All photographs courtesy of Hoang Minh
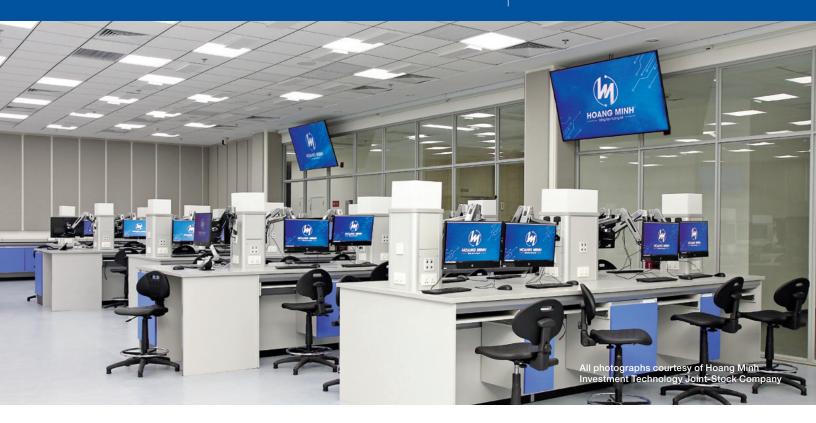Investment Technology Joint-Stock Company

Extron AV Switching, Streaming, and Sound Systems Augment Lab Studies at VinUniversity

"We did our utmost to give VinUniversity the best solution in terms of features and cost. Working closely with the administration, the professors, and the staff, we were able create AV systems with Extron products that are both fully functional and comfortable for the university users to operate."

Nguyen Truong Giang
Vice Director
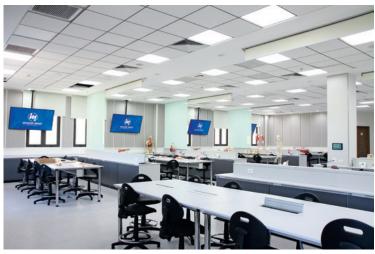Hoang Minh Investment Technology JSC

Challenges

VinUniversity is a private, not-for-profit university located in the Gia Lam district of Hanoi, Vietnam. Its mission is to educate and develop the talents and skills of Vietnam's youth, as well as provide in-country career paths. The campus buildings include lecture halls, classrooms, labs, multipurpose rooms, a medical simulation center, and a technologically enhanced library. Each structure also provides conference and meeting rooms.

At VinUniversity, they encourage the use of new training methods that help students learn to be proactive in mastering teamwork and soft skills across a wide range of career paths. To support this mission, the school needed high-performance AV signal switching and robust sound systems, along with streaming capabilities and user-friendly control. Integration firm Hoang Minh Investment Technology Joint-stock Company – HMICO worked in conjunction with the university planners to design and build complete AV solutions with products from Extron.

While Extron solutions are used across campus, this case study focuses on the AV systems installed in the building that houses multiple laboratory spaces that support a variety of academic disciplines.

The low-profile design of the Extron DTP HDMI 4K 230 Rx receiver allowed it to easily fit behind each of the 21 wall-mounted displays in the dry anatomy super lab.

Each display can show different material at resolutions up to 4K/60, with the source content routed by an Extron DXP 168 HD 4K PLUS matrix switcher.

Design Solution

VinUniversity's Building G houses multiple state-of-the-art labs as well as various support rooms and meeting spaces. The three stories of labs support a range of studies, from engineering and robotics to anatomy and chemistry. Two of the largest are super labs, each having an extensive number of displays and an independent Extron AV matrix switching and distribution system.

Extron Matrix Switching & Robust Sound Systems Facilitate Close Examination for Medical Students

An Extron DXP HD 4K PLUS 16x8 HDMI matrix switcher is at the heart of the anatomy lab, enabling the switching of multiple 4K/60 video sources to the displays wall-mounted around the lab. Rack-mounted and remote sources within the lab along with the displays are connected to the matrix switcher using DTP® transmitters and receivers for signal extension in the 2,583-square foot (240-square meter) facility. AV device control and audio can be extended over the same twisted pair cable infrastructure used for the 4K/60 video. The rack-mounted matrix switcher also de-embeds audio for integration with the sound system.

Extron transmitters and receivers enable optimal signal quality between the matrix switcher and the lab sources and displays. Extron DTP HDMI 4K transmitters and DTP wallplate transmitters send the 4K/60 HDMI source signals back to the matrix switcher. The DTP extenders provided clean and simplified integration of AV device control and audio within the room. For support of DisplayPort signals, the DTP T DWP 4K wallplate provides automatic switching between the two video inputs, simplifying operation.

