LIGHTING

Lighting enable
Lighting type (<Cbus/Dynalite/Dali etc.>)
Hostname/IP address or RS232 port
Area number (Dynalite)

Group addresses (Dali)
Preset 1 name (<On, Presentation, Off, ...>)
%% **repeat for Preset 2, 3, 4** %%

BLINDS

Blind Set 1 enable
Blind Set 1 name
Blind Set 1 control type (<RS-232, Relay, IP...>)
Hostname/IP address or RS232 port
Area number (Dyalite)
Group addresses (Dali)
Preset 1 name (<On, Presentation, Off, ...>)
%% **repeat for Blind Set 2, 3, 4** %%

VENUE MODES

Mode 1 name
Mode 1 lighting preset (<On, Presentation, Off, ...>)
Mode 1 lighting enable
Mode 1 blind state (<Open, Closed>)
Mode 1 blind enable
%% **repeat for Mode 2, 3, 4** %%

SWITCHER

Switcher type (<select model>)
Switcher hostname/IP address
Switcher username
Switcher password

POWER CONTROLLER

PDU enable
PDU hostname/IP address
PDU username
PDU password
%% **repeat for Outlets 2, 3, 4, 5, 6, 7, 8** %%

VIDEOCONFERENCE

VC enable
VC hostname/IP address
VC port number
VC username
VC password
VC manufacturer/model
VC Autoanswer enable

VC CAMERA

VC Camera 1 type
VC Camera 1 hostname/IP address
%% **repeat for Camera 2, 3** %%

LECTURE CAPTURE

Lecture capture enable
Lecture capture type
Lecture capture hostname/IP address
Lecture capture username
Lecture capture password

AUDIO PROCESSOR

DSP type (<QSC, Extron, Display, ...>)
DSP hostname/IP address
DSP username
DSP password
%% **repeat for each input** %%
DSP input 1 ID
DSP input 1 default volume

MICROPHONES

Microphone 1 enable
Microphone 1 name
Microphone 1 type
Microphone 1 DSP ID
Microphone 1 default volume
Microphone 1 input (<matrix input>)

%% **repeat for Microphone 2, 3, 4, 5, 6, 7, 8** %%

AMPLIFIER

Amplifier enable

Amplifier type

Amplifier control

Amplifier hostname/IP address

Amplifier username

Amplifier password

Amplifier output 1 (<matrix output>)

%% **repeat for Output 2, 3, 4** %%

AUDIO ZONE

Zone 1 exists?

Zone 1 name

Zone 1 follows display

%% **repeat for Zone 2, 3, 4, 5, 6, 7, 8** %%

USB

USB enable

USB Type

USB hostname/IP address

WIRELESS PRESENTER

Presenter enable

Presenter type

Presenter hostname/IP address

Presenter username

Presenter password

DECODER

Decoder enable

Decoder type

Decoder hostname/IP address

Decoder username

Decoder password

CAMERA CONTROL (PTZ)

Camera enable
Camera manufacturer (Panasonic/Visca ...)
Camera hostname/IP address/RS232 Port
Camera username
Camera password
Tracking default

PODS

Pod 1 exists?
Pod 1 name
Pod 1 on mode
Pod 1 switcher input

4.6 USER ACCEPTANCE TESTING

The user acceptance tests are described in Audiovisual Standards Part 7 – Resource 6.

4.7 REMOTE MONITORING

4.7.1 GUIDELINES

The remote audiovisual (AV) system management tool for Curtin University should provide a single location for the AV support team to handle remote support efficiently and with ease. It should provide remote monitoring and access to as many AV system components as possible to allow support staff to adjust, reset and check device status when requested by clients in the venue. The ability to analyse information monitored by this tool should also allow maintenance to be scheduled or initiated when needed.

Ideally the user interface will consist of a number of widgets that provide multiple views into the AV systems and infrastructure. Such widgets include:

- help requests
- support alerts
- system status
- system control, e.g. touch panel access
- venue camera live feeds
- audio control, e.g. volume levels
- support information links.

Curtin University currently uses the AMX Resource Management Suite (RMS Enterprise) application as its remote AV system management tool.

