



HIRSCHMANN

A **BELDEN** BRAND

Leading Networking Solutions for Industrial & Mission Critical Applications



Edition 9

**Hirschmann™ Networking
Equipment Maximizes
Throughput, Simplifies
Installation, and Reduces
Total Cost of Ownership**



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Belden® Solutions

Belden combines the strength of Hirschmann™ switches and Belden Ethernet cables for a complete end-to-end connectivity solution.

You can depend on us to keep your mission-critical systems up and running.



Be Certain with Belden



More Convenience and More Solutions for Networks in Harsh Environments and Large-scale Infrastructures

Belden Industrial Solutions

Belden has brought together a comprehensive line of industrial cabling, connectivity and networking devices, offering the most reliable communications solutions for your application. Whether you are networking your devices to the controllers, connecting the controllers to the control room, relaying data between the control room, the engineering department, and remote manufacturing sites – or all of the above – Belden has the products you need to seamlessly connect your communications.

From the petrochemical, automotive, pharmaceutical, power generation, pulp and paper, metals, food and beverage, or general manufacturing plant to the corporate headquarters – and everywhere in between – Belden has your signal transmission solution. Belden offers the most dependable network and communications system performance in tough and mission-critical environments.

Our Synergy Ensures Continuous Performance

With the Hirschmann™ and Lumberg Automation™ product line additions to the Belden offering, our line of Complete Industrial Solutions is uniquely positioned to provide the best network and communications infrastructure possible. Belden products and systems expertise means that you can maintain ongoing operations without interruption and costly downtime – in any environment. Here are a few more good reasons why Belden is your best choice for industrial networking, communications and control:

- We have the expertise to integrate your industrial and commercial networks.
- Our products are engineered to perform in the harshest and most demanding environments.
- We offer the broadest selection of products, for a complete, end-to-end Ethernet solution.
- Our sales and engineering professionals can audit, recommend/design, configure and assemble the products and systems to your specific requirements.

- Our global manufacturing, distribution and support network make our products and services available to you globally.

Offering Comprehensive Service & Support

Belden recognizes that comprehensive know-how is necessary to ensure an optimized, homogenous solution. We also know that consultation, support and training requires more than just a general understanding of the products, technologies and market trends. It requires a solid understanding of the application and the ability to provide the type of support that is needed – when and where it is needed. It requires the four key service and support areas that are critical to success:

- Network Design
- Training
- Technical Support
- System Performance

Network Design

Belden eliminates your design challenges because we understand the issues surrounding the design and operation of networks in industrial and mission-critical environments. Our engineers are available to work with you to deliver high-availability networks that meet your enterprise-wide IT needs. Whether it's designing systems for Greenfield facilities, or integrating into existing IT environments, our highly-trained staff lifts the design burden from your shoulders to ours.

We'll consult with you to develop a strategy – or we'll develop and implement your full design – either way our staff is available to you.

Training

Backed by years of meeting and exceeding the needs of a broad range of end-user applications, Belden is ideally suited to offer beginners and networking experts alike the opportunity to expand their understanding of mission-critical networks.

Belden has developed a series of training programs that are given by Belden-certified individuals – all experts in industrial networking and cabling.

Technical Support

At Belden, our personnel are poised to assist our customers – ensuring maximum uptime and reliability. And with offices in North America, Asia and Europe, Belden can respond globally.

System Performance

If Belden designs it, we guarantee performance – period. We are committed to ensuring world-class signal connectivity and to significantly improve your operational up-time. All Belden components are “designed” to deliver optimum performance: from cable, to connectors, to switches and routers. Based on this comprehensive product portfolio, we have the necessary industrial solutions DNA to deliver reliability.

For more information on our service and support offering, including our warranties, please go to the Belden web site at www.belden.com to locate a Belden sales representative near you.



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The Hirschmann Brand of Ethernet Switches and Connectivity Products Set the Standard for Quality, Reliability and Service.



Hirschmann™ Switches
Maximize Throughput,
Simplify Installation, and
Reduce Overall Costs.

Hirschmann™, a Belden brand provides the industry with leading Ethernet networking technology and sets the standards for quality, reliability and service.

Robust

Hirschmann's years as a networking leader and pioneer, the use of premium electronic components and effective (fan-less) thermal management translates to superior performance and the highest MTBF (mean time between failure) values possible – even at operational temperatures as high as +85°C.

Easy to Configure

Our managed switches are easy to configure with an integrated password controlled web interface, via SNMP or CLI (command line interface), providing secure remote configuration through the network. Configuration data and device OS/firmware can be saved and stored on an external flash-based configuration storage device, simplifying and automating commissioning and device replacement.

Assured Enterprise Interoperability

All switches have IT-compatible managed-switch functionality with SNMP and RMON and are compatible with industry standard network management tools and other name brand switches.

Media Redundancy Options

By using HIPER-Ring protocol, redundant network topologies are simplified – resulting in recovery from media failure within 50 ms (Gigabit ring) or 300 ms (100 Mbps ring). RSTP

(Rapid Spanning Tree Protocol) and trunk/link aggregation is also available.

