Embedded Platform Solutions in Advanced Railway Systems

Use Case: TTTech Solutions for Rolling Stock

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Use Case: TTTech Solutions for Railway Applications

Challenge

Train Control and Management Systems (TCMS) integrate control, safety and other functions by using fieldbuses and Ethernet-based networks. Train builders are looking for ways to further optimize TCMS and significantly reduce system complexity, weight and lifecycle costs. Optimization and reduction of system complexity can further lead to lower weight, improved reliability and significant reduction of certification effort.

Solution

TTTech has an excellent track record in advanced Ethernet-based integrated system platforms for aerospace applications with the highest safety and availability requirements, complemented with extensive experience in integrated automotive and energy systems. This allows TTTech to support the creation of optimized and integrated system architectures which are lighter and less complex, minimize system lifecycle costs and reduce safety certification effort.

With TTTech’s Deterministic Ethernet networks, safety control modules and real-time system design methodologies, experienced system architects can design fail-operational Ethernet-based architectures supporting SIL 4. This means the next generation of TCMS can be built by converging train controls and safety functions on one physical network safely and securely without extensive use of separate safety subsystems.

Current Architecture: Several Separated Networks for Safety and Control
Key Benefits

TTTech’s deterministic embedded platforms can substantially reduce the complexity and thereby enable further cost savings – from design, integration, verification, certification and maintenance to minimized wiring and component cost.

- Seamless integration of different control and safety functions into one network
- Reduced wiring and number of system components
- Lowering of system complexity and associated maintenance cost
- Avoidance of high re-certification cost when extending safety systems
- Flexibility for future system growth, upgrades and extensions

Portfolio

Our products enable the convergence of networks, the design of fault-tolerant systems and the full integration of all system functions, sensors and actuators in guaranteed real-time QoS. TTTech offers a range of components for safety-certifiable distributed control systems based on Deterministic Ethernet communication, including:

- Deterministic Ethernet networking products (switches and customizable switch boards)
- Customizable embedded safety controllers with Ethernet
- Rugged safety controllers and customizable I/O boards
- Intelligent HMIs
- Deterministic Ethernet development and test equipment

TTTech Solution: One Converged Ethernet Network for Safety and Distributed Control

TTTech’s converged Ethernet network integrates mission-critical and safety-critical functions (up to SIL 4) using one single Ethernet network. With this integration platform train controls and safety functions can be converged on one physical network.
Staying on Track With Robust Embedded Platform Solutions

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