An Extron DTP HDMI 4K receiver is installed at every flat panel display in the lab. Its low-profile design allowed it to be easily placed behind the wall-mounted displays. Signal extension of 4K/60 video, audio, and control signals was handled with ease by the DTP receivers as well as the transmitters that are capable of signal extension up to 230' (70 m). They also support transmission of HDCP 2.3-encrypted content.

An Extron ShareLink Pro 500 collaboration gateway facilitates wireless connectivity for the instructor and staff from any point within the super lab. It adds support for a Mac® or Windows® laptop, as well as Apple® and Android™ tablets and smartphones. Connected using a USB adapter, the gateway's Miracast™ capability enables content sharing without installing additional software, which is particularly appreciated by the university staff.

Powerful ProDSP™ Processing Enables Clear Sound Over Ambient Lab Noise

HMICO had concerns about the acoustics because of the lab's highly reflective surfaces. The solution was the Extron DMP 128 Plus ProDSP™ processor. This 12x8 audio processor was deployed to mix the live instructor and workstation microphones with the program audio, as well as ensure clear audio for streamed and archived recordings. An Extron XPA U 1002-100V amplifier rack-mounted with the matrix switcher distributes audio to 16 CS 26T Plus ceiling speakers. This speaker model was selected for several reasons. It includes a built-in transformer and a ferrofluid-cooled dome tweeter center-mounted on a honeycomb tweeter bridge that provides smooth off-axis response and wide 112° conical coverage. These features also enabled flexible speaker spacing to facilitate requirements within each of the labs.

XTP: A Powerful Tool for Research and Study within the Engineering Super Lab

To support the 4,306-square foot (400-square meter) engineering super lab, an Extron XTP® system provides high-performance matrix switching and distribution of HDMI over shielded, twisted pair cable.

The XTP II CrossPoint 1600 modular matrix switcher is configured with 4K HDMI and twisted pair I/O boards. The XTP II CP 4i HD 4K PLUS and XTP CP 4i 4K input boards support content from rack-mounted sources and those located within the lab. For AV and control signal distribution throughout the 4,306-square foot (400-square meter) lab, the matrix switcher includes XTP HDMI and twisted pair output boards. The XTP II CrossPoint® model was selected because of its modularity, reliability, and proven performance. As technologies evolve, such as higher resolutions, the matrix switcher frame stays in place while the XTP I/O boards are swapped out to meet new requirements. This is both efficient and cost effective for VinUniversity.

The engineering super lab uses an XTP II CrossPoint Series modular matrix switcher populated with a mix of XTP twisted pair and HDMI I/O boards that support distribution of 4K HDMI signals throughout the lab. The frame can be reconfigured as display technologies evolve.

Extron XTP T HD 4K HDMI transmitters extend signals from sources installed within the lectern to the matrix switcher. The XTP II output boards paired with 12 XTP R HD 4K receivers support the multiple displays over distances up to 330 feet (100 meters). This lab's AV system also supports wireless connectivity over the university network using six Extron ShareLink® Pro collaboration gateways.

Offering superior sound quality, the engineering super lab is designed around Dante® audio signal distribution for future scalability. It combines 14 AXI 02 AT audio interfaces and an AXI 22 AT interface, creating a sound system that takes advantage of AES67 standards and the university's high-speed network for distribution of line level audio. An Extron XPA 2002-100V audio amplifier feeds 12 CS 26T Plus ceiling speakers that ensure clear sound throughout the lab.

To facilitate streaming within the lab, 12 SME 211 encoders stream content that can include different resolutions and bit rates. The encoders also provides independent stream control, enhancing system flexibility.

A VLC media player embedded in the software running on each student computer decodes the streams from the SME 211 units. An Extron SMP 351 H.264 Streaming Media Processor simultaneously records, streams, and stores the content for later viewing.

Results

VinUniversity provides Vietnam's youth with an institute of higher learning that facilitates their studies and offers the graduates career paths that can improve the quality of life throughout Vietnam. The AV systems contribute to the school's efforts to help students achieve degrees in a wide variety of occupations. Additionally, technology is one small part of why VinUniversity has attained and maintained QS 5-star standard certification awarded by Quacquarelli Symonds of the United Kingdom. They have received recognition in three important areas: Facilities, Academic Development, and Inclusiveness.

The Extron DTP, XTP, and audio systems provide all of the required features and capabilities while staying within the lab building's budget for initial outlay and scheduled maintenance.