

AUTOMATION SYSTEM

FOR RAIL VEHICLE APPLICATIONS

System Overview



SELETRON

FLEXIBLE CONTROL SYSTEMS FOR RAIL APPLICATIONS

VEHICLE CONTROL UNITS AND DIAGNOSTIC CPUS



- SAFETY-ORIENTED CONTROL SYSTEM**
- Safety requirement level SIL 2 acc. to EN 50126, EN 50128, and EN 50129
 - Certified and safe operating system
 - Monitoring of safety-relevant functions
 - Safe operation and monitoring
 - Safe networking via SafetyCom
 - TRDP, SDT V2 protocols
 - Combined safe and non-safe signal conditioning on the extension bus

- HIGH-PERFORMANCE HEAD CONTROLLER**
- CPUs with different performance and interfaces
 - Centralized and decentralized I/O extensions
 - Same IEC 61131 programming environment for SIL and non-SIL applications
 - Maintenance-free
 - Extendable memory (SD card)
 - A wide variety of networking options

- FLEXIBLY EXTENDABLE COMMUNICATION LINKS**
- Extendable with up to 3 communication modules
 - CAN 831-T with 3 electrically isolated CAN interfaces
 - MVB 831-TG/EMD & MVB 831-TG/ESD as bus administrator or gateway
 - PNI 831-T as a PROFINET connection, ideal for integration into a PROFINET network (I/O device)

OPEN AND FLEXIBLE AUTOMATION SYSTEM WITH AN INTEGRATED AND TRANSPARENT NETWORK TECHNOLOGY

SUITABLE FOR TRAIN BUS PROTOCOLS



- ETHERNET TRAIN BACKBONE**
- Ethernet router
 - Protocols: TRDP, TRDP SDT, IPTCom, CIP, ...
 - 24/36 V DC & 96/110 V DC
 - 5 x fast Ethernet ports (4 x train bus and 1 x vehicle bus)
 - 2+2 Bypass

- WTB GATEWAY**
- WTB train bus acc. to IEC 61375 standard
 - WTB-CAN gateway with 2 x CAN interfaces
 - WTB-MVB gateway
 - 24 V DC
 - 19" rack installation

- CAN-POWERLINE**
- Extension modules for CPU 73x and CPU 83x
 - Max. 360 m between two couplers at 125 kbps (without repeater)
 - Max. 16 CAN-Powerline train bus couplers
 - Efficient WTB alternative solution

- WIRELESS BACKBONE**
- 2 x Ethernet 1 GB interfaces
 - 2 x WLAN interfaces
 - 24...110 V DC
 - Proprietary coupling protocol
 - 2.4 or 5 GHz
 - Compatible with IEEE 802.11a/b/g/n
 - Security e.g. WPA/WPA2 encryption

TRAIN-TO-GROUND COMMUNICATION



- EWM 902-TW**
- 2 x Ethernet 1 GB interfaces
 - 1 x USB interface
 - 2 x WLAN interfaces

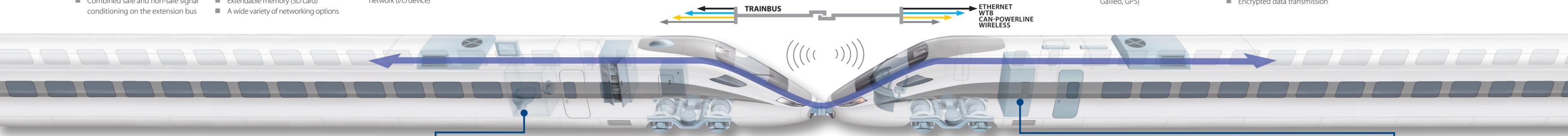
- EWM 904-TW**
- 2 x Ethernet 1 GB interfaces
 - 1 x USB interface
 - 1 x WLAN interface
 - 1 x LTE with GNSS (GLONASS, Galileo, GPS)



- EWM 903-TW**
- 2 x Ethernet 1 GB interfaces
 - 1 x USB interface
 - 1 x LTE with GNSS (GLONASS, Galileo, GPS)



- SGW 901-TW**
- 2 x Ethernet 1 GB interfaces
 - Security according to IEC 62443 SL-1
 - Open VPN client
 - Encrypted data transmission



