



Classroom Technology Support Minimum Classroom Standards

CTS

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PURPOSE

This document is intended to be the primary source of information to describe formal learning spaces at the University of Wyoming (i.e., classrooms). This document provides guidelines for classroom design to ensure that learning spaces meet the needs of students, faculty and staff.

The standards and recommendations for classroom design are intended to create classrooms that are characterized by the following qualities:

- Easy to use
- Intuitive design/layout
- Integration and supportability
- Reliability and performance
- Appropriately located, sized, and configured, to meet scheduling and academic programming needs
- Facilitate current pedagogy, integrating technology as appropriate
- Flexible, to cater to multiple learning styles through multiple activities
- Adaptable over time, to facilitate evolving pedagogy, changing student demographics, changing technology, and need to use classrooms for a variety of activities
- Accessible for physically challenged user access to devices

Classroom technology does not drive pedagogy. The goal is to provide instructional technologies that are simple and intuitive to use for teaching and for collaboration with tools such as video, audio and recording. The goal is to design an environment where classrooms are standardized to provide consistent learning environments and that are adequately maintained and supported for optimum operation and maximum utilization. The intent is for the instructors to be immediately familiar with the teaching space layout, with the audiovisual equipment and how to control the system, regardless of which multi-media space they happen to be assigned to, so that they can focus on the business of educating rather than spending valuable time trying to understand how to use the technologies.

SCOPE

The standards and recommendations apply to the construction of new classrooms and renovation of existing classrooms. The standards apply to general pool, department shared and department managed classrooms. These standards are not intended to apply to specialized learning spaces, such as teaching labs, studio space, or research space, however, applying these standards will promote better support of the spaces.

These standards are meant to complement internal standards developed by departments:

- UW Operations & Facility Construction maintains Technical Design Standards that specify construction parameters and preferred products

- Information Technology maintains standards for technology, including computers and computer labs.

When possible, classrooms should be designed with faculty input, to ensure that spaces are compatible with current and evolving teaching practices. In some cases, the end users of classrooms are not known during the design stage, and standards provide an important guide for creating quality learning spaces. All newly constructed classrooms shall be general pool classrooms unless they are designed to meet a specialized instructional need, such as a studio or lab.

CONTEXT: CURRENT TRENDS IN PEDAGOGY

Changes in teaching practices directly affect how classrooms are used. Two current trends impact classroom design: active, collaborative team-based learning and changing use of technology.

Active, Collaborative Team Based Learning

An increased focus on “active learning” in the classroom requires specific classroom functionality. Classrooms must accommodate increased collaboration, allowing students to work together. In some cases, classes are “flipped,” with lectures distributed online and class time being used entirely for exercises, group work, and interaction with the instructor.

In other cases, class time is a combination of traditional instruction and activities. When not lecturing, the instructor must be able to access the entire room to provide guidance to students working in groups. Depending on the subject, activities may benefit from multiple whiteboards, screens, smartboards, or computers for student use.

Use of Technology

The increased use of technology may be changing the role of physical space on campus.

Activities that may occur in classrooms include:

- Viewing of multimedia content
- Video-conferencing and/or streaming of content from outside the classroom
- Recording and/or streaming of lectures and content for viewing outside the classroom
- Use of provided computers and other electronic devices, whether stationary computers or laptops
- Use of personal computers and other electronic devices, sometimes in combination with provided electronic devices

The classroom standards were informed by these two trends. Although not every classroom must facilitate every activity, design choices, such as the inclusion of ample electrical outlets, multiple writing surfaces and sufficient Wi-Fi capacity, can impact the long-term flexibility of classrooms.

The University classroom continues to evolve and has, over the last decade, become a more active environment for engaging in learning. As we address these changes in learning environments, we need to consider the physical spaces in which we teach. Although a needed space, the traditional classroom, one in which the instructor sits or stands at the front of the room and the students sit passively in rows, is no longer the primary space in which learning takes place. Flexibility, in both layout and technology, is essential in addressing the needs of both our faculty and students.

