Photo Credit: City of Calgary

Crestron 3-Series™ Control Processor Powers Calgary Emergency Operations Centre

Background

The City of Calgary was building a new Emergency Operations Centre (EOC) to bring together the Calgary Emergency Management Agency (CEMA), as well as representatives from other City and provincial agencies and utilities. The new EOC with expanded facilities aims to better serve responders and local residents.

The EOC is a vital facility in protecting the lives of Calgarians, their property and equipment. In a disaster or major emergency, key personnel from the City of Calgary business units and external agencies such as ENMAX, ATCO, and Alberta Health Service assemble in the EOC and support front-line response personnel and business continuity by maintaining City services.

The new EOC is the city's multi-agency command centre in any large-scale emergency. Crestron integrated solutions serves as the technology backbone.

Challenges

The City wanted technology to play a major role in disaster and emergency relief, but required a simple, reliable control system to operate the facility round the clock. A large scale, complex AV system was required to meet their needs. They called on Calgary-based integration firm, Sharp's Audio Visual to design, program, and install the intricate system.

"The client wanted the city officials to be able to view content from a multitude of sources in each of the rooms, as well as

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share content between the rooms," said Neil Dorin, Systems Programming Team Lead at Sharp's Audio Visual.

Solution

The Crestron 3–Series control processor was the proven solution to provide ease of use to the client, seamless room to room communications between processors, and ease of installing replacement processors in case of breakdown.

"The client needed super high redundancy," added Dorin. "We had four main conferences rooms and knew we were going to need 3-series for the larger room no matter what."

Dorin's team created a program that he replicated onto several 3-series control processors. This took care of 90% of the functionality in all rooms. The systems were familiar with all of the room configurations and desired settings.

Crestron Smart Graphics™ For Advanced High-Resolution Touch Screen User Interfaces

Sharp's utilized Crestron's Smart Graphics framework to provide a consistent, simplified, and easy to use solution for the customer. "Using the new features and advantages of the software's smart objects, we were able to create easy to use interfaces for controlling a very large video wall, as well as complex source sharing operations," said Dorin.

Using Smart Graphics, Sharp's was able to create "drag and drop" AV routing interfaces on touch screens throughout the facility, providing a consistent look and experience at every corner.

Smart Graphics was instrumental in the development of a large interactive video wall. Sharp's was able to drag sources from a list onto the elements of the wall, even when elements are grouped together. Users can also swap sources from any elements on the wall allowing for simple and efficient routing in high-pressure situations.

To control this video wall, Sharp's installed a Crestron V24 HD touch screen display in the main EOC room to be able to make use of a graphical representation of the video wall elevation.

"The V24 offered the resolution real estate and physical size we needed to make the desired solution viable for end users," added Dorin.

Relying entirely on the 3-series processor to run the control system, allowed for Sharp's to take an extremely integrated approach for greater functionality, simpler user interaction, and less implementation concerns.

"We made use of the 3-series control processors to provide truly modular programming architecture for all rooms sharing similar hardware configurations," added Dorin. "The ability to run
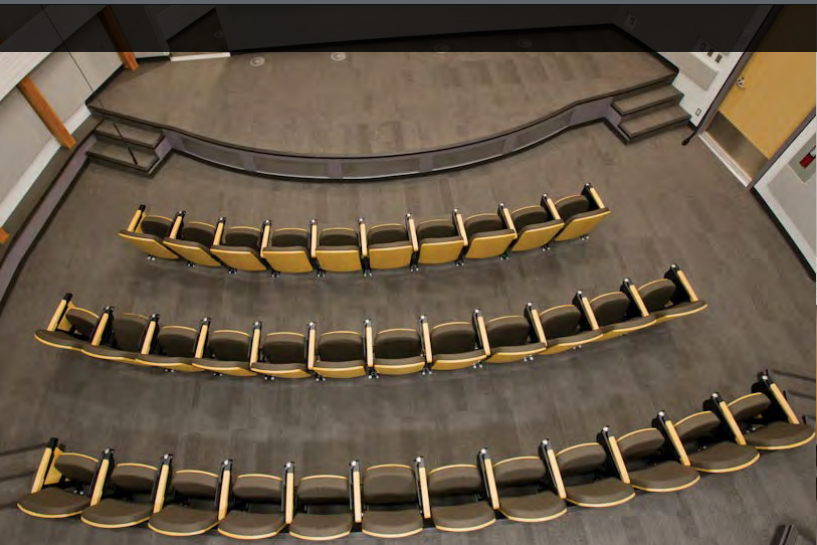
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multiple programs on any given processor allowed us to require fewer total processors by combining some of the smaller rooms onto a single processor. It also allowed us to separate complex logic into separate programs, on separate processors for increased reliability and performance."

