



Extron AV Switching and Control Systems Help Logan City School District Reinvent Learning

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Drayton Bailey
Associate and Project Manager
at BNA Consulting

Logan High School is a four-year public high school in Logan, Utah, with an enrollment of approximately 1,730 students. It is a premier technology school, offering 200 standard and advanced placement classes and concurrent enrollment courses through Utah State University and Weber State University.

To maintain the school's elite status, the Logan City School District embarked on a three-year project to remodel the entire campus. A significant part of this project involved converting traditional classrooms into advanced learning environments with high-performance AV systems. The school board selected MHTN Architects of Salt Lake City to actualize their concept. Prior to designing the physical spaces, MHTN brought in BNA Consulting to discuss technology needs. BNA Consulting determined that several Extron products would play critical roles in the AV system designs. IN1608 scaling presentation switchers are at the heart of each system, eLink 100 transmitters and receivers provide wireless extension of HDMI signals, and a Pro Series control system offers flexible system operation in conjunction with the Extron Control app.

“You can have a collaborative learning environment in a square room, as long as the technology supports one-on-one instruction and is intuitive to use,” says Drayton Bailey, Associate and Project Manager at BNA Consulting. “Extron’s IN1608, wireless extender, and Pro Series control systems with mirrored control through their app provide what the Logan city School District wanted for their 21st century-style of learning engagement.”



Extron Electronics
INTERFACING, SWITCHING AND CONTROL



The AV systems had to account for the glass dividing walls and enlarged exterior windows that provide a high degree of natural light within Logan High's pod room design, including internal areas such as the Collaboration Space.

Reinventing Education by Design

Logan City School District's vision of the modern learning environment focuses on self-directed learning. The student takes the initiative to pursue an educational experience and accepts full responsibility for exploring and mastering the subject of their choosing. Materials for a broad range of fields can be accessed from class, at home through the school's learning management system, or in the open air, providing the students with the freedom to choose what and where to study. Learning is accomplished individually, in partnership with another student, or as a member of a group.

Teachers serve as the facilitator and mentor to the students during self-directed sessions. "Our objective was to take the teacher from behind the lectern, allowing them to operate the AV system from anywhere in the room and where they're needed most," says David Long, Director of Educational and Technical Services for Logan City School District.

To create the optimal space and technology solution to support this concept, the team performed an in-depth evaluation of various room layouts and AV solutions. Specific design combinations were tested at the district office. This led to a prototype learning environment being set up in one building at Logan High School. The environment was refined through extensive hands-on use by groups of students and

facilitators over a nine-month testing period. Once the architectural layout and AV system design were validated, the multi-phased remodel began.

Evolutionary Learning Environment

The physical layout of each learning environment consists of eight rooms that are interconnected in a pod layout. Two Learning Studios with adjoining Learning Labs, a small breakout room between the studio and the lab, and the Thought Gallery with full videoconferencing capabilities face each other across a central area called the Collaboration Space. Students and teachers appreciate the sense of community from the pod design and high degree of natural light provided by the enlarged exterior windows and glass dividing walls. Tables and seating options are just as unique, offering mobility in a wide range of form factors. Walls and tables are treated with a whiteboard-type coating to allow students to write notes, calculations, and draw directly on these flat surfaces.

Each Learning Lab features six workstations arranged along the walls. A document camera with commercial-grade zooming is installed in the ceiling box above each station, and an 80" flat panel display is mounted on the wall closest to that station. Just as in each studio, a cart with an 80" flat panel display can be brought into the room,

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providing a total of up to seven displays in a lab. The workstation displays are connected to the system using wallplates. Each wallplate also provides AV connectivity for portable sources with HDMI or VGA output. All selected displays can receive material shared from any of the workstation resources or a connected AV device, as well as content from the teacher's devices.

The Thought Gallery is designed as a distance learning facility. In addition to content from the resident computer, document camera, or a portable source, the feed from the videoconferencing camera can be shared selectively to the mobile 80" display and a 55" flat panel display mounted on the front wall. The school principal can broadcast from his office to any combination of Thought Galleries to hold a remote staff meeting across campus. Teachers only need to walk 20 steps to attend. Also, these spaces are used for teacher collaborations and exchanges with other campuses, using one display for content and the other showing the live feed from the remote location.

IN1608 Provides Comprehensive Signal Scaling, Switching, and Distribution in Learning Environments

Logan High's evolutionary learning environments called for a system that could support fast and reliable source switching of various video formats from computers, the document camera, and handheld devices.

The Extron IN1608 IPCP MA 70 scaling presentation switcher with DTP® extension met the requirements. It offered a high-performance scaling engine with three simultaneous outputs, two mic/line inputs for the microphone system, a built-in audio amplifier, an integrated control processor, and an Ethernet port for access to the campus LAN. To maximize the usable space, the AV equipment is installed in a plenum-rated ceiling box.

"We were looking for something that was device agnostic, able to switch and transmit signals from any device and without cables stretched across the floor," says Long. "Regardless of which learning environment room they're in, the IN1608 and the wireless system enable our students and staff to easily present using their Apple® and Windows® devices."

In rooms with six wall-mounted displays such as the Learning Labs, Extron HDMI distribution amplifiers are used to deliver signals to workstation displays via Extron HDMI Pro Series high-speed cabling.

"For our high school learning environments, we required flexible AV switching and display capabilities that were on par with an installation at a college or university," says Long. "The Extron IN1608 has the



Each Learning Lab features six workstations arranged along the walls. A flat panel display mounted by each workstation can show lesson material or content shared from a portable device with an HDMI or VGA output.



