



CASE STUDY

Extron AV over IP and Control Enable Extensive Connectivity Capabilities at TU Delft's New Echo Building

Extron



The largest lecture hall is located on the ground floor and has the capacity to seat up to 700 students. It can be swiftly partitioned into three distinct rooms within 15 minutes. The combination of Extron NAV Systems and Extron Pro Series Control ensure seamless AV system operation in any configuration.

Delft University of Technology (TU Delft), in Delft, Netherlands, is renowned as the oldest and most extensive Dutch public technical university. By 2022, it had earned a distinguished place among the world's top 10 institutions for engineering and technology, as recognized by the QS World University Rankings.

The Echo building, a recent addition to their campus, was thoughtfully conceived to address the university's dynamic requirements for adaptable teaching spaces both in the present and the future. This architectural marvel is a dynamic hub for innovative learning, collaboration, and social interaction. Remarkably, it boasts energy-positive credentials and harmonizes seamlessly with its surrounding public spaces.

To address the university's need for connecting different halls to accommodate overflow situations, the system designers opted for the Extron NAV Pro AV over IP System to route all signals through the building's network. The NAV System plays a pivotal role as the core infrastructure of the entire AV system.

The Echo building offers more than 350 locations for group work and self-study.



Fresh air is pumped up from the floor. Vents can be relocated to accommodate changes to the room layout.

CHALLENGES

The Echo building boasts a generous 8,844 square meters (95,000 square feet), thoughtfully distributed across four floors. Various educational activities are accommodated within this space, including lectures, tutorials, group collaborations, project-based education, debates, and self-study sessions. The building's interior layout is designed to feature both medium and large rooms, with capacities ranging from 150 to 700 individuals. Additionally, several smaller rooms have been designated to facilitate specialized activities, such as project-based education, accommodating groups of up to 70 participants.

Designing the AV System

Versatile Teaching Spaces: The Echo building's diverse teaching rooms, including flexible layouts and the ability to divide the largest lecture hall into three separate rooms, required a highly adaptable AV system. Ensuring that AV equipment, such as projectors, screens, and microphones, can seamlessly transition between different room configurations was crucial. The system had to accommodate various teaching methods, from traditional lectures to interactive discussions and project-based activities.

User Experience and Interaction: TU Delft administrators wanted to boost social interaction between students, teachers, and visitors by implementing an AV system to support collaborative learning and group interaction. Additionally, the AV system had to be user-friendly to ensure that students and faculty could easily operate and access the technology.



The architects of the Echo building envisioned a welcoming space for both students and visitors to gather. It was essential for the AV systems to blend effortlessly with the rest of the facility's features.

Sustainability and Energy Efficiency: TU Delft's commitment to sustainability and carbon neutrality required that the selected AV equipment be able to support the building's energy-efficient initiatives. This meant integrating a wide range of power-saving features and ultra-efficient power supplies.

Scalability and Future-Proofing: With the increasing student population and evolving educational methods, the AV system had to accommodate potential modifications to teaching spaces.

Architectural Integration: The building's architects envisaged an attractive meeting place for students and visitors. The AV system had to seamlessly integrate with other facility features. Coordination with these elements was essential to create a holistic user experience that would encourage social interaction and convenience within the building.

In summary, designing the AV systems for the Echo building involved addressing the unique demands of versatile teaching spaces, enhancing user interaction, aligning with sustainability goals, ensuring scalability, and integrating with the overall building design.

The Echo Building features a total of seven teaching rooms, most of which, like this classroom, have a flexible layout.



DESIGN SOLUTION

The building's AV systems were designed by AV integrator PCI in cooperation with TU Delft's Marco Buitenhuis. The completion of the entire AV system project spanned nearly four years, from initial discussions to the final installation phase.

Extron products have been the longstanding standard for AV spaces at TU Delft, promoting consistency and standardization across the entire campus. This standardized approach streamlines installation, AV control programming, and troubleshooting, enhancing overall efficiency.

Multiple Learning Spaces with Maximum Flexibility

Buitenhuis, AV/IT Expert at TU Delft, explained some of the reasons for choosing Extron: "Due to integration in our existing AV ecosystem, a successful pilot, and proven technical support, it was an easy choice to implement Extron NAV Pro AV over IP in our new education building."

The Echo building is home to ten unique educational spaces, each crafted to cater to a range of teaching methodologies. Among these spaces, five are specifically designed for high-tech AV presentations. Each of these rooms is equipped with a digital writing board and an Extron MGP 641 Multi-Window Processor which supports 4K/60 video for an engaging learning experience.

Diving deeper into the functionalities of the five advanced AV rooms, three of them serve as 'classic' lecture halls designed primarily for traditional, frontal teaching. The remaining two are intended for collaborative learning, encouraging group discussions and activities.



An Extron TouchLink Pro touchpanel makes it easy for instructors to select between various sources for display on the screens in the large lecture hall.

"Whenever a request comes to connect different halls together for overflow purposes, it is easy to accommodate because every signal is already on the network with NAV to pick up."

Marco Buitenhuis
AV/IT Expert
TU Delft University



The Debate Hall serves as a hub for discussions, intellectual exchange, and collaborative thinking.

