Solutions for Smarter Trains

EKE-Trainnet® safety functions

EKE

Safety Integrity Level (SIL) is an indicator of the relative risk-reduction provided by a safety function.

EKE-Electronics develops SIL functions to make your trains | trams | metros safer and more reliable.

EKE

Automatic Selective Door Operation (ASDO)

The EKE-Trainnet® Automatic Selective Door Operation (ASDO) is developed to improve passenger operation at stations where the platforms are shorter than the trains. ASDO enables an automatic check of the train's position and the platform configuration so only the doors that can be safely opened are released. Passenger comfort and safety is enhanced while allowing for shorter stops at stations.

Correct Side Door Enabling (CSDE)

The EKE-Trainnet® Correct Side Door Enabling (CSDE) provides safe passenger access to trains and platforms. The system opens only the doors on the correct side of the train, in appropriate places. CSDE supports three operating modes; manual, semi-automatic and fully automatic door operation. CSDE ensures the correct location and side of the train based on trackside beacons, Global Navigation Satellite System (GNSS) and distance measuring.

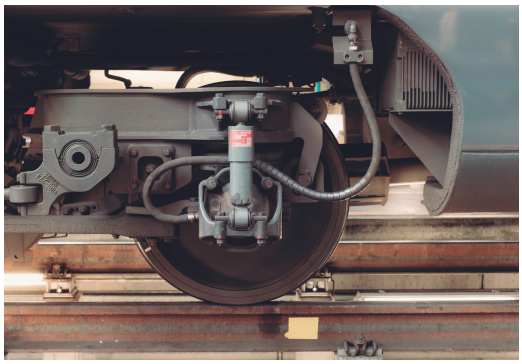
Automated Pantograph Control (APCO)

The EKE-Trainnet® Automated Pantograph Control (APCO) system is used for the automated power change-over. The EKE-Trainnet® APCO is a change-over function which provides location based control for switching power feed from the catenary to battery by controlling the pantograph directly or via the Train Control and Management System (TCMS).

Physical Prevention of Over-Speeding (PPOS)

The EKE-Trainnet® Physical Prevention of Over-Speeding (PPOS) system prevents trams from over-speeding. It allows the operator to set speed limits over the whole network by using trackside beacons and/or Global Navigation Satellite System (GNSS) together with distance measuring. The PPOS reads the speed limits from balises positioned on the tram tracks. If a tram is over-speeding, the system automatically applies service brakes, stops the tram and sends an alarm to the Control room.

Hot Axle Box Detection (HABD)



The EKE-Trainnet® Hot Axle Box Detection (HABD) is an on-board monitoring system that observes hot axle box bearing and gearbox temperatures. The system improves train safety by detecting wheelset bearings and gearbox presenting a risk of failure. The temperature sensors monitor the hot axle box grease temperature at all times, and the train computer issues warnings if the measurements vary from the normal. The EKE-Trainnet® HABD follows the EN 15437-2 standard.

Lateral Acceleration Monitoring (LAM)

The EKE-Trainnet® Onboard Lateral Acceleration Monitoring (LAM) system measures lateral vibrations from sensors placed in the bogie or on the car body. LAM helps prevent damages to the train and even possible derailment. The system also increases passenger safety and comfort. Alarm levels can be set to notify maintenance teams about abnormalities or even to automatically stop the train in case of immediate danger. The system can be supplemented with EKE SmartVision™ for remote train and track predictive maintenance.

Vigilance Control System (VCS)

The EKE-Trainnet® Vigilance Control System (VCS) known also as Dead Man's Switch or Driver Safety Device (DSD) monitors the train driver's vigilance at all times. The system automatically stops the train if the driver is unable to periodically press the pedal or button of the system. The Trainnet® VCS can be customized for different alarm periods or modified system setups.

EKE-Trainnet® additional safety functions

Train Speed and Distance Monitoring, Measurement and Display systems analyse different speed measurements such as train speed in bogie and wheel set, display the values to the train crew and provide an alternative speed source.

Fire Detection sub-system Monitoring reads fire detection signals from locomotives and coaches and displays the information to the train crew.

Safety Communication Management System ensures safe data communication throughout the train and enables centrally managed networked safety functions.

EKE-Trainnet® additional safety functions

Supervision of passenger alarm activation: Through train's safety circuits (alarm) and TCMS communication the equipment receives the activation of the passenger alarm when the train is at the platform or when leaving the platform.

Brake Pipe Pressure Monitoring scans the status of the main brake pipe pressure of the brake system, inform the driver and if necessary activate the protective actions.

Supervision of Traction Enabling: the function decides whether it is safe to enable traction, based on the status of traction manipulation devices, train speed and doors status.

The SIL notion results directly from the IEC 61508 standard. For the rail industry, CENELEC has developed the EN 50126, EN 50128 and EN 50129 standards which were derived from the IEC 61508 to meet railway specific requirements. EKE-Electronics Ltd functional safety solutions comply with these standards.

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