4.7.2 STAKEHOLDERS

4.7.2.1 Tier 1 AV Support

The front phone support technicians require the ability to view and access the following devices:

- touch panel
- venue camera
- iLecture SCHED
- lectern PC
- wireless presenter
- schematics
- system device list.

Tier 1 will use this remote tool to assist users over the phone and respond to requests sent from the location via the user interface.

Tier 1 should be able to resolve user-related faults and check live system status quickly and efficiently.

For example, to resolve the report of no image on a venue display, Tier 1 uses the tool to answer the following questions:

- What source is being used?
- Is a user device connected and/or switched on?
- Has the user interface been correctly set up?
- Is video detected from the required source?
- Are all devices communicating?
- Are assets switched on?

4.7.2.2 Tier 2 AV Support

Tier 2 need to have reliable and consistent alert notifications (email and/or SMS) generated by the tool. The monitoring tool should provide a hotlist of faults which will need to be monitored and proactively acted on by Tier 2. They should have the ability to implement remote support via this tool to assist quickly and efficiently to escalated incidents from Tier 1.

Tier 2 should have the ability to check system status and access systems from this tool. Information collated in the tool should provide Tier 2 support access to third party software. Tier 2 should have the ability to use information collated in the support tool to follow signal paths and problem-solve reported issues.

4.7.2.3 Tier 3 AV Support

Tier 3 should use the tool for access to system information and configuration. Reporting should be able to be utilised to schedule maintenance and any change requests for system updates and upgrades. Using scheduling, Tier 3 should have the ability to lock down and book systems to complete these change updates. An example of this may be pulling a report of system-wide firmware versions and implementing a firmware change upgrade across the AV network.

4.7.2.4 AV Management

AV Managers should use the reporting of metrics and consolidated information for strategic decisions.

4.7.2.5 Integration Contractors

The programming staff of the integration contractors configure the in-venue AV systems to report back to the central monitoring system using the standards described in the next section.

4.7.3 LOCATIONS

The organisational structure of the University AV-equipped venues must be configured using RMS **Location Groups** and **Locations** as follows:

- All Groups [← Curtin University \(Location Group\)](#)
 - Bentley [← Campus \(Location Group\)](#)
 - Building 108 [← Building \(Location Group\)](#)
 - 108.102 [← Physical Room \(Location\)](#)
 - Building 501
 - 501.101
 - 501.102
 - 501.103 [← Physical Room \(Location\)](#)
 - Central Rack 501.101-103 [← Central Rack \(Location\)](#)
 - Kalgoorlie.

4.7.4 LOCATION METADATA

The Location Metadata is primarily used to connect to hyperlinked devices and information, as shown in the following table.

Table 14: Location Metadata

Name	Type	Hyperlink Name	Hyperlink URL
Lectern PC	Hyperlink	BBB.RRR Lectern PC	http://bBBB-RRR-pc.av.curtin.edu.au:8210/
Lecture Capture	Hyperlink	BBB.RRR SCHED	http://bBBB-RRR-cap.av.curtin.edu.au
Schematic	Hyperlink	BBB.RRR Schematic	file://<Location>
Power Distribution Unit	Hyperlink	BBB.RRR ePDU	http://bBBB-RRR-pdu.av.curtin.edu.au
Presentation Switcher	Hyperlink	BBB.RRR Switcher	http://bBBB-RRR-ctlps.av.curtin.edu.au

Solstice Pod	Hyperlink	BBB.RRR Solstice Pod	http://bBBB-RRR-wpr.av.curtin.edu.au
Support Camera	Hyperlink	BBB.RRR Support Cam	http:// bBBB-RRR-cams.av.curtin.edu.au
Touch Panel	Hyperlink	BBB.RRR Touch Panel	vnc://bBBB-RRR-tpl.av.curtin.edu.au
VC Codec	Hyperlink	BBB.RRR VC Codec	http://bBBB-RRR-vc.av.curtin.edu.au

Where BBB = Building Number and RRR = Room Number

4.7.5 ASSETS

An asset is any device or object assigned to a location and tracked by the RMS system. The following standards apply in relation to assets:

1. All monitorable devices in a location are to be included, e.g. non-AMX equipment such as Extron switchers.
2. All devices must be individually monitored, e.g. an RX receiver must not be listed as the same asset as the corresponding projector.
3. No asset is to be monitored as a virtual device.
4. Device numbers utilised for RMS monitoring/reporting/control must correspond to the device numbers found in the Netlinx Studio online tree, e.g. as highlighted yellow in the screenshot below.

