

Integrating fire alarm systems into building management systems

Flexible gateway due to finely scalable control technology

Fire alarm systems work independently of the building automation system. Having detailed information about the state of the fire protection technology would make the work of many facility managers easier. Schrack Seconet has developed a flexible gateway using ultra-compact industrial PCs and TwinCAT from Beckhoff, which can be used to flexibly convert a customer-specific communication protocol to a wide range of transmission standards such as BACnet or OPC UA.

“Customers told us that they needed further interfaces in addition to the protocols supported by our fire alarm systems,” says Paul Panzitt, product manager for fire alarm systems at Schrack Seconet in Vienna, outlining the starting point of the development project for the gateway. During their research, the developers quickly became aware of the open PC-based control technology from Beckhoff.

Schrack Seconet offers the gateway as a supplement to the fire alarm systems, allowing operators to integrate the status and alarm messages of the systems into their building management technology. Due to the variety of building management systems that are available, it must be possible to implement a wide range of different transmission protocols. “TwinCAT 3 Connectivity provides a wide variety of protocols for this purpose, from classic TCP/IP-based protocols to SMS/SMTP servers, JSON, MQTT or HTTPS/REST and WebSockets to direct integration with databases and cloud storage such as Amazon AWS and Microsoft Azure,” emphasizes Balazs Bezeczkzy, head of the Beckhoff sales office in Vienna. In the projects implemented to date, integration has been implemented with BACnet (TF8020) and OPC UA (TF6100).

ISP-IP protocol recoded

The fire alarm systems send the status and alarm messages via ISP-IP to a C6015 or C6030 ultra-compact Industrial PC. “The conversion of the specific protocol to – currently – BACnet and OPC UA was realized as a C# program and implemented in TwinCAT,” says Georg Schemmann, Head of Industry Management Building Automation at Beckhoff. Due to the openness of PC-based control and TwinCAT as an engineering platform, the program can be combined with any other TwinCAT function in order to allow the fire alarm systems to communicate with the respective management technology.

The gateway primarily provides the building management system with alarms or status messages, which can then be integrated into the building visualization. As communication via the gateways is bidirectional, the building technician can shut down individual detector groups or adjust the operating mode during maintenance. “All of this can be operated centrally via the visualization of the building management system using the gateway implemented with Beckhoff technology,” says Georg Schemmann. Paul Panzitt adds: “Schrack

Seconet already supports such use cases via its own service platform, to which our fire alarm systems send all relevant information.” In principle, TwinCAT could be used to extract further information from the transmitted data, such as the degree of contamination of a smoke detector, and make it available to different end devices via TwinCAT HMI Server (TF2000), for example.

Simple scaling and retrofitting

Depending on the size of the fire alarm systems, Schrack Seconet uses a C6015 or C6030 ultra-compact Industrial PC. “The easy scalability of the computing power is important as we have fire alarm systems ranging from 200 to over 50,000 data points,” says Paul Panzitt. A C6015 is used up to around 10,000 data points; above that, the even more powerful C6030 comes into play. In addition to flexibility and scalability, simple implementation without the need for in-depth training was another criterion when choosing the system.

The clear separation between the gateway and the fire alarm system also enables easy implementation in existing buildings without the fire alarm system having to be approved again. “We can use the converter solution to integrate with any control system. We only get positive feedback from our customers because it is easy to implement and it works,” says Paul Panzitt. Even systems that are several decades old can be retrofitted with advanced communication protocols without having to replace the entire fire alarm system. “With TwinCAT, we support a wide variety of communication protocols used in industry, building automation, and IT, and are constantly implementing new standards as required,” says Balazs Bezeczkzy.

Using fire protection technology for room automation

Schrack Seconet’s converter solution currently focuses on exchanging fire protection data with the building management system, i.e., alarms and status messages. However, the fire detectors also register additional information, such as the temperature or CO concentration in the air. It would be conceivable to evaluate these measured values in the next generation of fire alarm systems and to use them in the building management system to monitor air quality and for room air conditioning. “Looking to the future, this is an exciting idea that would save a lot of additional sensors and therefore costs,” concludes Paul Panzitt.

Schrack Seconet integrates fire alarm systems into a wide variety of building management systems in a flexibly scalable manner via ultra-compact industrial PCs and TwinCAT functions.



More information:

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