



One of two active 3D theatres using Christie Mirage HD6 projectors.

and possibly the largest robotic surgery centre in the world.

"We had guidelines provided by the Imperial College London, but with help from our suppliers we were able to propose a higher-grade system that was accepted by the client. Primarily they wanted broadcast standard facilities - with the highest possible signal quality - HD-SDI."

Christie's EMEA sales director, Simon Smith who was involved in the consultation said, "Aside from consulting on the correct choice of projector, we advised on source routing and various other technical issues, including, projector set-up and final commissioning."

Essentially the facility consists of two active 3D theatres and a tele-mentoring room. The main active 3D theatre contains a Christie Mirage HD6 6000 ANSI lumens HD 3D projector, with active stereo capability,

firing onto a 2815mm x 1454mm curved screen via an HD projection zoom lens 1.4-1.8:1 HD (SXGA+ 1/5-2:1) and using the Twist module. The screens are painted with high gain acrylic emulsion to achieve the optimum brightness.

The second robotics theatre has a similar specification, although the screen measures a smaller 2393mm x 1454mm.

Either side of each screen are mounted Samsung 46" full HD LCD panels which can accept sources from the matrix - these include feeds from the Sony VC units or from the robot cameras themselves.

Operating in active 3D, the projectors themselves are mounted in specially built enclosures in the ceiling (not visible from the outside). Up to 20 trainees can be immersed in either of the two environments. A special Lightspeed Design passive to active converter includes

DepthQ®Capture and DepthQ®Player for high definition stereoscopic media. DepthQ Capture also allows the recording of procedures onto a local PC hard driver for later playback and learning.

The room occupants wear active LCD shutter glasses from Real D CrystalEyes eyewear and; the eye glass shutters are synced in high speed by a long range wide angle IR emitter in the ceiling, which in turn is synced by the projectors.

The left and right images from the Da-Vinci Robots are first fed into the Leonardo servers which then output a HD-SDI signal through an Extron HDXP 1616 Matrix switcher into the Depth Q system which resides on a Super Micro Super Chassis SC 743 incorporating NVIDIA Quadro FX 3700 single graphics cards. The Depth Q system converts the passive left and right image signals into an active signal in the DVI format.

Time frames to lose



- DVI-OPT 110 series: DVI connector sized extenders with several status LEDs, aluminum casing with advanced ESD protection and stable SC connectors.
- DVI-OPT 220 series: Professional DVI extender with OpticalCON fiber connectors and Accurate Reclocking. Local monitor output on transmitter and dual output on receiver.
- HDMI-OPT series: HDMI 1.3a extension with HDCP and bi-directional RS-232 through. Advanced EDID Management, Pixel Accurate Reclocking. Dual outputs on transmitter and dual output on receiver).
- DP-OPT series: Dual-mode DisplayPort extenders handling resolutions up to 2560x1600. Plug and play operation with several status LEDs.

< The infrastructure was built to handle all signal formats – from composite, DVI, SDI up to HD-SDI, using Extron switchers. “Using HD-SDI we transport the signal from the equipment room to the projectors in the two main theatres over optical fibre extenders – spanning distances between 60- 125 metres,” said Sayeed.

Other signals – for instance to the plasma displays located either side of the projection surfaces – are supplied over further Extron signal extenders, this time UTP-based.

Signal scaling is performed by Extron Annotator scaler units, which have the added benefit of allowing a lecturer to annotate any of the displays in use.

The theatres are to be used primarily for training purposes, each connected via a high bandwidth Sony HD video conferencing system, operable in three different modes.

Jan Nuyens, head of the QRSC explains, “The theatres can be used as

immersive 3D sessions where students/trainees are present, while live surgery from anywhere in the world can be screened live into the QRSC facility. Alternatively a surgeon can perform simulated surgery, which students can witness in 3D. And finally students can perform in the Doha theatres on a plastic dummy while expert surgeons can guide them from a remote location.”

The tele-monitoring room acts as an additional space for learning. Students can watch remotely procedures from either theatre, or participate in a remote lecture via the Sony VC system.

Audio reproduction is provided either through the speakers built into the Samsung displays, or alternatively via a 4-channel infra red distribution system from Listen Technologies. In this case each student is provided with a headset.

“ Because of our local presence and track record [in implementing several successful 3D projects] we had a major advantage. ”

- Ahmed H. Sayeed

“As a Systems Integrator, Technomight have done an excellent job in professionally implementing these complex systems” says Jan Nuyens, “Right from participating in design meetings with the experts from Imperial College to coordinating with the Centre to understand the requirements and to finally come up with innovative and cutting edge solutions that address all the high-tech needs of the Centre, Technomight have worked hard and the results speak for themselves”

“Seeing is believing, this is Cutting Edge, literally”, says Ahmed H. Sayeed. “As a result QRSC has really become a showcase of technology for the centre and is almost constantly busy with a steady stream of local as well as foreign dignitaries interested in experiencing the region’s much talked about facility with technology straight out of a science fiction book.”

ech-Spec

Audio
 Listen Technologies 4-channel
 Infrasonic IR System

Video
 Christie Mirage HD6 projectors +
 graphics cards
 Extron HDXP 1616 Matrix switcher,
 Extron Annotator Scalers, HD-SDI signal
 extenders
 Sony D1A Quadro FX 3700 single
 graphics cards
 Samsung Full HD 46" LCD panels
 Listen Technologies PCS HD Video Conferencing

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