



## Product information MACH104-16TX-PoEP +2X -E-L3P

Industrial Ethernet:Workgroup Switches:Gigabit/10 Gigabit Ethernet PoE Workgroup Switches, 22-24 Ports:MACH104-16TX-PoEP +2X -E-L3P

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<b>Name</b>	MACH104-16TX-PoEP +2X -E-L3P
	
	20 Port Gigabit Ethernet Industrial Workgroup Switch + 2 x 10GE Uplinks (16 x GE TX PoEPlus Ports, 4 x GE SFP combo Ports, 2 x 10GE XFP), managed, Software Layer 3 Professional, Store-and-Forward-Switching, Fan less Design, IPv6 Ready
<b>Delivery informations</b>	
<b>Availability</b>	available
<b>Product description</b>	
<b>Description</b>	20 Port Gigabit Ethernet Industrial Workgroup Switch + 2 x 10GE Uplinks (16 x GE TX PoEPlus Ports, 4 x GE SFP combo Ports, 2 x 10GE XFP), managed, Software Layer 3 Professional, Store-and-Forward-Switching, Fan less Design, IPv6 Ready
<b>Port type and quantity</b>	22 Ports in total; 16x (10/100/1000 BASE-TX, RJ45) PoEPlus and 4 Gigabit Combo Ports (10/100/1000 BASE-TX, RJ45 or 100/1000 BASE-FX, SFP) and 2 x 10GE XFP
<b>Type</b>	MACH104-16TX-PoEP +2X -E-L3P
<b>Order No.</b>	942 032-002
<b>More interfaces</b>	
<b>Power supply/signaling contact</b>	1 x terminal block 2-pins, contact manually or automatically (max. 1 A, 24 V DC or 24 V AC)
<b>V.24 interface</b>	1 x RJ11 socket, serial interface for device configuration
<b>USB interface</b>	1 x USB to connect the AutoConfiguration Adapter ACA21-USB
<b>Network size - length of cable</b>	
<b>Twisted pair (TP)</b>	0 m ... 100 m
<b>Multimode fiber (MM) 50/125 µm</b>	see SFP LWL-Module M-FAST SFP-MM/LC and SFP LWL-Module M-SFP-SX/LC
<b>Multimode fiber (MM) 62.5/125 µm</b>	see SFP LWL-Module M-FAST SFP-MM/LC and SFP LWL-Module M-SFP-SX/LC
<b>Single mode fiber (SM) 9/125 µm</b>	see SFP LWL-Module M-FAST SFP-SM/LC und SFP LWL-Module M-SFP-LX/LC
<b>Single mode fiber (LH) 9/125 µm (long haul transceiver)</b>	see SFP LWL-Module M-FAST SFP-SM+/LC
<b>10G-Multimode fiber (MM) 50/125 µm</b>	see LWL-Modul M-XFP SR/LC
<b>10G-Single mode fiber (SM) 9/125 µm</b>	see LWL-Modul M-XFP ER/LC, and LWL-Modul M-XFP LR/LC, and LWL-Modul M-XFP ZR/LC
<b>Network size - cascading</b>	
<b>Line - / star topology</b>	any
<b>Ring structure (HIPER-Ring) quantity switches</b>	50 (reconfiguration time < 0.3 sec.)
<b>Power requirements</b>	
<b>Operating voltage</b>	45 - 57 V DC (min. 52 V DC für PoEPlus)
<b>Heat dissipation</b>	136 Btu (IT) h
<b>Heat dissipation at max. PoE power</b>	180 Btu (IT) h
<b>Power consumption</b>	40 W
<b>Software</b>	
<b>Management</b>	serial Interface, web interface, SNMP V1/V2, HiVision file transfer SW HTTP/TFTP, LLDP-MED
<b>Diagnostics</b>	LEDs, log-file, syslog, relay contact, RMON, port mirroring 1:1 and n:1, egress/ingress traffic configurable, topology discovery 802.1AB, cable tester (TX), address conflict detection, network error detection, SFP diagnostic [temperature, optical input and output power (µW and dBm)], Trap for configuration saving and changing, duplex mismatch detection, disable learning, Port Monitor
<b>Configuration</b>	Comand line interface (CLI), TELNET, BootP, DHCP, DHCP option 82, HIDiscovery, easy device exchange with auto-configuration adapter ACA21-USB (automatic software and/or configuration upload), automatic script load from ACA21, integrated DHCP server per port, DHCP relay, automatic invalid configuration undo, Offline Configuration, SFP Whitelist, ARC automatic ring configuration (MRP), automatic port shutdown (link flapping), configuration signature (water marking), overload detection
<b>Security</b>	ACL/QoS, ACL Layer 4 fragment support, Port Security (IP and MAC) with multiple addresses (MAC 50 per port), SNMP V3, SSH, Authentication (IEEE802.1x), 802.1x Multi Client Authentication, Guest VLAN and Unauthenticated VLAN, Port based Radius VLAN assignment, MAC notification
<b>Redundancy functions</b>	HIPER-Ring, MRP, MSTP, RSTP - IEEE802.1D-2004, MRP and RSTP gleichzeitig, Link Aggregation



