

## CASE STUDY

*In the Zürich railway station, more than 8,000 I/O points are controlled remotely by T-BOX RTUs. This concentration cabinet has eight T-BOX units connected to an Ethernet network. Each T-BOX RTU has its own RS485 sub-network with up to 47 remote I/O modules.*



## T-BOX RTUs Control Switch Point Heaters for Swiss Railway System

SBB, the Swiss national railway, is one of the most technically advanced rail systems in Europe. The country's extreme winter weather means workers in over 700 railway stations are on call around the clock for clearing snow or ice from switch points to prevent them from blocking.

SBB decided to install automatically controlled heating systems at all strategic locations to reduce the enormous costs for manpower. In addition, hundreds of switch points were fitted with small heaters powered by gas or electricity. Using a complex algorithm based on data from temperature and humidity sensors, ice and snow on the rails are detected automatically. A complex PID control system starts the heaters to prevent the build up of snow or ice on the switch points.

In each railway station, automation is performed by a T-BOX remote terminal unit (RTU) located in a control cabinet. Depending on the complexity and size of the station, one or more remote RM21 modules are provided as sub-stations in the field to operate and monitor a group of switch point heaters. Via a local RS 485 network that can be up to several kilometers in length, the sub-stations handle the measurement and control tasks of the individual heating systems.

Despite electrical interference from passing trains, automation and communications remain perfectly stable. Each sub-station has its own operating console for maintenance and manual control.

All the data (correct sensor operation, set-points, outside temperature, gas pressure, present consumption, etc.) from the T-BOX RTUs are transmitted to a central station using WIZCON SCADA software and an Ethernet network with TCP/IP protocol. The SBB's WAN (wide-area network) uses fiber optics and 10Base-T communication. For redundancy and safety, each T-BOX RTU has its own PCMCIA modem that can be directly addressed for maintenance or control purposes. It also is used to send e-mails or alarms to GSM systems.

For SBB, the main advantages of the T-BOX solution are:

- An extremely fast return on investment thanks to significant savings in electricity and gas consumption by the fully controlled heating system
- Complete remote control of each railway station, eliminating the need for local personnel to clear the switch points
- Only one device is required for communications and remote control of the heating systems
- Utmost reliability of the hardware and software components in an extremely harsh environment (high electrical interference, low temperatures)
- Local data logging of events and recording energy consumption, temperatures, and equipment operating time
- Automatic alarm signaling to key maintenance personnel in charge of the switch points
- Just-in-time refueling of the gas tanks

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