



Trainnet® Ethernet Switch and Router
(functions: run applications, router, switch)



Trainnet® Ethernet Switch
(functions: switch with PoE)



Ethernet Switches

EKE is a pioneer in Ethernet based Train Communication Networks (TCN). Trainnet® Switches and Software were used on board the first train with 100% IP-based TCN.

FUNCTIONS

Depending on the Ethernet modules that you select, the following functions can be achieved:

→ Ethernet Train Backbone (ETB)

The Ethernet Train Backbone (ETB) is a modern train bus technology enabling a cost-effective setup with a large bandwidth (up to 100Mbit/s Vs 1 Mbit/s for WTB). It can replace or be used together with WTB and other train buses. Like the WTB, it allows for dynamic train configuration.

→ Ethernet Consist Network (ECN)

The Ethernet Consist Network (ECN) technology can be used to create vehicle buses and also as train-wide communication network in the case of fixed consist (no dynamic train configuration).

→ Ethernet Switch

Ethernet Switches are used to connect devices to the Train Communication Network enabling networked devices to communicate with each other. The managed

switches manage layer 3 protocols, such as DHCP and IGMP. It also allows for finer configuration of the switch.

→ ETB Router

The routing functionality allows the switch to be dynamically configured, thus redirecting messages to devices based on the latest information. A common application is dynamic train configuration: when changing the order of cars, the train communication network

is automatically reconfigured. The position and orientation of each car is identified, enabling flawless communications throughout the train.

→ Power-over-Ethernet (PoE)

Power-over-Ethernet allows for the passing of electrical power in addition to data with Ethernet cabling. It means you can dramatically reduce setup costs and wiring as only one cable is required to each device. More and more devices

COMPARING TRAINNET® ETHERNET MODULES

3U ESU POE



ERU



3U ESU

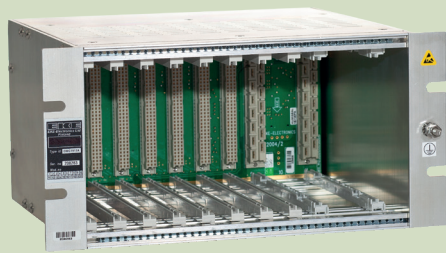


1U ESU



FUNCTIONS

| | | | | |
|--------------------------------|---|---|---|---|
| Ethernet Train Backbone (ETB) | - | ✓ | - | - |
| Ethernet Consist network (ECN) | ✓ | ✓ | ✓ | ✓ |
| Managed Switch | ✓ | ✓ | ✓ | ✓ |
| Unmanaged Switch | ✓ | ✓ | ✓ | ✓ |
| Router | - | ✓ | ✓ | - |
| Power-over-Ethernet | ✓ | - | - | ✓ |
| Firewall | - | ✓ | ✓ | - |



Trainnet®
Rack
(Here 3U 44 TE Rack)



Trainnet® Switch



Trainnet®
Power Supply
(PSV + PIU)

EN 50155
EN 45545
IEC 61375-3-4
IEC 61375-2-5

support PoE including surveillance cameras, displays, GSM antennas, emergency phones etc.

MODULARITY

The Trainnet® Systems are modular. You can build an Ethernet Switch with just the functionalities you need, for cost-efficiency. As a general rule, a standalone Trainnet® Ethernet Switch includes a Trainnet® Rack, a Trainnet® power supply and at least one Trainnet® Ethernet Module.

Trainnet® Ethernet Switches can be easily integrated into a more comprehensive Trainnet® system. For instance, the Ethernet Switch can be used as part of a Gateway, a VCU or a full TCMS train computer. That way, you are able to save space and money with a very compact and efficient system.

RACKS

The Trainnet® Racks are available in different sizes: the most common are 20TE, 44TE and

84TE wide racks. The racks are usually 3U high but a 6U 84TE Rack is also available for larger systems as well as for the Trainnet® 1U ESU Switch with Power-over-Ethernet. Other rack sizes are also available: please ask us.

POWER SUPPLY

Most Trainnet® Systems can be powered using the Trainnet® PSV and Trainnet® PIU modules. When Power-over-Ethernet is needed, the Trainnet® PSE, Trainnet® ESS and optionally the Trainnet® PBU are used.

TECHNICAL SPECIFICATIONS

Dimensions (W x H x D)

3U 44TE Rack
280 mm x 133 mm x 215 mm
(installation width 240 mm)

3U 84TE Rack
483mm x 133mm x 215 mm
(installation width 443 mm)

6U 84TE Rack
483 mm x 266 mm x 215 mm
(installation width 443 mm)

Weight

Depends on rack and installed modules

Input Voltage

PIU: 24, 36, 48, 52, 72 or 110 V DC
ESS (PoE): 36-52 or 110 V DC

Temperature Range (operational)

-40 °C...+70 °C

MTBF (40 °C ambient temperature)

Depends on installed modules

Ethernet Interfaces:

Depends on installed modules

Please read individual Ethernet Module datasheets for more detailed specifications.