



Markus Göbler

Berlin's new main railway station: a fascinating work of art in the transport sector – with Sauter technology.

The newly constructed main railway station in Berlin is located at Europe's largest rail intersection and one of the continent's most important transport nodes. As the first central rail station in the history of Berlin, it creates a new symbolic landmark for the city. This complex of buildings features filigree structures that are generously flooded with light; every day, hundreds of long-distance, regional and suburban trains (plus underground trains at a later stage) operate on five levels here. Ultra-modern building technology ensures the well-being and safety of passengers and visitors. An interview with civil engineer Markus Göbler, Infrastructure and Technology Manager at Deutsche Bahn, revealed the multi-faceted nature of this new structure.

The start of construction work on Berlin's main railway station involved setting up the world's largest underwater building site, because the building's base is 18 metres below the groundwater level. At the same time as the new station was being built, three other stations (Gesundbrunnen, Ostbahnhof and Südkreuz) were modernised and adapted to the requirements that the main railway station sets for a high-performance rail system in Berlin.

Excellent conditions of safety and comfort have been implemented for up to half a million people who will pass through the new main station every day.

A gigantic control system in safe hands

Building and commissioning the station added up to a logistical achievement at the very highest level.

About 1,100 building service systems are operating in 134 technical rooms throughout the entire station. The objective: to cope with supplying 3 MW of cooling, 3 MW of heat and an air volume flow of 2.65 million cubic metres per hour. Fault-free operation also has to be guaranteed for 54 escalators, six panoramic elevators, ten more passenger elevators, seven goods elevators and nine fire brigade elevators, and there are 9,000 sprinkler heads to be monitored. These technical systems are operated and supervised by a hundred-member team. For safety reasons, double manning is operated on the system groups.

Over 25,000 data points have been installed and about 140,000 metres of cable have been laid for the building's control technology, which has nothing to do with the rail operation as such.

All of the building's service systems

were tested individually after installation – several times in some cases – by the TÜV and the railway company's own experts.

The building management system as a whole was not commissioned until the

"Berlin's main railway station confronted us with some huge challenges in terms of control technology. Sauter played an outstanding part in achieving a successful outcome on deadline."

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station was opened, without a test phase of any sort. Operation went straight from '0 to 100' with immediate fault-free functioning. A period until the end of 2006 has been set to optimise all the functions.

Data transmission via BACnet and LON networks

The functions controlled by the building automation system comprise:-

- Heating
- Cooling
- Smoke clearance in the long-distance rail area
- Ventilation/smoke clearance for the underground garage and vehicle park
- Ventilation/smoke clearance for the commercial areas
- Glass roof control for ventilation and

- smoke clearance in the station hall
- Ventilation/smoke clearance/secondary exhaust air for technical rooms and centres, loading ramps, transformer rooms and staircases

A LON network has been installed to control lighting in the station, which is subject to strict regulations. This control allows adaptable, energy-optimised operation of the lighting.

More LON networks have been installed to handle operational and fault signals, and to activate and report fire protection dampers (which are not operated directly via the hardware on account of their function).

Fire and smoke protection to meet the strictest criteria

The key aspect of the fire protection system is smoke clearance, because the development of smoke in buildings of this sort poses a particular threat to life.

The development of the smoke clear-

ance system was based on the scenario of a fully occupied burning ICE driving into the station. Intensive tests with models resulted in a system of fan extraction devices to control the flows of air and smoke in four smoke clearance centres, in

"Thanks to the EY3600 automation stations, we can also react optimally to later requirements."

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combination with curtains that are activated in case of a fire. Smoke is removed via the roofs so as to keep the escape routes as free from smoke as possible. Access for the fire brigade is guaranteed via separate staircases, elevators and connecting passages.

A pleasant climate – naturally!

The general problem of poor air in rail stations was also approached with particular care at Berlin's new main railway station. Studies on models determined the influence exerted by incoming and outgoing trains on the air and the airflow in the station. The two main tunnel tubes in the new station – one running north-south and the other running east-west – mean that the travelling trains act like compres-

sors; together with the fixed ventilation equipment, this effect can be used to assist air exchange in the building.

There is no mechanical heating or air-conditioning in the areas of the station that are frequented by the public. Fluc-

tuations in the outdoor temperature are compensated by the shell of the building, airflow, and movements inside the station, so even with outdoor temperatures above 30°C (as occurred in the summer of 2006), the temperature in the station is always about 10°C lower and, therefore, within the comfortable range. And when the thermometer drops to minus 15°C in winter, the temperature in the station falls no lower than plus 8°C.

Sauter meets the highest quality standards

Deutsche Bahn has specified its extremely demanding standards for building services engineering in its TGA Manual (TGA is the German abbreviation for Technical Building Equipment). Only companies

with the highest technical and planning qualifications are able to meet these standards.

We are proud that Deutsche Bahn entrusted Sauter with providing a major part of the building management system for Berlin's new main railway station.

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