HYPEX ETHERNET TRAIN BACKBONE NODES

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COMBINED WITH MANAGED ETHERNET SWITCH

DESCRIPTION

A HYPEX ETBN is designed for a high speed Ethernet communication infrastructure in dynamically coupled trains. It features Gigabit Ethernet interfaces for both ETB and ECN networks. A powerful CPU ensures high routing performance of more than 300 kfps even with an active R-NAT and firewall.

A HYPEX ETBN entirely fulfils the requirements defined in both IEC 61375-2-5 and IEC 61375-2-3 standards. Its main function is to route data packets between the ETB and ECN networks. TTDP protocol detects all changes in train composition, performs ETB inauguration and automatically configures the IP routing tables and address translation rules. ETBN also creates and maintains the Train Topology Database with complete information on actual train composition. Standardized communication services provide access to the database for end devices.

ETB link redundancy is supported by four 1Gbps ETB ports with bypass relays, which ensure ETB operation even if one node is powerless or not operating.

Redundant connection between ETB and ECN is supported by using two ETBNs in operating in active / standby mode in the network. Router redundancy is completely transparent to end devices.

A modular HYPEX platform allows combination in one device ETBN with a managed Ethernet switch. A wide range of production models is available with different port counts and configurations, communication speeds and PoE support. The HYPEX platform also uses easily replaceable modules which are shared by many different on-board devices and therefore, helps to optimize life cycle costs. The HYPEX platform internal architecture uses 10Gbps communication lines between individual modules to ensure full wire speed switching between all ports.

KEY FEATURES

- An ETBN – Ethernet Train Backbone Node designed for Gigabit ETB and ECN networks.
- Full compliance to IEC 61375-2-5 and IEC 61375-2-3 standards.
- A powerful communication CPU to ensure high routing performance with R-NAT and firewall.
- TTDP protocol handles ETB inauguration and addressing.
- Builds and maintains Train Topology Database with information regarding train, consists and vehicles.
- An ETB interface realized by 4 gigabit Ethernet ports with bypass relays.
- Integrated with a managed Ethernet switch for ECN ports.
- On ECN supports fault-tolerant ring topology with fast recovery time.
- Support for redundant configuration with two ETBNs in one network operating in active / standby mode.
- A modular design with variable number of ports and optional PoE support.
- All models are based on a HYPEX modular platform and share the same HW and SW components.
- Integrated diagnostic features for detailed runtime network analysis.
- Easily replaceable modules to help optimise life cycle costs.
- Both rack and panel mounting options.

DEVICE MODELS

Optional configuration of the number of ports with different functionality (1000BASE-T, 1000BASE-T with BYPASS, 1000BASE-T with PoE, 1000BASE-TX, 1000BASE-T with PoE). Complete list of options is available on request.

STANDARDS

EN 50155:2018, EN 61373:2011, EN 50121-3-2:2017, EN 50124-1: 2002, IEC 61375-1:2012, IEC 61375-2-5:2015, IEC 61375-2-3:2017, IEC 61375-3-4:2017

OPERATING CONDITIONS

PARAMETER	VALUE	NOTE
Operating temperature range	-40 to + 70 ° C	Class TX according to EN50155
Power supply voltage	24 V DC, 110V DC, Class 52	Independent power supply for device and PoE
Power Consumption	< 50W (device) / 150W (PoE)	
Galvanic isolation	1000 V AC, 50 Hz	
Shock & Vibration	Category 1, Class B	
Altitude	up to 1400 m	Class A1 according to EN 50125-1
Dimensions BOX.B / BOX.C / BOX.E	206 × 133 × 123 mm / 280 × 133 × 123 mm / 304 × 133 × 123 mm	
Weight BOX.B / BOX.C / BOX.E	< 3.5 kg / < 4 kg / < 4.5 kg	
Protection	IP20	
CPU	QorIQ LS1043A, 4× Cortex-A53 64-bit cores at 1.0 GHz	
Memory	1GB DDR RAM / 256MB NOR Flash / 2MB MRAM / SD Card slot	
RTC	RTC with battery backup	
ETB ports	4×1000BASE-T with bypass relays	
ECN ports	Maximum 21 ECN ports: 2×1000BASE-T 21×100BASE-TX / 1000BASE-T Up to 16 ports with PoE support	Modular design, see different models below.
PoE power output	Max. 15W per port	

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