



Eemsdelta Campus

# Fibre To The Office installation in new Eemsdelta Campus construction project

The Eemsdelta Campus in Appingedam, Groningen province, the Netherlands, brings secondary education, a practical study programme and a sports cluster together in a single facility. With a total area of 16,600 m<sup>2</sup>, this new campus consists of several buildings that jointly accommodate 1,700 students. The project, which cost some 38 million euros, is energy-efficient, 100% circular and earthquake-proof. Thanks to smart layout and realisation of synergies, the number of classrooms has remained the same, while the total area has been halved. This is the first new-build educational project in The Netherlands to use Aginode Fibre To The Office (FTTO) in accordance with the smart Digital Ceiling principle.

## Challenges for a newly built campus

“The Groningen National Programme (nationaal programma Groningen) consists of 104 primary and secondary schools,” says Klaas Reinders, Director of Construction & Management, Stichting VO Eemsdelta, responsible for construction of the campus from its planning in 2016 to its completion. “The buildings that formerly housed these schools were found not to be earthquake-proof. Research showed that reinforcing these buildings was not an option and that new construction would be the better option. Furthermore, our region is experiencing demographic contraction. These were all excellent reasons to bring several facilities together in one location. We wanted the new campus to be as energy efficient as possible and utilise an absolute minimum of resources. For this reason, we wanted to use as little copper as possible. For example, we did not want to develop a traditional electricity network based on copper cabling, but instead create a voltage rail that runs along the facade. Minimise space usage and provide the best possible Wi-Fi were clear objectives.”

“There aren’t many environments in which you’ll find such a high density of devices as education,” says Casper Bijleveld, ICT Advisor, VO Eemsdelta Foundation, and responsible for ICT infrastructure. A 27x27 m2 classroom might house 32 students, all with laptops and smartphones, and often also tablets or smartwatches. This means you must be able to closely manage the configuration of the network and authentication. We created a basic template for all 180 switches based on a Best Practice document from Aginode, which we then pushed.”

For telephony, we are now also completely dependent on our network. We use Teams telephony for both fixed and mobile calling and have moved from 40 external numbers and 200 internal numbers to 240 external numbers. Other functionalities are also dependent on the network. For example, students use an app with a digital lock for lockers. Lighting, CO2 measurements, heating, cooling, the printing and copying system, and payment transactions have been digitised. Antennas everywhere ensure you can use your laptop to access education anywhere on and around the

campus. All these previously disparate systems are now converged and use the same network.”



## Aginode LANactive Fibre To The Office

FTTO proved to perfectly meet all Eemsdelta’s requirements regarding space saving, energy consumption, future-readiness, and performance. FTTO is an innovative, fibre-based LAN cabling concept. Optical fibre runs from a central switch to a connection point at each workplace. Here, a dedicated Ethernet switch provides intelligent media conversion from fibre to copper. Each FTTO switch is connected to the central distribution switch with one or two SFP uplinks and has four or five user ports, all of which are Gigabit Ethernet capable. The centralised structure of active network components greatly simplifies network deployment, and service, significantly reducing IT infrastructure costs. In addition, FTTO supports full Power over Ethernet (PoE) functionality.

“At the start of the design phase, a consulting firm compared three concepts: a traditional network with ample copper cabling, a GPON network, and an FTTO network,” explains Georges Kazantzidis, Territory Sales Manager, Aginode, who was closely involved from the beginning of the project until its completion. “The choice for FTTO was made quickly, partly because it uses 80% less cable than a ‘traditional’ installation. In 2020, Aginode developed a 10 G 8-port switch, named LANactive DICE, which can be mounted in ceilings. This allows future network capacity, bandwidth, as well as PoE power, to be doubled easily, with no need for structural modifications.”

“I found it extremely interesting to be involved from the beginning right up to delivery of the entire project. Due to Covid, we had to organise training through Teams, which was an interesting learning process for me. It’s great to see how this project stimulates innovative thinking among other parties, not only in the field of IT, but also in terms of new materials and processes.”

On campus, 5,000 devices could be online at a given moment, such as laptops, phones, sensors, and lighting drivers. Students had already started their school year while people were still moving into the new campus, but the FTTO network worked smoothly from day one. Klaas: "From the first moment, there were 2,000 people on the network, and we haven't had one complaint or failure so far. The network has not been down for even a single second - very unique for a new building."

A fibre-optic 'backbone' runs from the heart of the campus to the different buildings. Because FTTO eliminates the need for separate technical rooms and long, thick copper cables, huge space savings are achieved. 180 centrally managed switches, to which wall outlets and Wi-Fi access points are connected, are linked to four aggregation switches via fibre-optic cables. As there is always a switch nearby, flexibility is significant: with each new device, only a short section of copper cable needs to be installed at the terminal. The campus is connected to a small annex through a P2P connection via the switch. This works just as well as a wired connection - latency is even lower than when using a VPN over fibre. This is all possible because there are active connection points throughout the building, some 800 in total. The network management system always clearly shows which ports are available.



"The VO Eemsdelta Foundation got in touch with Aginode in an early phase of the project. A big advantage of working with Aginode is the direct contact with the support department," says Casper: "If I have a technical question I receive a clear answer very quickly - I don't need to go through a layer of contacts and resellers first. The switches are feature rich. For example, individual computers can be placed in the network by the switch, based on a username and password. For example, we can easily assign the computers in the exam room, shared by several schools, to a specific part of the network. Interoperability with our switches and the rest of the infrastructure is excellent, and there is hardly any heat generation - unlike with a traditional network."

Since then, many other educational institutions, companies and even the Chief Government Architect have come to take a look. Klaas concludes: "The innovative nature of the network is attracting numerous people and has even got major players in the construction world, such as BAM Bouw & Techniek, thinking. People immediately see how unique this project is, something we hardly realised ourselves when we started it!"

## Installation configuration

### FTTO

- 180x LANactive GigaSwitch V5 SFP-2VI 48/54VDC
- 180x LANactive Power Supply Click-In 48/54VDC 130W
- 34x LANmark Lockable ZD Box
- 34x LANmark-OF OM4 multimode pre-terms cable Cca
- 9x LANmark-OF Modular patch panels

### Wi-Fi

- 75x Extreme/Aerohive AP650, 99 Extreme AP410C
- 16x AP460S12C
- 14x AP460C (outdoors)

### Aggregation switches

- 4x 48-port FS.COM N5860-48SC with 1GB SFP transceiver.
- One of these switches acts as core switch
- Server environment
- Dell PowerEdge VRTX Chassis with 3 additional switches
- HP Aruba 2530 and HP Officeconnect

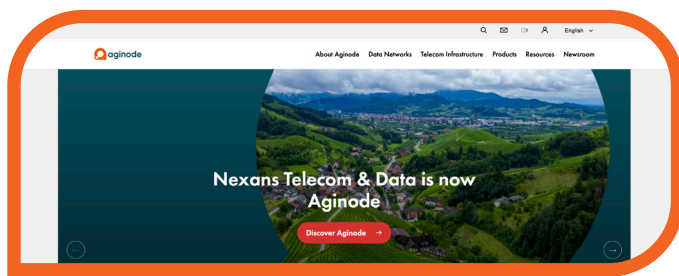
## Solution advantages

- Future-proof network (scalable, flexible, sustainable)
- Network security
- Area optimisation (no LTE)
- Improved energy efficiency and resource reduction
- Reduced operating costs
- Easy management, flexibility of use, no mixing of technologies
- Quick and easy installation
- Support for PoE evolution, PoE+, PoE++
- Interoperability / IP convergence

#smartconnection



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