



# HIRSCHMANN

A **BELDEN** BRAND

## New Product Bulletin

**PB 328**

### **Gigabit Ethernet Workgroup Switch with 16 PoE-Plus Ports**

What makes the new Hirschmann™ MACH104-16TX-PoEP so remarkable is the Gigabit speed and 246 W PoE Plus power that makes this “powerhouse” – in a housing only one unit high – the highest performing industry-standard PoE switch currently on the market.



### **MACH104-16TX-PoEP from Hirschmann™: 16 PoE Plus Ports and Gigabit Speed**

#### **New Hirschmann Workgroup Switches**

The MACH104-16TX-PoEP workgroup switches are an ideal solution for connecting IP cameras and VoIP phones on backbone automation networks and provides the power and speed for reliable communications. The MACH104-16TX-PoEP is equipped with 16 TX ports (10/100/1000 BASE-TX) – all of which support PoE and PoE Plus and 4 combo-ports (10/100/1000 BASE-TX or 100/1000 BASE-FX). Other variations include two 10-Gigabit XFP uplink ports, redundant power supply and fanless design with an external power supply unit.

#### **Features**

The 16 PoE ports offer a combined power of 246 W and can power up to 16 IP cameras, while the high bandwidth offers sufficient reserves – simultaneously transmitting the video streams of those cameras. The integration of PROFINET and EtherNet/IP networks is a common configuration with MACH104-16TX-PoEP. Additional features include extensive management and redundancy facilities and various configuration and diagnostic functions. Its high level of resistance to vibration and shock coupled with broad immunity to magnetic fields and electrostatic discharges contribute to the unit's operational safety. Since the switch is geared for a temperature range of 0°C to +50°C it can also be used inside switch cabinets without powerful cooling systems.

Redundancy systems such as HIPER ring, MRP (IEC ring function), rapid spanning tree and link aggregation ensure a high level of network availability. The extensive security mechanisms provided include multi-client authentication via RADIUS server, access control via IEEE 802.1x or MAB (MAC Authentication Bypass), IP and MAC port security plus SNMP V3 and SSH. Indicator contacts provide the means to monitor the switch locally while a Web browser displays detailed information. The integrated SNMP interface offers an additional centralized management function that makes it possible to use network management software such as Industrial HiVision.

#### **Installation**

Designed for installation in 19-inch switch cabinets and equipped with plug-n-play features, the MACH104-16TX-PoEP dimensions (WxHxD) are 448x44x345 mm. The switch configuration is set through the command line interface (CLI), Telnet, BootP, HiDiscovery, Watchdog Configuration or via DHCP server. A USB port interface port along with the Hirschmann auto configuration adapter ACA 21 provides the means to store the configuration data, recall it as necessary, and to upgrade or downgrade the operating software.

