

Erasmus Medical Centre

A Half-Century of Medical Excellence Gets an Update

As the largest university medical centre and the second largest hospital in the Netherlands, Erasmus Medical Centre is home to more than 1,320 beds found in three locations, including a pediatric hospital, a cancer institute, and a Level I trauma centre. As one of eight university medical centres in the Netherlands, Erasmus MC's day-to-day functions include not only patient care, but research and education as well.

At more than 50 years old, the medical facility embarked upon a €449 million expansion in 2009 that included a new site for the cancer centre, Erasmus MC Cancer Institute, and a comprehensive redevelopment of its IT infrastructure. To meet its goal of becoming one of the top 20 medical institutes in the world, Erasmus MC required a high performance, future-proof, and energy efficient network infrastructure to support state-of-the-art medical technology and mission-critical applications.

Challenges in Planning for Expansion

It was essential that the medical centre remain open for business throughout the construction and IT infrastructure deployment. Erasmus MC administrators considered their cabling and connectivity options and, with input provided by consultancy firm Royal Haskoning, chose Leviton.

Leviton network cabling solutions are installed in hospitals and health care facilities around the world. With a wide range of options — including small diameter cables, high density connectivity products, and modular based solutions — Leviton health care solutions offer best in class connectivity, ease of installation, and design flexibility, all of which were key priorities for Erasmus MC. System reliability and longevity were also critical considerations for the medical centre. Leviton offered an extended warranty that guaranteed that the system would function at optimal levels for at least 25 years.

“Working with a company that has significant experience in the health care sector was very important to us. We chose to work with Leviton because the company has both the knowledge and capability to create an IT system that would meet the needs of Erasmus MC staff and patients,” said Rik Binkhorst, Network Specialist for Erasmus MC.



Erasmus Medical Centre

At a Glance

Profile:	The largest university medical centre and the second largest hospital in the Netherlands, with three locations that together accommodate more than 1,320 beds
Industry:	Health Care
Location:	Rotterdam, the Netherlands
Business Problem:	A highly-reliable, future-proof hospital IT cabling infrastructure system capable of migrating to 40 GbE and 100 GbE to support a state-of-the-art medical facility
Solution:	A comprehensive redevelopment of the medical centre's IT infrastructure

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The new network infrastructure at Erasmus MC serves state-of-the-art medical technology, including instruments and interface devices used for remote diagnosis, high resolution imaging, medical records and patient services, security and building access control, and mobile device access for patients and visitors. Given the quantity and complexity of networked devices and mission-critical health and safety systems, Leviton recommended the installation of high performing cable and connectivity that would offer the longest possible lifecycle, allow for future expansion, and optimise the medical centre’s return on investment.

Initially, Erasmus MC was interested in a Cat 6 UTP solution. However, Erasmus MC elected to install a Leviton Augmented Category 6 shielded system after considering the long-term investment the project represented. The new IT infrastructure needed to provide superior performance and accommodate technology upgrades for decades. In addition, S/FTP cable offered the best protection against external electrical interference in key locations of the redeveloped hospital, such as the hyperthermia treatment facility in the cancer centre.

This high-performance shielded solution, which included Cat 6A S/FTP horizontal cabling, exceeds industry standards and offers optimal protection from sources of interference — an important consideration for demanding and electronically “noisy” applications, such as radiography labs, that operate throughout the medical centre. A single-mode fibre optic solution was chosen to provide the backbone throughout the campus. This future-proof system, which was third-party approved by independent test institute 3P, will ensure easy migration from 10 GbE to 40 GbE and 100 GbE as the needs of the medical centre evolve.

Tackling a Multi-Part Project

The network infrastructure, supplied by Leviton distribution partner Kannegieter and installed by BAM Infra Telecom, was constructed using over 1,200 kilometres of Leviton Cat 6A S/FTP cable terminated on Cat 6A shielded tool-free jacks. The jacks were installed in ceiling consolidation points, along with direct mountings in more than 37,000 wall outlets (with a minimum of two jacks per outlet). More than 30,000 Leviton Cat 6A patch cords were also deployed.

For the fibre backbone, 4,400 metres of Leviton MicroBlo® single-mode air-blown fibre optic cabling was deployed. This future-proof solution will allow Erasmus MC to install additional fibre as required, eliminating the need to pre-install dark fibre in anticipation of future network expansion.

