1980
1999
2009
10 years
BECKHOFF
Switzerland

Messe Basel: high-speed redesign of building services

Advanced building automation in historic Basel exhibition hall

Hall 2 at the Messe Basel (Basel Trade Show), with its landmark large clock on the glass facade above the main entrance, has been listed as a historic building since 2008. So that the building can continue to meet the tough requirements of modern trade fair operations, it has been fitted by Scherler AG of Basel with the latest building automation technology based on Beckhoff components with Ethernet communication.

Exhibition Hall 2 during the Baselworld, the world's leading trade fair for watches and jewelry. The Messe Basel also hosts Switzerland's most important automation trade fair, Go-Automation.

"The Swiss sample fair in Basel has been struggling against an ever increasing lack of space for years." This finding, which has lost none of its topicality, dates back to 1951, as the Zurich architect Prof. Hans Hofmann was commissioned with the task of planning a new proposal for the exhibition site and an extension to the buildings. The result was the large exhibition site, now traffic-free, and the new hall, known today as Hall 2, with a total floor area of 44,000 sq. meters. Due to the small size of the property, an exhibition hall with three stories was erected in 1954 on a square footprint with a side length of 145 meters. The eye-catcher in the interior is the architecturally unique, round, open courtyard with a diameter of 44 meters. This contains four open staircases, elevators and open connecting galleries. What is special about this exhibition center architecture is that all three stories have a great deal of available daylight for illumination.

Tight schedule for renovation

The large numbers of visitors and the competitive situation among exhibition centers made the replacement of the building services by more efficient technology unavoidable. Within the scope of planning

the building services for the 'Messe Basel 2012,' the Basel-based company Scherler AG was also commissioned with the project planning and implementation of the building automation in Hall 2. Daniel Mangold, an experienced automation specialist from Scherler, describes the particular challenges of this project: "There were no longer any functional descriptions of the existing system, so everything had to be redefined from scratch. Above all though, the timeframe for the renovation was very tight, from December 08 to January 09. That meant planning and preparation had to be 100 percent accurate."

Use of modular technology and Ethernet communication

Eight systems ventilate one eighth of the building each; the controller is placed on the first basement level. The local I/Os on the ground floor control the reheaters, the fire protection flaps and the swirl outlets from the ground floor to the second floor. The outside air is drawn in to the facade and fed via ducts to the ventilation system on the first basement level. It is filtered there and heated or cooled as necessary. The air supply fan pumps the prepared air via ducts into the air supply shaft, where reheaters are mounted on each floor, to special swirl outlets with actuators in the ceilings of the halls. The exhaust air is either fed back into the air supply circulation via circulating air flaps or exhausted to the outside via exhaust flaps.

Three modes of operation are distinguishable in automatic mode: standby operation, assembly and disassembly operation, and trade fair operation. In addition, emergency operation of the individual components and manual operation from the control cabinet and building management system are provided. The heating/cooling requirement is communicated from the new system to the heating/refrigeration plant via an OPC interface.

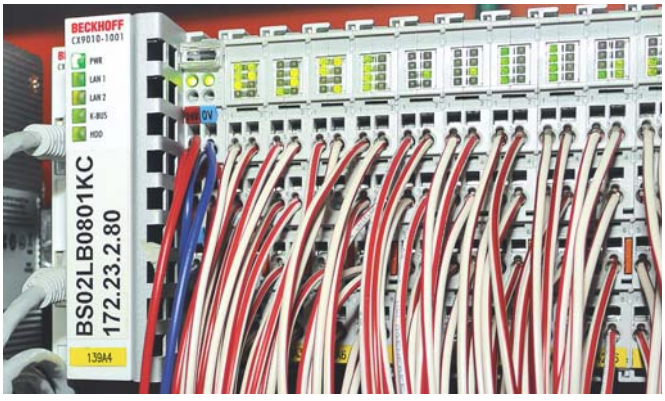
The PC-based building automation consists of Beckhoff Bus Terminals, Ethernet Bus Couplers and Embedded PCs. Each of the eight substations features a CX9010 Embedded PC functioning as a controller and a BK9100 Bus Coupler functioning as a data point controller. Due to the large distances involved and in order to avoid EMC problems, fiber-optic cables were installed between the central building distributor, where the server for the building automation is housed, and the substations. In the existing switching device combinations, only those building automation components were replaced that integrate the already existing sensors and actuators via Bus Terminals. Operating and event messages, including virtual data points, are displayed on the SCADA software in plant diagrams and event lists. Error and alarm messages are displayed at the substation by a touch panel.

Web-based building management system

Scherler utilizes the building management system Webfactory 2006, a complete Web-based SCADA software solution, for visualization, control, monitoring and analysis. All process data are displayed and analyzed online on a clear, Web-based user interface. It can be displayed on any browser worldwide with the corresponding access data.
In this project, the Beckhoff substations are integrated consistently via Ethernet interfaces. A total of 655 digital inputs, 248 digital outputs, 195 analog inputs and 163 analog outputs were used. The CX9010 Embedded PCs employed, with Windows CE as the operating system, communicate all data via the TwinCAT ADS protocol.

Exhibition Hall 2, built in 1954 and designed by Prof. Hans Hofmann, has been a listed historic building since 2008.

The signals to and from the sensors and actuators are integrated via Beckhoff Bus Terminals and processed in the CX9010. The system communicates with other substations and the SCADA software via Ethernet through fiber-optic cables.



TwinCAT building libraries simplify engineering efforts

The TwinCAT universal software platform forms the heart of the Beckhoff control system on the software side. Software libraries with extensive function blocks for building automation and interfaces to other systems, such as LON, EIB, EnOcean, etc., simplify the engineering decisively. "We have an absolutely modular and flexible hardware system with complete continuity, thanks to the serial communication via Ethernet. Engineering is considerably simpler with TwinCAT than with other systems and the price/performance ratio is extraordinarily good," says the satisfied project leader, Daniel Mangold.

Messe Basel (Basel Exhibition)	**www.messe.ch**
Scherler AG	**www.scherler-basel.ch**
Beckhoff Switzerland	**www.beckhoff.ch**