HIRSCHMANN
A BELDEN BRAND

Case Study

CS 104HE

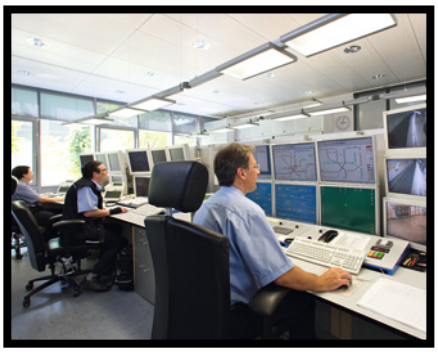
Stadtwerke München, which operates Munich's municipal utilities, is modernizing its subway and tramway cars by installing Hirschmann™ Ethernet technology.

Increased Safety and Comfort for Passengers

Munich is one of Germany's most attractive cities. One reason for this is its exemplary public transport system, operated – among others – by MVG (Münchner Verkehrsgesellschaft), a subsidiary of SWM (Stadtwerke München GmbH). MVG is Germany's second largest municipal transport company and operates more than 576 subway cars, 95 tramway trains and over 230 buses, with an additional 180 buses operated by private partner companies. Well over a million passengers use MVG's transport facilities every single day to reach the 1,170 stations and bus stops in its 626-kilometer route network.

At the beginning of 2009, SWM decided to modernize 358 subway cars, 18 complete trains and 90 tramway trains that were built between 1980 and 2006. A company spokesperson explained the background as follows: "We want the passengers who use these vehicles to also have the benefit of modern information technology, for example with screens showing the next stop and the position of the exit. We also want to install video cameras and passenger counting systems."

To ensure the secure transmission of data MSG decided to equip its subway and tramway cars with a redundant Ethernet network based on ring topology. Each train will also receive a powerful control computer with wireless communications to the central traffic control center.



HIRSCHMANN
A BELDEN BRAND

Robust Network Technology

Hirschmann™ Switches: Dependable even in rugged industrial environments.

Following a pan-European call for tenders, MSG awarded the contract for this work to INDANET AG, which also has its headquarters in the Bavarian state capital and is one of the leading system houses for integrated local public transport solutions. The designers responsible for the new IT infrastructure chose the network equipment from Hirschmann™.

Jörg Hundgeburth, Project Manager at INDANET AG, explains: "These switches have repeatedly demonstrated their reliability in rugged industrial environments. In addition, the various designs are all based on a uniform software platform with identical functionality and user guidance."

July 2009 then saw the kick-off for the subway and tramway modernization, which is scheduled to be completed by the end of 2011. Initially, three trains were equipped with passenger information and counting systems plus from four to eight IP cameras (depending on the type of vehicle), and these were then tested over a period of three months' regular operation. Once the Ethernet networks had passed this acid test, 50 more cars were equipped with Hirschmann™ technology in each subsequent quarter-year. The IP cameras and the individual components of the information and passenger counting system in each car are connected via one or two OCTOPUS series IP67 switches to the train's control computer. Since these switches support PoE (Power over Ethernet) the cameras can be powered directly via the data cable, which considerably reduces the outlay on cabling.

Industrial Networks for Demanding Tasks

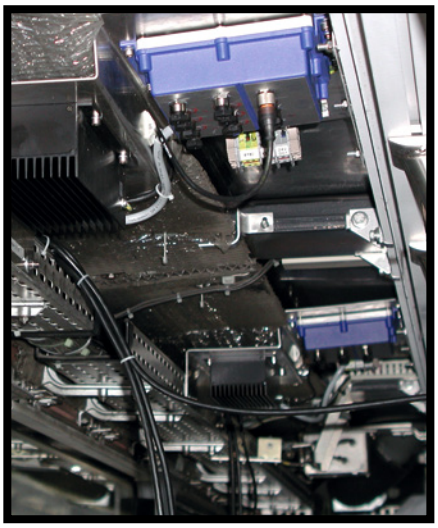
Altogether, the project will involve 523 OCTOPUS 8M-6PoE and 315 OCTOPUS 16M-8PoE units, providing respectively eight or sixteen Fast Ethernet ports with M12 connectors. These switches fulfill the required European standard for onboard equipment for rail vehicles, which means that they also comply with its stringent EMC requirements and are guaranteed to be able to withstand the high mechanical stresses that are frequently encountered in rail transport applications. In addition, this equipment supports the HIPER Ring protocol, which – in the space of a few milliseconds – reacts to interruption of the data connection by switching to a redundant connection. "This guarantees high network availability at all times, which is of particular significance in view of the combination of video, audio and data transmissions used in our subway and tramway cars", underlines Jörg Hundgeburth, INDANET AG's Project Manager.

As soon as the new Ethernet networks have been installed, the trains will gradually receive their control computers and wireless systems.

Apart from this, active network nodes will be installed at additional subway stations to enable the stationary process network to cope with the ever increasing demand for network connections for process technology. This will involve installing one or more dustproof wall cabinets at each of the 100 subway stations, with each cabinet containing one or two modular Hirschmann™ switches of type MS30. These additional node locations can then be used to link up control equipment and/or cameras.

"These switches can easily be retrofitted with appropriate media modules to offer up to 24 ports, which means that they also offer sufficient reserves for future applications", explains a spokesperson for the relevant SWM department, "and the fanless design guarantees reliable data communication in spite of the presence of abrasive dust and other environmental influences."

Rolf-Dieter Sommer, Product Manager at Hirschmann Automation and Control, comments: "The key factors for the successful completion of this project are the many years of experience of Hirschmann™ in the field of rail technology together with the competent support given to MSG by our long-term partner INDANET. With our optimally coordinated portfolio of products and services we have set a new communications systems benchmark for local public transport."



"This guarantees high network availability at all times, which is of particular significance in view of the combined video, audio and data transmissions used in our subway and tramway cars."

– Jörg Hundgeburth
Project Manager at INDANET AG

HIRSCHMANN
A BELDEN BRAND

The Hirschmann™ Product Range

As a specialist for automation and networking technology, Hirschmann™ develops innovative solutions, which are tailored to its customers' requirements in terms of performance, efficiency and investment reliability.

Hirschmann™ not only offers a complete range of products for company-wide data networks but also a broad support package direct from the product manufacturer. Customers not only receive support while their tailor-made communications solution is being designed, but also throughout the subsequent planning, design, commissioning and maintenance of their networks.

Seminars and workshops, in which trends and developments are evaluated and technical subjects put into practice, complete the range of services.

Product Details

OCTOPUS PoE

- Completely enclosed design IP67
- Standardized 4-pin M12-D technology (ODVA, PNO)
- Fiber Optic Gigabit backbone switch for use in the field
- Management via SNMP v1, v2, v3, web GUI or TELNET
- Redundancy via HIPER Ring and Rapid Spanning Tree
- Redundant power supply for high availability
- Operating temperature range from -40ºC to +70ºC
- External display of alarms via signaling contact or network

MICE Family

- Modular switch family
- Comprehensive range of hot-swappable media modules
- Maximum flexibility from a comprehensive selection of media types
- Supports a wide range of connectors
- MICE PoE media modules available

Phone **+49 (0)7127/14-1809**