An Extron eLink 100 T transmitter in the ceiling box sends signals from the IN1608 to the eLink 100 R receiver mounted on the portable display cart.

capabilities that allow us to meet the presentation needs of self-directed as well as teacher-led instruction.”

Audio

Intelligible speech is always a top concern to educators. The IN1608 provides an ample amount of audio processing features utilized for sound reinforcement within each space, supporting program audio and voice amplification. During switching transitions, the audio output level is set to automatically ramp down and then ramp back up to match the video.

The audio power amplifier built into the IN1608 drives a 70-volt distributed sound system that incorporates Extron FF 120T Flat Field® ceiling tile speakers. Flat Field technology allowed a system design with fewer speakers in each room that maintained a consistent coverage throughout the space. This was important because students have a range of seating options with different heights, from rolling lab stools, office chairs, and geometrically shaped ottomans to sitting on the floor. For the integrator, the drop-in design of the plenum-rated FF 120T speaker made it easy to install.

A small number of rooms in the basement had flat ceilings with exposed girders. The designer selected the Extron SM 26T SpeedMount® Two Way Surface Mount Speaker for these spaces. Rather than using its concealed wall-mounting system, the integrator used the Yoke Mount kit from Extron to mount the speakers horizontally to the bottom of the ceiling joists.

Wireless Signal Extension

An Extron eLink 100 wireless transmitter and receiver pair provides signal extension from the IN1608 to the portable display cart. The wireless transmitter is installed in the ceiling box, and the eLink 100 R US receiver is mounted beneath the display cart shelf. Initially, the school administrators were concerned about interference between multiple pairs of wireless extenders installed in close proximity. A demonstration using 15 pairs of eLink extenders, with five pairs



installed side-by-side on each of three floors at the district building, proved this to be a non-issue. “Our tests with the eLink 100 extender resulted in all 15 pairs streaming video with no signal interruptions or Wi-Fi overloads, and the transmissions went where they needed to go,” says Long.

One mobile display is assigned per room. Although an eLink 100 T transmitter can support up to four receivers, the transmitter/receiver pair are matched one-to-one per room. If student activities require additional displays, the teacher can bring in carts from the surrounding learning environments and connect them to the system through wallplates. “Extron’s eLink 100 was the perfect wireless extender for what Logan City School District wanted to accomplish in their high school learning environments,” says Jaime Verhaal, Audiovisual Department Head at BNA Consulting.

Control Flexibility with TouchLink Pro Touchpanels and the Extron Control App

System control was a key element to the system design. The teacher is responsible for encouraging and guiding students using the AV system. While some system administrative rights are reserved for teachers and staff access only, the students can also use the system to explore subjects and share their thoughts. Thus, the learning curve to operate the system had to be short.



The AV system is controlled using the Extron TouchLink Pro touchpanel mounted near the main entry or from a mobile device that includes the Extron Control app.

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Each space includes an Extron TLP Pro 520M TouchLink Pro Touchpanel mounted near the main entry. It communicates via Ethernet with the IPCP Pro control processor integrated within the IN1608. This arrangement simplified wiring and reduced costs for the school.

Teachers and students can use the touchpanel to set the room to one of several pre-programmed states. The user interface design was created by using and modifying Extron's GUI templates. The touchpanels were configured using Global Configurator Plus, which also supports the Extron Control app.

To operate the AV system from a tablet or phone, the teachers and students were instructed to download the Extron Control app to their Apple® iOS and Android® devices. The app interface provides the same user experience as the TLP Pro 520M TouchLink Pro Touchpanel. Button presses sync automatically between the touchpanel and the app, providing a convenient, mobile point of control for the various learning environments.

"The teachers love the freedom of using a phone to control the AV system," says Long. "The Extron Control app allows them to operate the AV system while moving around the room or staying close to the students who most need mentoring."

Teachers and students quickly learned how to switch between systems with a tap on the app interface. If the app is closed in error, an auto-reconnect feature recalls the previous state of the interface. "One of the benefits of the Extron Control app is that it enables multiple remote users to access the system at the same time, and without having to be tethered or plugged directly into the display," says Bailey.



Results

Logan High School rooms are no longer defined merely as physical spaces with rows of desks and a teacher who lectures from the front. Instructors and students now experience premier learning environments with flexible technology that is easy to use. Prior to the campus reinvention, aging equipment and lack of comfort with system operations often left teachers to plan lessons without the benefits of technology. This greatly diminished the potential advantages that technology could bring to student learning outcomes.

Teachers have since discovered an unprecedented opportunity to redefine their roles and tailor instruction to the individual student with the new paradigm of personalized instruction in reinvented learning environments featuring IN1608 scaling presentation switchers. Self-directed learning and the technology that can support it have played a pivotal role in modernizing teaching and student engagement at Logan High. "Our new environments with their high-end AV systems are agile and versatile enough to facilitate any learning style, be it individual, partnered, group, or whole class work. They spark the imagination of our students in a celebration of collaboration, thinking out loud, and top-speed problem solving," says Kenneth Auld, Principal at Logan High School.

"Learning that bridges formal and informal educational experiences is accomplished through the effective use of advanced technologies," says David Long at Logan City School District. "Competency-based progressions and digital learning modalities were enabled by Extron's IN1608 presentation switcher, wireless extenders, and Pro Series control."



Displays mounted in common areas are used to share school information and augment live events, such as Logan High's prestigious science and history fairs.

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