

Train Switch

KONUENDO NETWORKING



video display systems



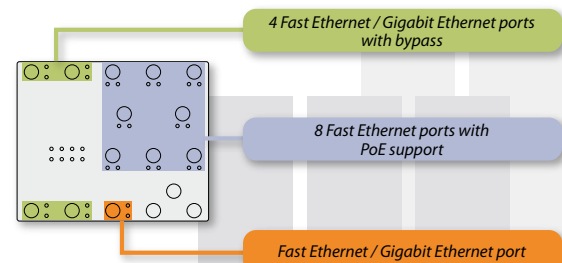
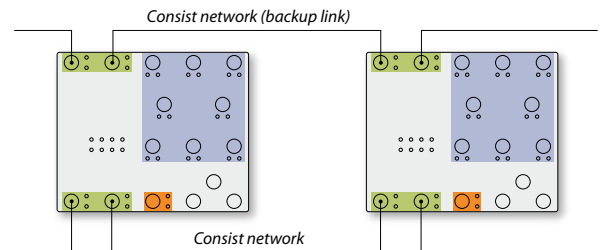
The *Train Switch* is 13 Fast Ethernet ports Layer 2 managed switch specifically designed for network applications in rolling-stock environment. Its purpose is to enable the implementation of network topologies in a train.

The *Train Switch* provides advanced traffic switching capabilities, including support for VLANs, (Rapid) Spanning Tree Protocol (STP/RSTP) protocols and the possibility to apply Quality of Service (QoS) policies. The bypass feature makes the device completely transparent to the network in case of power loss or failure, thus avoiding or reducing the impact of possible local drop outs or malfunction on network performance. Being capable of supporting Power-over-Ethernet (PoE) (on 8 ports), the device can also provide power to connected Ethernet devices, simplifying cabling design and implementation. Available in different models, the Train Switch supports up to 13 Fast Ethernet devices (2 pairs with bypass function).

Designed to operate in harsh environmental conditions typical of rolling stock applications, the *Train Switch* is fully EN-50155 compliant and provides the highest level of reliability and robustness required by the railway industry.

Technical Specifications

- IEEE 802.3 layer 2 managed switch
- 8 Fast Ethernet and up to 5 Gigabit Ethernet ports
- M12 circular connectors (4-ways for Fast Ethernet / 8-ways for Gigabit Ethernet)
- IPv4 protocol supported
- Device bypass for maximum reliability (2 pairs)
- Spanning tree (STP 802.1D) and Rapid Spanning Tree (RSTP 802.1w)
- Link aggregation protocol (LACP 802.3ad)
- Up to 4096 802.1Q VLANs
- DHCP option 82 handling
- Integrated per-port DHCP server
- IGMP versions 1, 2 and 3 snooping
- SNMP v1,v2c,v3 device management
- Extended RMON counters
- IEEE 802.3af PoE delivered on 8 ports
- Link Layer Discovery Protocol (LLDP 802.1ab) with LLDP-MED extensions
- 802.1X port authentication
- RADIUS authentication
- DSCP/802.1p Class of Service
- 4 output hardware queues for each port
- Strict priority or weighted (WRR) scheduler
- Ingress rate limiting
- In-band (SSH) and out-of-band (console) CLI interface for device management
- In-band and out-of-band firmware upgrade
- Fallback firmware image for maximum reliability



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Technical Specifications

PHYSICAL DATA

System status indicators:	8 LEDs	
Fast Ethernet connectors:	M12, female, 4-ways, D-coding	
Gigabit Ethernet connectors:	M12, female, 8-ways	
Power supply connector:		
24 Vdc version	M12, male, 5-ways, A-coding	
110 Vdc version	M12, male, 4-ways, A-coding	
Maintenance ports connectors:	M12, female, 5-ways, A-coding	
	M12, female, 5-ways, B-coding	
Power supply voltage range (isolated):		
24 Vdc nominal (48 Vdc nominal if PoE utilized)	14 ÷ 60 Vdc (PoE power supply not included)	
96/110 Vdc nominal	66 ÷ 154 Vdc (PoE power supply included)	
Power supply current:	0,6 A max @ 24 Vdc	
Power supply class:		
Standard	S1, according with EN-50155	
Optional	S2, according with EN-50155	
Power consumption (without PoE):	15 W max	
PoE class:	S3	
PoE max power:	60W	
Overall dimensions:		
24 Vdc version	190 x 184 x 50 mm	
110 Vdc version	190 x 184 x 70 mm	
Weight:		
24 Vdc version	1,3 Kg	
110 Vdc version	2,1 Kg	
Operating temperature:		
Standard	-25 ÷ +55 °C (+70 °C for 10 min. according with EN-50155 class T1)	
Optional	-25 ÷ +70 °C (+85 °C for 10 min. according with EN-50155 class T3)	
	-40 ÷ +70 °C (+85 °C for 10 min. according with EN-50155 class TX)	
Relative humidity (non condensing):	0 ÷ 95 %	
Storage temperature:	-40 ÷ +85 °C	
Color codes:	Pantone 430 / RAL 7045 (frame)	
	Pantone 431 / RAL 7046 (front panel)	

APPROVALS / COMPLIANCE

EN 50155	Railway applications: electronic equipment used on rolling stock
EN 50121-3-2	Railway applications: electromagnetic compatibility
EN 55011	Railway applications: conducted emission / radiated emission
IEC 61000-4-2	Electrostatic discharge immunity test
IEC 61000-4-3	Radiated, radio-frequency, electromagnetic field immunity test
IEC 61000-4-4	Electrical fast transient/burst immunity test
IEC 61000-4-5	Surge immunity test

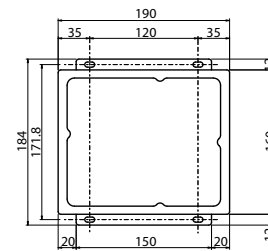
IEC 61000-4-6	Immunity to conducted disturbances, induced by radio-frequency fields
IEC 60068-2-1	Environmental testing - Part 2-1: Tests - Test Ad: cooling test
IEC 60068-2-2	Environmental testing - Part 2-2: Tests - Test Bd: dry heat test
EN 61373	Shock & Vibration - Category 1 class B
EN 60950	Information technology equipment – Safety
IEEE P802.3at	PoE, Data Terminal Equipment Power via the Media Dependent Interface Enhancements

INTERNETWORKING STANDARDS

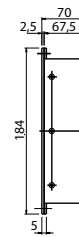
IEEE 802.3u	Fast Ethernet 802.3ab
IEEE 802.1Q	Tagged VLANs
IEEE 802.1D	Spanning Tree Protocol
IEEE 802.1w	Rapid Spanning Tree
IEEE 802.1X	Port-based network access control
IEEE 802.1AB	Link Layer Discovery Protocol (LLDP)
IEEE 802.3ad	Link Aggregation Protocol (LACP)
IEEE 802.3at	Power over Ethernet (PoE)

Wall Mounting

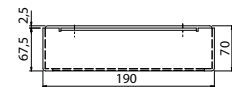
Dimensions only for reference (110 Vdc version)



FRONT VIEW



SIDE VIEW



TOP VIEW

Products list

Code	PSU	PoE	PoE PSU	Bypass	GbE ports	FE ports
TS-1426	24 Vdc	Yes	external	2+2 ports	0	13
TS-143E	24 Vdc	Yes	external	2+2 ports	5	8
TS-14E6	96/110 Vdc	Yes	internal	2+2 ports	0	13
TS-14FE	96/110 Vdc	Yes	internal	2+2 ports	5	8
TS-14FD	96/110 Vdc	Yes	internal	2 ports	5	8