Universities should seek to develop and foster a cooperative learning environment as one way to create more active student engagement in the classroom. Faculty and students want the ability to use portable and mobile technologies to facilitate collaboration and active learning (mobile one). The cost and ease of use of new technologies and methods for engagement and problem solving require access to wireless access at a minimum as well as space for group work, problem solving and active discussions. Portable classroom hardware and furniture will enable us to adapt the classroom to accommodate various styles of teaching and learning including discussion, group work, and problem-based learning opportunities, in addition to lectures.

Recent programming exercises for new buildings and subsequent feedback on the use of the current classrooms have resulted in the following common points of information:

- Faculty requests for flexible space in classrooms
- Faculty and student need for collaborative workspaces
- Faculty and student desire for mediated classrooms
- Ever increasing demand for special needs and accessible student furnishings.

The incorporation of web and interactive distance learning technologies has also prompted the reconsideration and design of learning spaces. Students should not be limited to physical classroom space and every opportunity to plan and install the infrastructure to support these technologies should be made for future learning opportunities across all of our campuses.

As pedagogy continues to evolve; classroom standards must be revisited.

The following items describe the *minimum* Classroom Technology Standards in UW Technology Classrooms. Any deviations from this standard must be approved by CTS.

ROOM CATEGORIES AND GENERAL CLASSROOM DEFINITION

Currently, the University of Wyoming classrooms and spaces are divided into three separate room categories. Room categories are governed by Academic Affairs and the Classroom Scheduling Committee. Room designations may not be changed without the review and recommendation of Academic Affairs, and the Classroom Scheduling Committee.

- **General Pool Rooms:** These rooms are the first priority for CTS support, and the technology for general pool classrooms is fully funded by CTS. Classroom assignments are completed through Central Scheduling.
- **Department-Shared Rooms:** Technologies in these rooms are not funded by CTS and are the second priority for CTS support. Departments preassign their classes into these classrooms and remaining open times are scheduled by Central Scheduling for teaching faculty and staff.
- **Department-Managed Rooms:** Technologies in these rooms are not funded by CTS and are the third priority for support. Departments preassign their classes into these rooms.

CTS DESIGN STANDARDS

Electronic Technology Classroom: A classroom that has fixed data/video projection capabilities, internet connectivity at the instructor's station, student networking (usually wireless) and/or other input devices, a user-friendly laptop interface, smart control system with networking option, and capabilities for other add-on modular features. All new systems must be of digital nature and compliant with HDCP and EDID protocols.

Electronic technology classrooms use standardized control/interface systems and employ a standardized operational protocol. The Technology Classroom Standard should include a help function on the control system for faculty assistance to the help desk for all classrooms but is not mandatory for dept. shared or dept. managed rooms.

All newly constructed general-purpose classrooms will meet this minimum standard. The standard will be met in major renovations wherever possible. The standard will be retrofitted in existing general purpose classrooms according to the University of Wyoming Classroom Renovation Plan.

Rooms will be equipped with a lectern, podium, pedestal or table instructor station depending on room characteristics and type of use. Special lectern/instructor stations may be specified on a case-by-case basis. MUST MEET ADA STANDARDS.

Rooms will be equipped with a standard easy-to-operate instructor control interface. The audio system will be monaural for speech reinforcement and stereo for program sound. The A/V system will be controlled by a control system with a control panel mounted on the instructor's station or located on the wall in close proximity to the instructor station. System parameters can be monitored, administered and controlled via the campus network. The A/V equipment will be located in an equipment rack inside of the instructor's station or on an adjacent wall or rack if more room is required.

It is important for the university to use a standard operating protocol so faculty can depend on a common familiar interface in the classroom. The interoperability standard is based upon existing communication protocols used by the help desk and classroom management software. Control processors and other maintenance-heavy electronics will not be mounted with ceiling projectors or above ceilings and if they have to be in the ceiling, they must be in a designated ceiling box. Control dashboards will be provided by UW CTS.

