

National Railway Company of Belgium

Overview

Created in 1926, the Nationale Maatschappij der Belgische Spoorwegen (NMBS, Dutch) or Société Nationale des Chemins de fer Belges (SNCB, French) operates a 3536 kilometer network throughout Belgium.

When it came time to update switchgear locations throughout the NMBS/SNCB system, Alstom called on Semaphore to provide T-BOX MS RTU's for remote monitoring and control.

Semaphore's T-BOX products are currently operating, throughout the world, in a wide variety of transportation applications. Key product features for transportation applications include the following:

- Wide operating temperature range is suitable for outdoor installation in remote locations.
- Rugged designs allow operation in locations with high electrical interference.
- IP/Web technology platform provides open communication over inexpensive, public networks.
- Alarm management and data logging functions are integrated in the RTU and include sophisticated operations such as sequence-of-events (SOE) monitoring.
- Open programming tools adapt to the specific requirements of the end user and reduce project implementation timing.



A T-BOX MS RTU provides all monitoring and control operations at the switching locations.

Operations

Switching facilities are located approximately 1 km apart throughout the railway system. At these locations, TBOX MS RTUs monitor and report on the following:

- Signal status.
- Building temperature.
- Fire detection (some locations).
- Water level (some locations, particularly tunnels).

While the switchgear buildings are naturally ventilated, the T-BOX MS will turn on a fan if the temperature becomes too high.

The T-BOX MS also maintains a temperature history to allow NMBS/SNCB personnel to determine how effective the natural ventilation is.

Communication is over a dual, fiber optic network, which follows the routing of the rail lines and connects the switching facilities. Fiber was selected due to its noise immunity, as the railway facilities are characterized by high electrical interference.

Unusual for an RTU installation, the switching facilities provide -48 Vdc for power. However, a T-BOX MS power supply module supports this input and provides intelligent filtering and conditioning for all RTU operations.

For SCADA HMI, at both local and remote locations, NMBS/SNCB used Semaphore's WebForms Studio to create web pages to be used for operations displays. Web pages are accessible using a standard browser and provide live, graphical displays with embedded, dynamic objects, as well as tabular reports and trends. NMBS/SNCB personnel have found the web pages to be excellent tools for local readings and diagnostics. Since local users carry lap-top personal computers, there was no need for a local display — PC-based web pages are used, instead.

NMBS/SNCB also provided the programming for monitoring and control operations. While Semaphore's TWinSoft environment provides programming in IEC 61131-3 LD (Ladder Diagram) as well as in Basic, NMBS/SNCB took advantage of TWinSoft's support of Microsoft Automation and wrote their programs using Excel. Using TWinSoft, they uploaded the Excel code and compiled it for execution in the target, T-BOX MS platform.

Conclusion

In conjunction with Alstom, NMBS/SNCB was able to take full advantage of many of the features offered by Semaphore's T-BOX products:

- Integral Webserver – This feature provided NMBS/SNCB significant savings by using it in place of SCADA /HMI software, which would have required numerous licenses. PC-based Web pages also provide all, local HMI operations when end user personnel visit the sites.
- Alarm management – The T-BOX alarm system detects and reports all alarm conditions using Push Technology. Alarm management ensures that un-acknowledged alarms will be escalated.
- Data logging – For trending and record-keeping purposes, the T-BOX data logging capability retains historical information, such as temperature profiles, for the site facilities.
- Push technology – NMBS/SNCB operations personnel are immediately notified of alarms and important events without the need for polling the RTU.
- TWinSoft programming environment – Support of Microsoft Automation fully satisfied programming requirements on the part of NMBS/SNCB operations engineering, who wrote all code using Excel.

NMBS/SNCB personnel added that another reason for selecting T-BOX was the responsiveness to their questions and the prompt service provided by Semaphore's people in Waterloo.