## Technical Information Workgroup Switches

Product Description			
Type	MACH104-16TX-PoEP	MACH104-16TX-PoEP -R	MACH104-16TX-PoEP -E
<b>Description</b>	220 Port Gigabit Ethernet Industrial Workgroup Switch (16x GE TX PoEPlus Ports, 4x GE SFP combo Ports), managed, Software Layer 2 Professional, Store-and-Forward-Switching, IPv6 Ready	20 Port Gigabit Ethernet Industrial Workgroup Switch (16x GE TX PoEPlus Ports, 4x GE SFP combo Ports), managed, Software Layer 2 Professional, Store-and-Forward-Switching, IPv6 Ready	220 Port Gigabit Ethernet Industrial Workgroup Switch (16x GE TX PoEPlus Ports, 4x GE SFP combo Ports), managed, Software Layer 2 Professional, Store-and-Forward-Switching, fan-less Design, IPv6 Ready
<b>Order No.</b>	942 030-001	942 026-001	942 027-001
More Interfaces			
<b>Power Supply/Signaling Contact</b>	1x terminal block 2-pins, contact manually or automatically (max. 1 A, 24 V DC or 24 V AC)	1x terminal block 2-pins, contact manually or automatically (max. 1 A, 24 V DC or 24 V AC)	1x terminal block 2-pins, contact manually or automatically (max. 1 A, 24 V DC or 24 V AC)
<b>V.24 Interface</b>	1x RJ11 plug, serial interface for configuration	1x RJ11 plug, serial interface for configuration	1x RJ11 plug, serial interface for configuration
<b>USB Interface</b>	1x USB to connect the AutoConfiguration Adapter ACA21-USB	1x USB to connect the AutoConfiguration Adapter ACA21-USB	1x USB to connect the AutoConfiguration Adapter ACA21-USB
Network Size – Cascadability			
<b>Line-/Star Topology</b>	any	any	any
<b>Ring structure (HIPER-Ring)</b>	50 (reconfiguration time < 0.3 sec.)	50 (reconfiguration time < 0.3 sec.)	50 (reconfiguration time < 0.3 sec.)
Power Requirements			
<b>Operating Voltage</b>	100 – 240 V AC, 50 – 60 Hz	100 – 240 V AC, 50 – 60 Hz (redundant)	44 – 57 V DC external power supply (min. 52 V DC for PoEPlus)
<b>Power Consumption</b>	35 Watt	35 Watt	35 Watt
<b>Heat dissipation in Btu (IT) h</b>	119 Btu (IT)/h	119 Btu (IT)/h	119 Btu (IT)/h
<b>Heat dissipation in Btu (IT) h/max PoE power</b>	235 Btu (IT)/h	235 Btu (IT)/h	146 Btu (IT)/h
Software			
<b>Management</b>	Serial-interface, Web-interface, SNMP V1/V2, HiVision file transfer SW HTTP/TFTP, LLDP-MED, Voice		
<b>Diagnostics</b>	LEDs, log-file, syslog, relay contact, RMON, port mirroring 1:1 and n:1, topology discovery 802.1AB, cable tester (TX), address conflict detection, network error detection, SFP diagnostic (temperature, optical input and output power, power in dBm), Trap for configuration saving and changing, duplex mismatch detection, disable learning, Port Monitor		
<b>Configuration</b>	Command 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 on boot, integrated DHCP server per port, automatic invalid configuration undo, Offline Configuration, SFP Whitelist		
<b>Security</b>	Port Security (IP und MAC) with multiple addresses(50 MACs per port), SNMP V3, SSH, Authentication (IEEE802.1x), 802.1x Multi Client Authentication, Guest VLAN and Unauthenticated VLAN, MAC based Radius VLAN assignment		
<b>Redundancy Functions</b>	HIPER-Ring, MRP (IEC-ring functionality), MSTP, RSTP, redundant network/ring coupling, MRP and RSTP in parallel, link aggregation		
<b>Industrial Profiles</b>	EtherNet/IP (PROFINET prepared), (2.2 PDEV, GSDML Stand-alone generator, automatic device exchange) profiles included, configuration and diagnostic via automation software tools like e.g. STEP7, or Control Logix		
<b>Filter</b>	QoS 4 classes, Port prioritisation (IEEE 802.1D/p), VLAN (IEEE 802.1Q), shared VLAN learning, Multicast (IGMP Snooping/Querier), Multicast Detection unknown Multicast, Broadcastlimiter, Fast Aging, Multicast GMRP IEEE 802.1D		
<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>Time Synchronisation</b>	PTPv2 BC and Two step TC		
Ambient Conditions			
<b>Operating Temperature</b>	0°C to +50°C	0°C to +50°C	0°C to +50°C
<b>Storage/Transport Temperature</b>	-20°C to +85°C	-20°C to +85°C	-20°C to +85°C
<b>Relative Humidity (non-condensing)</b>	10% to 95%	10% to 95%	10% to 95%
Mechanical Construction			
<b>Dimensions (WxHxD)</b>	448x44x345 mm	448x44x345 mm	448x44x345 mm
<b>Mounting</b>	19" Cabinet	19" Cabinet	19" Cabinet
<b>Weight</b>	4.5 kg	5.1 kg	4.5 kg
<b>Protection Class</b>	IP20	IP20	IP20
Scope of Delivery and Accessories			
<b>Scope of Delivery</b>	MACH100 Switch, terminal block for signal contact, 2 angles with screws (pre-mounted), rubber feed to agglutinate, Power cable for Europe, CD-ROM with manual, installation guide	MACH100 Switch, terminal block for signal contact, 2 angles with screws (pre-mounted), rubber feed to agglutinate, Power cable for Europe, CD-ROM with manual, installation guide	MACH100 Switch, terminal block for signal contact, 2 angles with screws (pre-mounted), rubber feed to agglutinate, CD-ROM with manual, installation guide
<b>Accessories to Order Separately</b>	Fast Ethernet SFP Module, Gigabit Ethernet SFP Module, AutoConfiguration Adapter ACA21-USB, Terminal cable, Net management system Industrial HiVision		