CONTROL SYSTEM

The control system will have the following features:

- The system will have a Web interface to control the system from a remote location.
- The system may have an interface that can be controlled from a mobile device or tablet.
- The main processor of each room system shall directly interface with the existing integration monitoring system (currently Crestron Fusion) at the University of Wyoming.
- Each system will have a dedicated managed Juniper (or approved by CTS) POE switch.
- When feasible equipment must be located in the podium.
- A Cisco VOIP phone will be provided for each General Pool Room.
- Devices to be controlled in the following order of preference.
 1. HDBaseT
 2. Ethernet
 3. RS-232
 4. Contact closure (relay)
 5. CEC
 6. IR will only be used when no other control protocol is available.

All devices are to have discrete power, input, volume, up, down, open and close commands where appropriate.

- All General Pool Rooms and Department Shared Rooms require control and audio/video devices are to be attached to the University of Wyoming's AV VLAN (**UW IS ALL DHCP-all the time**).
- No 802.11 wireless access points will be installed by an AV contractor. Any wireless devices must be approved by the University of Wyoming.
- Reserved IP addresses will be assigned and managed by the University of Wyoming. Have your Project Manager contact CTS for help (Don't wait till the end, this takes a bit of time.)
- CTS must be given the opportunity to review and approve any programming and functionality prior to the installation in any room.
- Podium GUI interfaces are to be a minimum size of 7" diagonal display.
- University of Wyoming CTS is to be consulted in the design of the GUI.
- The system will have indicators and alerts to assist in troubleshooting the system.
- Programming and commissioning is to be performed by the integrator and UW CTS must sign off before final payment is released.

VIDEO SYSTEM

The video system shall have the following listed requirements.

- The only input that shall be used on a projector is HDBaseT, HDMI or LAN.
- Any HDMI connection to the projector greater than 5 meters shall be made with an approved extender.
- All projectors are to be displayed on retractable screens. Exceptions for use of a White Board as a projection screen must be approved by UW CTS.
- Screen formats will be 16 x 10, 16 x 9
- All electronic powered screens are to have an interface into the local control system as well as a local low voltage wall override located by podium with a three button switch.
- All podiums are to be equipped with a desktop computer with HDMI/Display port signal and a local monitor (Likely OFE)
- Projectors shall have a minimum native resolution of 1920 x 1200 and 5000 ANSI lumens. Exceptions must be approved by UW CTS.
- All digital products shall be HDCP/EDID compliant.
- All sources and displays shall be capable of breakaway audio/video.
- The control system shall have the capability to control the projector and cameras.
- All technology rooms will utilize network trunks on the AV VLAN by using an in room switch specified by CTS.
- Signal preference is ordered as follows:
 1. HDBaseT
 2. HDMI
 3. Display Port

REMOTE RESOURCE MANAGEMENT SYSTEM (Centralized Control and Monitoring / RV Fusion)

Each Smart Classroom AV system will be connected to the campus AV network monitoring system. The software is a multi-user resource management program that allows administrators and support staff to manage AV resources, perform remote system diagnostics, track the usage of projector lamps, log network activity, and automate tasks through event scheduling. Interactive Help Desk capabilities allow users to send help requests from their touch-panel to the help desk. The system allows real-time control and cross-platform accessibility for facility managers, media directors, and IT specialists. The University of Wyoming currently employs Crestron Fusion for these needs and all new systems must be able to communicate with our local Fusion Server.

