Large-scale ‘Fibre to the Office’ solution for University Hospital Aarhus

R&M and Fibernet introduce pioneering solution across new hospital campus

Background

Denmark is currently consolidating its hospital infrastructure to arrive at fewer, larger and more specialised hospitals, in which use of health IT is intensified. The country is spending over five billion Euros on 14 ‘super-hospitals’. Amongst the first projects is the New University Hospital (DNU) Aarhus.

DNU is an integrated part of the hospital plan for the 1.2 million citizens of the Central Denmark Region. It will consist of 216,000 m2 of new buildings. Its construction will be put out to tender in 11 packages between 2012 and 2018. The hospital will treat about 100,000 patients admitted annually and receive around 900,000 patients for outpatient treatments per year. It will have 9,000 employees and offer room for some 1,000 students.

To accommodate tall of these functions on such vast scale, the hospital will features a wide range of state-of-the-art innovations. These serve to make the hospital significantly more efficient and cost-effective. Of course, this has significant consequences for infrastructural requirements.

The Challenge

One of the goals of the hospital was to provide fibre optic cables to every single outlet across its large campus-like environment. This involves some 80,000 fibres and a vast number of terminations, making it possibly the largest project of its kind in the world. Two fibres run from one end of the campus, two more run from the other side, and can be switched on in case of an emergency. The new network opens up all sorts of new possibilities, such as vast data storage, transfer and analysis, or support for patient monitoring and high definition cameras. Off-site medical consultants can advise or oversee medical procedures, operations or diagnostics. Patient services in the area of entertainment and communications can also be converged onto a single system. For the hospital, this means easier, more efficient management, at a lower cost.

An artists impression of the new hospital (outside view)

The Solution

Distributor Fibernet asked R&M to take part in this unique project from the outset. Fibernet has been involved in huge Data Centre projects (IBM, CSC, KMD, PBS), and has installed more than 100.000 fibre ports. Blowing and single mode fibre directly to the outlets helped overcome many of the challenges involved and keep the costs within limits. A unique solution was specifically engineered for this project, which requiring some changes to standard products. For example, alterations were made to ensure there would be no need for difficult on-site pigtail splicing and a small splice and patch box to install inside the

ducts. A tailor-made demo installation was created, the client was invited to Switzerland and feedback was positive.

All ODFs are preinstalled, so ensuring they're ready for splicing is vital - especially when more than 30.000 fibres have to be spliced in two separate splice and patch rooms. Cable and tube management brackets were redesigned so they could take more tubes to each rack. The POC (Proof of Concept) designs and schematics demonstrating ideas about main and sub patch rooms were well-received, as was the mockup for the cable solution, which used 50-metre coiled lengths of prewired cable, each containing 72 runs. These 50 metre lengths were used for running feeds from the active equipment room into the main patch room. This saves considerable time in the physical installation. Having this modular approach of factory manufactured and tested products, in turn, means greater confidence in maintaining the integrity of the overall network infrastructure and performance.

The cabling installation on site

Summary

Finding a way to manage such a large number of pre-terminated fibres on the way to the outlet was a big part of the challenge, but this was possible with the R&M ODF system. One key reason for choosing R&M was the high fibre density possible on the 900mm x 300mm 2304 fibre footprint.

The R&M solution requires relatively little space due to economic use of cable pathways. EMF, crosstalk or other interference issues are absent, which is vital in a hospital environment. An additional advantage is the fact that future-proofing is easy, as fibres can be added to existing tubes without any need for digging or reconstruction.

An artists impression of the new hospital (inside view)

Contractors from the other hospital construction sites around Denmark have followed this project with great interest. R&M now has a fantastic reference site and sees a great deal of opportunities for future hospital installations.

"In the world of healthcare, there's no room for error," concludes says Ganzhorn Knudsen IT project manager DNU. "We were very pleased that the suppliers were highly pro-active and could develop a solution that matched our needs precisely. We were also happy with the easy installation, made possible by the modular approach, as well as the support provided in this large, challenging project."

Jan Willem Veldhuis, Technical Manager Public Networks, Western Europe, R&M

Andrew Cliffin, Manager Public Networks, Western Europe, R&M

Model of the new site

Fibre to the Office or FTTO: One fibre link goes direct to an in-building outlet, where a small switch handles the communications.