When the going gets tough on the verge of the office world:

The genuine industrial-grade Workgroup Switches MACH100/PowerLION

- Industrial-grade switch with built-in media conversion
- Available with fixed port count or as modular workgroup switches
- High quality and durability
- Low initial investment compared to solutions that need additional media converters; low ongoing costs
- ACA support Security/Authentication/VLAN, SpanningTree, etc.
- Fanless design
- Hot-swappable modules
- Hirschmann™ CLI and WEB interface
- Range of functions similar to L2P firmware: DHCP Option 82, HiDiscovery, HIPER-Ring, MRP RSTP, disable learning, SNTP; Industrial Profiles (EtherNet/IP, Profinet)
- Fully integrated in Industrial HiVision
- Temperature range: 0° C up to + 50° C

Price-conscious automation in environments closely tied to the office setup place enormous demands on hardware. Because large amounts of data have to be processed quickly, safely and flexibly – after all, data has a short expiry period. A workgroup switch must therefore meet the requirements of the office environment and above all have one thing in particular: maximum performance.

Hirschmann™ has expanded its product range with the Fast Ethernet workgroup switches of the MACH100 Family. These Switches support Profinet and EtherNet/IP protocols. This way workgroups can be net worked by copper cables and via fiber optics, and can be connected to the backbone. For this purpose 2 Gigabit Combo ports are available. The switches are offered in versions with 8 or 24 permanently installed Fast Ethernet ports, or as modular devices with 8 ports and slots for 2 additional 8 port media

modules. The switches are designed for a temperature range from 0°C up to + 50°C and support a large range of management and redundancy modes, as well as several functions for configuration and diagnostics. Further features are fanless cooling as well as an optional power supply. As a result the devices of the MACH100 Family offer a high level of security and flexibility for Ethernet network design or upgrade in production-related areas.

As Hirschmann™ is a true "boardroom to factory floor" networking company, part of the product offering includes high quality, high performance switches without the industrial ratings. The PowerLION meets the needs of IT professionals. The full-featured management and high traffic performance makes the PowerLION compatible with larger office-grade brands while maintaining an economical price. .
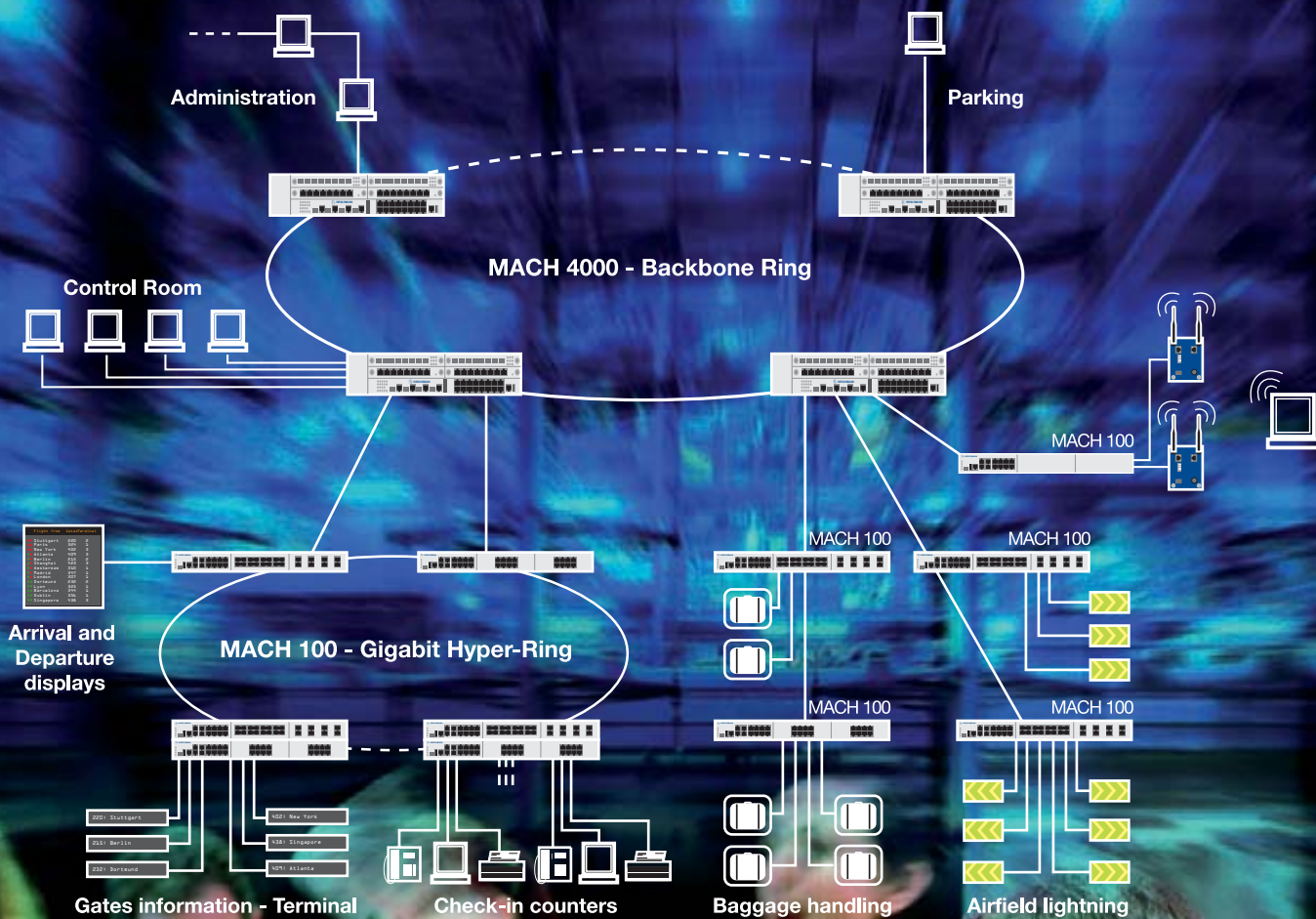

