



HIRSCHMANN

A **BELDEN** BRAND

The new MACH100 family



Workgroup Switches

MACH 100



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**MACH100: Industrial Workgroup Switches.
The quality that customers expect from
Hirschmann™ – designed for control room
and light industrial applications.**



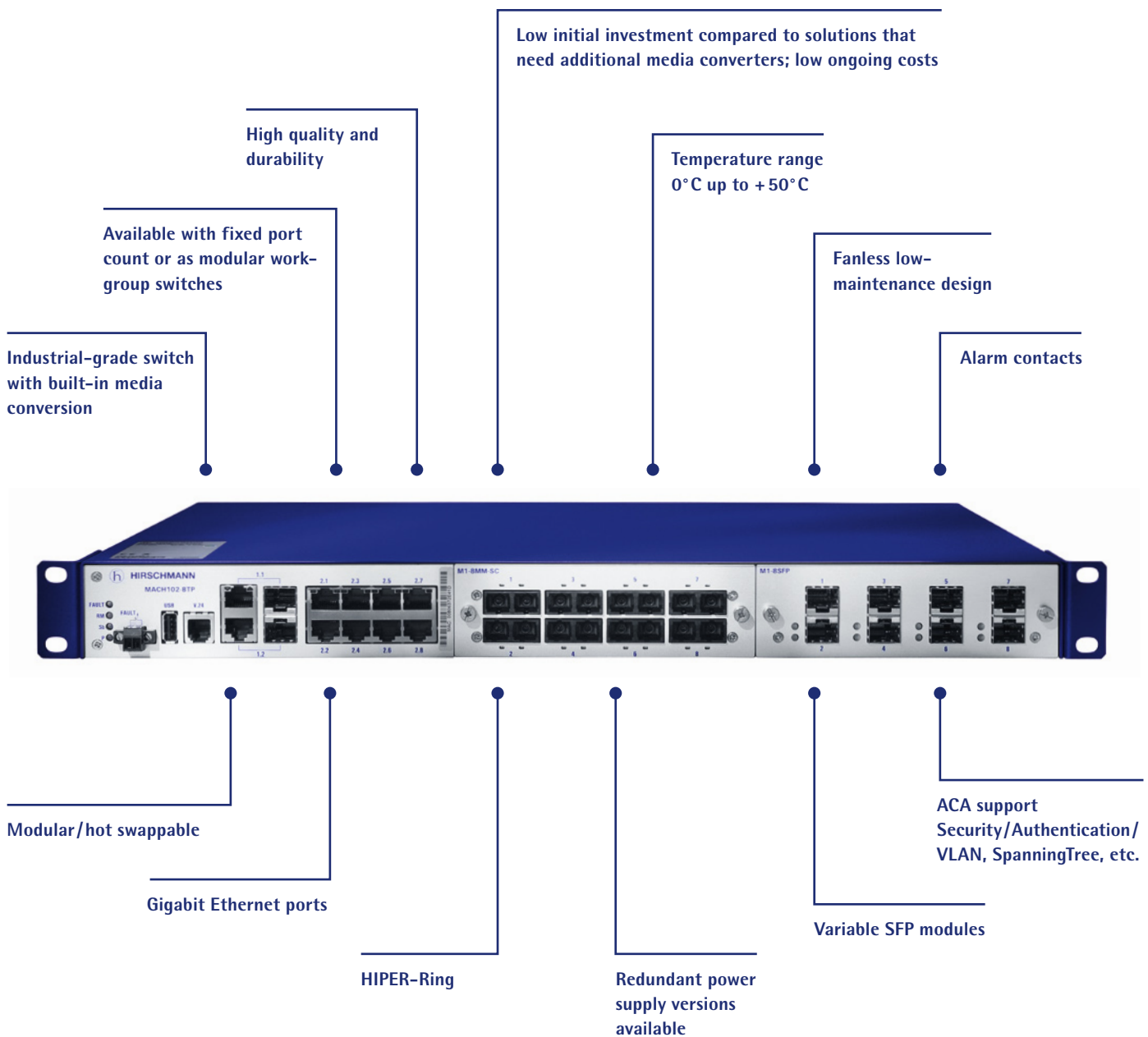
MACH100 – the genuine industrial-grade Workgroup Switch family.

