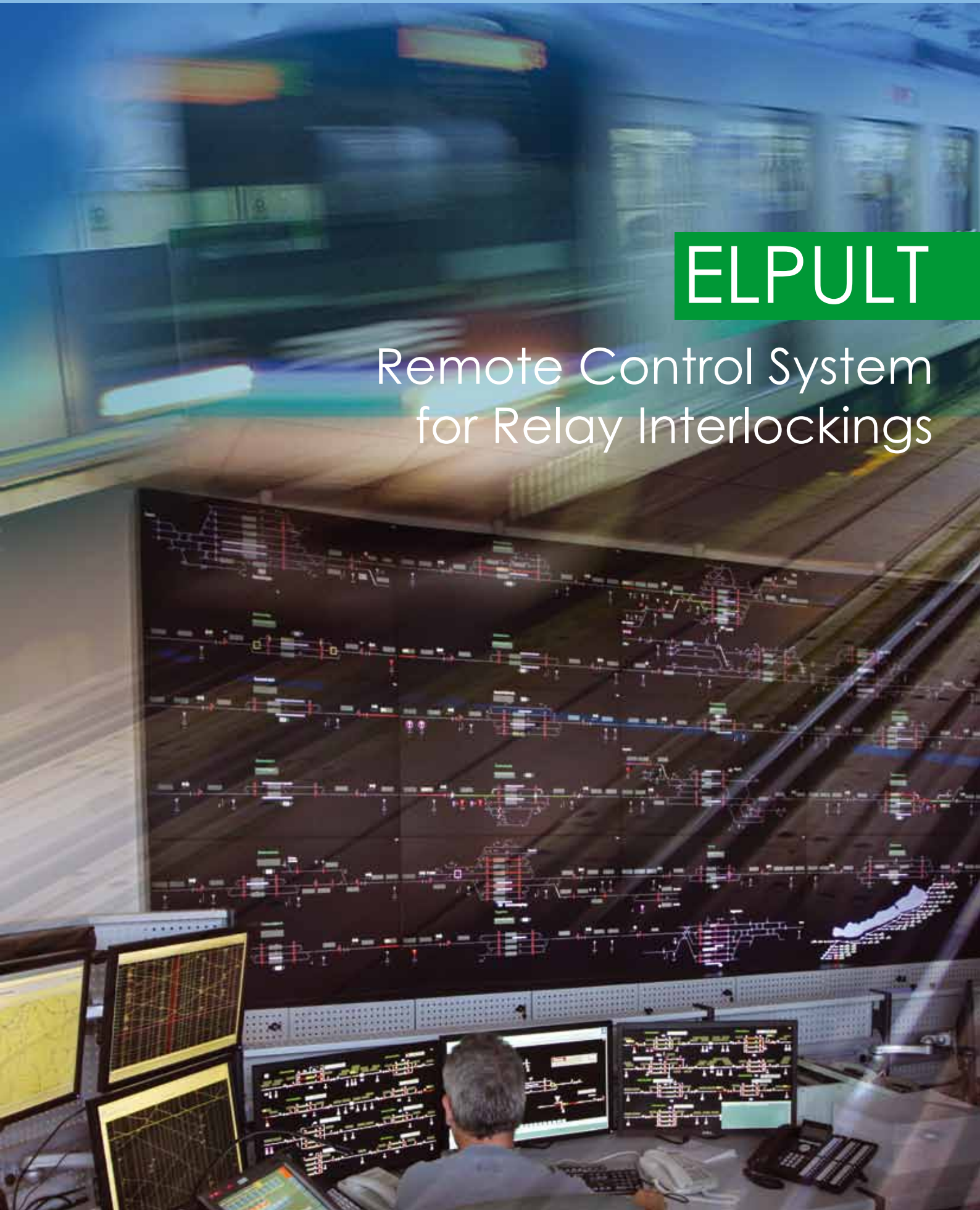# ELPULT

Remote Control System for Relay Interlockings

What is ELPULT Electronic Control System?

PROLAN ELPULT is a remote control system, developed for extending the life-cycle and the functionality of the relay-based interlocking equipments at railway stations.

