MTES1048 switches are modular Train Communication Ethernet devices suitable to be installed on rolling stock. The devices are useful for implementing on-board Consist & Train Backbone networks fully comply with IEC 61375 series & EN 50155 Railway standards.

The modular design and the available communication units can be combined to obtain versatile Ethernet switches implementing both ECN and ETBN functions enabling the user to select the Train Communication Networks technologies required by the project.

The software features have been developed by means of a standard Linux-based solution that runs over hardware designed by MIOS Elettronica exclusively for railway applications.

Train inauguration process fully complies with the IEC 61375 standard as well as the interface with the TRDP equipment. MTE1048 switches support the High-availability Seamless Redundancy (HSR) protocol according to IEC 62439-3 providing seamless failover against failure network equipment and include a Web-based GUI for complete management and configuration of the network and the switches.

EN 50155
IEC 61375
EN 45545-2

International Standards

Railway Standards:
EN 50155/IEC 60571, EN 50121-3-2, IEC 61000-6-2, IEC 61000-6-4, IEC 60068-2-1, IEC 60068-2-2, IEC 60068-2-30, IEC 61737,
EN 50124-1, EN 45545-2, IEC 61375-2-5, IEC 61375-2-3, IEC 61375-3-4, IEC 62236-3-2.

Networking Standards:
IEEE 802.3-2012 IEEE 802.1ab, IEEE 802.1ax:2008, IEEE 802.3ad, IEEE 802.3x, IEEE 802.1d, IEEE 802.1s, IEEE 802.2, IEEE 802.1Q
IEC 62439-3:2016, ISO/IEC 11801.

Software Features

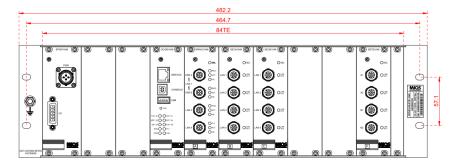|	
Link Layer 2 Functionality	IGMP Snooping v1/v2/v3, Spanning Tree STP, Port isolation, High-availability Seamless Redundancy (HSR) according to IEC 62439-3:2016
Link Layer 3 Functionality	Static Routing, DHCP Server/Relay, ARP Proxy, VRRP
VLAN	Supports up to 4K VLANs simultaneously (out of 4K VLAN IDs), VLAN Management
Security	SSH v1/v2, SSL v2/v3/TLSv1, Port Security
Networking Applications	Ping, Tracert, Telnet, SNMP, SSH, SSL, Http/Https, FTP, TFTP, NTP, NAT, TTDP & TRDP according to IEC 61375
Web-based GUI management	SNMP v1/v2c/v3, compatible with public MIBs, DHCP/BOOTP server, DHCP Option82, CPU Monitoring, Port Mirroring, Dual Image, Time Setting: SNTP Firmware Upgrade: Web, SYSLOG.
IEC 61375-2-3 TCN Services	ECSP, TTDB manager, DNS Server, ETBN control
QoS (Quality of Service)	802.1p CoS/DSCP priority, 4 priority queues
Performance	Routing capability up to 120 Mbps. Packets dimension: 2Mb. ARP Table: 2K. Jumbo frame: 10K

MIOS ELETTRONICA

Consist & Train Backbone Ethernet Switch

MTES1048

Technical Data	
Dimensions (W x H x D)	482,2 x 132,6 x 196,0 mm. (3U 84TE rack)
Weight	4 Kg. approx. (depends on installed modules)
Protection Level of Enclosure	IP20 according to IEC 60529
Input Nominal Voltage	24 to 110 Vdc
Operating Voltage	16,8 to 143 Vdc (14,4 to 154 Vdc for 100 msec.)
Power interruption	Class S2 according to EN 50155/IEC 60571
Power Consumption	20W typ., 50W max. (120W typ., 150 W max. with PoE option)
Operating Temperature	-40° C to +70° C (+85° C for 10 min.) according to EN 50155 class OT4 + class ST1 or according to IEC 60571 class TX
Storage Temperature	-40° C to +85° C
Humidity (operating non condensing):	<75% yearly average <95% for 30 consecutive days in one year
Shock and Vibration	According to IEC 61373 category 1, class B
EMC	According to EN 50121-3-2 and relevant referenced standards
Ethernet ports	Up to 24 ports depending on installed modules as follows: • 4x 10/100 Mbps M12-D coded (ETBN ports with by-pass relay) • 2x 1000 Mbps M12-X coded + 2x 1000 Mbps M12-X coded with HSR capability according to to IEC 62439-3:2016 • 4x 10/100 Mbps M12-D coded with PoE/PoE+ capability Ports with Auto Negotiation/Auto MDI/MDIX capabilities
Service ports	• 1x Ethernet 10/100/1000 BaseT, IEE802.3 console port • 1x USB Type B serial console port • 1x USB Type A slot for key storage
LED indication	10 LEDs on front panel for diagnostics information

Dimensional Drawing

October 2020 - DSH-2020-01276-00

MIOS ELETTRONICA