MACH100

PowerLION-24 TP

Accessories

for this family you can find
on the following pages:

Administration

Parking

Control Room

MACH 4000 - Backbone Ring

MACH 100

Arrival and Departure displays

MACH 100 - Gigabit Hyper-Ring

MACH 100   MACH 100

MACH 100   MACH 100

Gates information - Terminal   **Check-in counters**   **Baggage handling**   **Airfield lightning**

Hirschmann™ Competence Center

Also in the Control Room the Hirschmann™ Competence Center ensures appropriate service and support for your industrial network. With **consulting offers** such as **network optimization check, network technology evaluation** or **network baselining consulting** and **trainings** such as **PEd–Control Room Switches** and **XXd PowerLION**. In addition, we support you with the installation and configuration, via our service hotline and later with Advance Hardware Replacement and warranty extensions.

www.hicomcenter.com

Industrial Ethernet

Type	MACH102-8TP
Order No.	943 969-001
	26 port Fast Ethernet/Gigabit Ethernet Industrial Workgroup Switch (fix installed: 2 x GE, 8 x FE; via Media Modules 16 x FE), managed, Software Layer 2 Professional, Store-and-Forward-Switching, fanless Design
Product description	
Port type and quantity	Up to 26 Ethernet ports, thereof up to 16 Fast-Ethernet ports via media modules realisable; 8x TP (10/100 BASE-TX, RJ45) Fast Ethernet ports and 2 Gigabit Combo ports fix installed
More Interfaces	
Power supply/signaling contact	1 x plug-in terminal block, 2-pin, output manual or automatic switchable (max. 1 A, 24 V DC bzw. 24 V AC)
V.24 interface	1 x RJ11 socket, serial interface for device configuration
USB interface	1 x to connect auto-configuration adapter ACA21-USB
Network size - length of cable	
Twisted pair (TP)	0 - 100m
Multimode fiber (MM) 50/125 µm	Fast Ethernet: cf. SFP LWL module M-FAST SFP-MM/LC; Gigabit Ethernet: cf. SFP LWL module M-SFP-SX/LC and M-SFP-LX/LC
Multimode fiber (MM) 62.5/125 µm	Fast Ethernet: cf. SFP LWL module M-FAST SFP-MM/LC; Gigabit Ethernet: cf. SFP LWL module M-SFP-SX/LC and M-SFP-LX/LC
Single mode fiber (SM) 9/125 µm	Fast Ethernet: cf. SFP LWL module M-FAST SFP-SM/LC and M-FAST SFP-SM+/LC; Gigabit Ethernet: cf. SFP LWL module M-SFP-LX/LC
Single mode fiber (LH) 9/125 µm (long haul transceiver)	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 - cascadibility	
Line - / star topology	any
Ring structure (HIPER-Ring) quantity switches	50 (reconfiguration time < 0,3 sec.)
Power requirements	
Operating voltage	100 - 240 VAC, 47 - 63 Hz
Power output in Btu (IT) h	41 (without media modules)
Rated current	0.4 - 0.2 A
Power consumption	12 W (without media modules)
Software	
Management	serial Interface, web interface, SNMP V1/V2, HiVision file transfer SW HTTP/TFTP
Diagnostics	LEDs, log-file, syslog, signal contact, RMON (statistic, history, alarms, events), port mirroring, topology discovery 802.1AB, cable diagnostic
Configuration	Comand line interface (CLI), TELNET, BootP, DHCP, DHCP option 82, HIDiscovery, auto-configuration adapter (ACD11, ACA21-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 Klassen, Portpriorisierung (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
Industrial Profiles	EtherNet/IP, PROFINET, configuration and diagnostic via automation software tools like e.g. STEP7, or Control Logix
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
Ambient conditions	
Operating temperature	0° - +50°C
Storage/transport temperature	-20° - +85°C
Relative humidity (non-condensing)	10% to 95%
MTBF	15.67 years (MIL-HDBK-217F Gb 25°C) (without media modules)
Mechanical construction	
Dimensions (W x H x D)	448 x 310 x 44 (without fixing bracket)
Mounting	19" control cabinet
Weight	3.60 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	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 47 CFR Part 15 Class A
EN 55022	EN 55022 Class A
Approvals	
Safety of industrial control equipment	cUL 508 (pending)
Safety of information technology equipment	
Safety of information technology equipment	

Industrial Ethernet

Type	MACH102-8TP-FR	MACH102-8TP-F
Order No.	943 969-301	943 969-201
	10 port Fast Ethernet/Gigabit Ethernet Industrial Workgroup Switch (2 x GE, 8 x FE), managed, Software Layer 2 Professional, Store-and-Forward-Switching, fanless Design, redundant power supply	10 port Fast Ethernet/Gigabit Ethernet Industrial Workgroup Switch (2 x GE, 8 x FE), managed, Software Layer 2 Professional, Store-and-Forward-Switching, fanless Design
Product description		
Port type and quantity	10 ports in total; 8x (10/100 BASE-TX, RJ45) and 2 Gigabit Combo ports	10 ports in total; 8x (10/100 BASE-TX, RJ45) and 2 Gigabit Combo ports
Power requirements		
Power output in Btu (IT) h	44	41
Power consumption	13 W	12 W
Software		
Redundancy functions	HIPER-ring (ring structure), MRP (IEC-ring functionality), RSTP 802.1D-2004, redundant network/ring coupling, dual homing, link aggregation, redundant 100 - 240 VAC power supply	HIPER-ring (ring structure), MRP (IEC-ring functionality), RSTP 802.1D-2004, redundant network/ring coupling, dual homing, link aggregation
Ambient conditions		
MTBF	18,06 years (MIL-HDBK-217F Gb 25°C)	15.67 years (MIL-HDBK-217F Gb 25°C)
Mechanical construction		
Weight	3.85 kg	3.60 kg

