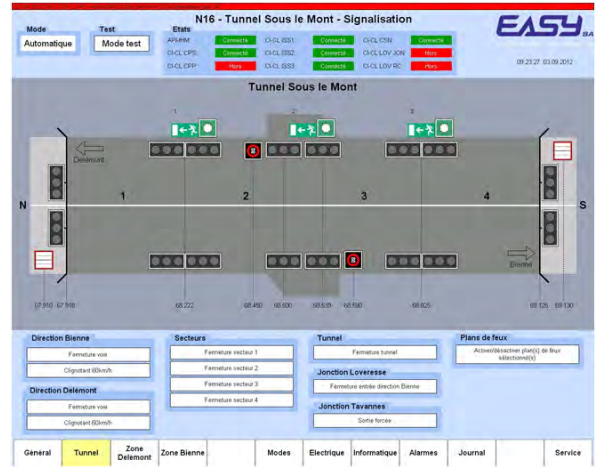*Image source: A16 Info*

zenon as a central traffic management point for tunnel monitoring

Swiss Transjurane monitored in real time

Switzerland has many years of experience in the construction and safe operation of tunnels. For the new construction of the A16 highway, the Cantons of Bern and Jura have specifically invested in modern control for tunnel systems and traffic management. EASY SA, the system integrator in charge of the project, wanted a modern, flexible and long-lasting solution: zenon from COPA-DATA met their requirements best.

"Bure" tunnel: View of the speed segments

"Sous le Mont" tunnel: View of the signals

Transjurane is Swiss Highway A16. It covers over 84 km from the French border through the cantons of Jura and Bern to Biel/Bienne and will connect the region to the French and Swiss highway networks once it has been completed in 2016. Numerous bridges and 27 tunnels have been built for the A16. In order to guarantee the safety of traffic in the tunnels, the most up-to-date technology with an extremely high degree of availability is to be used for control of the tunnel and traffic.

GUARANTEEING OPTIMUM TUNNEL SAFETY

The planning and implementation was carried out by the engineering company Bonnard & Gardel. Project manager Pascal Crétin: "The requirements for the Transjurane tunnel project were very clear. It is operated by several people who must have access, independently of one another, by means of a web browser. All tunnels must be monitored in real time. Key functions are traffic management technology, ventilation, CO2 measurement and lighting, and also fire alarm systems by means of temperature measurement and quick, clear information for the operators in the event of an accident."

In addition, specific design requirements must be implemented for traffic symbols. This is because the system should provide perfect support for the user with a clear display of the status of traffic and signals. Another criterion for the choice of the system was the technology used, from which future-orien-

tation and a long system lifecycle are expected. Exchange of data with the superordinate "Steria" control system must also be assured. The decision to implement the project was made after a public tender to EASY SA, the system integrator.

EASY SA implemented its first projects with its own visualization system and Beckhoff controllers in 2001. These have been supplied by B&R and Beckhoff with zenon as the visualization since 2009. For Pascal Menozzi, the manager of automation at EASY SA, it was obvious after previous good experiences that the monitoring of the "Sous le Mont", "Montaigre", "Bure" and "Graitery" tunnels should also be implemented with zenon.

SIMPLE AND SAFE CONFIGURATION

For the monitoring of the tunnels and the control of traffic and systems, EASY SA focused on reliability and clear information. For example, in the "Sous le Mont" tunnel, eight B&R X20 type systems with zenon are used for the local HMI. In the "Montaigre" tunnel, 24 sub-controls of the Beckhoff CX series are connected.

zenon takes on the function of a control system and is connected to the master CPUS using a fiber-optic network. High-quality, animated symbols provide the users in the control center with clear information about the status of the tunnels and the traffic. They can react immediately to problems. Clear alarm lists display any problems that may arise immediately and the

Chronological Event List makes it very easy to trace all events and interventions. Trend curves graphically illustrate the temperatures in the tunnel and are thus perfect fire alarms.

Pascal Menozzi: "What was ideal for us was that we only needed to create the animated symbols once in a central traffic symbol library in the global project and could then pass them on to all sub-projects without problems. This also makes maintenance very clear and easy. For the animation, we simply used a variable that gives us up to ten states and thus controls the changes."

The zenon Web Server is used to provide remote access from a central location for all controllers. This means that all devices can be operated easily and safely on site. In doing so, the access rights can be subtly adjusted, which also makes usage easy for heterogeneous groups with different roles and rights. Ideal for the tunnel project: The zenon Web Server can be used with both Windows CE and Windows XP or Windows 7.

Important data is exchanged with the superordinate "Steria" control system via an OPC UA server. In zenon, this can be easily configured, as can the direct drivers to Beckhoff and B&R.

HIGH PERFORMANCE IN THE TUNNEL

For Pascal Crétin from Bonnard & Gardel, the decision to use zenon for the visualization was an easy one. "The pre-integrated drivers for the TwinCAT from Beckhoff and the PVI interface from B&R, as well as the OPC UA server and the consistency of the system from CE through Windows 7 Embedded to Windows 7 64-bit made it very easy to build the system. With the zenon Web Server, the users always have a perfect overview."

TRANSJURANE TUNNEL WITH ZENON

- 8 B&R X20 systems with local HMI
  (zenon V6.51 CE)
- 24 Beckhoff CX series sub-controls
- Ethernet with redundant fiber-optic network
- Direct driver to Beckhoff,
  B&R and OPC UA server
- zenon as visualization with alarms,
  Chronological Event List and trend curves

- zenon Recipegroup Manager
- zenon Web Server with Windows CE, Windows XP
  and Windows 7
- Inheritable vector-based symbols,
  animated using a variable

EASY SA:
YOUR ZENON SYSTEM INTEGRATION FROM MOUTIER

EASY SA, a company employing 15 people, has enjoyed success in infrastructure and automation since 1989. EASY stands for "Etudes et Applications système"; the company implements modern technology for tunnel control systems, water supplies and sewage systems as well as mechanical and plant engineering. Further information: *www.easysa.com.*

SATOMEC AG:
YOUR ZENON SALES PARTNER IN SWITZERLAND

SATOMEC AG is a commercial company with dealers for automation systems. The partner, based in Cham, supports its customers in Switzerland and Liechtenstein with highly-qualified support, consulting, instruction, training and a comprehensive warehouse in Switzerland. Control systems, visualization, HMI or IPC and network technology are some of the areas of expertise of the Swiss company with 15 employees. SATOMEC AG was founded in 1976 and has been privately owned by the Studhalter family since 2005.
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