



## LockTrac 6111 ESTW L90 Electronic Interlocking System

### Main References

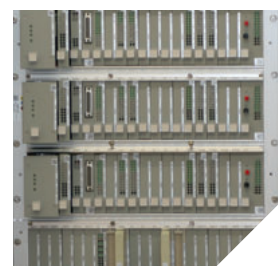
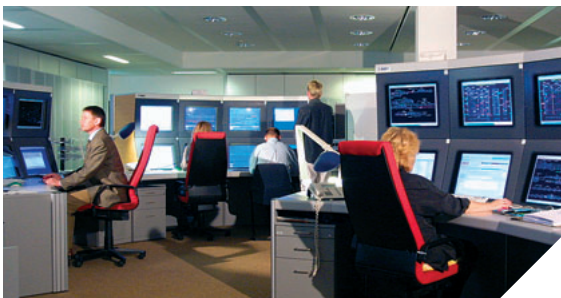
- DB AG                Germany
- CFL                 Luxembourg
- CFR                 Romania
- IR                    Israel
- PKP                 Poland
- REFER              Portugal
- Renfe                Spain

LockTrac 6111 ESTW L90 is an electronic interlocking system (ESTW) designed for meeting the highest safety requirements. For approximately 20 years it has been successfully operated by national and international customers in both mainline/high-speed railway networks and urban rail networks. LockTrac 6111 ESTW L90 systems currently in service switch over 20,000 signals and more than 8,000 points.

LockTrac 6111 ESTW L90 is a crucial element of the network infrastructure for railway operators for optimising network throughput, on-time operations and life cycle costs.

The highest levels of safety and availability, functions allowing far-reaching automation of the operations and easy integration into existing network structures are among the most important assets contributing to the success of LockTrac 6111 ESTW L90.

LockTrac 6111 ESTW L90 is acknowledged as a well proven technology which will be consistently further developed within the framework of the technological evolution.



# > LockTrac 6111 ESTW L90

## Features

- Safety Integrity Level SIL 4
- Safety principle: 2-out-of-3 computer architecture, 2-channel safety system
- Type approvals: component-based Mü 8004, CENELEC
- Route protection and supervision: route table principle
- Conventional or fully electronic control of field elements such as signals, points, axle counters, etc.
- Interfaces to:
  - Electronic interlocking systems
  - Various block types
  - Train protection systems, e.g. continuous automatic train control system (LZB) and European Train Control System (ETCS)
  - Level crossing systems
  - Operating and display systems, train describer/train routing and other train management systems via standard user interface (SBS)
  - Central maintenance/diagnosis system
- Operation and display
  - Central or decentral operation
  - Vital display
  - Area view and zoom display
  - Integration of safe remote control of relay interlocking systems (NetTrac 6654 F L90)
- Configurations
  - Central
  - Decentral (connection of remote units via open or closed network, flexible switching distances)
  - Support of geographic redundancy
- High industrialisation level, well-proven in numerous projects
  - Separation of system and project data
  - Tool-assisted configuration and data generation
  - Optimised test facilities
  - Use of standard boards
  - Extensive pre-assembly in own factory
- Flexible modification/expansion possibilities

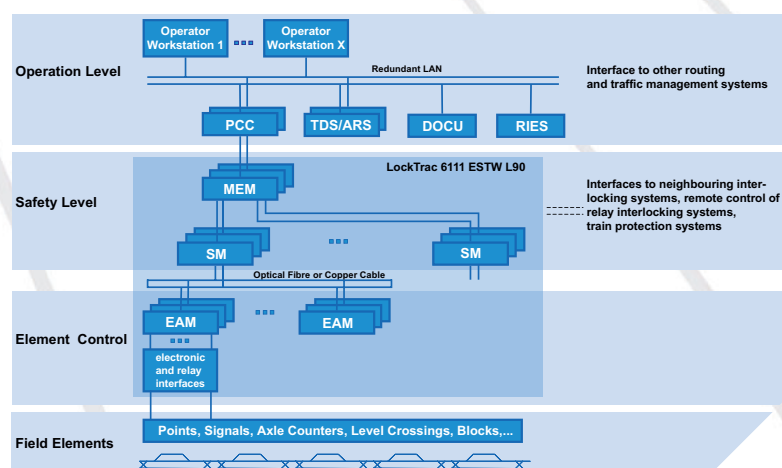
The below block diagram shows the basic set-up of a LockTrac 6111 ESTW L90 system.

An ESTW L90 central unit is composed of an Input/Output Module (MEM) and several Safety Modules (SM) whose number depends on the size of the interlocking system. The field elements are controlled via the Element

## Key Benefits

- Highest safety level SIL 4
- High availability by 2-out-of-3 computer architecture
- Support of LCC optimisations
- Easy integration into existing infrastructures both on the field level and on the operating level
- System scalability
- Flexible switching distances
- Large scope of functions including high flexibility of customer adaptation
- Year-long well-proven system with consistent technology evolution

Control Modules (EAM) installed in the ESTW central unit or decentrally along the line. The EAMs are connected either via optical fibre or via copper lines. At option a safe connection via a public telecommunication network can be provided. Interfaces to neighbouring interlocking systems, train protection systems and to the remote control of relay interlocking systems are provided by the relevant LockTrac 6111 ESTW L90 modules. The operation system (installed centrally in a control centre or locally in the ESTW) and systems of the management level are connected via the standard user interface.



Block diagram of a LockTrac 6111 ESTW L90 central unit

<b>ARS</b>	Automatic Route Setting	<b>PCC</b>	Protocol Conversion Computer
<b>DOCU</b>	Documentation System	<b>RIES</b>	Computer Based Maintenance of Signalling Systems
<b>EAM</b>	Element Control Module	<b>SM</b>	Safety Module
<b>LAN</b>	Local Area Network	<b>TDS</b>	Train Describer System
<b>MEM</b>	Input/Output Module		