Type	MACH102-8TP-R	MACH102-24TP-F
Order No.	943 969-101	943 969-401
	26 port Fast Ethernet/Gigabit Ethernet Industrial Workgroup Switch (fix installed: 2 x GE, 8 x FE; via Media Modules 16 x FE), managed, Software Layer 2 Professional, Store-and-Forward-Switching, fanless Design, redundant power supply	26 port Fast Ethernet/Gigabit Ethernet Industrial Workgroup Switch (2 x GE, 24 x FE), managed, Software Layer 2 Professional, Store-and-Forward-Switching, fanless Design
Product description		
Port type and quantity	Up to 26 Ethernet ports, thereof up to 16 Fast-Ethernet ports via media modules realisable; 8x TP (10/100 BASE-TX, RJ45) Fast Ethernet ports and 2 Gigabit Combo ports fix installed	26 ports in total; 24x (10/100 BASE-TX, RJ45) and 2 Gigabit Combo ports
Power requirements		
Power output in Btu (IT) h	44 (without media modules)	55
Power consumption	13 W (without media modules)	16 W
Software		
Redundancy functions	HIPER-ring (ring structure), MRP (IEC-ring functionality), RSTP 802.1D-2004, redundant network/ring coupling, dual homing, link aggregation, redundant 100 - 240 VAC power supply	HIPER-ring (ring structure), MRP (IEC-ring functionality), RSTP 802.1D-2004, redundant network/ring coupling, dual homing, link aggregation
Ambient conditions		
MTBF	18.06 years (MIL-HDBK-217F Gb 25°C) (without media modules)	13.26 years (MIL-HDBK-217F Gb 25°C)
Mechanical construction		
Weight	3.85 kg	3.85 kg

Industrial Ethernet

Type	MACH102-24TP-FR
Order No.	943 969-501
	26 port Fast Ethernet/Gigabit Ethernet Industrial Workgroup Switch (2 x GE, 24 x FE), managed, Software Layer 2 Professional, Store-and-Forward-Switching, fanless Design, redundant power supply
Product description	
Port type and quantity	26 ports in total; 24x (10/100 BASE-TX, RJ45) and 2 Gigabit Combo ports
Power requirements	
Power output in Btu (IT) h	58
Power consumption	17 W
Software	
Redundancy functions	HIPER-ring (ring structure), MRP (IEC-ring functionality), RSTP 802.1D-2004, redundant network/ring coupling, dual homing, link aggregation, redundant 100 - 240 VAC power supply
Ambient conditions	
MTBF	14.93 years (MIL-HDBK-217F Gb 25°C)
Mechanical construction	
Weight	4.10 kg

Industrial Ethernet

Type	M1-8SFP
Order No.	943 970-301
	Media module for modular, managed, Industrial Workgroup Switch MACH100 100 BASE-X with SFP slots
Network size - length of cable	
Twisted pair (TP)	0 - 100m
Multimode fiber (MM) 50/125 µm	cf. SFP LWL module M-FAST SFP-MM/LC
Multimode fiber (MM) 62.5/125 µm	cf. SFP LWL modul M-FAST SFP-MM/LC
Single mode fiber (SM) 9/125 µm	cf. SFP LWL-Modul M-FAST SFP-SM/LC and M-FAST SFP-SM+/LC
Single mode fiber (LH) 9/125 µm (long haul transceiver)	cf. SFP LWL modul M-FAST SFP-LH/LC
Power requirements	
Rated current	
Power consumption	11 W (incl. SFP module
Ambient conditions	
Operating temperature	0° - +50°C
Storage/transport temperature	-20° - +85°C
Relative humidity (non-condensing)	10% to 95%
MTBF	109.33 years (MIL-HDBK-217F Gb 25°C)
Mechanical construction	
Dimensions (W x H x D)	138 x 90 x 42
Mounting	Media Module
Weight	0.13 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	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 47 CFR Part 15 Class A
EN 55022	EN 55022 Class A
Approvals	
Safety of industrial control equipment	cUL 508 (pending)
Safety of information technology equipment	
Safety of information technology equipment	
Scope of delivery and accessories	
Scope of delivery	Media module, user manual

