



Photographs © Università di Trento - U.A.M.

University Establishes Advanced Multimedia System Using Fiber Optics from Extron

“Extron’s FOX Matrix and FOXBOX extenders provide the best solution in terms of supported resolution and quality.”

Stefano Bernardini
Audiovisual Sector Head
Multimedia Technology Center
University of Trento

The University of Trento in Italy proposed using technology to enhance the learning experience in the Departments of Humanities and Philosophy building. Rather than hire an outside consultant or integrator, the university’s Multimedia Technologies Center was tasked with designing a future-proof system that would combine the best of traditional teaching methods with the latest technological advancements. The project concept was to use the best technology to deliver 1920x1200 resolution computer-video signals to the entire campus. Of equal importance, this system needed to support services such as high quality videoconferencing, distance learning, computer-based training, interaction with personal Web sites, video on demand, and AV archiving to the campus library.

To achieve all of this, the university’s Multimedia Technologies Center team selected fiber for what would be called the Advanced Multimedia System, or AMS. After extensive research, it was determined that Extron’s FOX Matrix 7200 modular fiber optic matrix switcher would meet the demands of the enterprise-wide AV system. “Extron’s FOX Matrix and FOXBOX extenders provide the best solution in terms of supported resolution and quality,” says Stefano Bernardini, Audiovisual Sector Head for the Multimedia Technologies Center at the University of Trento.

Centralized Audiovisual and Multimedia Network

The first step was to define the goals of the AMS for use within the campus building and satellite locations. Bernardini knew that the AV portion of the AMS had to support multimedia activities with exceptional sound support in each room, be capable of sharing a presentation between two or more rooms that could be on different floors, and be operable from a control center as well as from





AV equipment vital to AMS operations is rack-mounted in the RAM center.

the front of the room. The AV system control interface had to provide a consistent look and user experience, be easy to use, and compatible with the university's automation program, which enables commands from remote sites to be part of the single management user interface. To meet distance learning and archival requirements and to create synergy with personal Web sites for online lessons, the system also needed to include live streaming and recording capabilities. Finally, it had to be flexible enough to tie in with the university's LAN, videoconferencing system, and other systems for information sharing within the building and to remote locations. To provide these services in a single system, Bernardini designed the Rete Audiovisiva Multimediale – RAM, which translates to Audiovisual and Multimedia Network system. RAM is the nerve center of the AMS.

OM3 multimode fiber optic cable is used for the both networking and AV system infrastructures. The rooms are linked over the infrastructure to the FOX Matrix 7200, which is configured with five, hot-swappable 8x8 multimode boards. A collection of Extron PowerCage® and FOXBOX Series transmitters and receivers provide signal extension to the various rooms and the digital signage destinations. This design enables AV system monitoring and operations within 33 multimedia-enabled rooms and provides broadcasting of general campus news and targeted information to flat panel displays located throughout the building. Bernardini also reports that the FOX fiber system has proven to be very useful in extending control signals to all campus destinations.

Common Room Features

All classrooms and labs include rack-mounted in-room digital and analog sources and AV connectivity for portable devices as well as access to remote sources over the fiber optic infrastructure. Switchers featuring automatic signal detection simplify integration of portable analog source devices. Extron fiber optic transmitters and receivers connect the equipment to the FOX Matrix located in the RAM center to share signals throughout the building.



Larger classrooms include multiple display devices to ensure optimal viewing.

Rooms other than the auditorium have a projection system that includes an LCD projector suspended from the ceiling and either a three-meter (10' high) or 3.5-meter (11.5' high) screen, depending on room size. An Extron receiver mounted with the projector delivers high quality video to the projector. Rooms feature Panasonic® PTZ cameras with HDMI and component video outputs to enable lecture streaming and recording and Extron extenders to send the captured video to the RAM center.

The sound system in each classroom and lab includes the appropriate-sized Extron audio digital signal processor and microphone preamplifier based on the number of sources and microphones. Where necessary, the Extron MDA 3A Stereo Audio Distribution Amplifier is used to provide additional signal routing.