PROJECTION SURFACE

The room will be equipped with a matte white 16:9 or 16:10 aspect ratio front projection surface mounted to the front wall or ceiling. Manual electric low voltage control switches shall be located

at switch height, on the wall with a three button switch. All motorized screens shall be installed with low voltage control for the control system. Multiple screens may be required. The number of screens required is based on the type of seating, seating capacity, the configuration of the room, and the primary instruction style. No Tab Tension unless approved by CTS

To calculate the distance from the projection screen to the seats the following formulas are adequate:

- Minimum distance to front row = 2x the image height
- Maximum distance to back row = 6x the image height

TV SCREENS

In rooms where TV screens are installed for display they must be LED with CEC capable commands capable.

- a wall-mounted display between 27 inches and 80 inches above the floor may not protrude more than 4 inches from the wall per ADA standards.
- If any AV equipment installed behind (scaler, airmedia, etc) a TV then the TV must be on an approved scissor mount for maintenance purposes.

PROJECTION SYSTEM

The projection system will consist of a fixed (usually ceiling mounted) networked data/video projector capable of at least 5000 ANSI lumens, accepting inputs from HDBaseT, HDMI or LAN. The projector's native resolution shall be no less than 1900 x 1200 pixels (WUXGA). The projector shall support HDBaseT or LAN Control or Serial Control. There shall be an activated LAN port at each projector location. Projector must be ADA compliant (at least 80" above the floor). The projection path must be clear of all obstructions and must not be angled or keystone. HDMI input must comply with the latest HDCP specifications. Crestron Fusion-ready capability is required on all projectors. Maintenance: access is required to change projector lamps and clean the filters (if any) without removing the projector from its ceiling mounted location. All projectors will have ¼" aircraft type cable securely connected to the projector to a solid structure. CTS regularly establishes a projector standard that is used for any classroom upgrades. Please check with CTS to see what the current standard is.

QUICK START USER GUIDES

All completed and commissioned projects shall include a user quick start guide authored by the integrator and delivered as a PDF and an editable (.docx) file type. This guide will provide instructions for basic operation of all system functions.

INTEGRATORS

Please see the document “Integrator Information for the University of Wyoming” for detailed integrator specifications and requirements at the end of this standard.

INSTALLATION BEST PRACTICES

- All installations must adhere to the NEC (National Electric Code).
- It is preferred that podiums will be located over a floor box with no cables exposed to eliminate trip hazards and outside interference.
- Podiums will be secured with locks.
- Cables and connector are to be color-coded and labeled.
- No splicing of low-voltage cables will be permitted.
- Each team of installers will be led by a CTS-I certified Installer.
- Cables shall be dressed in a manner for ease of service and removal of equipment without undressing cables.
- Cable management will be Velcro only.
- J hooks or other approved cable supports must be used for any cable management above drop ceilings.
- Projectors are to be pipe mounted or safety cabled, tile mount, to the superstructure.
- Electrical outlets and connections for projectors shall be within 12” of the mast or mounted in tile-bridge for the projector mount.
- If equipment is in an approved ceiling box and it must not be directly above the projector and must have enough clearance (2’-4’) to properly open said box.
- All General Pool Rooms and Department Shared Rooms, control and audio/video devices are to be attached to the University of Wyoming’s AV VLAN.
- No 802.11 wireless access points will be installed. Any wireless devices must be approved by the University of Wyoming.
- IP addresses must be DHCP unless arranged and approved by UWIT CTS.
- Passive ventilation is preferred, use of fans are discouraged in classroom podiums.
- Ventilation for equipment must be provided to keep equipment rack at 85°F or less.

A/V POWER REQUIREMENTS

A 20-Amp un-switched dedicated circuit shall be provided for each of the following locations: Instructor station, each projector location and electronics rack with duplex outlets located in the cabling junction box and at the ceiling support bracket for the projector. The projector circuit will be a dedicated line independent of any lighting circuits. A green wire ground shall be required on all new construction. For new installations of projectors that require greater than a six-foot ladder for service or for rooms that have control systems that require a way to disconnect power to the projector, a security-keyed projector power kill switch will be located on the wall in a convenient location.