Industrial Ethernet

⣿ Media modules > Versions

Type	M1-8TP-RJ45	M1-8SM-SC
Order No.	943 970-001	943 970-201
	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 Singlemode
Network size - length of cable		
Multimode fiber (MM) 50/125 µm	-	-
Multimode fiber (MM) 62.5/125 µm	-	-
Single mode 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)
Single mode fiber (LH) 9/125 µm (long haul transceiver)	-	-
Power requirements		
Power consumption	2 W	10 W
Ambient conditions		
MTBF	169.95 years (MIL-HDBK-217F Gb 25°C)	72.54 years (MIL-HDBK-217F Gb 25°C)
Mechanical construction		
Weight	0.21 kg	0.18 kg

Type	M1-8MM-SC
Order No.	943 970-101
	Media module for modular, managed, Industrial Workgroup Switch MACH100 100 BASE-FX Multimode
Network size - length of cable	
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
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
Single mode fiber (SM) 9/125 µm	-
Single mode fiber (LH) 9/125 µm (long haul transceiver)	-
Power requirements	
Power consumption	10 W
Ambient conditions	
MTBF	68.94 years (MIL-HDBK-217F Gb 25°C)
Mechanical construction	
Weight	0.21 kg

Industrial Ethernet

● ::: LION Control Room Switch > Chassis

Type	PowerLION-24 TP
Order No.	943 886-001
	Gigabit Ethernet managed switch, store-and-forward forwarding scheme
Product description	
Port type and quantity	24 x 10/100/1000BASE-T ports (RJ-45 connectors), 4 of which are Gigabit Ethernet combo ports (RJ-45/SFP), with one optional 10GE uplink module, Layer 3
More Interfaces	
V.24 interface	outband management connection via V.24 (DB9 RS-232 console interface)
Network size - length of cable	
Twisted pair (TP)	0 - 100 m
Multimode fiber (MM) 50/125 µm	see media modules and transceivers
Multimode fiber (MM) 62.5/125 µm	see media modules and transceivers
Single mode fiber (SM) 9/125 µm	see media modules and transceivers
Network size - cascadibility	
Line - / star topology	any
Power requirements	
Operating voltage	min. 100 V, max. 240 V, input frequency: 47 to 63 Hz
Current consumption	max. 140 W
Service	
Management	SNMP v1 and SNMP v2 management functions, integration in HiVision; RMON (groups 1,2,3 and 9); web-based management; TELNET console interface; BOOTP and DHCP for IP address assignment; firmware upgraded by TFTP file transfer protocol through the Ethernet network; dual firmware images; configuration file upload/download by TFTP protocol; two or more Configuration files; sytem error log (syslog)
VLAN	IEEE 802.1Q; GVRP protocol for automatic VLAN registration and dynamic VLAN; management
Security	RADIUS client; TACACS+ client; HTTPs/SSL; Secure Shell (SSH, Secure Telnet); Access Control; IEEE 802.1x port based security
Quality of Service	L2/L3/L4Traffic ClassIPv4 routing; CoS by IEEE 802.1p 4 priority queues control; WRR for priority queues; Strict scheduling for priority queue; Rate Limiting; Random Early Detection (RED)
Other services	auto-sensing, auto-negotiation on all 10/100/1000BASE-T ports up to 16 kByte memory for MAC address entries flow control mechanism: backpressure for half duplex; full duplex mode port mirroring IGMP snooping broadcast storm control QoS: DiffServ, Traffic and Bandwidth Management, 8-level priority in switching stacking: stacks up to 10 units
Layer 3	IPv4 routing at wire speed; Static IP routes; RIP I and RIP II; OSPF routing; IP Multicast Routing: DVMRP, PIM-DM; IP Redundancy - VRRP
Redundancy	
Redundancy functions	IEEE 802.1D Spanning Tree Protocol IEEE 802.1w Rapid Spanning Tree IEEE 802.1s Multiple Spanning Tree link aggregation: - up to 8 ports in one trunk - up to 4 trunk groups - 802.3ad (LACP) - Ether-channel (static truck)
Ambient conditions	
Operating temperature	0 °C to +40 °C
Storage/transport temperature	-40 °C to +70 °C
Relative humidity (non-condensing)	10% to 95%
MTBF	19.8 years
Mechanical construction	
Dimensions (W x H x D)	440 mm x 44 mm x 410 mm
Mounting	19" cabinet or table unit
Protection class	IP 20
Scope of delivery and accessories	
Scope of delivery	device, AC power cord, serial cable, mounting brackets, manual
Accessories to order separately	SFP transceivers: M-SFP-SX/LC (943 014-001), M-SFP-LX/LC (943 015-001), M-SFP-LH/LC (943 042-001) and M-SFP-LH+/LC (943 049-001) 10GE uplink: PowerLION-XM-10G (943 886-201), XENPAK-10G-LR (943 886-901) Stack cable: PowerLION-XM-C30 (943 886-401), PowerLION-XM-C130 (943 886-501)

