Backbone Repeater

4 ports - 2xFE+2xFE

VDS Rail
The onboard networking company

The Backbone Repeater is a EN 50155 compliant device specifically designed for network applications in Rolling-Stock environments, able to regenerate the Ethernet frame data and the electrical parameters to overcome the 100m maximum Ethernet segment limit imposed by the standard.

The Ethernet Train Backbone (ETB) physical architecture defined in the IEC 61375 standard requires that - when the distance between the two ETBNs is higher than 100 m - one or more Repeaters have to be placed between two adjacent Ethernet Train Backbone Nodes (ETBNs). In this case, the use of a Backbone Repeater, is highly recommended.

The Backbone Repeater provides two (2) completely separated and independent Ethernet Repeaters into a single enclosure. The two (2) protected ethernet lines are powered by an independent power supply unit on each line.

The Backbone Repeater has two (2) + two (2) 100BASE-TX ports.

The device is transparent to all Ethernet protocols and offers full speed connectivity on both lines. Each Repeater is equipped with a fault relay, triggered by a diagnostic micro-controller or in case of power loss. To simplify the cabling requirements, both relays are available on a single four-pin connector.

Designed to operate in harsh environmental conditions typical of Rolling-Stock applications, the Backbone Repeater is fully EN 50155 and IEC 61375 compliant and provides the highest level of reliability and robustness required by the railway industry.

Technical specifications

- Two (2) completely separated independent Ethernet Repeaters into a single device
- Two (2) + two (2) 10/100BASE-T(X) Ethernet ports
- M12 circular connectors
- One (1) + one (1) Fast Ethernet lines repeated
- Fault indication: Normally open and Normally closed contacts of a mechanical relay protected by a 0.5A non-resettable / non-replaceable internal fuse
- Separated and independent power supply unit on each line
- Insulated power supplies

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Technical specifications

PHYSICAL DATA

System status indicators	1 green LED (Power OK)
Fast Ethernet connectors	M12, female, 4-ways, D-coding
Power supply / Fault connector	M12, male, 4-ways, A-coding
Power supply voltage (insulated)	Nominal 24 ÷ 110 Vdc Range according to EN 50155
	Nominal 37.5 Vdc Range according to IEEE Std 1476-2000
Interruption voltage supply class	S2, according to EN 50155
Power consumption	7 W max
Overall dimensions	165 x 133 x 47 mm
Weight	1 Kg
Operating temperature	
Standard	-25 °C ÷ +70 °C (+85 °C for 10 min. according to EN 50155 class OT3 with extended operating temperature ST1)
Optional	-40 °C ÷ +70 °C (+85 °C for 10 min. according to EN 50155 class OT4 with extended operating temperature ST1)
Relative humidity (non-condensing)	0 % ÷ 95 %
Storage temperature	-40 °C ÷ +85 °C
Color codes	
	Grey Pantone 430 / RAL 7045 (frame)
	Black (front panel)
Degree of protection	IP65

APPROVALS / COMPLIANCE

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EN 50155	Railway Applications (Electronic equipment used on rolling stock)
IEC 61375	Electronic railway equipment - Train communication network (TCN)
EN 50121-3-2	Electromagnetic compatibility rolling stock apparatus
IEC 60068-2-1	Environmental testing: Tests - Test Ad: Cold
IEC 60068-2-2	Environmental testing: Tests - Test Bd: Dry heat
EN 60068-2-30	Environmental testing: Tests - Test Db variant 2 – Damp heat
EN 61373	Shock & Vibration - Category 1 class B

APPROVALS / COMPLIANCE

EN 50124-1	Insulation coordination
EN 45545-2	Fire & Smoke

INTERNET WORKING STANDARDS

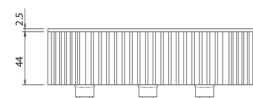|	
IEEE 802.3	Fast Ethernet (10/100BASE-T(X))

Wall Mounting

Dimensions only for reference
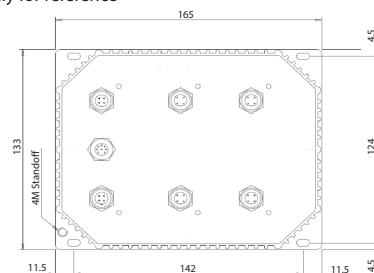
FRONT VIEW
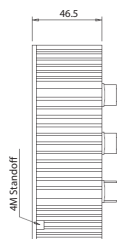
SIDE VIEW

TOP VIEW

H*: see overall dimensions specification