A/V CONDUIT REQUIREMENTS

The minimum conduit size of the fixed projector location for the signal and control cables shall be 1" with 1 ¼" preferred. Appropriately sized conduit (minimum ¾") shall be provided from cabling junction box to speaker locations and to additional equipment locations as necessary.

CABLING JUNCTION BOXES

Access to wiring connections shall be at the cabling junction box underneath the podium. The floor box will be installed in the front corner of the room beneath the teaching station location. The placement will be a minimum of 5.5 feet from each wall to allow for ADA requirements. The floor box will accept a 1 ½" low voltage conduit for AV wiring, a ¾" conduit for dedicated 20 amp 110v power service, and a 1" low voltage conduit for data. It shall also house boxes for four data jacks, one duplex outlet and all conduits necessary for connecting to other A/V system components. Boxes will be specified on a project-by-project basis between CTS and the AV consultant.

DATA REQUIREMENTS

Gigabit Ethernet Connectivity. The cabling junction box shall house a minimum of four data jacks and be located close to the teaching station: Two lines will be routed to the teaching lectern. One line will be setup as a trunk line and will connect directly to the internal switch. The second line will be a spare connection. Connectivity will also include one connection for each projector, one connection for the room schedule display, and one connection for the video feedback camera for future use. Please contact CTS for our current requirements.

ROOM EVENT PANELS

Room event panels are not encouraged but if these are required they must be POE and compatible with the Help Desk and management system and connected to 25-live.

VOIP

In General Pool Rooms an IP-based single line telephone will be located on or near the instructor station that will be POE. The phone will be configured to dial the Help Desk when the handset is lifted off hook.

WIRELESS REQUIREMENT

Each classroom should include Wireless Access Points with the capacity to support the occupancy level of the room times three (assumes each student has at least three network capable devices on them at any time). UW IT must approve any and all wireless APs and be fully involved in the setup and installation.

AUDIO SYSTEM

The room will incorporate speech reinforcement with a preferred rechargeable wireless lavalier microphone included on an as-needed basis according to room requirements. The program audio system will be a minimum of stereo and (exact type to be determined by room requirements) will be designed to fit the room's environment with an appropriate speaker system and instructor's monaural speech reinforcement as required. Large classrooms /auditoriums may have audience microphone capability provided throughout the student seating area.

The audio system shall have the following listed requirements.

- Will meet ADA requirements for assisted listening needs.
- All sources, mixers and amplifier(s) shall be connected to a matrix switch capable of audio breakaway.
- Gain structure, polar radiation measurement, and loud speaker performance shall be compliant with Audio Engineering Society standards and best practices.
- Program and room PA mute function must not mute the program or mic audio feed to the lecture capture device.

LECTURE CAPTURE AND VIDEO CONFERENCING

Information Technology has standardized on Sonic Foundry's Mediasite classroom capture product line for the campus lecture capture system. This system is commonly referred to as WyoCast.

Information Technology has standardized on the Zoom video conference system. Equipment installed to support Video Conferencing should be fully Zoom capable, but also be flexible to allow use by alternative platforms.

Note: Colleges/Departments can deploy other lecture capture and video conferencing solutions as fits best with their objectives. However, those solutions falling outside the campus standard will not have enterprise level support available to their user base(s).

AV/IT SPACE

In large capital projects or renovations where there is a large amount of technology spaces or classrooms, an office space of approximately 150 square feet will be provided to house IT professional staff.

There is often a need for a small storage room for classroom supplies that is separate from the audio/visual storage. It should be approximately 100 square feet to store board supplies, movable lecterns and additional chairs. This space requires lighting, a lockable door, conditioned air, power, and a few shelving units for small supplies. It should have no window and needs to be

equipped with a storeroom function lock. Classroom storage should be accessible from outside the classroom.