The architecture of the ELPULT system has been made to satisfy the ultimate requirements of functionality, safety and availability.

Information provided by ELPULT based Central Traffic Control Systems (CTCS) makes the operation of the connected Passenger Information Systems fully automatic.

How does it work?

The ELPULT architecture is divided into two layers, where its functionality is realized:

- The RTU (data collection) level, that is a modular, industrial microcomputer, connected to the I/0-s of the relay system, installed typically into the relay room of the station and assigned for the primary processing of the site information,

- The Man Machine Interface level - a workstation with LCD monitors, keyboard, mouse, and printer - is connected via an Ethernet link to the RTU level and installed typically in the traffic control room of a hub station or in the dispatching room of a Central Traffic Control System (CTCS)

For meeting the requirements of EN50129 compliant safety, the processing of the signals coming from the railway infrastructure objects is redundant within an RTU, i.e. a single signal generates two independent inputs (straight and inverted).
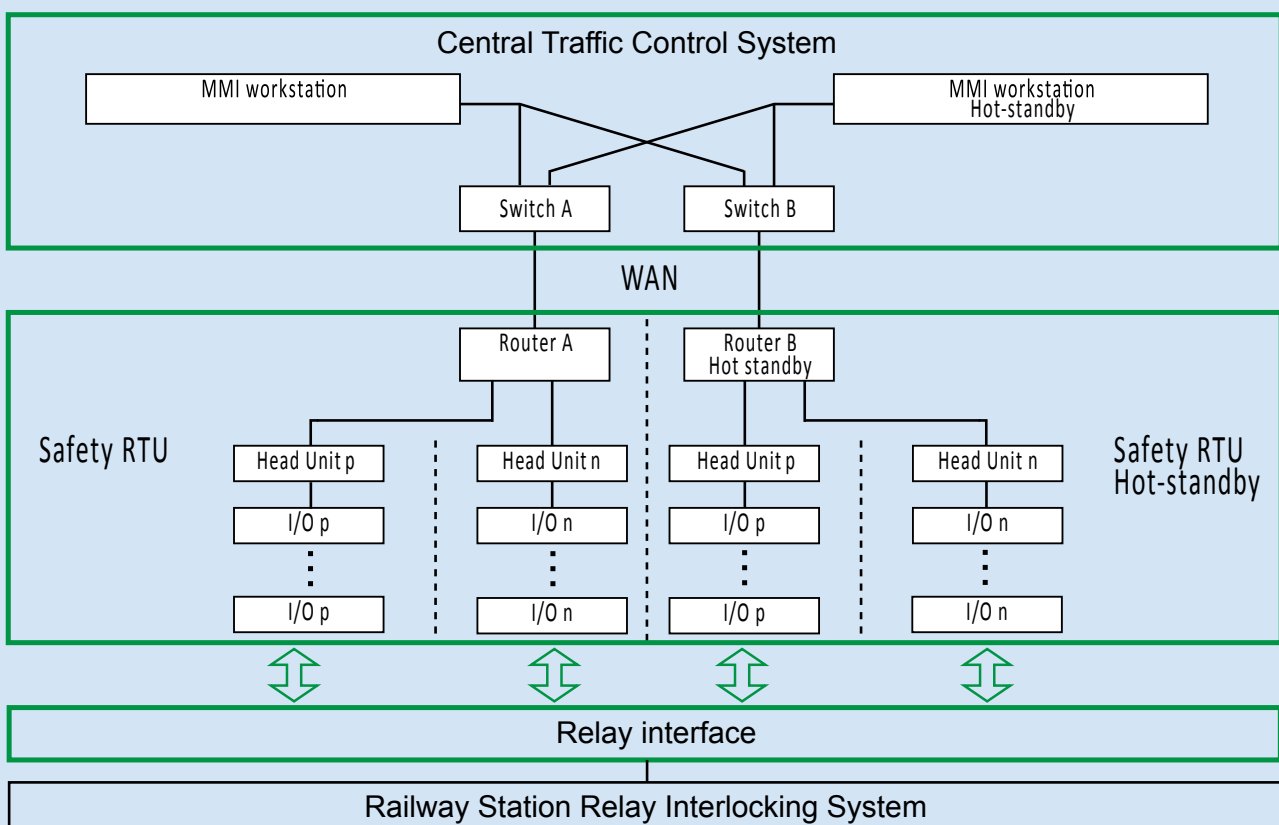
In the same way, an output command can only be generated if the two independent output channels operate unanimously.
These two output signals are connected to the two leads of a relay coil, thus evaluating a logical AND function, that results the safe output operation.