Cabling for the Health Care Sector

Critical Considerations for the Erasmus Project

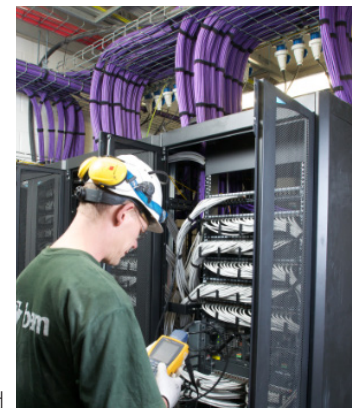
Performance requirements for IT systems and infrastructure in the healthcare sector entail higher levels of complexity than many comparable enterprise systems. A number of cabling and related standards have been published to account for the unique needs of health care facilities.

Standards include:

- EN 50173-2
- IEEE 802.3
- ISO/IEC 24702
- TIA 1179
- TIA/EIA-568

The Erasmus IT system was designed to meet and exceed all healthcare cabling standards.

The medical centre maintains two external data centres to serve the campus. Leviton’s cassette based high density, high bandwidth pre-terminated fibre optic cabling system was deployed with OM4 and single mode fibre in both data centres, along with Cat 6A U/FTP DC zone cable looms pre-terminated on 6-way modules installed in 1/2U panels.



*One of 28 SER locations
Photo courtesy of BAM*

Building security was an important concern for the medical centre. A robust infrastructure of OM3 fibre optic cable was installed as part of the closed-circuit television (CCTV) system. All 28 Satellite Equipment Room (SER) locations in the building were pre-patched, eliminating additional labour time and cost, IT staff needs, and the potential for patching errors.

Patient Care Areas with Special Requirements

Cutting-edge surgical technology found the operating rooms required highly specialized solutions. To carry out both routine and specialized procedures, surgeons frequently operate with the aid of an endoscope, which outputs a detailed video display via a 4K or FHD screen. This display is crucial to the procedure, as it allows the surgeon to view the smallest details of the operation in real time as he or she works. There can be absolutely no latency between what the surgeon sees on the screen and what he or she is doing, and the quality of the image is vitally important. Image compression is undesirable, as video footage and screenshots are not just used during the procedure, but also for training purposes after the surgery is complete.

To achieve this critical functionality and support the bandwidth needed for the 4K HD video technology, a third-party 4K HD video over IP system was installed, built on the Leviton OM4 fibre optic infrastructure, which included more than 2,000 OM4 fibre ports.

Leviton Cat 6A stranded patch cords were deployed in medical pendants anchored to ceilings in the emergency room and operating rooms. These patch cords are able to accommodate the equipment bends and tight interior spaces of these rail-mounted power, data, and therapeutic gas delivery units, and allowed a greater number of data outlets to be installed thanks to the cords small diameter.



One of the 26 new state-of-the-art operating rooms

Photo courtesy of Erasmus Medical Centre

The unique needs of the operating theatre environment also required a make-to-order hybrid patch cord solution designed to connect medical equipment in sterile operating and recovery areas. The specialized patch cords included an industrial ruggedised plug at one end and a traditional RJ-45 plug at the other. Several hundred of the hybrid patch cords were deployed in surgical and patient care spaces.

To establish galvanic separation in the 26 operating rooms, Leviton worked with Erasmus MC medical technology and IT staff to design a system in which shielding from the cable entering the rooms was discontinued. Rather than following the traditional method of using a fibre optic cable running from the SER to a SUB SER at the operating room and installing additional active equipment such as switches, decision makers at Erasmus MC wanted a cost effective and less service-intensive solution that would eliminate the possibility of cross-contamination by IT staff entering the sterile operating environment. The solution created by Leviton was inspected and independently approved by TÜV Rheinland through its Means of Operator Protection and Means of Patient Protection custom certification process for the medical market.

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“Thanks to the new network system, Erasmus MC is ready to meet the future and provide cutting-edge care for our patients, both today and for years to come,” said Paul Driever, Architect of ICT Network Infrastructure at Erasmus MC. “Medical technology is constantly evolving, and keeping up with the latest healthcare innovations is vitally important to ensuring positive patient outcomes.”

“Since the beginning, Leviton demonstrated its highly reputable service and involvement as a supplier. Key members of the Leviton team were regularly on site to share their expertise and advice, and to carry out interim quality inspections. This not only provided us with peace of mind but enhanced their reputation for guaranteeing quality,” said Binkhorst.

The project was completed in December 2017. The high-performance IT infrastructure has allowed Erasmus MC to integrate state-of-the-art medical equipment and healthcare services within the new campus. Along with improved building security features, the site offers superior energy efficiency and is ready to accommodate future technology upgrades, including digital building applications and Internet of Things (IoT) innovations.

For more information, visit Leviton.com.