

Ethernet Networking for Rail Vehicles

Reliable Ethernet communication from the train backbone to every consist.

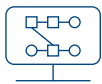
Selectron's Ethernet Consist Switch and Train Backbone Switch provide reliable, configurable network connectivity for modern rail vehicles. An integrated toolchain simplifies network engineering, commissioning and lifecycle management.



SELECTRON

Ethernet Networking for Rail Vehicles

Two solutions. One rail network.



Smart network engineering

Configure the entire train network centrally. SAND manages device settings for easy setup and updates.



High network availability

Hardware bypass options help maintain network communication if a device loses power or becomes unavailable.



Compact 2-in-1 architecture

The TBS combines train backbone node and consist switch functionality to reduce onboard hardware, cabinet space and wiring.

A compact 2-in-1 solution combining a Train Backbone Node and an Ethernet Consist Switch.

The TBS connects the consist network to the Ethernet Train Backbone while also providing Ethernet switching within the consist. Its combined architecture reduces hardware, installation space and integration effort.



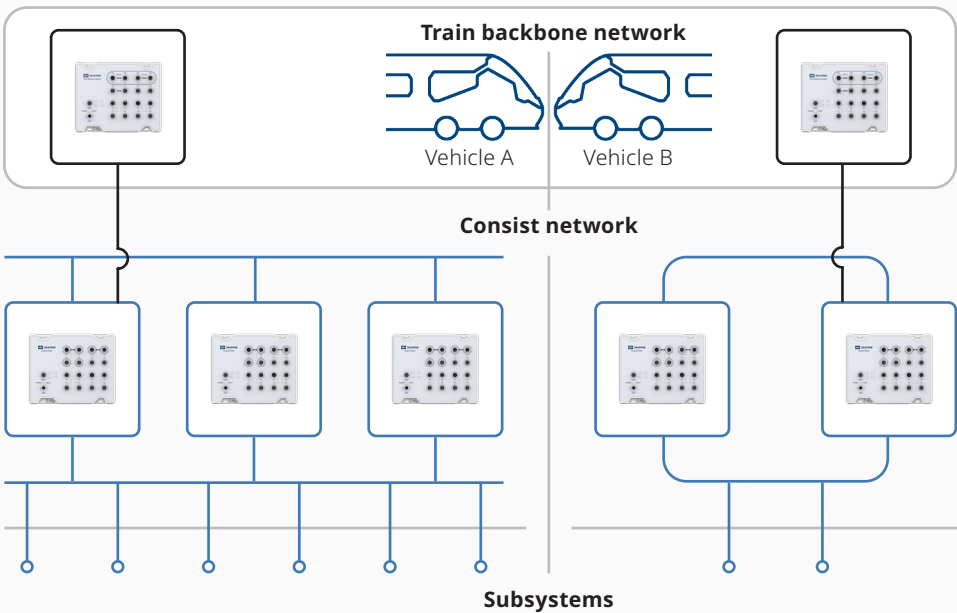
Managed Ethernet switching for communication within a rail vehicle consist.

The ECS connects onboard devices and subsystems within the consist network. It supports flexible network topologies, traffic management and resilient communication for rail vehicle applications.



From train backbone to onboard subsystems.

The TBS connects each consist to the Ethernet Train Backbone. Within the consist, ECS devices distribute Ethernet communication to controllers, I/O systems and onboard subsystems. The architecture can be adapted to the vehicle configuration and expanded as project requirements evolve.



SELECTION

One engineering workflow from initial network design to lifecycle modifications.

Configure the Network

The **Selectron Advanced Network Designer (SAND)** provides a system-level approach to train network engineering. Configure the network topology and device parameters centrally, then deploy the configuration across the network platform.



Centralised configuration

Define the network architecture and device parameters in one engineering environment.



Automatic device integration

Selectron devices detect newly added compatible devices and apply the assigned parameters.



Efficient lifecycle changes

Update network configurations more efficiently when vehicles are modified, extended or modernized.

Reliability & Cybersecurity

Built for dependable rail applications.



Cybersecurity by design

Aligned with IEC 62443-4-2, Security Level 2 (SL 2).

*) TBS/TBN: Certification planned for Q1 2027



Defense in depth

Multiple protection mechanisms help reduce the risk of accidental or intentional network manipulation.



Network resilience

Redundancy and bypass options ensure communication during failures.



Developed for rail networks

Designed for Ethernet communication within demanding onboard rail environments.

Technical highlights

- Up to 16 Fast Ethernet ports or configurations with up to 6 Gigabit Ethernet ports and 10 Fast Ethernet ports.
- Managed Layer 2 switching with selected Layer 3 functions
- RSTP and STP network redundancy
- Link Aggregation according to IEEE 802.3ad
- VLAN and multicast support
- Up to three hardware bypasses, depending on the model
- Cybersecurity by design, SL 2

Engineering & lifecycle support



Network architecture

Support for Ethernet Train Backbone, consist network and onboard subsystem integration.



Configuration & commissioning

Engineering support for network topology, device configuration, testing and vehicle commissioning.



Lifecycle & retrofit

Support for network extensions, vehicle modernisation and long-term operation.

Built for your reliable rail network



Save space and hardware

Combine backbone and consist networking in one compact TBS device.



Reduce engineering effort

Configure the network centrally with SAND instead of programming each switch separately.



Adapt to different vehicles

Choose the port configuration, bandwidth, bypass and PoE options required by the vehicle architecture.



Maintain communication

Redundancy protocols and hardware bypass options help minimise the effect of local network failures.

Next steps | Find the right combination of ECS and TBS for your onboard Ethernet architecture.



Get in touch

Expert advice and tailored support for your projects.



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