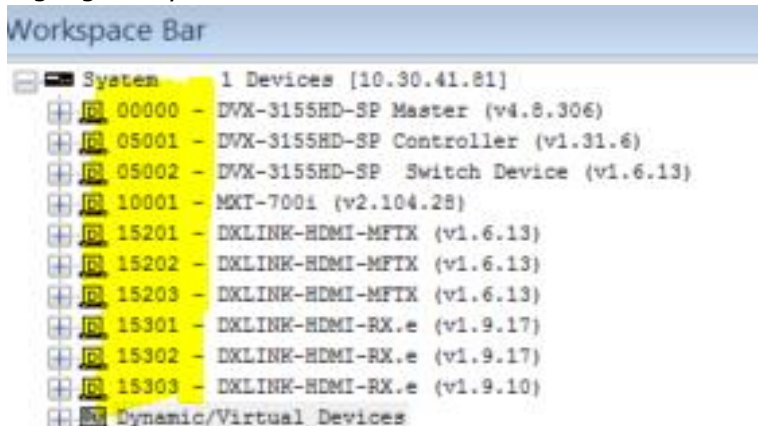


Figure 41: Device Numbers

5. Assets assigned to multiple rooms will be located in the Central Rack Location, e.g. master controller, DSP, switcher. All other assets that are part of the individual rooms should be labelled and assigned into the individual locations.

4.7.6 SETTINGS AND METADATA

An asset must be populated with the following information and metadata where available:

- asset name (see following table for naming convention)
- asset type (see following table for acceptable types)
- manufacturer
- model
- serial number
- firmware version
- IP address (metadata entry).

Table 15: Asset Naming Conventions

Asset Type	Naming Convention
Amplifier	Amplifier
Audio Conferencer	Audio Conferencer
Audio Processor	Audio Processor
Camera	Camera (purpose) – where purpose = support, audience, presenter
Control System	System
Device Controller	Device Controller
Digital Media Decoder	Decoder (peripheral) – where peripheral = display, projector, capture etc.
Digital Media Encoder	Encoder (peripheral) – where peripheral = laptop, pc, pod1, wb etc.
Digital Signage Player	Digital Signage Player
Display	<ol style="list-style-type: none"> 1. Display Primary/Secondary (X#) – where Primary/Secondary indicates source connectivity and X# describes the location if multiple displays are present where X signifies F(ront), (L)eft, (R)ight (B)ack with observer facing forward and # is numbering the projectors left to right as displayed on wall. 2. Display Pod# – to be used if the display is associated with a student pod.
Document Camera	Document Camera
Keypad	Keypad
Lecture Capture*	Lecture Capture
Light System	Lighting
Motorised Screen*	Motorised Screen
Power Device	Power
Receiver	Receiver (peripheral) – where peripheral = laptop, pc, pod1, wb etc.
Switcher	Switcher

Asset Type	Naming Convention
Touch Panel	Touch Panel
Transmitter	Transmitter (peripheral) – where peripheral = display, laptop, pc, pod1 etc.
UPS	UPS
Utility	Venue Information and Control. This asset type is a consolidation point for support information and control for a venue.
Video Conferencer	Video Conferencer
Video Processor	Video Processor
Video Projector	Projector Primary/Secondary (X#) – where Primary/Secondary indicates source connectivity and X# describes the location if multiple projectors are present where X signifies F(ront), (L)eft, (R)ight (B)ack with observer facing forward and # is numbering the projectors left to right as displayed on wall.
Wireless Presenter*	Wireless Presenter

* = Curtin defined

Note: There is no reason to use an Asset Type called 'Source Usage' (see Special Note in the Parameters section).

4.7.7 PARAMETERS

The required parameters by asset type are listed in the table below. The table includes information about parameter type, data type and any special conditions for polling or tracking the parameter variation. Where possible, parameters should be polled at least every 60 seconds.

It is understood that some physical assets may not be able to support all the parameters requested, in which case the University AV staff should be consulted for direction.