Room Differentiation

The building includes four room designs, designated as Types A through D. The type identifies a space by size and primary educational activity and dictates AV capabilities. Type A rooms support HDMI, VGA, and composite video sources and digital or analog audio signals, and include limited AV connectivity for portable devices. In addition to shared and portable sources, a local computer is connected directly to the projector through a separate HDMI input for independent in-room presentation. Audio signals are switched to the DMP 44 LC 4x4 Digital Matrix Processor. An MP 101 Microphone Preamplifier is also used in these rooms. This combination allows mixing of the fixed microphone and wireless microphone feeds with possible audio sourced through the room's MLS 100 A Four Input Stereo Audio Switcher.

Type B rooms support a wider range of digital and analog signal formats, including HDMI, DVI, RGB computer video, HDTV, component, S-video, and composite video. An Extron DVS 605 A five input scaler with audio switching is used to process video for routing to the projector. Bernardini selected this particular scaler because of its seamless switching capability and the ability to present HDCP-encrypted content.

University Establishes Advanced Multimedia System Using Fiber Optics from Extron



The auditorium includes AV technologies for standard classroom activities to full multimedia presentations at conferences and other important campus events.

FOXBOX HDMI transmitters and receivers provide signal extension of video, audio, and RS-232 over multimode fiber optic cable to these rooms. Audio support is similar to that of a Type A room; however, Type B rooms include multiple fixed and wireless microphones. The Extron DMP 64 6x4 ProDSP™ Digital Matrix Processor simplifies audio mixing, routing, and room optimization.

Although very similar in design to the Type B room, Type C includes two Samsung SM-ME55B Professional 55" LED flat panel displays mounted approximately half way back in the room for optimal viewing in the larger space. The room's projector has a native resolution of 1920x1200, and the two panels are locked to 1920x1080. Again, a DVS 605 A is used to convert and scale video signals to the proper resolution for the display devices. Type C also includes a second pair of speakers, ensuring uniform sound pressure across the room.

The auditorium, Type D, is used for conferences, and can also serve for classroom overflow situations. Typically, signals are routed from sources that are rack-mounted in the auditorium's control room. This equipment includes an Extron DXP 88 HDMI matrix switcher to support additional HDMI devices. It is linked to the RAM for access to sources available over the fiber optic infrastructure and for streaming and recording purposes. The desk on the stage offers similar AV connectivity as with the other spaces and includes two computers connected to Extron scalars through HDMI twisted pair extenders. In addition to the standardized functionality, the auditorium's two DVS 605 AD scalars support 3G-SDI, HD-SDI, and SDI transmission. Display devices include two Christie LHD700 full HD resolution



Presentation in the auditorium can be monitored and controlled from the front of the room, through the control room at the back, or remotely via tablet.

projectors at 7,000 ANSI lumens with two four-meter (13' high) screens and five confidence monitors and touch screens of varying sizes.

To share departmental news and messages from the Dean's office throughout the building, entry ways and natural gathering areas include Samsung 55" flat panel displays. FOXBOX Rx HDMI MM receivers are mounted discreetly behind the 10 displays to deliver content over the fiber optic infrastructure. For enhanced security, the receivers are set to send a notification to RAM operators through the control system if a fiber link is lost.

Results

Installation was completed in slightly less than five months. The university is quite pleased with the AMS, because it provides a unified and easily expandable infrastructure for AV transmission across the university. Above all, presentation control is accessed through one simple and easy-to-manage interface and is enabled both locally and remotely. This design allows optimal usage of AV-enabled rooms in terms of resources and man hours.

The fiber optic AV system and network technologies that comprise the AMS ensure reliable instruction and information sharing within the building and to external destinations now and well into the future. Stefano Bernardini of the University of Trento summarizes, "The AMS project, which was developed and implemented entirely in-house, improves student experience and their achievements while allowing us to provide and control high resolution presentation throughout the building."

Worldwide Sales Offices

Anaheim • Raleigh • Silicon Valley • Dallas • New York • Washington, DC • Toronto • Mexico City • Paris • London • Frankfurt
Amersfoort • Moscow • Dubai • Johannesburg • New Delhi • Bangalore • Singapore • Seoul • Shanghai • Beijing • Tokyo

UNITED STATES

+800.633.9876
Inside USA/Canada

EUROPE

+800.3987.6673
Inside Europe

ASIA

+800.7339.8766
Inside Asia

MIDDLE EAST

+971.4.299.1800