The advantages are a family matter:

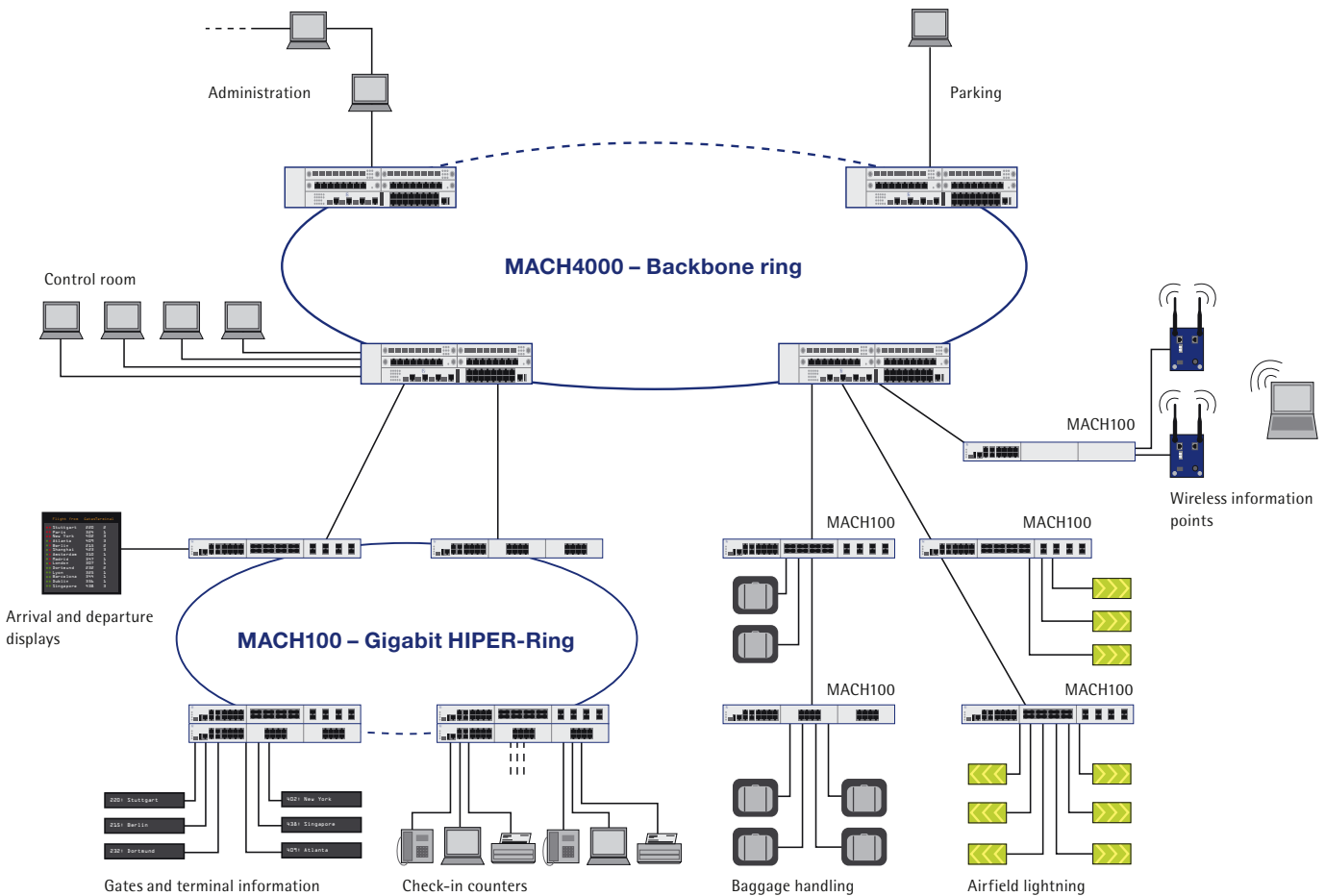
The design and software of the new MACH100 family are based on Hirschmann™'s proven OpenRail platform, and the switches are fully

integrated into the Industrial HiVision Management Software. MACH100 switches are also an excellent pairing for MACH4000 switches.

Product Features:



When the going gets tough on the verge of the office world: the MACH100 family.









The new MACH100 is designed primarily for the control room environment. Customers can choose one of two versions. The modular workgroup switch replaces the SmartLION-TP/FX, and the variant with a fixed port count supersedes the LION-24TP. The fan has been eliminated on these new, extremely durable switches, and the MACH100 is built to take the punishment in industrial environments. Customers get the quality they expect from Hirschmann™ – made in Germany.

The high-quality modular workgroup switch links nodes via copper or fiber cable and connects them to the backbone. The switch supports seamless connectivity over a single medium, or it can function as a media converter. The feature set includes 8 port modules (Twisted Pair, SFP, Multimode and Singlemode).







The switches offer a high degree of flexibility during installation and expansion of networks which are located in close proximity to the production floor.





The version with fixed port count supports workgroup networks with a variable number of nodes (8–24 nodes) and provides the link to the backbone. With its extensive range of redundancy features, the MACH100 is the ideal interface between the industrial and office worlds, e.g. for control room installation in factory and process automation applications. Belden with its Hirschmann™ range is the right partner to contact when you are looking at your future needs.



