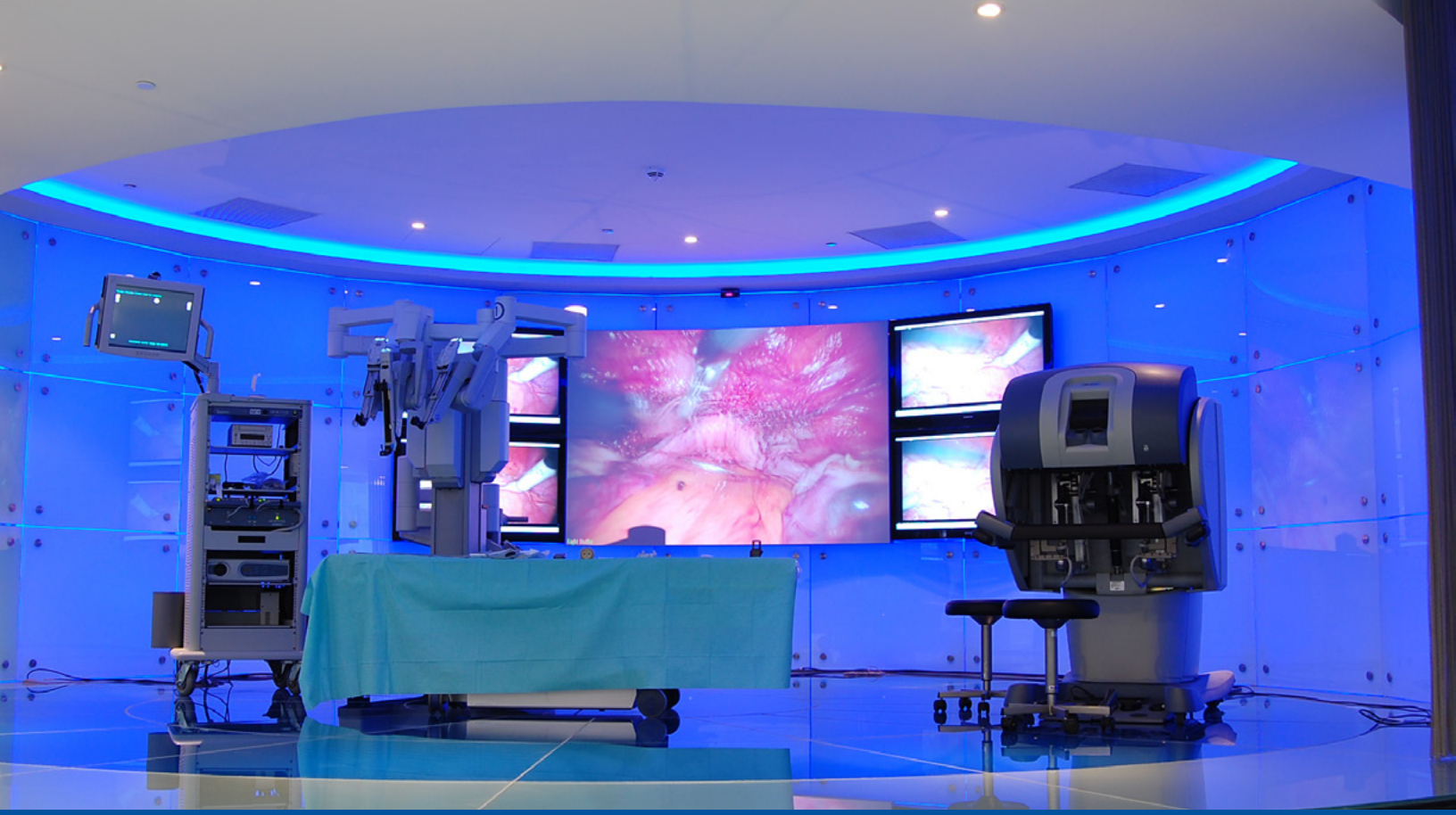

Robotic Surgery Center Creates Broadcast Quality Video with Extron Matrix Switching and Fiber Technology

"The reliable performance and ease of installation of the Extron products contributed to a coherent and smooth execution in record time."

