



CYBERSECURITY

## ETHERNET TECHNOLOGY FOR RAIL VEHICLES

### Communication is key - The seamlessly integrated network system

Invisible from the outside, train bus couplers, switches, converters, and repeaters perform indispensable functions for the safe operation of modern rail vehicles. Technically, we underpin this service competence with our new network products. The new Ethernet Consist Switch (ECS) features the latest hardware technology. Its purpose is the implementation of network topologies inside the vehicle.

A true 2-in-1 product is our new Train Backbone Switch (TBS). It is both a Train Backbone Node and an Ethernet Consist Switch. This combination allows customers to save space in the vehicle while improving the robustness of the network to ensure compliance with standards.

Designing and configuring the network has never been easier than with the Selectron Advanced Network Designer (SAND). The great advantage is that the system is programmed and not the individual devices. The Selectron devices detect the presence of a new device and automatically set the parameters of the new device.



**SELETRON**

# Convincing user benefits offer cost advantages

The **Consist Switch** is a Fast/Gigabit Ethernet Layer 2-managed switch with some Layer 3 functionalities. Its purpose is the implementation of network topologies in a train.

Save time and money by configuring the network – and not the switch.

State-of-the-art capabilities providing Rapid Spanning Tree Protocol (RSTP) implementation features and routing capacity.

Highest flexibility thanks to fast ports or Gigaports, bypass or PoE with different hardware configurations.

In addition, the bypass function makes devices completely transparent to the network in the event of power down or failure, thus avoiding or reducing the impact of possible local dropouts or a malfunction on the network performance.

The **Train Backbone Switch** is a true 2-in-1 device: A Train Backbone Node and an Ethernet Consist Switch.

This combination allows customers to save money, onboard space and, at the same time, improve network robustness to maintain compliance with standards.

On the backbone side, four Fast Ethernet or Gigabit ports are available with hardware bypass for maximum reliability.

On the consist side, eight Fast Ethernet ports can be equipped with PoE functionalities.

Fully supported IEC 61375-2-5 train inauguration procedure and provides an ETBN control interface for Train Real-Time Data Protocol (TRDP) devices.

Advanced configuration at train level in addition to device configuration give you full flexibility.

## Technical data

- Up to 16 Fast Ethernet ports, or
- 6 Gigabit Ethernet ports + 10 Fast Ethernet ports
- IPv4 protocol supported
- 2-3 hardware bypasses for maximum reliability (depending on model)
- Spanning tree (STP 802.1D) and Rapid Spanning Tree (RSTP 802.1w)
- Link Aggregation Protocol (LACP 802.3ad)
- Up to 4096 802.1Q VLANs and Inter-VLAN routing
- Multicast Group Membership IGMP
- Multicast routing
- 8 output hardware queues for each port
- Strict priority or weighted round-robin (WRR) scheduler
- Cybersecurity by design (SL2)

# Discover the entire range of Selectron solutions



## Train Control and Management Systems

Individual requirements need individual solutions. That is why there is not one Train Control & Management System for controlling trains and their subsystems. The solutions from Selectron Systems are therefore adapted to the very specific requirements of your automated rail vehicle.



## Our services - your success

Nothing is more important than responding to customer- and project-specific needs. We help projects achieve rapid success - with the right hardware architecture, reliable components, efficient software tools and overall knowledge transfer. Our job is to support you from the initial concept idea to the end of the lifecycle.



## Holistic cybersecurity approach

The digitization of the railways is moving at high speed. The flip side of the coin: The rapid pace of technological development makes rail vehicles vulnerable to cybercrime. All the more important is that you can rely on someone who keeps an eye on the big picture. Selectron is on the spot with its forward-looking cybersecurity solutions.

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