MACH100 basic devices						
Product description	MACH102-8TP	MACH102-8TP-R	MACH102-8TP-F	MACH102-8TP-FR	MACH102-24TP-F	MACH102-24TP-FR
						
Order No.	943 969-001	943 969-101	943 969-201	943 969-301	943 969-401	943 969-501
Description	Fast/Gigabit Ethernet switch according to IEEE 802.3; modular, managed Industrial Workgroup Switch, Layer 2 with Software Professional; Store-and-Forward-Switching; fanless design					
		Redundant power supply		Redundant power supply		Redundant power supply
Port type and quantity	8 x 10/100BASE-TX ports (RJ-45) 2 x Gigabit combo ports and 2 slots for FE media modules M1-xx		8 x 10/100BASE-TX ports (RJ-45) 2 x Gigabit combo ports		24 x 10/100BASE-TX ports (RJ-45) 2 x Gigabit combo ports	
More interfaces						
Signaling contact	1 x plug-in terminal block 2-pin, egress manual or automatic switchable (1 A, 24VDC respectively 24VAC)					
V.24 interface	1 x RJ11 socket, serial interface for device configuration					
USB interface	1 x USB to connect auto configuration adapter ACA 21-USB					
Network size – length of cable						
Twisted Pair (TP)	0–100 m;					
Multimode fiber (MM) 50/125 µm	Fast Ethernet: cf. SFP LWL-Modul M-FAST SFP-MM/LC; Gigabit Ethernet: cf. SFP LWL-Modul M-SFP-SX/LC and M-SFP-LX/LC					
Multimode fiber (MM) 62.5/125 µm	Fast Ethernet: cf. SFP LWL-Modul M-FAST SFP-MM/LC; Gigabit Ethernet: cf. SFP LWL-Modul M-SFP-SX/LC and M-SFP-LX/LC					
Singlemode fiber (SM) 9/125 µm	Fast Ethernet: cf. SFP LWL-Modul M-FAST SFP-SM/LC and M-FAST SFP-SM+/LC; Gigabit Ethernet: cf. SFP LWL-Modul M-SFP-LX/LC					
Singlemode fiber (LH) 9/125 µm	Fast Ethernet: cf. SFP LWL-Modul M-FAST SFP-LH/LC; Gigabit Ethernet: cf. SFP LWL-Modul M-SFP-LH/LC and M-SFP-LH+/LC					
Network size – cascadiability						
Line/star topology	any					
Ring structure (HIPER-Ring)	50 switches (fault recovery time < 0.3 sec.)					
Power requirements						
Operating voltage	100–240 VAC, input frequency: 47–63 Hz					
Current consumption/Power output	12 W / 41 Btu (IT)/h (without media modules)	13 W / 44 Btu (IT)/h (without media modules)	12 W / 41 Btu (IT)/h	13 W / 44 Btu (IT)/h	16 W / 55 Btu (IT)/h	17 W / 58 Btu (IT)/h
Software						
Management	Serial interface, web interface, SNMP v1/v2, HiVision file transfer SW HTTP/TFTP					
Diagnostics	LEDs, log-file, syslog, signal relay, RMON (statistic, history, alarms, events), port mirroring, topology discovery 802.1AB, cable tester (TX)					
Configuration	Command line interface (CLI), TELNET, BootP, DHCP, DHCP option 82, HiDiscovery, auto configuration adapter (ACA 11, ACA 21-USB), watchdog configuration, integrated DHCP server					
Security	Port security (IP and MAC), SNMP V3, SSH, authentication (802.1x)					
Redundancy functions	HIPER-Ring (ring structure), MRP (IEC-ring functionality), RSTP 802.1D-2004, redundant network/ring coupling, dual homing, link aggregation					
Filter	QoS 4 classes, port priority (IEEE 802.1D/p), VLAN (IEEE 802.1Q), shared VLAN learning, multicast (IGMP Snooping/Querier), multicast detection unknown multicast, broadcast limiter, fast aging, multicast GMRP IEEE 802.1D					
Realtime	SNTP server, realtime clock with energy buffer					
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					
Industrial profiles	EtherNet/IP, PROFINET compatible, configuration and diagnostic via automation software tools like e.g. STEP7 or control logix					
Ambient conditions						
Operating temperature	0°C up to +50°C					
Storage/transport temperature	–20°C up to +85°C					
MTBF	15.5 years; MIL-HDBK 217F: Gb +25°C	17.8 years; MIL-HDBK 217F: Gb +25°C	15.5 years; MIL-HDBK 217F: Gb +25°C	17.8 years; MIL-HDBK 217F: Gb +25°C	13.1 years; MIL-HDBK 217F: Gb +25°C	14.7 years; MIL-HDBK 217F: Gb +25°C
Mechanical constructions						
Dimensions (W x H x D)	448 mm x 310 mm x 44 mm (without brackets)					
Mounting	19" cabinet, table unit or wall mounting					
Weight	appr. 3.6 kg	appr. 3.85 kg	appr. 3.6 kg	appr. 3.85 kg	appr. 3.85 kg	appr. 4.1 kg
Protection class	IP20					
EMC interference immunity						
EN 61000-4-2 electrostatic discharge (ESD)	4 kV contact discharge, 8 kV air discharge					
EN 61000-4-3 electromagnetic field	10 V/m (80–2700 MHz)					
EN 61000-4-4 fast transients (burst)	2 kV power line, 4 kV data line					
EN 61000-4-5 surge voltage (surge)	power line: 2 kV (line/earth), 1 kV (line/line), 4 kV data line					
EN 61000-4-6 conducted immunity	10 V (150 kHz–80 MHz)					
EMC emitted immunity						
FCC CFR47 part 15	FCC CFR47 part 15 class A					
EN 55022	EN 55022 class A					