The parellel data processing and the 2 out of 2 safety criteria is realized throughout the whole system architecture.

The Man Machine Interface functions (display and control) can be executed only if the results of the parallel processing and the databases are equivalent.
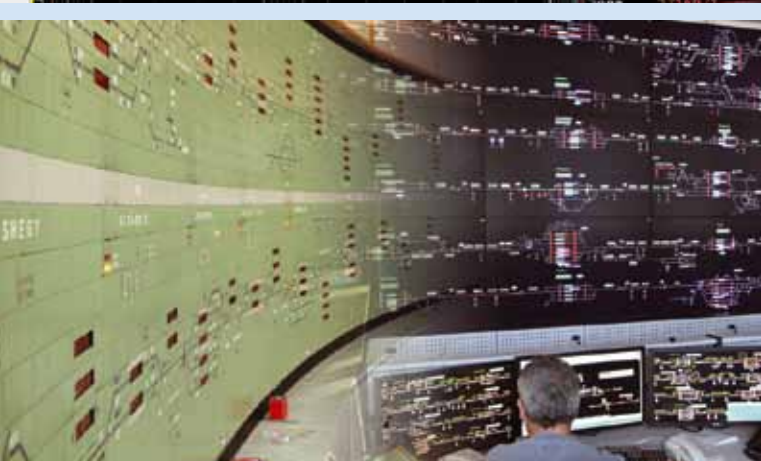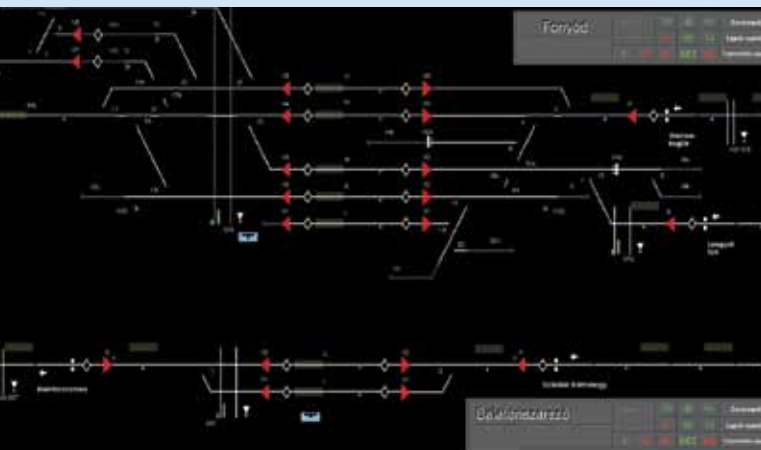
The requirement of availability is fulfilled by the total hot-standby feature of the system, realized by a complete duplication.

Central Traffic Control System

| MMI workstation | | | | MMI workstation Hot-standby |

Switch A   Switch B

WAN

Router A   Router B Hot standby

Safety RTU | Head Unit p | Head Unit n | Head Unit p | Head Unit n | Safety RTU Hot-standby

I/O p | I/O n | I/O p | I/O n

I/O p | I/O n | I/O p | I/O n

Relay interface

Railway Station Relay Interlocking System

PROLAN - ELPULT Remote Control System Benefits

- Remote control of railway stations with legacy relay-based interlocking systems

- SIL 4 realization of the special commands makes up unnecessary to employ any personnel at stations

- Stations with different interlocking systems can easily be hooked up to a control center

- For total remote control of a region, other systems, like overhead line equipment SCADA can be realized on the software and hardware platform of ELPULT