Table 16: Parameters by Asset Type

Parameter Name	Parameter Type	Parameter Data Type	Update Conditions
Audio Processor / DSP			
Fault Message	None	String	Internal faults, poll = 60 sec

Parameter Name	Parameter Type	Parameter Data Type	Update Conditions
Online Status	Asset Online	Enumeration (online, offline)	Track changes
Power Consumption Rate	Power Consumption	Decimal	Track changes
Temperature	Temperature	Number	Resolution in degrees centigrade
Volume Level (X) <source>	None	Level	Per input source X labelled with source (e.g. Lapel Mic)
Volume Mute (X) <source>	None	Boolean	Per input source X labelled with source (e.g. Lapel Mic)
Camera			
Last Selected Camera Preset	None	String	
Online Status	Asset Online	Enumeration (online, offline)	Track changes
Source Usage	Source Usage	Decimal	Track changes
Power Consumption Rate	Power Consumption	Decimal	Track changes
Control System			
System Status	System Online	Enumeration (online, offline)	Track changes
Power Status	Asset Power	Enumeration (on, off)	Track changes
Power Consumption Rate	Power Consumption	Decimal	Track changes
Last Reboot	None	String	Time and date
Reason for Last Reboot	None	String	
Number of Reboots	None	Number	
System Power	System Power	Enumeration (on, off)	Track changes
Digital Signage Player			
Online Status	Asset Online	Enumeration (online, offline)	Track changes
Power Consumption Rate	Power Consumption	Decimal	Track changes
Source Usage	Source Usage	Decimal	Track changes, resolution in hours

Parameter Name	Parameter Type	Parameter Data Type	Update Conditions
Display			
Aspect Ratio	None	Enumeration (16:10, 16:9, 4:3, Auto Full, Normal, Real, Zoom)	On condition
Fault Message	None	String	Internal faults, poll = 60 sec
Input Source	Source State	Enumeration (Computer, DisplayPort, HDMI, LAN, Video, USB - as per display labelling)	On condition, track changes, poll = 60
Power Status	Asset Power	Enumeration (on, off)	Track changes
Online Status	Asset Online	Enumeration (online, offline)	Track changes
Power Consumption Rate	Power Consumption	Decimal	Track changes
Run Time	None	Decimal	Internal counter, hourly resolution
Video Mute	None	Boolean	
Volume Level	None	Level	0-100
Volume Mute	None	Boolean	
Document Camera			
Online Status	Asset Online	Enumeration (online, offline)	Track changes
Source Usage	Source Usage	Decimal	Track changes, resolution in hours
Power Consumption Rate	Power Consumption	Decimal	Track changes
Power Status	Asset Power	Enumeration (on, off)	Track changes
Run Time	None	Decimal	Internal counter, hourly resolution
Lecture Capture			
Online Status	Asset Online	Enumeration (online, offline)	Track changes
Power Consumption Rate	Power Consumption	Decimal	Track changes
Recording State	None	Enumeration (idle, paused, recording)	Poll = 60 sec
Recording Type	None	Enumeration (scheduled, ad hoc, monitoring)	Poll = 60 sec

Parameter Name	Parameter Type	Parameter Data Type	Update Conditions
Temperature	Temperature	Number	Resolution in degrees centigrade
Motorised Screen			
Online Status	Asset Online	Enumeration (online, offline)	Track changes
Power Consumption Rate	Power Consumption	Decimal	Track changes
Screen State	None	Enumeration (up, moving, down)	Poll = 60 sec
Power Device / UPS			
Online Status	Asset Online	Enumeration (online, offline)	Track changes
Mains Voltage	None	Decimal	
Power Consumption Rate	Power Consumption	Decimal	Track changes
Temperature	Temperature	Number	Resolution in degrees centigrade
Receiver			
Aspect Ratio	None	Enumeration (maintain, stretch, zoom, anamorphic)	
Audio Mute	None	Boolean	
Online Status	Asset Online	Enumeration (online, offline)	Track changes
Video Mute	None	Boolean	
Video Resolution	None	String	
Video Scale Mode	None	Enumeration (auto, manual, bypass)	
Power Consumption Rate	Power Consumption	Decimal	Track changes
Switcher (parameters that can implemented will depend on switcher type and functionality)			
Audio Output (Y) Volume Level	None	Level	Poll = 60 sec, per output bus (e.g. FOH, Record)
Online Status	Asset Online	Enumeration (online, offline)	Track changes
Power Consumption Rate	Power Consumption	Decimal	Track changes