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Approvals						
Safety of information technology equipment	Safety of information technology equipment: cUL 60950 (pending)					
Safety of industrial control equipment	cUL 508 (pending)					
Scope of delivery and accessories						
Scope of delivery	MACH100 device, terminal block for signal contact, 2 brackets with fastening screws (pre-assembled), housing feet – stick-on, non-heating appliance cable – Euro model, CD-ROM with user manual, installation user manual					
Accessories*	Fast Ethernet SFP modules, Gigabit Ethernet SFP modules, auto configuration adapter ACA 21-USB, terminal cable, Industrial Hivision Network Management Software					

MACH100 media modules				
Product description	M1-8TP-RJ45	M1-8MM-SC	M1-8SM-SC	M1-8SFP
				
Order No.	943 970-001	943 970-101	943 970-201	943 970-301
Description	Media module for modular, managed Industrial Workgroup Switch MACH100 10/100 BASE-TX	Media module for modular, managed Industrial Workgroup Switch MACH100 100 BASE-FX Multimode	Media module for modular, managed Industrial Workgroup Switch MACH100 100 BASE-FX Singlemode	Media module for modular, managed Industrial Workgroup Switch MACH100 100 BASE-X with SFP Slots
Port type and quantity	8 x 10/100BASE-TX ports (RJ-45)	8 x 100BASE-FX Multimode ports (SC)	8 x 100BASE-FX Singlemode ports (SC)	8 x 100BASE-X SFP Slots
Network size – length of cable				
Twisted Pair (TP)	0–100 m	–	–	–
Multimode fiber (MM) 50/125 µm	–	0–5000 m, 8 dB link budget at 1300 nm, A = 1 dB/km, 3 dB reserve, B = 800 MHz x km	–	cf. SFP LWL-Modul M-FAST SFP-MM/LC
Multimode fiber (MM) 62.5/125 µm	–	0–4000 m, 11 dB link budget at 1300 nm, A = 1 dB/km, 3 dB reserve, B = 500 MHz x km	–	cf. SFP LWL-Modul M-FAST SFP-MM/LC
Singlemode fiber (SM) 9/125 µm	–	–	0–32.5 km, 16 dB link budget at 1300 nm, A = 0.4 dB/km, 3 dB reserve, D = 3.5 ps/(nm x km)	cf. SFP LWL-Modul M-FAST SFP-SM/LC and M-FAST SFP-SM+/LC
Singlemode fiber (LH) 9/125 µm	–	–	–	cf. SFP LWL-Modul M-FAST SFP-LH/LC
Power requirements				
Current consumption	2 W	10 W	10 W	11 W (incl. SFP-Module)
Power output	7 Btu (IT)/h	34 Btu (IT)/h	34 Btu (IT)/h	37 Btu (IT)/h (incl. SFP-Module)
Ambient conditions				
Operating temperature	0° C up to +50° C			
Storage/transport temperature	–20° C up to +85° C			
MTBF	170 years; MIL-HDBK 217F: Gb + 25° C	69 years; MIL-HDBK 217F: Gb + 25° C	72.5 years; MIL-HDBK 217F: Gb + 25° C	109.3 years; MIL-HDBK 217F: Gb + 25° C
Mechanical constructions				
Dimensions (W x H x D)	138 mm x 90 mm x 42 mm			
Mounting	Media module			
Weight	210 g	210 g	180 g	130 g
Protection class	IP20			
Scope of delivery and accessories				
Scope of delivery	Media module, user manual			
Accessories*	–	–	–	Fast Ethernet SFP Module

*to order separately



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