Building automation system optimizes energy consumption while ensuring comfort and security

The "intelligent care" home

The French organization "Turbulences" recently built a home for autistic and handicapped adults in the city of Saint-Dié-des-Vosges that seeks to implement the latest in care technology. "Maison Mosaïque" sets the gold standard in terms of integrative care concepts and intelligent building automation. Based on Beckhoff components, French systems integrator A2I implemented a solution in which all components are integrated, configurable, and remotely controllable.

Développé par a2i http://a2i.eu

In each room, the temperature can now be set according to the resident's individual needs.

With its "Maison Mosaïque", the French organization "Turbulences" has built a care home for autistic and handicapped adults in Saint-Dié-des-Vosges that provides an extremely high level of flexibility for personnel.

To protect the health of the residents, the "Maison Mosaïque" features a monitoring system which is accessible by all care staff and educators. The operators decided from the start that they wanted to install a building automation system that featured the latest in advanced monitoring technology. This was the only way to implement a modern care facility that would be open to the outside while ensuring the residents' safety. Using presence and motion sensors, the staff knows where residents are located at all times and can respond accordingly, if necessary.

Another building automation requirement involved the ability to use and remodel rooms in a flexible manner. In view of the broad spectrum of patient needs, the operators wanted the ability to adapt the rooms to the different needs of their residents. A2I, a French company specializing in building automation and technical building management, accepted this challenge.

Wireless communication permits flexible usage of space

"For the Maison Mosaïque building, we envisioned an automation system where each device can be integrated and fully configurated," explains Olivier Franoux, head of automation projects at A2I. Since all lights, doors, rolling shutters and windows of the building are equipped with wireless sensors, very little wiring was needed. The sensor and switch signals are transmitted via EnOcean radio technology. "This is a huge advantage when a switch needs to be moved to another wall if a change is made in the way the space is used. It also enhances the safety of the residents, because the wireless, battery-less EnOcean devices are energized just by the kinetic energy generated from a button push," elaborates Olivier Franoux.

Diverse interfaces ensure reliable communication

A2I implemented the building automation system on the basis of Beckhoff control components. The controllers communicate via various protocols such as EnOcean for the wireless switches, remote controls, and door sensors, among other systems, and EIB/KNX for the heating system. One advantage of the Beckhoff controllers is the fact that they can handle all communication protocols common to industrial and building automation. "All in all, we installed 29 embedded controllers from the CX9000 series. Each of these handles two rooms

or one office area in the building's administrative section," Franoux continued. "A CX5020, with a powerful 1.6 GHz Intel® Atom™ processor, runs supervisory control functions, as well as the monitoring software."

Personal comfort at the push of a button

Developing the complex automation system, with its multitude of adjustable parameters for each object, took less than six months. Today, the operator of the "Maison Mosaïque" building can specify a wide range of scenarios for each room. Some residents are allowed to open their rolling shutters themselves; others are not. Some patients must be wakened with light that slowly becomes brighter. A switch may control optional a single lamp or all of them. The care staff can even program an alarm that senses if a patient stays in the bathroom for an excessive amount of time (indicating that he or she might need help). Although the monitoring software itself is complex, the operation of the system is quite intuitive: "We received support from a web designer to make the application visually attractive. We also worked on its ergonomics so that no action requires more than three clicks," emphasizes Franoux.

The browser-based monitoring application for various display types, such as touchscreens or tablets, is based on the Beckhoff controllers' web server. The building automation system not only improved the comfort and safety of the residents, it also saves the operator money. Due to the intelligent integration of lighting, blinds and sunlight sensors into the system, the facility uses much less electricity than before. In addition, with access to historical data such as individual room temperature readings, the efficiency of the heating system could also be optimized.

Further information:
www.a2i.eu
www.beckhoff.fr
www.association-turbulences.com/maison-mosaique