The 3-series control system®, at the heart of the facility, gives city staff the ability to save and recall AV routing presets for the 40 destinations in the main EOC room as recallable "scenarios." One challenge with using a main/back up 3-series processor configuration was that the values saved in the main processor for each scenario needed to be transferred to the backup processor in the event that the main processor should fail. To accomplish this, Sharp's decided to store the running program, as well as the file containing the user presets to a USB memory device. The USB device is then switched from the main to the backup processor when a failure of the main processor is detected. This process will also notify the Fusion RV monitoring server of the main processor failure so that a service technician can be dispatched to remove the failed main processor and replace it with one of the spare processors stored onsite for this eventuality. Using a USB device to store the program means the service technician can simply swap the processor in the equipment rack and literally turn a key switch that moves the program back to the now replaced main processor and the system functionality is fully restored.

"From a service, maintenance, and code management perspective, it is much easier to maintain one program over four," noted Dorin.

EOC Main Room
The main room features two 24-inch touch screen displays for redundancy. The redundant 3-series processors operate independent of each other. If a processor fails, the other goes to work. "It is a seamless transition from one processor to the other, so operations continue smoothly," said Dorin.

The room also includes a large video wall configuration comprised of (32) 55" LCD displays. There are three walls in a 2x4, 4x4 and 2x4 configurations (the 4x4 in the middle). On the sides of the room, there are four 55" displays for additional visibility. The users of the room can send any of over 25 PC sources from within the room to the video wall to be displayed in any configuration of 1x1, 2x2 or 4x4 configuration. There are also five dedicated satellite receivers that can be displayed within the room, as well as any sources shared from any or all of the other facilities rooms.

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>
> **Neil Dorin,** Systems Programming Team Lead, Sharp's Audio Visual

To simplify ease of use, any combination of wall configuration presets as well as audio and video source routings can be saved to user named "scenarios." This way, the staff can pre-configure the system to optimize it for anticipated event responses. This greatly improves the responsiveness and usability of the otherwise very complex system.

This room can also monitor the Crestron controlled HD PTZ camera in the media briefing room to set up and prepare content for press conferences and announcements.

Conferencing Rooms
The conference rooms serve as meeting and conferencing rooms for the CEMA staff and any other support agencies. Crestron controls the audio/video, including Smart Board® and

LCD displays that interact with smart software or a room PC, audio and video conferencing, and satellite TV's. All rooms have the ability to share content on the room displays or share AV sources with other rooms throughout the building through the central video switch.

Communications Room

The communications room serves as a space for communications staff to generate content for distribution through the media to the general public. The room features two large displays for satellite TV viewing or to share information.

Deputy Chief's Office

The Deputy Chief's office has a single display. The DC can share content from his own PC onto the display. He can also view content shared from other rooms in the building and control PTZ cameras for monitoring operations in the EOC.

Media Briefing Room

The briefing room is used for city personnel to host press conferences. The room allows media to bring in cameras and connect to the integrated audio/video systems to distribute press conferences to the general public. The city presents content from a laptop onto two 70-inch monitors. Audio DSP provides an in-room voice lift and audio distribution so the media can record and broadcast the press conference. Crestron controls the lighting to enable the optimal lighting levels for the media to film the conference.

Photo Credit: City of Calgary

Media Work Room

The Media Work Room provides audio and video from the Media Briefing Room for the overflow personnel. The room includes five TV's with their own satellite receivers so they can watch five different channels at once. The media in the work room can see and hear everything going on in the briefing room through via the Crestron-controlled camera in the briefing room. The audio and video are distributed to the work room so all additional media are engaged in the conference when the primary room is full.

Backup

The backup area serves as a secondary facility for the 911 PSC agency in the event that the primary facility is unusable. Representatives from other government agencies (fire, police, EMS, roads, etc.) and private service providers (power, gas, water, etc) are invited as needed to assist with resolving emergencies as required.

The room features three 2X2 video walls used to display one large image or four small images. The room includes connectivity to the satellite receivers, laptop or PC. Police, fire, and emergency services can view traffic cameras and other content that the 911 center would need to review during operations.

Conclusion

The EOC houses approximately 25 staff daily and operates as a self-contained facility for the critical first 72 hours of an emergency. The EOC system includes a Geographic Information System that involves the relay of maps with embedded information, and live feeds from city traffic and police helicopter cameras.

The Crestron system was truly put to the test recently when the city endured a severe flood. The City used the media briefing room several times a day to ensure citizens were informed and updated throughout the flood.

"It was extremely beneficial for the city to be able to respond and field information quickly using the new system," said Dorin.

City staff and guests are extremely pleased with the ease of operation of the systems. Despite the high level of complexity of the systems and the interconnected functionality between all of the rooms, there is minimal user training required to operate the EOC day-to-day.

"We couldn't have done it without Crestron. Crestron offered some features that we weren't initially considering," added Dorin. "When we saw what we could do with the Smart Graphics framework, we saw the value add to our client."

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