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10 Gigabit Ethernet Connections for Operating Theaters

Leiden University Medical Center extends its SYSTIMAX® Structured Connectivity Solutions to operating theaters with LazrSPEED® multimode fiber

Leiden University Medical Center (LUMC) is one of the largest university medical centers in the Netherlands. The organization employs nearly 7,000 people and its activities include patient care, research and education. A key factor in achieving high levels of excellence across all these areas is the performance and reliability of the Center's network infrastructure, so choosing cabling to extend its existing installation was an important decision.

LUMC consists of Leiden Academic Hospital and the Medical Science Faculty at Leiden University. These facilities offer both basic medical care on a

regional basis and top flight clinical care at a national and international level. The organization's specializations include organ transplants, cardiovascular operations and all types of bone marrow transplants. The pace of technological change in these fields and other medical applications made extension of the existing network a necessity.

The project involved 22 operating theaters, of which four are thorax operating theaters, and four holding/recovery rooms. LUMC selected SYSTIMAX BusinessPartner, Croon ICT, as a technology and service partner for the extension work because of its specific knowledge and experience in the medical sector.

"Croon's enthusiasm was apparent right from the start and we have built a solid, lasting business relationship," said Henk van Hattem, the project manager responsible for infrastructure within LUMC Information Services Department. The design and implementation for operating theaters is extremely complex - and you obviously can't afford to make any mistakes in this type of environment," he continued. We made full use of the specialist knowledge available at Croon - good examples of this were the specific requirements for electrical and galvanic insulation that apply within operating theaters and recovery rooms."



High Performance

A major issue in implementing the new network was the bandwidth required for digital X-Ray images, MRI scans and remotely performed surgery.

Explaining, Henk van Hattem said: "The Radiology Unit intends to start using PACS (Picture Archive Computer System), a storage system for digital X-ray images, instead of the traditional X-ray photo-images we currently use. It will now be possible to transmit the digital images direct to operating theaters and, this being the case, the transmission speed of the network cabling is obviously extremely important.

"In addition, staff in operating theaters will start to use PDMS (Patient Data Management System) and, as a university hospital; we are also heavily involved in medical education," he continued. For this reason, we will need to transmit video images from operating theaters to lecture halls in the near future."

To meet all these new requirements, LUMC decided on SYSTIMAX Structured Connectivity Solutions (SCS). This choice was based on the performance required, including the necessity for maximum bandwidth.

SYSTIMAX SCS already installed in LUMC and other hospitals had also gained a good reputation for reliability over a number of years. The existing LUMC installation has over 8,000 outlets connected via 25 communications rooms housing nearly 500 SYSTIMAX patch panels.

Croon and LUMC decided on the SYSTIMAX LazrSPEED® Solution for backbone connections to operating theaters and recovery rooms. This will run 10 Gigabit Ethernet over multimode fiber without excessively expensive electronics. More than 2,100 meters of LazrSPEED cable was installed during the project, connected using small form factor LC connectors, which have the lowest loss in the industry.

Inside the operating theaters, LUMC decided on the SYSTIMAX GigaSPEED® Solution. This provides throughputs of 1 Gb/s over copper cable at distances up to 100 meters. Each operating theater has between 4 and 6 outlets and, in total, more than 4,000 meters of GigaSPEED cabling is installed in the theaters and recovery rooms.

“ Working in a hospital is extremely demanding for installation personnel. We are very satisfied with the way in which SYSTIMAX Solutions™, Croon ICT and Anixter worked with us successfully to complete such a complicated project. ”

Mr Henk van Hattem, Project Manager, LUMC Information Services Dept.

"The solutions they chose will give the LUMC sufficient growth potential for the foreseeable future," said Frits Kuus, Sales Director, SYSTIMAX® Solutions, The Netherlands. "We believe the bandwidth demanded by present and future applications can be accommodated without any problems. This is extremely important since an operating theater can't easily be relocated and is not an area where upgrade work can be carried out simply or at short notice."

Operating Theater-proof

The choice for SYSTIMAX SCS was not only based on performance requirements; susceptibility to interference and manageability were equally important in the evaluation. So, prior to implementation, the GigaSPEED cabling was extensively tested to prove it was not affected by other equipment in the operating theater.

Conversely, the evaluation team also checked that signals carried by the cabling would not interfere with medical equipment. The installation also had to conform to the NEN 3134 standard, which describes safety provisions for low-voltage equipment used in medical rooms. According to this standard, areas such as operating theaters must be electrically and galvanically insulated from the rest of the building so that risk of interference with medical equipment is minimized. For this reason, fiber-optic cabling was chosen to connect sensitive areas with the network.

Since the fiber cable contains no metallic elements, sufficient insulation is guaranteed. As each operating theater is internally cabled using the GigaSPEED Solution, they form separate sub-networks within the overall LUMC network.

The GigaSPEED cabling for the operating theaters is connected using the SYSTIMAX PATCHMAX®

panels. It was difficult to find suitable locations for patch panels in the theaters. However, using PATCHMAX panels provided a solution within the limited space available that meets current needs and has potential for future growth.

Croon ICT drew up a detailed project plan for the new installation in cooperation with the LUMC Information Services Department and departmental managers responsible for the operating theaters. Together, they meticulously planned the availability of theaters for the implementation. They also had to adapt delivery of the materials and working methods to the special environment. Anixter, the distributor responsible for the delivery of the SYSTIMAX products, also played an important part in the complex team effort.

"We were very pleased that operating theaters could remain in normal use during the implementation period," said Henk van Hattem. "Following any implementation activity, the operating theaters were cleaned, inspected and certified for operations to continue."

"Working in a hospital is extremely demanding for installation personnel," he added. "We are very satisfied with the way in which SYSTIMAX Solutions, Croon ICT and Anixter worked with us successfully to complete such a complicated project".

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