Safe4RAIL2

SAFE architecture for Robust distributed Application Integration in roLling stock 2

Shift2Rail

MISSION

Safe4RAIL-2 aims to develop railway demonstrators where next-generation architectures and components for the Train Control and Monitoring System (TCMS) will be included.

The project will also perform testing of the TCMS functions in a simulated environment.

Safe4RAIL-2 targets to increase the flexibility and reliability of the TCMS communications, reduce development and maintenance costs, and achieve novel train functionalities, paying special attention to manufacturer interoperability and the availability of multiple sources.

VISION

Safe4RAIL-2 will look at ways of utilizing wireless (5G), interoperable, on-board communication, as well as universal integration of the TCMS.

The results from Safe4RAIL-2 will define new train standards and pave the way for deterministic communications, as well as secure and interoperable interconnections while increasing efficiency and safety of the TCMS.

Safe4RAIL-2 has huge potential to improve train systems and focuses on efficient interconnections, standardized interfaces and enhanced safety levels of distributed train systems and applications.
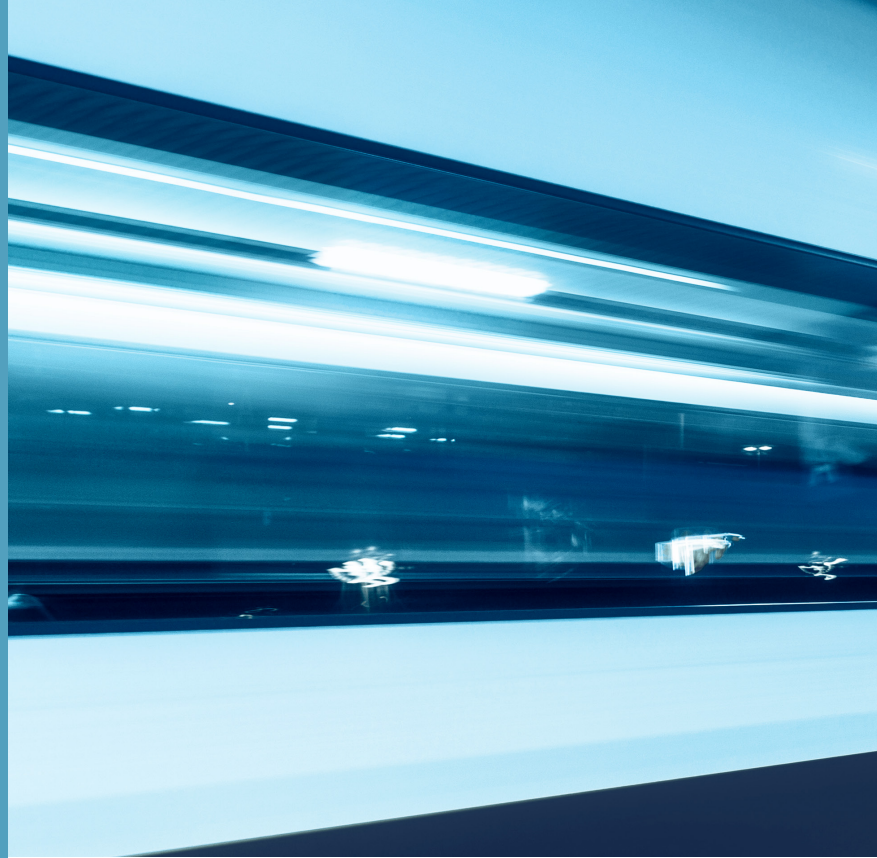
OBJECTIVES

Implementation of interoperable network devices for deterministic train communications	Integration of TCMS subsystems in Functional Distribution Framework
Demonstrator Integration and Validation	Contribution to standardization in railway and wireless domains
Development of wireless technologies for a wireless TCMS	Simulation Framework for virtual certification

STANDARDIZATION

Safe4RAIL-2 will pave the way to the definition of new standards and will contribute to already defined standards, in railway, wireless and deterministic communications.

Virtual Certification

A Simulation Framework (SF) has been defined by previous research projects for validation and virtual certification of train functionalities. This SF will be incorporated and validated in the railway demonstrators for different train functions.

This tool will allow easier certification procedures and the integration of new train functionalities in the early stages of development.

Deterministic Train-Wide Communications

Deterministic Train-Wide Communications imply modifying all the network elements that currently deploy the wired communications inside the train.

For this purpose, the expertise of railway network-device manufacturers will be combined with Time-Sensitive Network (TSN) technology suppliers and system architects.

Wireless TCMS

Wireless technologies will be utilized in the railway demonstrators at both backbone and consist levels in order to replace currently existing wired TCMS communications, creating WireLess Train Backbone (WLTB) and WireLess Consist Network (WLCN) solutions.

Distributed Application Development

In the railway demonstrators, several train functions will be integrated on top of the Functional Distribution Framework, proving the feasibility of distributed application development and device-independent implementations.

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CONSORTIUM

Safe4RAIL-2 is driven by a well-balanced, European consortium composed of six industrial partners (including SMEs and large companies), one research institution and one academic partner providing expertise from the automotive, aerospace, and railway sector to create synergies with existing and emerging concepts and technologies.

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For more information,
visit www.safe4rail.eu

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