VERTICAL WRITING SURFACES (Includes Smart Walls)

- Fixed-height whiteboards should be mounted with the bottom edge at 36 inches above the finished floor.
- Each whiteboard should have a continuous marker tray below each marker board. Do not mount marker holder to the wall due to marker bleed ruining wall finish.
- At the top of the whiteboard, a tack board strip and clips for display materials are required.
- Multiple boards should be required depending on programming.
- Boards should be located on at least two different walls. There should be as many writing boards as the room will support. A board must always be installed on the front teaching wall; the other wall/walls should be selected as appropriate to the layout of the room.

ADA REQUIREMENTS

The principles of universal design establish desirable goals with respect to classroom design and installed technology. The Technology Classroom Standard includes easily-reached control panel locations, hearing assistance capability, and user-friendly operator protocols among the features that are consistent with universal design principles (based on design and structure). This includes ADA compliant podiums designated by UWIT CTS.

Design all classrooms to comply with the most recent ADA Standards for Accessible Design

- New facilities shall be compliant with ADA requirements.
- Renovated facilities shall be as compliant as possible. University Facilities Planning should be consulted when learning rooms cannot be fully compliant.

CLASSROOM LEVELS

Classrooms (10-19 Stations) Media-Ready

- One networked HDBaseT ceiling-mounted projector (optional display).
- LAN connectivity near instructor location.
- One Draper projection screen - electric. (Tab tension not preferred)
- Audio system with mounted speakers to provide program playback in the room.
- HDMI video and analog audio input on the wall.
- Smart control button panel on the wall with networking option. (optional)
- WyoShare BYOD (Crestron Airmedia) device.
- System to be integrated into the Help Desk system.

Classrooms (20-30 Stations) LEVEL I *indicates optional equipment

- One networked ceiling-mounted projector or large display.
- LAN connectivity at instructor station.
- One Draper projection screen – electric. (Tab Tension not preferred)
- Dual audio systems with mounted speakers to provide speaker and program playback in the room and a compliant assistive listening and sound reinforcement system.
- Desktop computer (HDMI) department furnished.
- User-friendly laptop interface. HDMI with audio).
- Rechargeable Wireless microphone (optional).
- Document camera (HDMI, POE LAN/HDBaseT).
- Smart control system with networking option.
- ADA Teaching station with a writing surface.
- Wall writing surfaces.
- WyoShare BYOD (Crestron Airmedia) device.
- Video conferencing system (Zoom) with video and audio to support both instructor and audience participation. *
- System to be integrated into the Help Desk system.

Classrooms (31 -120 Stations) LEVEL II* indicates optional equipment

- Two networked ceiling mounted HDBaseT/HDMI projectors.
- Two Draper projection screens.
- Desktop computer (HDMI) department furnished.
- Dual audio systems with mounted speakers to provide speaker and program playback in the room and a compliant assistive listening and sound reinforcement system.
- User friendly laptop interface (HDMI with audio).
- Rechargeable Wireless microphone.
- Document camera (HDMI POE LAN/HDBaseT).
- Smart control system with networking option.

- ADA Teaching station.
- Writing surfaces.
- WyoShare BYOD (Crestron Airmedia) device.
- Video conferencing system (Zoom) with video and audio to support both instructor and audience participation. *
- System to be integrated into the Help Desk system.

Classrooms (121- 250 Stations) LEVEL III * indicates optional equipment

- Minimum of two networked ceiling mounted projectors. (The number of projectors and specifications will be determined by CTS and the AV consultant.)
- Draper Projection screens. (Screen sizes to be determined by the AV consultant and/or CTS)
- Dual audio systems with mounted speakers to provide speaker and program playback in the room and a compliant assistive listening and sound reinforcement system.
- Desktop computer (HDMI) department furnished.
- User friendly laptop interface (HDMI with audio).
- Rechargeable Wireless microphone
- Document camera (HDMI, LAN, HDBaseT)
- Writing surfaces.
- Smart control system with networking option.
- WyoShare BYOD (Crestron Airmedia) device.
- ADA compliant teaching station
- Event capture systems (Mediasite / Sonic Foundry)*
- Video conferencing system (Zoom) with video and audio to support both instructor and audience participation. *
- Additional equipment rack (if needed)
- System to be integrated into the Help Desk system

