1. Scope of Document
2. The Three Standards
3. Installation Requirements
4. Product Compatibility Requirements
5. Control Programming Standards

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1.0 Scope of Document

The purpose of this document is to outline requirements for new installations containing any classroom technology or audio-visual equipment.

Described herein are the typical room standards that are currently in place, the manner in which IITS requires the installation to be carried out, preferred products, and finally the programming and interface designs.
2.0 The Three Standards

There are three distinct audio-visual standards currently in use at UTSC campus defined by the size and purpose of rooms. Auditoriums and larger classrooms, defined as having 100 seats or more, follow the Large Classroom Standard. Smaller classrooms seating ninety-nine or less follow the Small Classroom Standard. Lastly, for boardroom spaces with one large central table and surrounding seats follows the UTSC Meeting Room Standard.

2.1 Large Classroom Standard

These classrooms are outfitted with a ceiling-mounted digital projector, a large projection surface, and a wooden podium known as the Full Teaching Station – hereafter FTS.

Fig 2.1.1: The Full Teaching Station in a typical large classroom
The FTS podium itself is a custom millwork wooden lectern containing all the various components required for the normal operation of the classroom. It contains a PC, Crestron processor, Crestron Touchscreen for user interaction, breakout cables for portable devices VGA + audio, HDMI and wired Ethernet, flexible podium microphone, cabinet for wireless Lavalier microphone, input plate with four USB ports, composite video/audio, and 3.5mm audio lineout connections, audio amplifier, video switching / processing hardware, and transmission hardware for the video signal(s) which often have a lengthy cable run to the projector.

Please see [http://www.utoronto.ca/teachingstation/architect.html](http://www.utoronto.ca/teachingstation/architect.html) for a comprehensive list of plans, specs, and dimensions pertaining to the FTS podium.

For large classrooms, UTSC is currently specifying a digital projector of 7000 ANSI Lumens or over. The screen height must conform to the Infocomm standard “1/6th requirement”, meaning that the height of the screen must be no shorter than 1/6th of the distance from the screen to the furthest seat in the classroom. Going forward, we specify that the screen use the 16:10 aspect ratio. The electric screen must accept low-voltage AC to be controlled by the FTS touchscreen interface.

The Large Classroom Standard requires that the audio system be comprised of ceiling mounted speakers configured in a overlap pattern suitable for the seating layout, and that the wattage of said system be powerful enough to satisfy the demands of program audio and voice reinforcement in accordance with the room’s size, layout, and composition of building materials.
2.2 Small Classroom Standard

The Small Classroom Standard comprises the Teaching Station Junior podium - hereafter TSJr - in conjunction with a data projector, audio system, and electric screen. In the case of the Small Classroom, the audio system need only be used for program (PC) audio; no microphones are in this standard. However in the cases of some borderline semi-large rooms with abnormal layouts, microphones have been included for voice reinforcement.

The TSJr is a half-height podium, which features a simple Crestron button panel for projector and volume control. The TSJr also includes a local PC inside the millwork, with monitor mounted on a flexible arm.

![Fig 2.2.1: A Teaching Station Jr. in a typical small classroom](image)

The button panel on the TSJr has basic controls for System On, System Off, VGA and HDMI source selection, screen and volume controls, and audio / video mute. There are breakout cables for portable device VGA + audio, HDMI and wired Ethernet. The input plate to the right of the button panel has similar connections to the FTS; two USB ports, composite audio and video, as well as 3.5mm audio in for mobile devices.

The Small Classroom Standard requires that the audio system and ceiling or wall–mounted speakers meet the requirements of the seating layout. For rooms of this size we are specifying a digital projector with an ANSI Lumen rating of 5000 or more. The motorized screen must meet the 1/6th height requirement, fit the 16:10 aspect ratio for all new installations, and must accept low-voltage AC for control from the podium.

More detailed information on the TSJr can be found here

http://www.utoronto.ca/teachingstation/tsj/index.html

However, note that unlike the UTSC version, the TSJr specified at aforementioned URL does not include a built-in PC.
2.3 UTSC Meeting Room Standard

In meeting room-type scenarios, IITS uses provides a single or dual wall-mounted LCD display with built-in PC for simplicity of use.

