



# ESA 44

## Electronic interlocking



- Failsafe and reliable system meeting SIL4 requirements according to CENELEC standards
- Microprocessor based interlocking designed for control of medium and large size railway stations and line sections
- Full compatibility with ERTMS/ETCS L1/L2 (Plug & Play for ERTMS/ETCS solution)
- Connectivity to any centralized traffic control system
- Large screen display possibility
- Full integration with Graphical and Technological Layer (GTN)
- Automatic Route Setting supported
- Integrated line signalling and interfacing to any external system supported
- Modular system, can be modified for any railway network world-wide
- Architecture allowing expansion by new types of controlled wayside signalling systems
- Space saving
- High reliability and availability
- Low maintenance costs



TPC Case

### GENERAL DESCRIPTION

Station electronic interlocking ESA 44 (further ESA 44) has been designed to safeguard and control the operation in stations with and/or without track branching. ESA 44 is the successor to ESA 11 and ESA 33 type and it is fully electronic interlocking with contactless interfaces to wayside elements. All control, checking and logical functions of the interlocking are executed by computers pursuant to requirements of traffic operators and state of the technological system. Electronic contactless interfaces (EIP) are used for transmission of power signal to signal lights, LED lamps, point machines or for monitoring of state of track circuits, axle counters, auxiliary commanding posts, electromagnetic locks and adjacent electronic or relay systems.

### BASIC TECHNICAL DESCRIPTION

#### ESA 44 is composed of:

- commanding level formed by ZPC commanding computers. This level is used for interaction of the operating staff with the equipment, i.e. for control and visual check of the traffic situation.
- control level, formed by TPC vital computers. This level is used for generating of traffic algorithms.
- executive level formed by EIP electronic interface panels. This level is used for generation of partial algorithms, contactless control and monitoring of wayside elements. This level can be decentralized to remote locations.

ESA 44 complies with CENELEC standards (primarily EN 50 126, EN 50 128, EN 50 129, EN 50 159).

Control level safety concept is based on a 2x2oo2 redundant arrangement using diversified and defensive programming. To increase availability, the control and executive levels use a hot standby solution.

Safety concept of the executive level is based on a redundant arrangement with intrinsic safety elements using diversified and defensive programming with error detection codes.

Data transmission between ESA 44 components is realized by closed communication networks ETMNET, ETMNET+, PENET+ and EINET with





data line backup (according to CELENEC standards).

System has the functions for integration of line signaling equipment enabling also interconnection with external line signaling elements.

System has implemented functions for processing and monitoring of train numbers (Train Descriptor).

ESA 44 is programmatically de-

signed for integration with ERTMS/ETCS - providing the necessary information for ERTMS / ETCS system (Level 1, Level 2).

ESA 44 enables connection to the remote control system of AŽD Praha (DOZ-1) or other manufacturers.

System allows automatic setting of train routes (ASVC).

ESA 44 can be supplemented by

a Graphical and Technological Layer (GTN) designed for automatic processing of traffic documentation.

The commanding, control, and executive levels provide functional behavior data to LDS-3 and GDS diagnostic systems for their archiving, display, and analysis.

ESA 44 can also be adapted to aggravated climatic conditions.

### BASIC TECHNICAL PARAMETERS

Input power supply	AC 3x 400 V/50 Hz, DC 24 V
Temperature range	0 °C to + 55 °C (commanding and control level) - 25 °C to + 70 °C (executive level)
Relative humidity	to 80 % (commanding and control level) to 100 % (executive level)
Complies with EMC requirements according to	EN 50121-4, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-6-4
System service life	More than 25 years



EIP Panel



Executive level

