SCADA for rail
Operational confidence.
Supervisory control and data acquisition (SCADA) with Network Manager X

As the world’s population continues to grow, demand for transportation services will also ramp up, whether it’s passenger rail systems for mass rapid transit in dense metro areas, or long-haul freight routes to move goods efficiently and economically across continents.

Industry challenges

Railway operators need to provide safe, reliable service that consistently meets customers’ expectations. This is no easy task, given the ever-increasing operational and maintenance costs of aging fleets and infrastructure, and constantly changing policy and regulations. How can you improve network reliability and efficiency and ensure worker health and safety in this challenging environment?

Network Manager can help.

Solution

Network Manager is a real-time, cyber-secure platform for a wide range of control and monitoring applications. The solution is designed for mission-critical applications that demand high performance and availability, such as power generation, transmission and distribution systems, and electrical networks for railways and airports. It supports networks of all sizes, from local grids to large-scale networks with millions of devices and high volumes of data throughput.

Benefits

- Highly-scalable platform and modular design ensure that the system can grow with your future needs
- Designed for high availability, with support for multiple redundant schemes, secondary/emergency control centers, and backup facilities for automatic failovers and no loss of data
- Modern human machine interface (HMI) enhances operator situational awareness for improved decision support to shorten response time
- Easy to implement, deploy and maintain – runs in both native and virtualized environments to minimize total cost of ownership
- Open architecture allows for interoperability and integration with other IT and OT systems
Solutions for rail
The future of rail electrification networks

Network Manager X helps railway operators increase reliability and improve journeys, while reducing costs and carbon emissions.

Maximize the operational efficiency of your main line and urban railway systems.

- Remote monitoring, control and operation of transportation distribution grids, including traction power flow and data acquisition for traction substations
- Extensive toolbox for adapting safety procedures and work processes to ensure full compliance with transportation safety regulations
- Specialized functional modules built for rail operations, such as advanced switch order creation, support for high occurrences of switching, and complex switching and protection control of catenary systems
- Complete control interface to monitor the network remotely, carry out isolations and implement service restoration
Key features

Real-time data acquisition and supervisory control
- Supports all major SCADA data types such as power flow or interchange schedules, and custom application-defined data messages
- Supports all standard and legacy RTU protocols, including IEC 60870-5-101/-104, DNP 3.0, and RP570
- Integrated ICCP communication front ends
- Fully redundant, with support for automatic failover and multiple redundant schemes
- Supports distributed data acquisition, local or remote encryption, and periodic, on-demand or event-triggered data transfer
- Limit manager enables centralized configuration and maintenance of limit thresholds for optimizing operation closer to physical limits

Intuitive HMI
- Intuitive graphical user interface with dynamic network coloring, zoom, layers and de-cluttering tools
- Locate feature allows operators to quickly focus in on problem areas
- Graphical editor makes it easy to define and update network topology
- Smart tool tips and online context-sensitive help reduces the learning curve

Advanced switching management
- Easily create, maintain and validate complex switching plans, reducing switching errors
- Specialized functions built for rail operations, such as support for high occurrences of switching and catenary systems

Intelligent alarm & event handling
- Fully configurable and intelligent alarm/event processing to reduce the number of nuisance alarm messages
- Catch highly complex conditions with custom alarms and stale data detection
- Multiple alarm acknowledgment, limits and priority levels
- Advanced filtering capabilities, customizable color and alarming schemes

User-defined sequences
- Easily define and maintain automated sequences to minimize operator error
- Supports automatic and manual execution of sequences
Programming and calculations

- Advanced real-time calculations using MATLAB®-based ARTC (Advanced Real-Time Calculation) package
- Pascal-like SPL (System Programming Language) allows direct access to real-time and historical data, and database functions for user-defined calculations
- No knowledge of database structures required – built-in wizard provides a step-by-step guide for defining and implementing calculations

Data exchange and external adapters

- Supports enterprise integration with external systems
- External adapters for real-time data access, including EAI, CMMS, GIS, CRM and others
- Supports SQL, ODBC, OPC, DAIS, and ICCP data exchange

Flexible operator authority

- Prohibits unauthorized system access at different levels – system operation, data entry and data retrieval
- Areas of responsibility can be defined by geographical/physical locations or network zones/components
- Authority assignment tool makes it easy to assign different privileges and multiple AORs for each operator

Historian

- Integrated historian provides seamless data storage and retrieval
- Advanced data compression allows storage of an asset’s data over its complete lifecycle, often millions of data points with sub-second resolution
- One-lines and alarms/events playback, and comprehensive audit trail capability
- General data warehouse capabilities such as advanced calculations and read-only replica avoids the need for an additional corporate historian
- Automated data engineering and database maintenance minimizes DBA activities

Cyber security

- Network Manager conforms to security standards CIP 002-011, ISO 27001/2, and the NIST Cyber Security Framework
- Internal and external penetration testing performed by the Idaho National Lab
- Advanced security and compliance services available through ABB Cyber Security Care offerings

Advanced data engineering

- Centralized database engineering tool
- Supports common information model import/export for easy migration from legacy systems
Network Manager X in operation

Network Manager powers the trips of **8 million riders a day** in these major cities.
Have absolute confidence in your system with ABB.