Auditoria (251 - 1850 Seats) * indicates optional equipment

- Minimum of two networked ceiling mounted HDBaseT Laser projectors. (The number of projectors and specifications will be determined by CTS and the AV consultant.)
- Draper Projection screens. (Screen sizes to be determined by the AV consultant and/or CTS)
- Multi-audio systems with mounted speakers to provide speaker and program playback in the room and a compliant assistive listening and sound reinforcement system.
- Desktop computer (HDMI) department furnished.
- User friendly laptop interface (HDMI with audio).
- Rechargeable Wireless microphones.
- Document camera.
- Writing surfaces.
- Smart control system with networking option.
- WyoShare BYOD (Crestron Airmedia) device.
- ADA Teaching Station
- System will be integrated into the Fusion Help Desk system.
- Event capture systems (Mediasite / Sonic Foundry)*
- Video conferencing system (Zoom) with video and audio to support both instructor and audience participation. *
- Advanced audio systems
- Advanced camera systems
- Advanced control room
- Additional equipment rack (if needed)

ACTIVE LEARNING CLASSROOMS / SPECIAL NEEDS ROOMS Deviations from the standard or special needs for rooms must be approved in consultation with CTS.

VENDOR INFORMATION

Priorities for UW Classroom Technology:

- 1) Safety for Students, Faculty and Staff -don't forget the safety wiring for overhead equipment... in particular tile mounted equipment.
- 2) Reliability –it does what it was designed to do, every time.
- 3) Consistency of operation across similar rooms, across the campus. We have provided basic Touch panels for classrooms. Other examples are available on request. If you have questions, ask.
- 4) Innovation. Got a better idea? Bring it up.

UW has an A/V VLAN. UWIT has setup a campus-wide A/V VLAN.

We use an in-room switch that connects A/V equipment to the campus LAN through a single port uplink (Juniper EX2300-C-12P).

IPID; Please use our IPID conventions at UW. 03=Room View, 4=ISC, 05=Touch Panels. The rest is your choice.

TP / code; UW will provide you with classroom VTP files. We expect the finished product to look and feel like ours. For non-classroom/ teaching spaces, other solutions are possible on client approval.

Room View Modules; UW uses Fusion to manage our Crestron based classrooms. The Fusion information is included in this package.

Naming; UW has a convention, see the included document. Generally; building ID, four-digit room number and the device. (CR-0133-proc1).

IR controls IR controls are to be avoided where possible. In order, HDBaseT, CEC, RS232 and TCP/IP are preferred. CEC controls tend to be preferable to IR.

XPanels included for all rooms on the processor.

SIMPL/VTP code; as per the UW IP agreement with every job, UW CTS archives all source code at UW. If you have “trick”, “secret” or “personal” code that you want to use at UW –don’t, you will have to turn over the source as part of our IP agreement. Also, in the future, other Integrators may need the code you wrote to complete projects they’ve been awarded.

If it’s sacred to you, don’t use it at UW! Do not use locked modules. Thank you.

On completion of the project, turn all project source code over to UWIT CTS Manager. CTS will archive the code against future needs of the University. Payment will not be completed until the source is archived at UW.

Cabling and Labeling

UW has some additional requirements for the installation of equipment in racks.

We all love a tightly strapped rack, until we have to work on it or replace equipment. At UW we have hundreds of rooms to maintain and not much staff to do so. The following requirements are intended to speed up troubleshooting and equipment replacement.

- 1)** Use Velcro cable ties rather than zip ties in the lecterns/racks.
- 2)** Leave enough slack to replace the connector (once or twice) w/o pulling in new wire.
- 3)** Labeling: UW **also requires** that in addition to the primary label, the installer should include a secondary source or destination identifier. The secondary label should at least

have the exact nomenclature of the equipment jack that it connects to (i.e. “Display1 HDMI Input 1”).