Ahmed H. Sayeed
Founder and Managing Director,
Technomight

The Qatar Robotic Surgery Center resembles the set of a science fiction movie, filled with da-Vinci surgical robots, laparoscopic simulators, and 3D telecast equipment. The technology is all real, however, and is used at the center to demonstrate new medical robots and train surgeons from Qatar and the region.

The da-Vinci Surgical System dramatically improves laparoscopic surgery by translating the motion of a surgeon's hands into far more precise robotic movements. It includes two 3D high resolution fiber optic cameras inserted into the surgery site via separate incisions. The 3D images from the cameras are displayed through twin high resolution, high frame-rate eyepieces for the surgeon seated at the da-Vinci console.

The challenge was to enable student doctors and others, both in the room and remotely, to see what the surgeon sees during surgery, by routing HD-SDI signals from the da-Vinci cameras to wall-mounted displays in broadcast quality 3D.

Technomight, an AV integrator with offices in Dubai, United Arab Emirates, and Qatar, was contracted to design and install the system. For signal distribution, they chose Extron signal routing equipment, including an HDXP Plus 1616 matrix switcher and DVI 104 fiber optic extenders. "We selected Extron specifically because their products and solutions are of the highest quality and reliability," says Ahmed H. Sayeed, Technomight founder and Managing Director. "Also, because we've come to rely on their unmatched technical support."

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The center includes two active 3D projection theaters set up as operating rooms for the purpose of training, and for displaying the high definition video signals from da-Vinci robots. A "telementoring" room with passive 3D projection acts as an interactive classroom for trainee surgeons.

The Theaters and Telementoring Room

Each theater contains a da-Vinci surgical robot and a Christie Mirage HD6 6000 lumen HD 3D projector. A RealD circularly polarizing liquid crystal filter, which can switch polarity 144 times per second, sits in front of the projector lens. Only one projector is needed to create the 3D effect, as left and right eye images are displayed alternatively by the filter. RealD Crystal Eyes active LCD shutter glasses are synced through RealD EXXR IR emitters to the projectors to create the full 3D effect.

The theaters and telementoring room feature specially coated curved screens flanked by four 52" HD LCD panels capable of receiving signals from Sony video conferencing equipment, da-Vinci robotic cameras, and a DepthQ Capture digital recording system. The telementoring room uses a 3D projection system consisting of two matched Inition stereoscopic 3D projectors projecting superimposed images onto the screen through different polarizing filters, and passive polarizing glasses containing differently oriented polarizing filters.

HDXP Plus Matrix Switcher for Signal Distribution

Images from da-Vinci robotic cameras are sent to the center's Leonardo server for recording and archiving, allowing signals to be accessed remotely without using local switching equipment. The server routes the signal in HD-SDI format through an Extron HDXP Plus 1616, a multi-rate SDI matrix switcher optimized for dual-link HD-SDI.

The switcher routes signals from the theaters' robotic cameras through the DepthQ system, which converts the dual images into a DVI signal and a sync signal which are then sent over an Extron DVI 104 fiber optic transmitter/receiver extender set and Extron fiber optical cables up to 125 meters to the theater projectors.

The HDXP 16x16 matrix switcher sends signals from the telementoring room robotic cameras through graphic scalers as two DVI signals to the two Inition stereoscopic projectors in the telementoring room. The HDXP's ability to handle data rates up to 2.97 Gbps as well as dual-link HD-SDI signals makes it uniquely suited to the center's sophisticated 3D HD AV system and long cable distances.

"We chose Extron because of our past experience with their products," Sayeed says. "The reliable performance, and ease of installation of the Extron products contributed to a coherent and smooth execution in record time."

Results

Despite the sophistication of the system design, Technomight was able to complete the entire project with a team of only four engineers and six installers. "The use of Extron products allowed us to achieve our objective of delivering ultimate HD 3D with broadcast quality on an HD-SDI platform, a cutting-edge showcase system that both the end user and Technomight are equally proud of," Sayeed says. So with the help of high tech equipment ranging from da-Vinci surgical robots to Extron switchers and fiber optic extenders, the Qatar Robotic Surgery Center stands at the forefront of developing, applying, and teaching robotic medicine.

HDXP Plus 1616
16x16 Multi-Rate SDI Matrix Switcher

DVI 104
DVI Fiber Optic Extender

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