Parameter Name	Parameter Type	Parameter Data Type	Update Conditions
Power Status	Asset Power	Enumeration (on, off)	Track changes
Temperature	Temperature	Number	Resolution in degrees centigrade
Video Input (X) –Signal Status	None	Enumeration (not active, no signal, unknown signal, valid signal)	One parameter per input X labelled to match sources (e.g. Resident PC)
Video Output (Y) Selected Source	None	String	If available, one parameter per output Y.
Touch Panel / Keypad			
Brightness Level	None	Level	1-100
Online Status	Asset Online	Enumeration (online, offline)	Track changes
Power Consumption Rate	Power Consumption	Decimal	Track changes
Power Status	Asset Power	Enumeration (on, off)	Track changes
Volume Level	None	Level	
Volume Mute	None	Boolean	
Transmitter			
Online Status	Asset Online	Enumeration (online, offline)	Track changes
Video Auto Select	None	Boolean	
Video HDCP Compliance	None	Boolean	
Video Input Signal Status	None	Enumeration (not active, no signal, unknown signal, valid signal)	
Power Consumption Rate	Power Consumption	Decimal	Track changes
Video Conferencer / Audio Conferencer			
Audible Ring	None	Boolean	
Auto Answer	None	Boolean	
Dialer Status	Dialer State	Enumeration (dialing, busy, ringing, disconnected, connected, fault)	

Parameter Name	Parameter Type	Parameter Data Type	Update Conditions
Fault Message	None	String	Internal faults, poll = 60 sec
Input Source	Source State	Enumeration (input list)	Track changes
Last Incoming Call	None	String	Track changes
Off Hook	None	Boolean	
Online Status	Asset Online	Enumeration (online, offline)	Track changes
Power Consumption Rate	Power Consumption	Decimal	Track changes
Power Status	Asset Power	Enumeration (on, off)	Track changes
Privacy	None	Boolean	
Source Usage	Source Usage	Decimal	Track changes
Temperature	Temperature	Number	Poll = 60 sec, resolution in degrees centigrade
Volume Level	None	Level	0-100
Volume Mute	None	Boolean	
Video Projector			
Aspect Ratio	None	Enumeration (16:10, 16:9, 4:3, Auto Full, Normal, Real, Zoom)	On condition
Fault Message	None	String	Internal faults, poll = 60 sec
Input Source	Source State	Enumeration (Computer, DisplayPort, HDMI, LAN, Video, USB - as per projector labelling)	On condition, track changes
Lamp Consumption	Lamp Usage	Decimal (max = rated max per projector lamp specifications)	Internal counter, hourly resolution X.XX, track changes
Lamp Power	Asset Power	Enumeration (on, off, warming, cooling)	
Online Status	Asset Online	Enumeration (online, offline)	Track changes
Power Consumption Rate	Power Consumption	Decimal	Track changes
Run Time	None	Decimal	Internal counter, hourly resolution
Video Mute	None	Boolean	

Parameter Name	Parameter Type	Parameter Data Type	Update Conditions
Volume Level	None	Level	
Volume Mute	None	Boolean	
Venue Information and Control			
Last Activity	None	Number	
Lighting State	None	Enumeration (on, off, <other modes>)	
Source Selected (Primary)	None	Enumeration (<source list>)	Track changes
Source Selected (Secondary)	None	Enumeration (<source list>)	Track changes
System Mode	None	Enumeration (none, presentation, vc)	Track changes
System Power State	None	Enumeration (on, off)	Track changes
Volume Level	None	Level	0-100
Wireless Presenter			
Online Status	Asset Online	Enumeration (online, offline)	Track changes
Power Consumption Rate	Power Consumption	Decimal	Track changes
Version	None	String	Current software version on pod
Unmonitored Source Devices (see Special Note below)			
Source Usage	Source Usage	Decimal	Track changes, resolution in hours

Note: There is a specific Parameter Type called Source Usage for tracking hours used by unmonitored assets such as:

- DVD
- laptop (Location/Plug)
- resident PC
- set-top box
- wireless presenter.

