

## Product information

### MACH104-16TX-PoEP +2X-L3P

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

<http://e-catalog.hirschmann.com/link/57078-24455-49848-85613-352356/en/conf/ui/state>

| Name                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
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| MACH104-16TX-PoEP +2X-L3P                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
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| 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, IPv6 Ready |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Delivery informations</b>                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Availability                                                                                                                                                                                                              | available                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Product description</b>                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Description                                                                                                                                                                                                               | 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, IPv6 Ready                                                                                                                                                                                                                                                                               |
| Port type and quantity                                                                                                                                                                                                    | 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                                                                                                                                                                                                                                                                                                                                              |
| Type                                                                                                                                                                                                                      | MACH104-16TX-PoEP +2X-L3P                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Order No.                                                                                                                                                                                                                 | 942 031-002                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>More interfaces</b>                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Power supply/signaling contact                                                                                                                                                                                            | 1 x terminal block 2-pins, contact manually or automatically (max. 1 A, 24 V DC or 24 V AC)                                                                                                                                                                                                                                                                                                                                                                                                             |
| V.24 interface                                                                                                                                                                                                            | 1 x RJ11 socket, serial interface for device configuration                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| USB interface                                                                                                                                                                                                             | 1 x USB to connect the AutoConfiguration Adapter ACA21-USB                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Network size - length of cable</b>                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Twisted pair (TP)                                                                                                                                                                                                         | 0 m ... 100 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Multimode fiber (MM) 50/125 µm                                                                                                                                                                                            | see SFP LWL-Module M-FAST SFP-MM/LC and SFP LWL-Module M-SFP-SX/LC                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Multimode fiber (MM) 62.5/125 µm                                                                                                                                                                                          | see SFP LWL-Module M-FAST SFP-MM/LC and SFP LWL-Module M-SFP-SX/LC                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Single mode fiber (SM) 9/125 µm                                                                                                                                                                                           | see SFP LWL-Module M-FAST SFP-SM/LC und SFP LWL-Module M-SFP-LX/LC                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Single mode fiber (LH) 9/125 µm (long haul transceiver)                                                                                                                                                                   | see SFP LWL-Module M-FAST SFP-SM+/LC                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 10G-Multimode fiber (MM) 50/125 µm                                                                                                                                                                                        | see LWL-Modul M-XFP SR/LC                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 10G-Single mode fiber (SM) 9/125 µm                                                                                                                                                                                       | 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>                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Line - / star topology                                                                                                                                                                                                    | any                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Ring structure (HIPER-Ring) quantity switches                                                                                                                                                                             | 50 (reconfiguration time < 0.3 sec.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Power requirements</b>                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Operating voltage                                                                                                                                                                                                         | 100-240 VAC, 50-60 Hz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Heat dissipation                                                                                                                                                                                                          | 153 Btu (IT) h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Heat dissipation at max. PoE power                                                                                                                                                                                        | 281 Btu (IT) h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Power consumption                                                                                                                                                                                                         | 45 W                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Software</b>                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Management                                                                                                                                                                                                                | serial Interface, web interface, SNMP V1/V2, HiVision file transfer SW HTTP/TFTP, LLDP-MED                                                                                                                                                                                                                                                                                                                                                                                                              |
| Diagnostics                                                                                                                                                                                                               | 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                                                                                                      |
| Configuration                                                                                                                                                                                                             | 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 |
| Security                                                                                                                                                                                                                  | ACL/CoS, 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                                                                                                                                                                                                                    |
| Redundancy functions                                                                                                                                                                                                      | 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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