Limtec+ has built a state-of-the-art training center for service technicians at the Diepenbeek Technology Park in Belgium. For building automation, the company has adopted the principles of Industrie 4.0 and integrates building services, media control and industrial communication on the PC-based control platform.

Building Automation, media technology and industrial communication combined on a single platform

Industrie 4.0 meets Building Automation

Service technicians in the field of electrical engineering receive advanced training based on the latest standards at the Limtec+ Training Center in Diepenbeek, Belgium. More than 2,000 participants attend these training courses each year. The advanced building automation platform in the company's new building, which was completed in 2017, reflects the principles of Industrie 4.0 and integrates the complete range of building services, media control and industrial communication in a central control system.

"In order for the industrial companies in our region to grow, they need well-trained personnel," says Limtec Managing Director, Benny Siemons. "Our training courses focus specifically on the maintenance of machines and systems. In order to help participants learn how to efficiently eliminate machine malfunctions, frequently occurring incidents are simulated and corrected using state-of-the-art technology."

EtherCAT network connects all rooms

Limtec's goal was to implement the principles of Industrie 4.0 in the context of building automation, so all systems had to be intelligently connected. "First, we wanted to implement a powerful system, and now we can expand our training activities to also include building automation," explains Benny Simons. His colleague, Bert Vanderhallen, a technical coordinator at Limtec, adds: "We have implemented extensive digitization and a holistically integrated system, so that all technical functions can be managed from one software platform."

A C5210 Industrial PC was chosen as the central control platform, while the building management system was developed completely in software using TwinCAT 3. Monitoring and operator interface are carried out on 28 multi-touch CP2611 Panel PCs using TwinCAT HMI software. "The PC platform offers us the necessary openness required for seamless communication between the various systems in the building," explains Bert Vanderhallen. He continues: "In the world of buildings, each system speaks its own language: in our training building, there are a total of 14 different bus systems. Of these, 13 were already available in the extensive Beckhoff interface portfolio, while Beckhoff developed one new RFID interface especially for us." In addition to DALI, M-bus and MP-bus, the window blind control system as well as Modbus and RFID for access control and security equipment were also integrated into the automation platform.

Limtec uses the industrial communication standards of EtherCAT and Safety over EtherCAT to guarantee safety in the training workshops, with the possibili-

ty to shut off the machines using an emergency stop button. All the classrooms are interconnected via an EtherCAT network, and each room has a decentralized I/O station, to which the various bus systems of all systems and the Control Panels are connected. The less time-critical applications communicate with the controller via standard Ethernet.

Seamless integration of media control and building automation
"The special thing about our new building is that all building functions, including media technology, are handled on one platform. In addition, we can communicate using almost any of the common protocols. This gives us the freedom to implement all the functions we want and need at any time. In the control system, for example, we used AES 70 (OCA) to integrate the loudspeakers and PJLink to operate the projectors," explains Benny Siemons.

The intelligent networking of all systems in the building improves not only the energy efficiency of the building, but also makes life easier for the users. The air conditioning and lighting of the rooms are dependent on whether or not people and daylight are present, and this is linked to the blind control system as well. "It's all incredibly easy to use," Bert Vanderhallen explains: "As soon as someone wants to start a presentation, he or she can switch on the projector, dim the lights and close the blinds by pressing a single button. Each room is equipped with a centrally configured touchscreen that offers these functions. As an alternative, each device in the room can also be operated separately using the touchscreen." In addition, the Beckhoff platform is linked to the room occupancy plan, so that the control system can also take this into account.
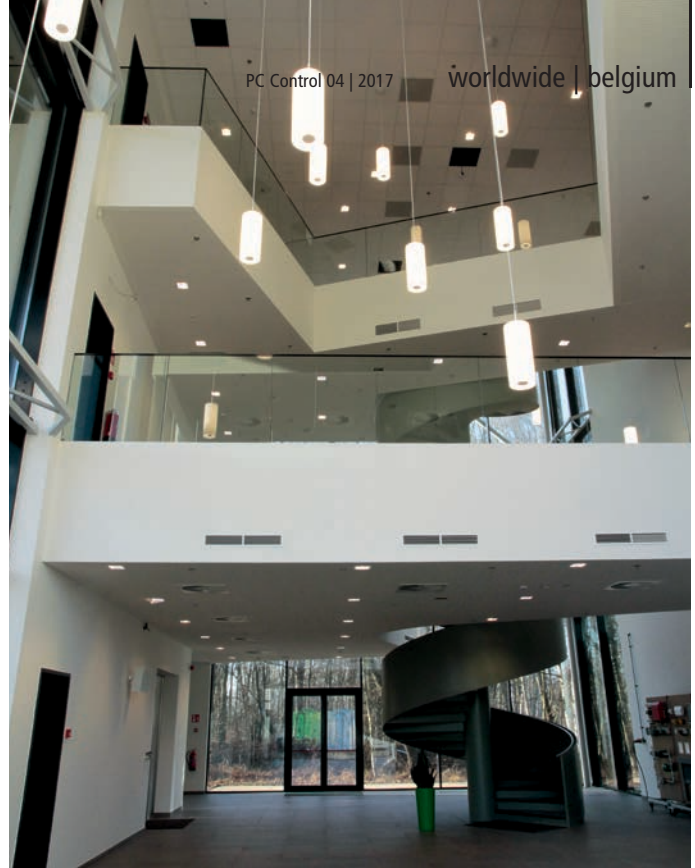
On the basis of system-spanning building automation from Beckhoff, all the functions of the building – including media technology – are holistically integrated on one software platform. This ensures a high level of energy efficiency with great user convenience at the same time.

All of the building's status messages can be retrieved and managed from the touchscreen in the entrance hall. All technical systems, from HVAC, lighting and façade, to media technology and safety systems, are integrated into the central control platform.

Each room is equipped with a centrally configured touchscreen on which, for example, the projector in the classroom can be switched on, the lighting can be dimmed and the blinds can be lowered by the press of a button.

"The control platform functions like a large, modular system," reports Bert Vanderhallen. A large part of the programming is carried out using pre-configured software function blocks, which are provided by Beckhoff as a standard offering. This also includes functions that only run in the background – for example, a specially developed automatic process for testing emergency lighting. To do so, the controller activates a test function in the lighting module via the DALI bus to which the emergency lighting is connected; the result is then read out via the bus. The building manager receives an automatically generated e-mail with the test results on a regular basis.

Further information:
www.limtec.be
www.beckhoff.be