4.7.8 CONTROL METHODS

The required control methods by asset type are listed in the table below. The table includes information about data type and any special notes about the expected action of the control method.

It is understood that some physical assets may not be able to support all the control methods requested in which case the University AV staff should be consulted for direction.

Table 17: Control Method by Asset Type

Control Method Name	Data Type	Description
Audio Processor/DSP		
Set Volume Level (X) <source>	Level	Set volume level for input X labelled with source (e.g. lapel mic)
Set Volume Mute (X) <source>	Boolean	Set volume mute for input X labelled with source (e.g. lapel mic)
Camera		
Set Power	Enumeration (on, off)	Turn on/off the asset power
Select Camera Preset	String	Change view to camera preset
Control System		
Reboot Controller	String	Enter reason for system reboot
Set System Power	Enumeration (on, off)	Turn on/off the system power
Digital Signage Player		
Set Power	Enumeration (on, off)	Turn on/off the asset power
Display		
Select Input Source	Enumeration (source names)	Set source for display
Set Power	Enumeration (on, off)	Turn on/off the asset power
Set Video Mute	Boolean	If applicable
Set Volume Level	Level	0–100. If applicable
Set Volume Mute	Boolean	If applicable
Document Camera		
Set Power	Enumeration (on, off)	Turn on/off the asset power
Lecture Capture		
Set Power	Enumeration (on, off)	Turn on/off the asset power
Motorised Screen		

Control Method Name	Data Type	Description
Set Screen State	Enumeration (up, down)	Set screen level
Receiver		
Reboot Device		Reboot the device
Set Aspect Ratio	Enumeration (maintain, stretch, zoom, anamorphic)	
Set Audio Mute	Boolean	
Set Video Mute	Boolean	
Set Video Scale Mode	Enumeration (auto, manual, bypass)	Set the video scale mode if scaling function is available
Switcher		
Select Video Source	String	Arguments are output port and input source
Set Power	Enumeration (on, off)	Turn on/off the asset power
Touch Panel / Keypad		
Beep		Signal audio tone
Calibrate		Calibrate the touch panel
Enter Setup		Enter setup configuration on the touch panel
Set Brightness Level	Level 0–100	Set the brightness level on touch panel
Set Volume Level	Level 0–100	Set the volume level on touch panel
Sleep		Wake the touch panel from sleep mode
Wake		Put the touch panel into sleep mode
Transmitter		
Reboot Device		Reboot the device
Set Video Auto Select	Boolean	
Set Video HDCP Compliance	Boolean	
Video Conferencer / Audio Conferencer		
Select Camera Preset	Number	Argument is preset list
Select Input Source	String	Argument is input source

Control Method Name	Data Type	Description
Set Power	Enumeration (on, off)	Turn on/off the asset power
Reboot		Reboot the codec
Set Auto Answer	Boolean	Set the auto answer state
Set Off Hook	Boolean	Set the off hook state
Set Privacy	Boolean	Set the privacy state
Set Volume Level	Level	0–100. If applicable
Set Volume Mute	Boolean	If applicable
Video Projector		
Select Input Source	String	Argument is input source
Set Lamp Power	Enumeration (on, off)	Turn on/off the asset power
Set Aspect Ratio	Enumeration (auto, full, normal, real, zoom)	
Set Volume Level	Level	0–100. If applicable
Set Volume Mute	Boolean	If applicable
Venue Information and Control		
Select Source (Primary)	Enumeration (<source list>)	Select the input source for the primary displays in the venue
Select Source (Secondary)	Enumeration (<source list>)	Select the input source for the secondary displays in the venue
Set Lighting State	Enumeration (on, off, <other modes>)	Set venue lighting level
Set System Mode	Enumeration (none, presentation, vc)	Set system operation mode
Set System Power	Enumeration (on, off)	Turn on/off the system power
Set Volume Level	Level	0–100. Set system volume level
Test Pattern (Primary)		Send a test pattern to the primary projector set
Test Pattern (Secondary)		Send a test pattern to the secondary projector set
Wireless Presenter		

Control Method Name	Data Type	Description
Reboot Device		Reboot the device

4.7.9 CONTROL MACROS

Control Macros are to be used in situations when a venue function needs to be automated and/or scheduled.