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<b>Filter</b>	QoS 8 classes, prioritisation (IEEE 802.1D/p), VLAN (IEEE 802.1Q), Voice VLAN, shared VLAN learning, Q-in-Q double VLAN tagging, multicast IGMP v1/v2/v3, (snooping/querier), multicast detection unknown multicast, broadcast-, unicast-, multicast limiter, fast aging, GMRP IEEE 802.1D, Jumbo Frame Support, Industrial Profiles, EtherNet/IP und PROFINET (2.2 PDEV, GSDML Stand-alone generator, automatic device exchange) profiles included, configuration and diagnostic via automation, software tools like e.g. STEP7, oder Control Logix IEC61850 protocol (MMS Server, Switch Model)
<b>Time synchronisation</b>	PTP IEEE 1588 v1/v2 Boundary and Transparent Clock hardware time stamping with accuracies of 30ns, SNTP server, realtime clock with energy buffer
<b>Flow control</b>	Flow Control 802.3x, Port Priority 802.1D/p, Priority (TOS/DIFFSERV), Prio (MAC/IP), Prio Mapping (TOS Layer2), Traffic Shaping (Unicast, Multicast, Broadcast), Ingress / Egress
<b>Layer 3</b>	Full wired speed IPv4 routing with lowest latency Multinetting (Aliasing), Net directed broadcasts, Port based router interfaces, Proxy ARP, Static routing with ECMP (Equal Cost Multiple Path), VLAN based router interfaces, CIDR (Classless Inter Domain Routing), ICMP Router Discovery (IRDP), Double VLAN Tagging, Protocol based VLANs Multicast Routing (DVMRP, IGMPv1/v2/v3, Multicast routing and IGMP Unknown Multicast Filtering simultaneously, PIM-DM, PIM-SM / SSM, Router Redundancy (VRRP, VRRP tracking, E-VRRP, Interface Tracking, OSPFv2, Ping Tracking, RIPv1, RIPv2, Tracking of static routes)
<b>Ambient conditions</b>	
<b>Operating temperature</b>	0 °C ... 50 °C
<b>Storage/transport temperature</b>	-20 °C ... 85 °C
<b>Relative humidity (non-condensing)</b>	10 % ... 95 %
<b>MTBF</b>	n/a
<b>Mechanical construction</b>	
<b>Dimensions (W x H x D)</b>	448 mm x 44 mm x 345 mm
<b>Mounting</b>	19" control cabinet
<b>Weight</b>	4500 g
<b>Protection class</b>	IP20
<b>Mechanical stability</b>	
<b>IEC 60068-2-27 shock</b>	15 g, 11 ms duration, 18 shocks
<b>IEC 60068-2-6 vibration</b>	3.5 mm, 5–8.4 Hz, 10 cycles, 1 octave/min; 1 g, 8.4–150 Hz, 10 cycles, 1 octave/min
<b>EMC interference immunity</b>	
<b>EN 61000-4-2 electrostatic discharge (ESD)</b>	4 kV contact discharge, 8 kV air discharge
<b>EN 61000-4-3 electromagnetic field</b>	10 V/m (80-3000 MHz)
<b>EN 61000-4-4 fast transients (burst)</b>	2 kV power line, 4 kV data line
<b>EN 61000-4-5 surge voltage</b>	power line: 2 kV (line/earth), 1 kV (line/line), 4 kV data line
<b>EN 61000-4-6 conducted immunity</b>	10 V (150 kHz-80 MHz)
<b>EMC emitted immunity</b>	
<b>FCC CFR47 Part 15</b>	FCC 47 CFR Part 15 Class A
<b>EN 55022</b>	EN 55022 Class A
<b>Approvals</b>	
<b>Safety of industrial control equipment</b>	cUL 508
<b>Safety of information technology equipment</b>	cUL 60950-1
<b>Scope of delivery and accessories</b>	
<b>Scope of delivery</b>	Device, terminal block for signal contact, 2 brackets with fasteningscrews (pre-assembled), housing feet - stick-on, non-heating appliance cable - Euro model, CD-ROM with user manual, installation user manual
<b>Accessories to order separately</b>	Fast Ethernet SFP modules, Gigabit Ethernet SFP modules, autoConfiguration Adapter ACA21-USB, terminal cable, Industrial Hivision Network Management software

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