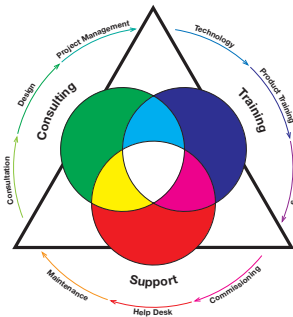
## Technical Information Workgroup Switches

Product Description			
Type	MACH104-16TX-PoEM +2x	MACH104-16TX-PoEP +2X -R	MACH104-16TX-PoEP +2X -E
Description	20 Port Gigabit Ethernet Industrial Workgroup Switch + 2x 10GE Uplinks (16x GE TX PoEPlus Ports, 4x GE SFP combo Ports, 2x 10GE XFP), managed, Software Layer 2 Professional, Store-and-Forward-Switching, IPv6 Ready	20 Port Gigabit Ethernet Industrial Workgroup Switch + 2x 10GE Uplinks (16x GE TX PoEPlus Ports, 4x GE SFP combo Ports, 2x 10GE XFP), managed, Software Layer 2 Professional, Store-and-Forward-Switching, IPv6 Ready	20 Port Gigabit Ethernet Industrial Workgroup Switch + 2x 10GE Uplinks (16x GE TX PoEPlus Ports, 4x GE SFP combo Ports, 2x 10GE XFP), managed, Software Layer 2 Professional, Store-and-Forward-Switching, IPv6 Ready
Order No.	942 031-001	942 033-001	942 032-001
More Interfaces			
Power Supply/Signaling Contact	1x terminal block 2-pins, contact manually or automatically (max. 1 A, 24 V DC or 24 V AC)	1x terminal block 2-pins, contact manually or automatically (max. 1 A, 24 V DC or 24 V AC)	1x terminal block 2-pins, contact manually or automatically (max. 1 A, 24 V DC or 24 V AC)
V.24 Interface	1x RJ11 plug, serial interface for configuration	1x RJ11 plug, serial interface for configuration	1x RJ11 plug, serial interface for configuration
USB Interface	1x USB to connect the AutoConfiguration Adapter ACA21-USB	1x USB to connect the AutoConfiguration Adapter ACA21-USB	1x USB to connect the AutoConfiguration Adapter ACA21-USB
Network Size – Cascadability			
Line-/Star Topology	any	any	any
Ring structure (HIPER-Ring)	50 (reconfiguration time < 0.3 sec.)	50 (reconfiguration time < 0.3 sec.)	50 (reconfiguration time < 0.3 sec.)
Power Requirements			
Operating Voltage	100 – 240 V AC, 50 – 60 Hz	100 – 240 V AC, 50 – 60 Hz (redundant)	44 – 57 V DC external power supply (min. 52 V DC for PoEPlus)
Power Consumption	45 Watt	45 Watt	45 Watt
Heat dissipation in Btu (IT) h	153 Btu (IT)/h	153 Btu (IT)/h	136 Btu (IT)/h
Heat dissipation in Btu (IT) h/max PoE power	281 Btu (IT)/h	281 Btu (IT)/h	180 Btu (IT)/h
Software			
Management	Serial-interface, Web-interface, SNMP V1/V2, HiVision file transfer SW HTTP/TFTP, LLDP-MED, Voice		
Diagnostics	LEDs, log-file, syslog, relay contact, RMON, port mirroring 1:1 and n:1, topology discovery 802.1AB, cable tester (TX), address conflict detection, network error detection, SFP diagnostic (temperature, optical input and output power, power in dBm), Trap for configuration saving and changing, duplex mismatch detection, disable learning, Port Monitor		
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Redundancy Functions	HIPER-Ring, MRP (IEC-ring functionality), MSTP, RSTP, redundant network/ring coupling, MRP and RSTP in parallel, link aggregation		
Industrial Profiles	EtherNet/IP (PROFINET prepared), (2.2 PDEV, GSDML Stand-alone generator, automatic device exchange) profiles included, configuration and diagnostic via automation software tools like e.g. STEP7, or Control Logix		
Filter	QoS 4 classes, Port prioritisation (IEEE 802.1D/p), VLAN (IEEE 802.1Q), shared VLAN learning, Multicast (IGMP Snooping/Querier), Multicast Detection unknown Multicast, Broadcastlimiter, Fast Aging, Multicast GMRP IEEE 802.1D		
Flow Control	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		
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Mounting	19" Cabinet	19" Cabinet	19" Cabinet
Weight	4.5 kg	5.1 kg	4.5 kg
Protection Class	IP20	IP20	IP20
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Scope of Delivery	MACH100 Switch, terminal block for signal contact, 2 angles with screws (pre-mounted), rubber feed to agglutinate, Power cable for Europe, CD-ROM with manual, installation guide	MACH100 Switch, terminal block for signal contact, 2 angles with screws (pre-mounted), rubber feed to agglutinate, Power cable for Europe, CD-ROM with manual, installation guide	MACH100 Switch, terminal block for signal contact, 2 angles with screws (pre-mounted), rubber feed to agglutinate, CD-ROM with manual, installation guide
Accessories to Order Separately	Fast Ethernet SFP Module, Gigabit Ethernet SFP Module, AutoConfiguration Adapter ACA21-USB, Terminal cable, Net management system Industrial HiVision		



