automationX

aX Reference

Welser Spange - Tunnel and Traffic Control Technology made perfect

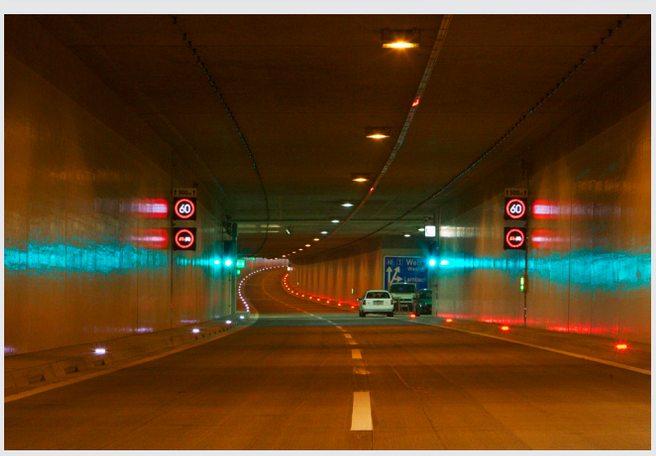
Scope of Project	Autobahn A25: Installation Process Control, Application, Visualisation and Control of two underground tunnels
Particularities	Anbindung aller Subsysteme an automationX
Plant Location	Wels / Österreich
Client	Dürr Austria GmbH

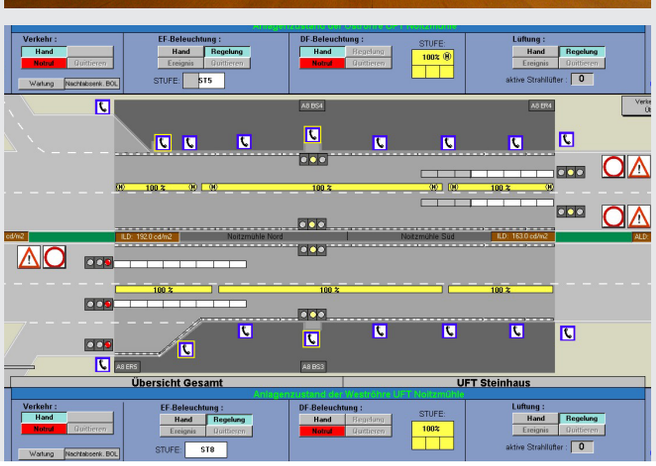
KEY FACTS

aX Software	automationX, redundant
aX Hardware	2 aXcontroller 57 aXdevice 21 ET200M 16 aXpbc1 Profibus Counter
aX Server	1 redundant server pair - Control Center Wels 1 Data bank server Oracle - Control Center Wels 2 redundant server pair - tunnel Noitzmühle and tunnel Steinhaus
aX Client	2 operator stations with 1 monitor per tunnelhead 2 operator stations with 4 monitors ABM
I/O's	12.000 via Siemens ET200S
Data Points	25.000
Interfaces	Burning Control Unit, RS232 / IEC104 Line Control Unit, RS232 Emergency, SMNP Video System with large-scale display (ABM) Cameras, RS232 Changing Traffic Signs, I/O-Interface Information Board, RS485
Network	Process controll: Redundant Ethernet ring Field: Profibus DP

OUR PARTNER

The Realization of this extensive tunnel system came through a joint project with Dürr Austria. Dürr Austria is the leading supplier of electro technical systems for traffic tunnels. The control technology from field level to central observation complex was developed in house at AutomationX. As of September 2003, the link between Voralpenkreuz and Wels, known as the Welser West Spange, has been open to the public.





THE SOLUTION

The 12 km long link between the Voralpenkreuz (A9) and Wels (A8) is double lane both directions and includes 2 underground tunnels. Approaching from the south, one drives through the 2.3 km long Steinhaus underground tunnel followed by the 1.6 km long Noitzmühle underground tunnel located near Wels. Each underground tunnel is made up of two tubes, each tubes has two lanes, one tube per direction. For each tunnel there is a system HQ which is connected through a network to the central observation complex in ABM Wels.

Complete from the Field to the Central Observation Complex
The operation's energy supply, lighting, circulation and traffic controls for both tunnels' systems are currently automated with the highest security standards. Systems which are run with the AutomationX V 4 control system developed in house by AutomationX.

aXdeviceS Technology in the Field
The two underground tunnels and part of the open field are handled by approximately 12000 I/O points which primarily handle traffic, lighting, low voltage systems and the monitoring of the technical safety and security concerns (fire alert system, emergency services, video monitoring system, etc.). The majority of this system operates on aXdeviceS components. These components operate as self-contained control units which are distributed over three Profibus rings. This allows for a program download from the tunnel control device over the field bus system. The aX System assures that the program download can reach the field terminal.

aX Tunnel Control Devices in Operational HQs
The operational HQs for both tunnel systems are supplied with tunnel control devices from AutomationX. The whole system can be, if needed, operated through a normally unmanned maintenance station. With AutomationX's Client/Server technology, every maintenance station has a graphical view and control, through the network present aX - Systems. Incorporated into the aX system, the central fire alert system and emergency response
are also operated through Operational HQ.

Transparent Data Networking with the Highest Security
The tunnel systems are networked together through two redundant Ethernet rings. The aX control devices and the control server have the ability to either of the two Ethernet rings through industry switches. Because of the network structure, the system tolerates redundancy errors. Thanks to aXDAO (automationX Distributed Automation Objects) technology, there is data transparency and security on the entire network. The XML based technology allows for the vertical integration of the entire system and also allows for easier error identification and maintenance.

Cutting Edge Technologies in the Tunnel Observatory Center ABM Wels
The central observation complex in ABM Wels, which is the heart of the system, has access to approximately 25,000 data points. The control system is a pair of redundant AutomationX servers where approximately 4000 data points are archived in an Oracle database on a regular basis. The approximately 160 system displays are available at every maintenance station (4 monitors per station) in addition to the eight big screen projectors. These displays provide dynamic viewing of data along with access to video surveillance cameras. All 19 tunnels in Oberösterreich (Upper-Austria) have been integrated into the AutomationX control system located in ABM Wels.