An example is the automatic control of outdoor digital signage displays.

4.7.10 NOTIFICATIONS AND ALERTS

4.7.10.1 Status Types and Priority

The required status types and hotlist priority are shown in following table.

Table 18: Alert Status Types and Priority

Name	Image	Display on Hotlist	Hotlist Priority
Help Request	<default>	No	100
Control System Error	<default>	Yes	90
Power Error	<default>	Yes	85
Device Communication Error	<default>	Yes	80
Security	<default>	No	70
Lamp Life Warning	Lamp	Yes	65
Maintenance	<default>	Yes	60
Network Error	<default>	No	50
Temperature Warning	Thermometer	No	45
Fan Speed Warning	Fan	No	45
System Maintenance Mode	<default>	Yes	30
New Client Gateway	<default>	Yes	20

4.7.10.2 Parameter Thresholds

The required parameter thresholds and actions are shown in following table.

Table 19: Parameter Thresholds and Actions

Asset Name	Asset Type	Device Number	Parameter Name	Parameter Type	Thres hold Name	Thres hold Action	Thres Delay
System	Control System	0:1:0	System Online	System Online	System Offline	Equal to Offline	10
TouchPanel	Touch Panel	10001:1:0	Online Status	Asset Online	Offline	Equal to Offline	10
Power Distribution Unit	Power Device	0:29:0	<Device> - Power State	None	State		10
Doc Camera	Camera	5001:3:0	Online Status	Asset Online	Offline	Equal to Offline	60
iLecture	Digital Video Recorder	0:43:0	Online Status	Asset Online	Offline	Equal to Offline	60
Lecture (iSmart)	Camera	5001:1:0	Online Status	Asset Online	Offline	Equal to Offline	60
Light System	LightSystem	5001:3:0	Online Status	Asset Online	Offline	Equal to Offline	60
iLecture	Digital Video Recorder		iLecture Fan X speed	Transport Usage	FanX Speed	<1000 RPM	60
Switcher	Switcher	0:20:0	Fan X Speed	None	Fan X Speed Fault	<100RPM	60
Audio Processor	Audio Processor	0:41:0	DSP Chassis Fan Speed	Transport Usage	DSP Chassis Fan Speed	<100RPM	60
Audio Processor	Audio Processor	0:41:0	DSP Processor Fan Speed	Transport Usage	DSP Chassis Fan	<100RPM	60

4.7.10.3 Notification Templates

The current default notifications are sufficient with the most used being:

- Asset Parameter Trip
- Asset Parameter Restore.

4.7.10.4 Notification Rules

The notification rules will be developed by Curtin University AV staff as required.

5 APPENDICES

APPENDIX A: GLOSSARY OF TERMS

Term or Acronym	Definition
AV	Audiovisual
AVIP	Audiovisual Interface Point (aka lectern)
Audiovisual (AV) System	All equipment integrated into the infrastructure necessary to fulfil the intent of the communicating audio and/or video content to an audience. It is a set of specified, individual audio and video components designed and configured to operate as one comprehensive system.
Audio	Any audio signal in either analog or digital format.
BYOD	Bring Your Own Device, e.g. laptop, tablet, smart phone.
CITS	Curtin Information Technology Services
CITS-AV	CITS Audiovisual (project and support team)
dB	decibel
DSP	Digital Signal Processor (or Processing)
DTMF	Dual Tone Multi Frequency – the signal generated by pressing ordinary telephone touch keys.
FPD	Flat Panel Display
GUI	Graphical User Interface
HDMI	High Definition Multimedia Interface
Information and Communications Technology (ICT)	Any communication device, application, or service related to radio, television, mobile, telephony, computing, networking and satellite systems.
IP	Internet Protocol
LED	Light Emitting Diode
Parametric EQ	Parametric Equalisation – audio control of three aspects of each frequency: level (boost or cut), the center or primary frequency and the bandwidth.
PC	Personal Computer

PDU	Power Distribution Unit
Presentation Media	The teaching material or meeting documentation.
UPS	Uninterruptable Power Supply
VC	Videoconference