Behind the LCD display is mounted a Mac Mini (running either OSX or Windows) that is within easy reach for the use to turn it on and insert USB drive for presentation material, if required. On the table sits a wireless keyboard and mouse, and the LCD remote. Also included in this standard is an HD webcam and high quality USB table microphone for use in videoconferencing.

The display – typically 60", 70" or 80", must again meet the 1/6th requirement for screen height.

In the case of larger board- or meeting-rooms, two LCD screens should be wall-mounted on perpendicularly opposed or opposite-facing walls for optimal viewing.

Typically, these rooms do not require voice reinforcement so no microphones are needed; however program audio is required, so the LCD screens must have built-in speakers that meet the sound requirements of the room. In the case where the built-in speakers of the screen(s) are insufficiently loud, an auxiliary "speaker-bar" type amplification accessory for the display is required.

Fig 2.3.1: A typical UTSC Meeting Room
3.0 Installation Requirements

All wiring must be neat and tidy inside the podium, cabinet, or behind wall mounted displays. All cabling must be meticulously labeled using printed labels. Hand printed labels will not be accepted. Cable bundling must be done using removable Velcro ties, and never plastic zip-ties. When possible, especially in the case of the Full Teaching Station, cable management laneways as seen in fig 3.0.1 are required.

Below please see three examples of installations that followed requirements:

Fig 3.0.1: Inside the rear compartment of a well installed Full Teaching Station – note the clean integration and cable laneways.
Fig 3.0.2: Inside a well installed TSJr. Note the clear cable labeling, cleanly integrated wire blocks, and Velcro tie for bundling.
Fig 3.0.3: Top view of a clean TSJr installation – note presence of UTSC provided PC and Network Switch.
4.0 Product Compatibility Requirements

The custom millwork for the podiums used in FTS and TSJr standards are made exclusively by 9Digits Inc.

All control system hardware must be Crestron brand, in accordance with the current University of Toronto standards.

All projectors must be either NEC or Christie brand.

LCD screens for meeting rooms are currently specified as Sharp brand.

Wireless microphones for FTS are Shure brand.

NB: Podium PCs for FTS and TSJr, and mini-computers for meeting rooms are UTSC provided.

Also, all FTS and TSJr podiums are outfitted with UTSC-provided Cisco brand managed network switches. Other networking equipment must not be used without explicit approval from IITS.
5.0 Programming and Interface

5.1 Standard GUI for FTS

The FTS podium uses a standardized graphical user interface (GUI) on the Crestron Touchscreen which allows faculty and staff across three campuses to have the same user experience in every large classroom they may be using. The layout can be seen here:

![Fig 5.0.1: The standard FTS podium control GUI](image)

Seen here are all the podium controls pertaining to projector control, source selection, volume and in some cases lighting controls.

Prior to getting to this screen of the GUI, any user must log in using their universal UTORID credentials. This is tied in to the tri-campus LDAP authentication server. A touchscreen keyboard must be coded into this interface so that the user can enter their UTORID credentials before getting any further.
Fig 5.0.2 – the FTS interface video preview window

This image shows what the user will see once a source has been selected. Before “Send To Projector” is even pressed, the source video of the presenter’s material must be visible to them on the touchscreen. The reason for this is so the presenter can cue up their material before displaying to the class via the projector.

For these touchscreen interfaces, the power-saving options must be set to the following settings: the unit’s screen must go black after thirty minutes if not logged in, and after three hours if logged in.

The button layout for TSJr also follows a strict standard. However, unlike the FTS, there is no authentication required to turn on the system.

Fig 5.0.3 – The TSJr button panel layout
The Crestron Roomview Server module must be coded onto all processors for FTS, TSJr, and meeting rooms following a specified list of attributes and controls provided by UTSC. Processor and server IPs will be provided by UTSC. Furthermore, eControl (Xpanel) functionality to work in conjunction with Roomview Server must be coded onto the processor by the AV installer, and must visually resemble the standard Crestron GUI for either the touchscreen or button panel in the case of FTS and TSJr rooms.

Smaller meeting rooms do not have a control system other than remote control for the LCD screen(s).