Beyond these, the Echo building also offers a separate room dedicated solely to student debates. Moreover, there are four spaces crafted as project rooms, supporting a variety of learning activities. A notable feature in some of these rooms is the presence of movable walls, which provide flexibility in room configuration. The NAV System plays a crucial role in ensuring seamless AV operations, regardless of whether rooms are combined or kept separate.

To ensure fluid transitions between sources, these rooms use the Extron SW HD 4K PLUS Series HDMI Switcher, which is managed through a TouchLink® Pro touchpanel at the lectern. A key advantage of this switcher is the incorporation of Extron EDID Minder® technology, which guarantees uninterrupted communication with the connected source devices.

AV over IP System Management

The building's central rack houses the NAVigator System Manager, a secure appliance that centralizes control of the NAV System. It also accommodates multiple NAV encoders, which accept signals from cameras and whiteboards, as well as NAV scaling decoders, which provide signals to projectors and

The well-organized central AV equipment rack simplifies installation, maintenance, and troubleshooting.



displays. Some of the NAV encoders and decoders feature USB extension for access to the central servers. This centralized approach makes for a streamlined system design and simplifies maintenance.

The user-friendly browser-based NAVigator System Manager empowers technicians to configure, monitor, and troubleshoot the entire system through a single interface. NAV encoders are strategically placed at each AV source, ensuring delivery of high-quality, ultra-low latency video, along with HDMI and AES67 audio. NAV scaling decoders, positioned behind each display, deliver high-quality video tailored to the capabilities of the respective displays.

"The ease of use with the NAVigator console to route the different signals between the devices is nice," says Buitenhuis. "Whenever a request comes to connect different halls together for overflow purposes, it is easy to accommodate, because every signal is already on the network with NAV to pick up."

System Control and Monitoring

TouchLink Pro touchpanels are positioned on the podiums and walls. They operate seamlessly with IPCP Pro xi control processors to offer adaptable, user-friendly management for all AV functions in the room. They are also perfectly synchronized with the NAVigator System Manager to distribute content via the network. For overall AV system monitoring, support personnel use Extron GlobalViewer® Enterprise (GVE) to monitor every connected device. With GVE, they are able to monitor and evaluate equipment and room utilization, schedule maintenance tasks in advance, and manage inventory lists with tailored reports.



The Extron NAV Pro AV over IP System enables signal switching and distribution from a central location and is essential for maintaining smooth AV functions throughout the Echo building.



RESULTS

The Echo building at TU Delft stands as a testament to the university's commitment to innovation, adaptability, and sustainability. As one of the world's premier institutions, TU Delft's forward-thinking approach is not only evident in its academic programs but also in its infrastructure, seamlessly combining cutting-edge technology with energy-efficient designs.

With its advanced AV systems, the Echo building fosters an environment that is conducive to both traditional and collaborative learning methodologies.

The meticulous integration of Extron products, the dedication to sustainability, and the ability to adapt to the evolving needs of the student population demonstrate the university's vision for the future. This commitment ensures that the Echo building will remain a hub of innovative learning for years to come.

Recognized globally as a leading educational institution, TU Delft showcases its progressive mindset through both its curriculum and its facilities. This commitment is clearly visible in the way the university integrates the latest technology with eco-friendly architectural solutions.

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Marco Buitenhuis
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TU Delft University

TU DELFT ECHO BUILDING VIDEO LINKS

Echo Building Overview by UNStudio

<https://www.youtube.com/watch?v=C-b9792hX-w>

What Makes the Echo Building at TU Delft So Flexible?

<https://www.youtube.com/watch?v=ye0PnPMTgMw>

Teaching by example: UNStudio completes Echo at TU Delft

<https://www.youtube.com/watch?v=83aaGXN9LSk>

Completed 100% Green Energy Building Saving |
Echo, TU Delft Netherlands

<https://www.youtube.com/watch?v=lw0kYFcGMzw>

Architectural photography on pages 1, 2, 3, 4, 5 (top image)
and 8 by www.evabloem.com

EXTRON EQUIPMENT

Model	Description
NAV E 101	1G Pro AV over IP Encoder - HDMI
NAV E 501	1G Pro AV over IP Encoder - HDMI, Ethernet, and USB
NAV SD 101	1G Pro AV over IP Scaling Decoder - HDMI
NAV SD 501	1G Pro AV over IP Scaling Decoder - HDMI, Ethernet, and USB
NAVigator	Pro AV over IP System Manager
LinkLicense for NAVigator 240 Endpoints	Upgrade NAV Systems to Support Additional Endpoints
IPCP Pro 350	IP Link Pro Control Processor
IPCP Pro S1 xi	IPCP Pro xi Control Processor
IPL EXP RIO8	Control System I/O Expansion Interface
TLP Pro 1025M	10" Wall Mount TouchLink Pro Touchpanel
TLP Pro 525M	5" Wall Mount TouchLink Pro Touchpanel
TLP Pro 725M	7" Wall Mount TouchLink Pro Touchpanel
TLP Pro 725T	7" Tabletop TouchLink Pro Touchpanel
SW4 HD 4K PLUS	4K/60 HDMI Switchers with Ethernet Monitoring and Control
MediaPort 200	HDMI and Audio to USB Scaling Bridge
MGP 641	4K/60 HDMI Multi-Window Processor with DTP2 Extension
DSC HD-3G A	HDMI to 3G-SDI Scaler with Audio Embedding

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