

A6 Motorway, Wattenheim Ensuring mobility



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Most people driving on German motorways today are not aware that they are protected, monitored and guided by a wide variety of information and communication systems. It is the German federal states that are responsible for the large number of tasks in connection with these systems. In one such state, Rhineland-Palatinate, the Landesbetrieb Mobilität, LBM, (State Office for Mobility) is the responsible authority. Within the LBM in Rhineland-Palatinate the tasks in question are performed locally by the Wattenheim telecommunications group as a representative of the Koblenz vehicle telematics department. The team at Wattenheim is small, but highly effective: it comprises approximately ten experts, who are responsible for the networking of data between five motorway maintenance offices and the electronic equipment along about 500 kilometres of motorway in the southern region of Rhineland-Palatinate – from Bingen to the north of the region to Schweigen in the south, Zweibrücken in the west and Ludwigshafen in the east.

The term 'telecommunications group' in this context is somewhat confusing. Conventional telephony represents only a minor share of the work today. In fact, the work of the group includes the maintenance, servicing and extension of systems and equipment for emergency calls, digital trunked radio, traffic metering, road status and weather information, icy condition reports,

clocks, gate intercoms and avalanche/landslide reports with GPS localisation. Recently, effective co-operation in the field of traffic management has also evolved. The network of telecommunications cables (> 1000 km) and optical fibres (320 km) also available to the motorway is used wherever possible in order to minimise operating costs. It is clear for so many different types of tasks that all-round knowledge coupled with specialist in-depth know-how is required.

Megapixel video over IP

Completely new to the service portfolio of the telecommunications group at Wattenheim with their head, Dietmar Borth, is the monitoring of key motorway sections by means of high-resolution digital cameras from the innovation and technology leader MOBOTIX (www.mobotix.com) installed along the A6 autobahn. The initial impulse for the implementation came from the motorway head technicians, who require accurate information at all times to optimise the winter road services.

When a project group comprising Sandra Schwen-der, Dietmar Borth, Elmar Breitwieser and Alexander Kirkwood began their initial rough planning at the end of 2006, the available resources threatened to cripple the project. The goal was to install cameras at eight locations on the A6 and connect them to the control centre in Wattenheim through a 2-Mbit/s LAN that was still to be set up.

This task has been solved by use of a free wire pair in the link networks, inexpensive modems, support of the motorway maintenance offices by construction teams, and existing construction materials along with a lot of creativity and the motivation of everyone involved.

The head of the motorway maintenance office and his team now have eight cameras at their disposal that at all times deliver excellent quality and brilliant colour (during the day; images are in monochrome at night). The MOBOTIX video and alarm management software MxControlCenter presents the cameras on a monitor in an overview arrangement. A section of interest can be shown in full format with a mouse click. Decisions can be carefully considered and taken on the basis of this reliable information. The telecommunications group at Wattenheim has created a solution with pilot model character that sets new standards. The camera images can also be viewed with updating every three-minute intervals on the Internet after they have been added to the LBM website (www.lbm.rlp.de).

IP network with telecommunications cable

How do you utilise an existing wire pair in a telecommunications cable and inexpensive LAN components to construct an extended virtual LAN providing at least 2 Mbit/s? Many experts judged this to be a difficult endeavour in view



Monitoring of key motorway sections

of the distances involved, but initial tests demonstrated it was quite feasible. The fundamental concept is to use powerful DSL modems with an integrated Ethernet switch. Two modems are needed at a location along the link that are connected on the Ethernet side together with one or more cameras to form a small LAN. The data traffic flows in both directions of the link through a DSL port in each direction over a wire pair to the next camera position. The cameras must be located within the range of 90 m Ethernet twisted-pair cable link stations with power connections and access to the link network. This was always the case on the previously monitored motorway sections. The relevant technology can be installed, powered and taken into operation on these sections.

The use of an existing overhead gantry sign at the traffic control system in Kaiserslautern for the motorway or a pylon at the edge of the motorway is particularly cost-effective. Particularly in wintertime, this means 'service in extreme conditions' for the MOBOTIX cameras.

The aggressive salt-laden mist in the vicinity of the motorway lanes after salt has been strewn by motorway service vehicles, together with low temperatures and frequent storms, means the technology has to face tough challenges.

Thanks to their robust design, MOBOTIX cameras have no serious problems with these conditions. And technicians and users agree. Monitoring images in such top quality just cannot be achieved for less outlay and costs.

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