

In order to mitigate the GNSS errors in the railways domains, the Virtual Balise Reader, in cooperation with EVC and RBC, implements many monitoring techniques, some of these are also based on the SIL4 Odometry.



With regard to the communication between on-board and the wayside LDS subsystems the same ERTMS Radio signalling network is used. Furthermore, the Hitachi Rail STS solution is already set for using Packet Switching radio networks with IP based interfaces.

Telecommunications are becoming increasingly important with regards to the costs to deploy and operate the train control system due to the projected increase of required data for supporting new services, such as the driverless automation and video monitoring of critical assets.

Hitachi Rail STS Satellite-based signalling covers a wide range of applications, stretching from dedicated Freight lines to Regional Passenger lines, and in the future, high speed and conventional lines.

Hitachi Rail STS is working with the major satellite stakeholders, such as the European Space Agency, the Italian Space Agency and the European Global Navigation Satellite Systems Agency.

LDS Project

In the Hitachi Rail STS Location Determination System LDS project

In the Hitachi Rail STS Location Determination System (LDS) project, a new European Rail Traffic Management System based on the satellite localization has been designed, developed, tested and verified.



 **Hitachi Rail STS**

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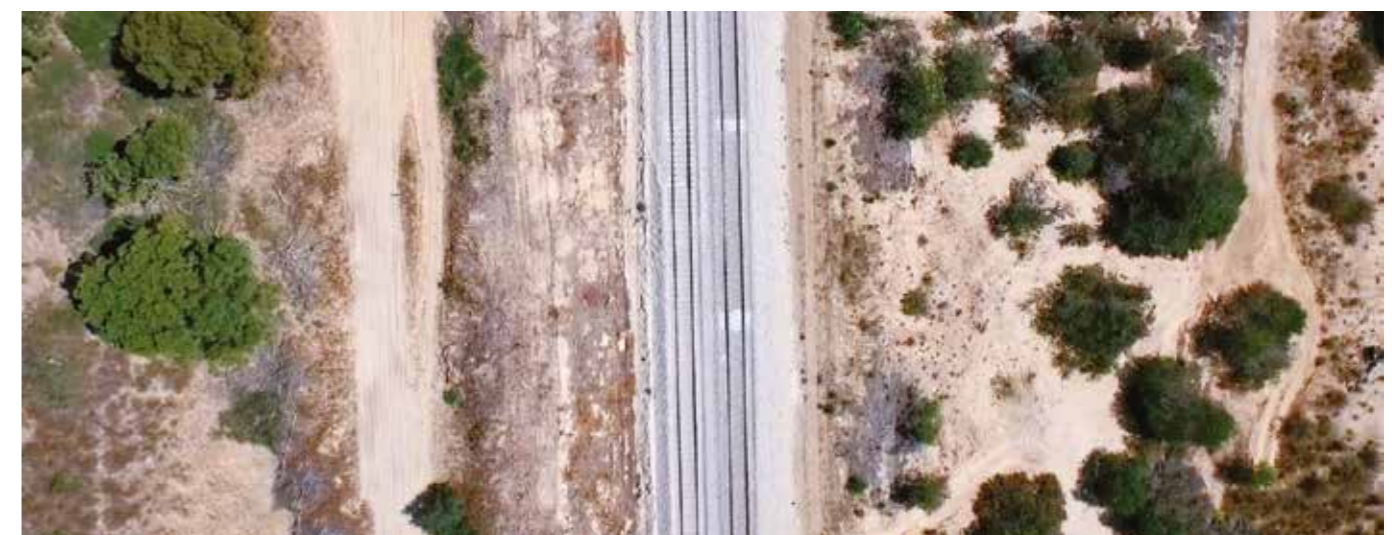
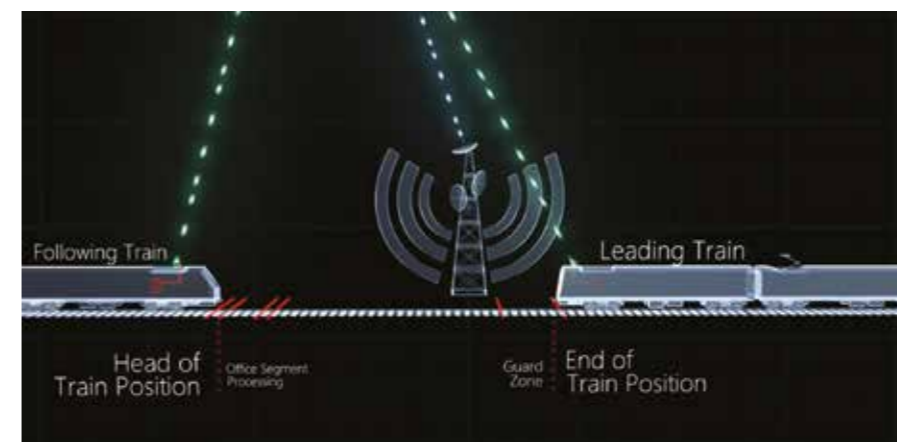
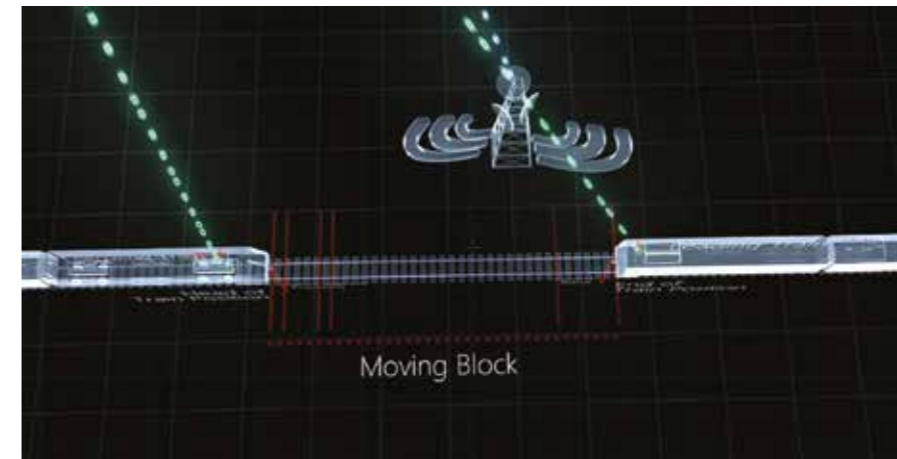
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 **Hitachi Rail STS**

The Location Determination System realized by Hitachi Rail STS is composed of wayside and on-board subsystems.

The on-board subsystem, named Virtual Balise Reader, consists of Global Navigation Satellite System Antennas and Receivers and of the Virtual Balise Detection modules; it functionally works like the typical Balise Transmission Module.



Based on the GNSS position, the Virtual Balise Reader delivers virtual balises stored on the on-board track database to the European Vital Computer as if they were Physical Balises.

The Hitachi Rail STS solution also implements the concept of virtual blocks and the train spacing is set on the braking distance of each train. It is not dependent on infrastructure constraints.

The length of the virtual blocks is a configuration parameter and can be statically modified without impacting on the site infrastructure.

The LDS solution developed by Hitachi Rail STS assures the backward compatibility with existing ERTMS installations and guarantees the highest safety level along the stretches of regional and semi desert areas, as well as low traffic routes.

Moreover, this system also increases the line capacity and reduces the installation and maintenance costs with respect to the conventional signalling system.