

Information system of R2 Highway Ruskovce – Pravotice.

IP cameras perform surveillance over traffic on R2 highway.



Organization:
National Motorway
Company

Location:
Slovak Republic

Industry segment:
Transportation

Application:
Traffic monitoring

Axis partner:
PPA INŽINIERING, s.r.o.

Mission

The R2 highway Ruskovce – Pravotice operation was launched in October 2016. The result was a significant reduction of automobile traffic through the city of Bánovce nad Bebravou. A highway information system (ISRC) need to be installed for the increased safety and comfort of use of the R2 highway by motor vehicle users, video surveillance over traffic and provision of the data and information required by the highway administrator, the National Motorway Company.

Solution

The R2 motorway uses AXIS Q8665-LE Network Cameras. These cameras are installed on concrete pillars on four key points required by the traffic situation and equipped with a tilting and revolving positioning system without an end point, allowing the camera to rotate across the full range of 360 degrees in the continual (endless) mode.

The cameras are equipped with several predefined positions for the operator to be able to quickly change the field of vision, serving for monitoring of the most critical places of the highway section.

Result

The directly measurable aspect is represented by the reliability of the equipment itself, which is rated as excellent, despite the limitations caused by remote installation and limited data connectivity. The expected development is that on the basis of the very positive experience with the high standards of the design used for the R2 ISRC the existing cameras will also soon be replaced by the more up-to-date IP-based devices in the D1 section Piešťany – Ladce. The expected replacement of the existing cameras with the digital IP cameras is further supported by the fact that the server repository – the network video recorder – still disposes with sufficient capacity for serving the additional IP cameras.

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Ing. Robert Birnstein – head of department of transport technologies and ITS of the National Motorway Company (Národná diaľničná spoločnosť, a.s.)

The project included the requirement of a camera system for video surveillance over the entries and exits, and the critical points (before bridges) and sections of the R2 highway identified as sections with high accident potential. The basic parameters and technological equipment of the ISRC system are defined by the “technical requirements for highway and motorway construction.” On their basis the design, technological and some elements of the construction part of the ISRC were implemented by PPA INŽINIERING, s.r.o., limited liability company, a member of PPA CONTROLL a.s. Group.

The Highway Information System (ISRC) consists of numerous components, such as switchboards, technological nodes, road lights, meteorological systems, traffic counters and last but not least a camera system for video surveillance. All of these components are interconnected for mutual data communication by optical and metallic cables. As this is based on remote installation, the whole ISRC system is connected by wireless internet connection to the local operator centre of the Motorway Administration and Maintenance Centre in Trenčín – Zlatovce (SSÚD 4 Trenčín), the administrator of the R2 highway.

The section of the R2 highway Ruskovce – Pravotice itself is several dozen kilometres away from SSÚD 4 Trenčín. As there is no connection between the two, transmission of all ISRC data is based on radio transmission from the highway to the nearest transceiver at Bánovce nad Bebravou with internet connection, through which the whole system infrastructure of the ISRC Ethernet connects to the switch at the SSÚD 4 Trenčín including the D1 motorway section Piešťany – Ladce.

Observe the current situation

The camera image transmitted to SSÚD 4 Trenčín in high resolution (FullHD/1080p) and with maximum frame frequency is saved in an AXIS S1032 Mk II Network Video Recorder network. With the help of two client AXIS S9001 MKII video computers for image processing and display, the operator can observe the current situation at the highway on a large wall-mounted monitor and a working desktop monitor.

An AXIS T8310 video panel is provided for control of and work with the camera surveillance system. The operator authorised to work with the saved camera records uses intuitive AXIS Camera Station video management software. As required by the client, each camera is provided with a pair of infrared spotlights for scene visibility even in complete darkness. The cameras use high-luminosity lenses with optically variable focus allowing for scene monitoring across very large distances.

This solution finally uses four AXIS Q8665-LE Network Cameras and two AXIS S9001 Mk II Network Video Recorders, one as the control computer for the video wall and the other as the operator computer for the desktop monitor directly used by the authorised operator and controlled from an AXIS T8310 video control panel. The image data from the cameras is saved in an AXIS S1032 Mk II Network Video Recorder.

Cameras for extreme site conditions

The cameras must resist extreme site conditions. The camera is equipped for work in a wide range of ambient temperatures from -40 to +55°C with its start-up at level low temperatures aided by an automatic defrosting function. The camera cover is further provided with a wiper for immediate cleaning of the cover glass from dust or rain drops.

“The overall solution of the ISRC technology integration into the existing system used by the SSÚD 4 Trenčín including visualisation, technology control, light signalling control and data collection from the meteorological station did not require any further knowledge from the NDS employees as they already know and use the existing system into which the new system was integrated. The new development was the camera system whose hi-tech standard offers the operators of SSÚD 4 Trenčín an excellent overview, reliability and user-friendly operation of the camera surveillance system of the R2 highway Ruskovce – Pravotice,” says Ing. Marek IVAN, manager of information technologies and security systems of PPA INŽINIERING, s.r.o.



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