SMARTIO® – THE SMART SYSTEM FOR DISTRIBUTED APPLICATIONS



- ELECTRONIC TERMINALS "TAILORED TO THE SYSTEM"**
- SIL and non-SIL modules combinable
 - Node modules for Ethernet, CAN, and MVB
 - 24 V DC and 110 V DC versions
 - Flexible, tailor-made system extension
 - Flexible mounting position
 - Space savings thanks to integrated connector blocks

- connector blocks
- Simplified connection technology (1, 2, & 3-wire technology)
- Redundant wiring concept
- Connector coding
- Fine or coarse granularity
- Digital I/O modules
- Analog I/O modules

- Front-facing module name, serial number, and revision status
- Large labeling area
- Monitoring and status indicators
- Integration in the Selectron IEC 61131 programming environment

SWITCHES & ROUTERS



- INTEGRATED SOLUTIONS WITH ETHERNET TECHNOLOGY**
- Network technology with high bandwidth
 - Ethernet is deployable as a vehicle bus, a train bus, and in multiple units
 - One integrated Ethernet platform

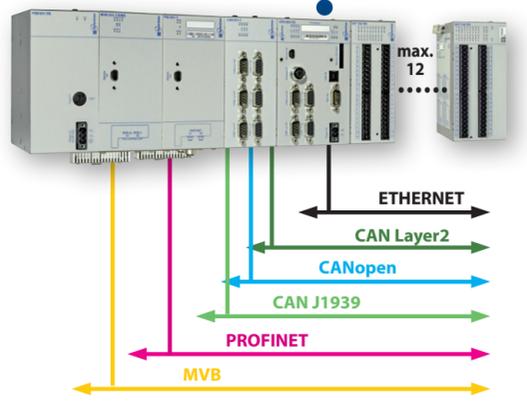
- Use of standardized technology (IEC 61375-2-5/-3-4)
- Physically separate networks consolidated to one network
- Wireless data connections are possible
- High availability with linear topologies thanks to bypass function
- Graphical configuration tool for easy configuration of switches

- 8/13 port 10/100/1000 Mbit/s
- M12 connectors
- Bypass function
- PoE
- Auto-configuration
- DHCP
- USB interface: Master, slave
- 24/36 V DC / 96/110 V DC

OPEN TO VEHICLE TCN PROTOCOLS

- A SYSTEM WITH MULTIPLE COMMUNICATION OPTIONS – SUITABLE FOR ANY NETWORK STRUCTURE**
- Protocol diversity
 - Optimization of application-specific requirements; such as data throughput time, control processes, and network availability
 - Gateways between train and vehicle bus
 - Easy integration of subsystems
 - All protocols managed by one CPU

- VEHICLE BUS**
- CAN, CANopen, J1939 CAN
 - Ethernet, TRDP, TRDP SDT, PROFINET, CIP
 - MVB
 - RS-485 / 422 / 232



WHEEL SLIDE PROTECTION SYSTEM



- Wheel slide protection for vehicles with speeds up to 200 km/h
- Can be used both in new vehicles and for modernization
- TSI-compliant
- Control of up to 6 wheel slide protection valves per system
- Automatic activation in tow operation
- Modular for different wheel slide protection configurations
- Integration in rail vehicle control and monitoring system for straightforward system diagnosis

GRAPHICAL CONTROL ELEMENTS



DISPLAY

- 10.4" and 12.1" touchscreens
- Touch and UIC 612 display size 10.4"
- SIL and non-SIL versions
- Safety-oriented communication (SIL 2)
- 24–110 V DC
- 2 x Ethernet interfaces
- 2GB DDR3 / 4GB SLC NAND
- Same programming environment for SIL/non-SIL applications



SYSTEM FOR DECENTRALIZED APPLICATIONS



DECENTRALIZED CONTROL SYSTEMS

- Standalone or networked, freely programmable controller
- IEC 61131 programming environment
- Extendable with local I/O modules
- Extendable with decentralized node modules
- Ethernet, CAN, MVB, and RS interfaces
- Use as a gateway
- J1939 communication

DECENTRALIZED NODE MODULES

- SIL and non-SIL modules combinable
- Node modules for Ethernet, CAN, and MVB
- Versions available for the usual voltage ranges in rail applications
- Digital I/O modules
- Analog I/O modules

- Function modules
- Monitoring and status indicators
- Integration in the Selectron IEC 61131 programming environment

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