4) UWIT CTS will require a complete set of original one line drawings. As-built wiring diagrams that follow all ANSI/USA standard drafting protocols of any new install. Payment will not be completed until the As-builts are delivered.

Quick Start User Guide

All completed and commissioned projects shall include a user quick start guide authored by the integrator and delivered as a PDF and an editable (.docx) file type. This guide will provide instructions for basic operation of all system functions. Try to keep it to one or two pages w screenshots.

University of Wyoming CTS equipment naming scheme

Building	Room	Device	Domain
CR-	0133-	Proc1	uwyo.edu
Cr-0133-proc1.uwyo.edu			

Names for devices that are on-line

Even if there is only one device of a type, include the number. I.e. one projector in a room would still be proj1 rather than just proj. Stay away from using zero or no number at all.

Things with names;

Processors =proc1...procX	where proc1 is the room master processor, proc2 and beyond are slave processors.
Projectors = proj1...projX	Where projector 1 = Stage Left or single projector, Proj2=stage right(from the instructors point of view), Proj3=the center projector(when there is one), proj4= an additional projector. Can't think of any room with more than 4 projectors –but STEM may have some rooms like that.
Switchers (A/V)=sw1...n	The main A/V switch is switch1 (this will mostly apply to DMswitches since other switches are seldom on-line).
Network switch=swi1...n	Network switches
Touch Panels=TP1...n	TP1= the main in-room touch panel (the one on the lectern), TP2... are additional touch panels

Transmitters=Tx1...Tx XX them	Transmitters are everywhere and I don't have a clever scheme for them	
Receivers=Rx1 ...Rx XX	Receivers are everywhere and I don't have a clever scheme for them either.	
Document cam= DocCamX	Document Camera	
Camera =CamX	Video Cameras ((not a document camera)	
TV = TV1...n	TVs, monitors	
Video Conference =VTC1..n	Video codecRoom Schedulers =RSx..n	Scheduling panels
DSP= DSP1...n	Any stand-alone DSP	
Microphones=MICx	Any mic that's remotely accessible	
WyoShare =WS1...n	WyoShare, any wireless BYOD, AM-101	
Lighting control = LCx	Any Lighting control	
Shades =Shx	any shade control	

Other devices. We can use the same convention if they are on-line. If they are off-line then they probably don't need names

Crestron Fusion

AT UW we use Crestron Fusion/Room View 8 for remote monitoring, Help Desk, device usage and some classroom control. We are using on premise, Fusion RV 11 with Room View 8 modules.

The latest Information on programming the room View Modules can be found here;

<http://crestron.com/products/line/fusion-enterprise-monitor-management-av-bms-room-scheduling-lighting-lights-shades-hvac-climate>

Use IPID 03 for the Fusion Room device.

UW will require the following Room View functionality for Crestron controlled rooms;

- Processor offline/online status
- TP on-line/off-line status
- System power on/off status
- Display power status.
- System Power remote On/Off.
- Display power remote On/Off.
- Start/Stop recording(s)
- **Help requests** from the touch panel (via Help ssi). These will be used for automatic ticket generation. Help with(7 buttons); PC, Laptop, Document Camera, DVD, WyoShare, Cancel Help request
- Projector lamp hours reporting to Fusion.
- Device usage reporting (Device usage ssi), all source devices.
- Recording (classroom Capture from Media Site. Device usage ssi)

UW maintains the Fusion RV server and will assist in getting your project on-line. Contact Classroom Technology Support. 307-766-2515, 2872

IPID

03=Fusion

04=ISC

05 = Touch Panel

06 = X panel

TOUCH PANEL SCREEN SHOT EXAMPLES

(PLEASE NOTE that CTS will provide VTP files on request.)