## Benefits at a Glance

- 16 Gigabit TX ports for PoE/PoE Plus
- 4 Gigabit combo ports (TX or FX)
- 2 XFP uplinks for 10 Gigabit speeds
- Redundant power supply
- Fanless design with external power supply unit
- Integration into Profinet and Ethernet/IP networks
- Extensive management and redundancy facilities
- Various configuration and diagnostic functions
- High level of resistance to vibration and shocks
- Broad immunity to magnetic fields and electrostatic discharges
- Temperature range from 0°C to +50°C
- Fast activation by plug and play
- USB interface for autoconfiguration adapter



## The Hirschmann Competence Center

Hirschmann provides an economical end-to-end solution for your network. In addition to its well-known products, Hirschmann also offers a wide range of vendor-independent services - whether it is consulting, training or support. At the Hirschmann Competence Center, you can be sure of tailor-made service from a single supplier.

Whichever technology you use, our experts will support you all the way, from designing your network to optimizing the performance required in the operational phase. Up-to-date manufacturer's expertise, an international service network and fast access to external specialists guarantees you the best possible support. Bundle your individual service package today!

To learn more about the Hirschmann Competence Center or to register for sessions go to:

[www.hicomamericas.com](http://www.hicomamericas.com)

### Always the Right Solution

Belden is the world's leading supplier of signal transmission solutions including cable, connectivity and active components for mission-critical applications ranging from industrial automation and alternative power generation through to professional broadcasting. Belden offers an extensive portfolio of highly specialized products for steering, control and field level, which the company produces and markets under its proprietary Belden®, Hirschmann™, and Lumberg Automation™ brands. We would be glad to give you a more personal introduction to our integrated product palette for industrial applications and the worldwide Belden Service

You will find further information and technical details online at [www.belden.com/hirschmann](http://www.belden.com/hirschmann) or contact our Sales Team directly: **Tel. 717.217.2299.**