KONUENDO NETWORKING

Ethernet Train Backbone Node

5 ports - 4xFE+1xFE

VDS Rail
The onboard networking company

The Fast Ethernet Train Backbone Node (ETBN) is used when two or more trains need to be connected together. The Train Backbone Node has been specially designed to meet the requirements specified by IEC 61375 for the Ethernet Train Backbone (ETB) network.

The Train Backbone Node has four (4) 100BASE-TX switched ports for Train Backbone Network implementation and one (1) 100BASE-TX port to be connected to the Consist Network.

The two (2) pairs of Backbone ports are equipped with bypass function.

One or more ETBNs can be used together with an active/passive redundant configuration to obtain the maximum level of protection.

IEC 61375 Train inauguration procedure is fully supported as well as ETBN control interface for TRDP devices. Routing and address translation rules for multiple consist networks interconnections are automatically defined during train inauguration. Other interfaces (SNMP, REST) are also available in order to provide a wider range of potential implementations.

The TTCMP© provides automatic device configuration and continuous monitoring giving the customer a way to reduce commissioning and maintenance costs.

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

Technical specifications

Management

- Two (2) hardware bypasses for maximum reliability
- Extended RMON counters
- Fallback firmware image for maximum reliability
- IPv4 protocol supported
- In-band (SSH) and out-of-band (console) CLI interface for device management
- In-band and out-of-band firmware upgrade
- Train Topology and Configuration Management Protocol (TTCMP©) for automatic device configuration
- RADIUS authentication
- Simple Network Management Protocol (SNMP) v1/v2c/v3

Layer 2 features

- Four (4) 10/100BASE-T(X) Ethernet switched ports
- One (1) 10/100BASE-T(X) Ethernet port
- Wire-speed switching
- Auto MDI/MDIX
- Four (4) output hardware queues for each port
- Up to 8192 MAC addresses
- DSCP/802.1p Class of Service
- Ingress/egress rate limiting
- Link Layer Discovery Protocol (LLDP 802.1ab)
- Strict priority or weighted (WRR) scheduler
- Up to 4096 802.1Q VLANs

Layer 3 features

- Integrated DNS
- Standard IEC 61375 TTDP Train Topology Discovery Protocol
- R-NAT (railway 1:1 NAT)
- Router Redundancy Protocol
- Static unicast/multicast routing
- Dynamic inter-consist routing following train inauguration
- Train-wide standard multicast routing

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Technical Specifications

PHYSICAL DATA	
System status indicators	8 LEDs
Fast Ethernet connectors	M12, female, 4-ways, D-coding
Power supply connector	M12, male, 4-ways, A-coding
Maintenance port connector	M12, female, 8-ways, A-coding
Power supply voltage (insulated)	Nominal 24/48/72/96 ÷ 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	22 W max
Overall dimensions	207 x 184 x 51 mm (without connectors)
Weight	2.0 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	Pantone 430 / RAL 7045 (frame)
	Black (front panel)
Degree of protection	
Standard	IP40
Optional	IP54, IP65

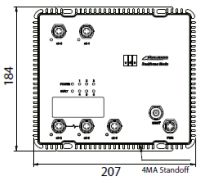
APPROVALS / COMPLIANCE	
EN 50155	Railway Applications (Electronic equipment used on rolling stock)
IEC 61375	Electronic railway equipment - Train communication network (TCN)
EN 50121-3-2	Electromagnetic compatibility rolling stock apparatus
IEC 60068-2-1	Environmental testing: Tests - Test Ad: Cold
IEC 60068-2-2	Environmental testing: Tests - Test Bd: Dry heat
IEC 60068-2-30	Environmental testing - 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

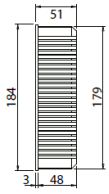
INTERNET WORKING STANDARDS	
IEEE 802.3	Fast Ethernet (10/100BASE-TX)
IEEE 802.1Q	Tagged VLANs
IEEE 802.1D	Spanning Tree Protocol
IEEE 802.1w	Rapid Spanning Tree protocol
IEEE 802.1X	Port-based network access control
IEEE 802.1AB	Link Layer Discovery Protocol (LLDP)
IEEE 802.3ad	Link Aggregation Protocol (LACP)

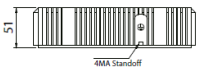
Wall Mounting

Dimensions only for reference

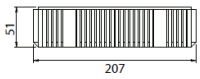


FRONT VIEW





UNDER VIEW



SIDE VIEW

TOP VIEW