

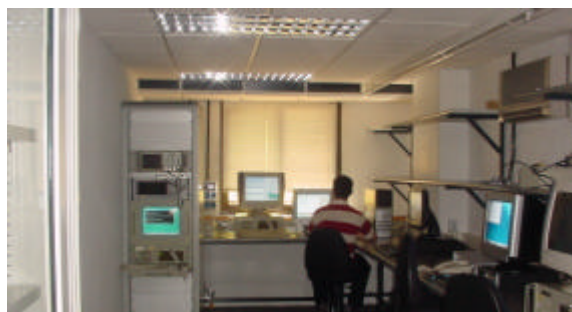
ERTMS AND RAIL INTEROPERABILITY LABORATORY (LIF)



Eurobalise Laboratory



Interoperability Test on the track



Eurocab Laboratory

Description

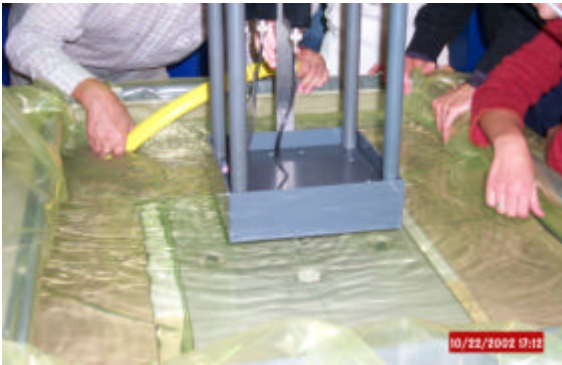
The Rail Interoperability Laboratory (LIF) at CEDEX aims to perform interoperability tests among the various ERTMS (*European Rail Traffic Management System*) components and sub-systems. ERTMS is the standard European rail signalling system as defined in the European Community Directive 96/48/CE on the interoperability of High Speed Trans-European Rail Systems. It is intended by implementing this system to raise competence among the signalling suppliers as well as to eliminate the hindrance of establishing different rail systems in different countries.

Only is it possible, before performing the actual tests on the track, to prove interoperability among the ERTMS components built up by several manufacturers, in neutral labs formerly accepted by all European agents, such as the ERTMS and Rail Interoperability Lab at CEDEX. LIF has been appointed by all signalling companies in the UNISIG consortium as the first reference Lab in Europe, ready to perform tests not only for interoperability but also certification purposes of different ERTMS components.

Tests on the interoperability between the on-board equipment (Eurocab) and the track-side one (Eurobalise and Radio Block Centre RBC), which may belong to different companies, are performed at LIF. Thus it can be promptly and economically tested the joint functioning of both, by executing a set of scenarios fairly larger than the one that can be tested on the real track, due to the flexibility in the configuration of the simulated track as much as the readiness to test in a lab where real conditions are reproduced.

Besides, tests are carried out at LIF for the certification of ERTMS basic components: Eurocab, Eurobalise, BTM (Balise Transmission Module)-Antenna, Juridical Recording Unit (JRU), Euroradio and Radio Block Centre (RBC).

Technical Features



Eurobalise testing under clear water debris

The ERTMS and Rail Interoperability Laboratory at CEDEX groups together two main lab units:

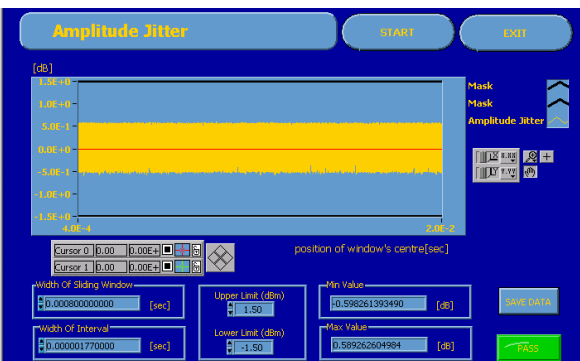
1) The Eurobalise Lab, where this sub-system is tested on according to the European norm "UNISIG Test Specifications for Eurobalise FFFIS" (Ref. Subset-085):

- Balise 4.2 MHz up-link field conformity testing. Input/output curves.
- Balise 27 MHz tele-powering conformity measurements.
- Crossed-talk Immunity.
- Balise Up-link signal characteristics.
- Balise performance testing under debris conditions.
- BTM-Antenna system radiation pattern.
- BTM-Antenna system transmission tests.

2) The Eurocab lab, where functional testing on eurocabs is performed in accordance with the European norm "System Test Specifications" (Ref.: Subset-076) and "Test Architecture" (Ref.: Subset-094):

- EVC(European Vital Computer) functional tests, including 62 test sequences defined in that European norm.
- Euroradio Transmission tests.
- Download and analysis from the Juridical Recording Unit (JRU).
- Interoperability tests between a RBC and a Eurocab from different suppliers.
- Simulation in the lab of eurocab testing on a real track.

Application



Balise Up-link signal characteristics: amplitude jitter test

- ERTMS component certification: Eurobalise, Antenna-BTM, Eurocab, Juridical recording Unit and RBC.
- Functional and physical Interoperability tests between the on-board and track-side sub-systems: Eurobalise and/or Euroradio.
- Simulation of tests on real tracks. Balise transmission test and On-board response tests under complex operational circumstances.
- Collaboration in the European process of writing and consolidating the ERTMS Specifications. Definition of European test architectures.



Tests on commercial eurocabs in LIF's Eurocab Laboratory