1.0   GENERAL

1.1   Related UBC Guidelines

.1   UBC Learning Space Design Guidelines
.2   UBC Technical Guidelines Interior Building Lighting Section 26 51 00

2.0   MATERIALS AND DESIGN REQUIREMENTS

2.1   General

.1   UBC IT Audio Visual has trained Crestron programmers on staff to manage and maintain the learning space AV control systems. All control systems must be Crestron to allow internal support and maintenance

.2   UBC IT Audio Visual has a campus wide learning space AV monitoring desk. All control systems must be connected to the building network and must be remotely accessible from the monitoring desk.

.3   UBC IT Audio Visual has standardized GUI style guides and examples for standard touch panels that will be provided to the Crestron programmer. These standards and templates will form the basis of most projects, however any additional graphical elements or alternate GUI types required for unique situations will be considered within the control system programming scope of work. In cases where faculties provide their own GUI spec, the faculty GUI spec will be implemented in place of the UBC IT AV GUI standard.

.4   UBC IT Audio Visual has a comprehensive Crestron programming guideline that indicates how systems operate, and how features are to be implemented in programming. These must be followed for any control system.

.5   UBC IT Audio Visual will coordinate all UBC network configuration and IP address assignment for all control systems. Non-UBC network configurations will be coordinated with faculty network staff, or directly with third party network owners.

.6   UBC IT Audio Visual employs a team of dedicated in house AV control system programmers, and wherever feasible the utilization of these internal UBC resources for AV control system programming functions is preferred.

.7   Prior to final acceptance, UBC IT Audio Visual shall be consulted and have the opportunity to comment as well as perform quality control testing on any and all control system programming and user interfaces implemented at UBC.

.8   The UBC Point Grey campus implements the following virtual local area networks (VLANs) for audio-video systems:

.1   AV Control (trunkable on network switch)
.2   Video Conferencing (trunkable network switch)
.3   Media Capture (trunkable network switch)
.4   Room PC (requires dedicated data port)
.5   Digital Signage (requires dedicated data port)

.9   The UBC Okanagan campus implements the following VLANs for audio-video systems:

.1   AV Control (requires dedicated data port, per-building subnets)
.2   Video Conferencing (requires dedicated data port)
.3   Room PC (requires dedicated data port)
.4   Digital Signage (requires dedicated data port)

2.2   Intellectual Property

.1   It is understood that the machine language or high level programming language will remain the property of the particular audio, video or control system product manufacturer, and the University of British Columbia will have the use and benefit of this hardware/software for as long as they own this equipment.

.2   The University of British Columbia will become the outright owner of all value-added intellectual property in the form of all audio, video or control system programming (including objects, modules and macros) to adapt and configure the equipment for the specific functions and performance required by this specification, whether performed by the Audio-Visual Contractor or the product manufacturer. No password protection or other locking mechanism is permitted for all control code, modules, or macros. Supply one copy of the compiled and uncompiled source code for all the audio, video and control system value-added programming. All subsequent revisions of control code must be provided under the same guidelines as described above. Any raw graphics, custom themes, and other graphical elements implemented within the control system shall be provided, under the same stipulations as above.

2.3   Control System Processor

.1   Each control processor will have suitable control ports and connections for the scale of the project *or ethernet control field devices*.

.2   Every control processor will have Ethernet connectivity for connection to campus AV control LAN. Rooms implemented off campus will be evaluated on a room by room basis considering available infrastructure.

.3   Include Cresnet Distribution Blocks as required to avoid stacking Cresnet cables in terminal blocks.

.4   *Virtual Control Processor shall have the following features:*

   .1   *Server-based control platform for enterprise applications that can be used in place of hardware-based Crestron control systems. The platform runs programs to control multiple rooms over the network from a single, centralized location.*

   .2   *Access to XiO Cloud to validate its licenses.*

   .3   *Network connected devices to be controlled and integrated into a pre-programmed system.*

   .4   *Single server shall be capable of controlling up to 500 rooms.*

   .5   *Software shall run on the following platforms:*

      .1   *Red Hat Enterprise Linux 8.2 software (64-bit version) or greater;*
      .2   *AlmaLinux OS 8.2 software (64-bit version) or greater;*
      .3   *Rocky Linux OS 8.2 software (64-bit version) or greater.*

.5   *The control software shall support the following programming languages:*

    .1   C#
    .2   SIMPL
    .3   SIMPL#PRO

.6   All control processors shall be minimum 4-series.

.7   Approved manufacturer is:
    .1   Crestron

2.4   Touchscreen Panel

.1   All wired touch screen shall be 10" diagonal in size, colour display, installed with anti-theft bezel, locking system or suitable cable lock restraint. 15" diagonal size touch screens shall be provided for Collaboration Labs and Faculty of Medicine Lecture Theatres. 7" diagonal size touch screens can be used for basic AV systems with approval from UBC IT Audio Visual.