Industrial Ethernet

LION Control Room Switch > Module

Type	PowerLION-XM-10G	PowerLION-XM-C30
Order No.	943 886-201	943 886-401
	10 Gigabit Ethernet uplink module for PowerLION	10 Gigabit Ethernet stacking cable for PowerLION, 30cm
Product description		
Port type and quantity	1 X 10 GE, XENPAK Transceiver connector	
Network size - length of cable		
Single mode fiber (SM) 9/125 µm	see 10 GE optical transceiver, XENPAK-10G-LR	
Power requirements		
Current consumption	6 W	
Ambient conditions		
Operating temperature	0 °C to +40 °C	0 °C to +40 °C
Storage/transport temperature	-40 °C to +70 °C	-40 °C to +70 °C
Relative humidity (non-condensing)	10% to 95%	10% to 95%
Mechanical construction		
Dimensions (W x H x D)	180 mm x 40 mm x 200 mm	30cm
Mounting	plug-in device	
Scope of delivery and accessories		
Scope of delivery	module	stacking cable, 30 cm

LION Control Room Switch > Fiberoptic Transceiver

Type	GBIC SX	GBIC LX
Order No.	943 411-100	943 411-200
	GBIC tranceiver for expansion module LION-GBIC 1000BASE-SX	GBIC tranceiver for expansion module LION-GBIC 1000BASE-LX
Product description		
Port type and quantity	1 x 1000BASE-SX with duplex SC optical interface	1 x 1000BASE-LX with duplex SC optical interface
Network size - length of cable		
Multimode fiber (MM) 50/125 µm	500m	
Multimode fiber (MM) 62.5/125 µm	275m	
Single mode fiber (SM) 9/125 µm		10km
Power requirements		
Operating voltage	via expansion module	via expansion module
Power consumption	5 W	5 W
Ambient conditions		
Operating temperature	0 °C to +50 °C	0 °C to +50 °C
Storage/transport temperature	-25 °C to +70 °C	-25 °C to +70 °C
Relative humidity (non-condensing)	10% to 95%	10% to 95%
Mechanical construction		
Dimensions (W x H x D)	80 mm x 10 mm x 30 mm	80 mm x 10 mm x 30 mm
Mounting	plug-in	plug-in
Weight	40 g	40 g
Protection class	IP 20	IP 20
EMC emitted immunity		
FCC CFR47 Part 15	FCC CFR47 Part 15 Class A	FCC CFR47 Part 15 Class A
EN 55022	EN 55022 Class A	EN 55022 Class A
Scope of delivery and accessories		
Scope of delivery	transceiver	transceiver
Accessories to order separately		expansion module, order number: 943 118-605

Industrial Ethernet

LION Control Room Switch > Module

PowerLION-XM-C130	XENPAK-10G-LR
943 886-501	943 886-901
10 Gigabit Ethernet stacking cable for PowerLION, 130cm	10 Gigabit Ethernet optical transceiver for PowerLION
	1 X 10GBASE-LR, SC Duplex
	10 km
	6 W
0 °C to +40 °C -40 °C to +70 °C 10% to 95%	0 °C to +70 °C -40 °C to +70 °C 10% to 95%
130cm	45 mm x 20 mm x 130 mm Transceiver for PowerLION-XM-10G uplink module
stacking cable, 130 cm	transceiver