

# Case Study Outdoor Cabinets for Metro Train Automation

## Enabling Driverless Train Operation In Extreme Temperature Conditions

### APPLICATION

- Grade Of Automation (GoA) upgrade from 3 to 4 for Metro operating in Middle East
- Ensure swift and precise operations in the event of a disruption without employing a train attendant
- Enable automatic train control systems to work within an overall signaling system with interlocking, automatic train supervision, track vacancy detection and communication functions

### CHALLENGE

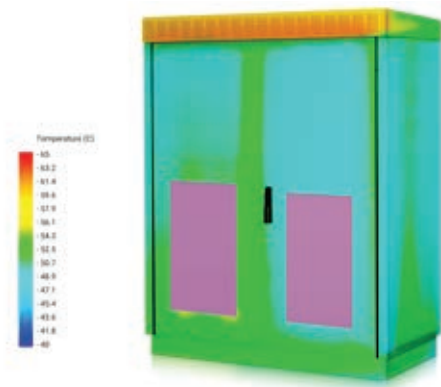
**Extreme heat** | Middle East climate sees a range of 16°C to 52°C.

**EMC Protection ensuring zero errors** | Electronics need to be electromagnetically shielded to ensure operational stability and continuity.

#### Maximizing Energy Efficiency

- Regulated Cooling: Even with demanding environmental temperatures, the operator needed to optimize energy utilization
- Thermal Profiling: Clear understanding of thermal profiles within the cabinet would be necessary to effectively deploy a cooling solution

### SOLUTION



The nVent SCHROFF engineering team used thermal modeling to create a customized cooling solution, ensuring each heat pocket in the outdoor modular cabinet is optimally cooled while balancing the overall energy usage of the cooling system.

Ensuring the shortest design cycle possible, the project management team ran the electronics integration engineering in parallel with the thermal modelling. It allowed integration flexibility as cooling system requirements changed depending on the operational location of the cabinet.

Project Details	
Location	Middle East
Area of Application	Outdoor, Wayside
Product Solution	nVent SCHROFF Outdoor Modular Cabinet with Smart Cooling Technology
Railway Certifications	IEC 61969-3 and EN 5015-3, EN 50121, and EN 60529 / IP55
Contract Scope	Thermal and Design Analysis, Mechanical and Electrical Integration