.2   The unit will have video preview capability, either via dedicated video input or via H.264 streaming.

.3   Provide all required video interface hardware when required.

.4   Provide Ethernet interconnection between the touch panel and control central processor and suitable power supply or PoE Injector as conditions require.

.5   Provide programming to implement the touch panel layouts in the UBC Touch panel programming guidelines or applicable faculty GUI requirements.

.6   Approved manufacturers are:
    .1   Crestron
    .2   ELO touchscreen with embedded windows running executable GUI
    .3   ELO touchscreen with Crestron DGE graphics engine

2.5   Integrated Button Control Processor

.1   Small room wall mount applications typically use wired button panel with integrated control processor for RS-232 or Ethernet control of single display device (and motorized screen where needed).

.2   Provide Ethernet interconnection to the button panel control central processor and suitable power supply as conditions require.

.3   Provide programming to implement the functions in the UBC programming guidelines.

.4   All control processors shall be 3-series or higher.

.5   Approved manufacturers *for UBC Point Grey* are:
    .1   Crestron
    .2   AMX
    .3   Biamp

.6   *Approved manufacturers for UBC Okanagan are:*
    .1   Crestron

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2.6 Remote Button Control Panel

.1 Wired button panels without integrated control processors may be paired with a separate control processor, to act as either a primary or secondary control interface.

.2 Provide wired interconnection to the central processor and suitable power supply as conditions require.

.3 Provide programming to implement the functions in the UBC programming guidelines.

.4 Approved manufacturers are:
.1 Crestron

2.7 Wireless Tablet Control Panel

.1 Wireless tablet control panels may be paired with a separate control processor, to act as either a primary or secondary control interface.

.2 Wireless tablet must be configurable to operate on UBC wireless network, including password authentication.

.3 Wireless tablet control must be configured to run current xPnael. 3rd party apps are not permitted.

.4 Provide programming to implement the functions in the UBC programming guidelines.

.5 Provide compatible docking station for storage and charged, in either wall mounted or table top mounted form.

.6 Approved manufacturers are:
.1 Microsoft Surface

2.8 Low-Voltage Projection Screen Controls

.1 Where LV projection screen controls are included in a project, include connections between AV control system LV control and the screen LV controls so that the screens may be operated from wall mounted screen button panel or the AV control system.

2.9 AVB Network Switch

.1 The network switch shall provide 10/100/1000 Mbps ports for high-speed network connectivity.

.2 The network switch shall automatically identify and determine the correct transmission speed and duplex mode of the attached devices.

.3 The network switch shall be unmanaged providing non-blocking switch fabric and wire-speed throughput as high as 48 Gbps.

.4 The network switch shall support IEEE AVB standards to enable reliable real-time audio-video transmissions over Ethernet.

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.5   The AVB network switch will remain isolated from all other networks unless required to connect to an additional audio swtich in support of the system design.

.6   Product shall be Biamp TesiraConnect, Extreme Networks Summit X440-8P, Netgear GS724T AVB V3, Motu AVB Switch or Approved Equal.

2.10   Network Switch

.1   The network switch shall provide 10/100/1000 Mbps ports for high-speed network connectivity.

.2   The network switch shall be fully managed with layer 2 and layer 3 features.

.3   The network switch shall have per-port broadcast, multicast and unicast storm control, and VLAN trunking protocol.

.4   The network switch shall automatically identify and determine the correct transmission speed and duplex mode of the attached devices.

.5   The network switch shall have Power-over-Ethernet 802.3at (PoE+) support.

.6   The network switch shall be connected and configured to use the last port for the trunk.

.7   The network switch shall have one (1) unused port configured to the AV Control VLAN used by the service team to connect a field laptop for troubleshooting the AV system.

.8   Product shall be Cisco, or Approved Equal.

2.11   Electronic Polling Device

.1   The polling device shall allow instructors to initiate an in-room polling with student participation.

.2   The polling device shall use RF (900MHz) between the base station and voting transmitter.

.3   The polling device shall have a USB connection to capture results on a PC.

.4   Refer to AVSK-13 for polling device installation details.

.5   Product shall be iClicker.

2.12   *Ethernet Control Field Devices*

.1   *The ethernet control field device shall provide RS-232, relay closures or IR to control devices.*

.2   *The ethernet control field device shall be used for the following applications:*

  .1   *Systems need to be expanded or upgraded with minimal cost or infrastructure coordination.*

  .2   *Dedicated control device requires additional functionality.*

  .3   *Infrastructure and/or space constraints necessitate deploying a networked device with a single cable.*

.4   *Control processor does not have built-in control ports.*

.3   *Approved Manufacturers are Crestron and Global Cache*

END OF SECTION