EtherNet/IP and PROFINET Profiles Permits switch management and configuration from within RSLogix 5000 and Step 7. Examples include: displaying switch core temperature, redundancy, and link status, and security violations.

Fault Contact(s) and SNMP Trap

97% of Hirschmann switches include a minimum of one configurable fault contact and all managed switches offer the ability to send a SNMP Trap, which enables clear indication when one or both power inputs are lost, a link is down, an unauthorized device is connected to the switch, or a predetermined temperature range has been breached, etc.

Broad Product Line

The breadth of our product line is un-matched and includes serial to fiber optic converters, fieldbus repeaters for all major fieldbus protocols, managed and unmanaged Ethernet switches (3-52 ports) with an almost limitless mix of copper/fiber ports, Layer 3 switches, media converters, wireless Access Points/ Clients/Bridges, firewalls with VPN tunneling and deep packet inspection and network management software (SNMP and OPC).

Network Software

Monitoring and visualizing your network is made easy with the use of our Industrial HiVision network management software. Requiring little or no IT knowledge, Industrial HiVision allows users to monitor alarms, bandwidth utilization, and availability of networked devices – not just switches. Industrial HiVision allows the user to configure a single switch or multiple switches at the same time, significantly simplifying commissioning.

Design Innovation

Continuous product innovations to meet expanding customer needs. This includes Gigabit (even 10 Gigabit speeds) industrial profiles, software tools, various form factors, e.g. IP67 industrial watertight switches, and the integration of a USB port to facilitate quick recovery of a switch and the network.



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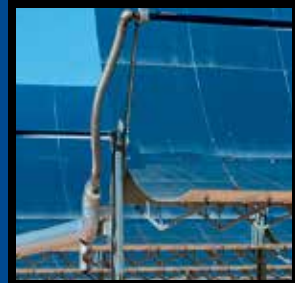


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Ethernet Products at a Glance

Unmanaged DIN Rail Mount Switches

SPIDER, SPIDER II 10

Cost-effective, plug & play unmanaged switches

- SPIDER 2, 3 and 5 ports
- SPIDER 2 and 5 ports with PoE PD
- SPIDER II 8, 9 and 10 ports
- SPIDER II PoE 4 PoE and 4 standard ports
- SPIDER II GIGA 5 and 7 ports, all Gigabit



RS2, RS20, RS30 12

Feature-rich unmanaged switches with selectable port types, features and approvals

- RS2 5 and 8 ports
- RS20 4, 8, 9, 16, 17, 24 or 25 ports
- RS30 10, 18, or 26 ports, two of which are Gigabit



Managed DIN Rail Mount Switches

RS20, RS30, RS40, RSB20 14

Managed switches with selectable features and approvals

- RS20 4, 8, 9, 16, 17, 24 or 25 ports
- RS30 10, 18, or 26 ports, two of which are Gigabit
- RS40 9 ports, all Gigabit
- RSB20 8 or 9 ports



RS22, RS32

Managed PoE switches with selectable features and approvals

- RS22 4, 8, 9, 16, 17, 24 or 25 ports, four ports are PoE
- RS32 10, 18, or 26 ports, four of which are PoE and two are Gigabit

RSR20, RSR30 26

Ultra-hardened switches w/-40°C to +85°C operating range, DC or mains/AC power input

- RSR20: 8 or 9 ports
- RSR30: 9 or 10 ports, two or three of which are Gigabit



MS20, MS30, MS4128 21



Managed modular switches with selectable features and approvals as well as user hot-swappable Media modules for almost limitless copper/fiber combinations.

- MS20 up to 24 ports
- MS30 up to 26 ports, two of which can be Gigabit
- MS4128 optional Layer 3/routing, up to 28 ports, four of which can be Gigabit

RSP Series 28

Hardened managed switches. Uninterrupted data communication thanks to new technologies PRP and HSR.



- RSP20: 3 x FE SFP slots, 4 x FE SFP and 4 x 10/100 TX ports, or 8 x 10/100 TX ports
- RSP30: 3 x FE/GE SFP slots, 4 x FE SFP/4 x 10/100 TX ports, or 8 x 10/100 TX ports
- RSP25: 3 x FE SFP slots, 4 x FE SFP/4 x 10/100 TX ports, or 8 x 10/100 TX ports - Fast MRP, PRP, HSR (pending)
- RSP35: 3 x FE/GE SFP slots, 4 x FE SFP/4 x 10/100 TX ports, or 8 x 10/100 TX ports - Fast MRP, PRP, HSR (pending)

IP67 Waterproof Switches

OCTOPUS 30

- OCTOPUS 5TX unmanaged, 5-ports, 12 D-code
- OCTOPUS 8M/16M/24M managed, 8, 16 and 24 ports, M12 D-code
- OCTOPUS 8M-6POE and 8M-8POE managed, 8 ports, M12 D-code, 6 and 8 of which are PoE
- OCTOPUS 16M-8POE and 24M-8POE managed, 16 and 24 ports, M12 D-code, 8 of which are PoE



- OCTOPUS OS20, 8 ports of M12 D-code and 2 multimode or singlemode ports
- OCTOPUS OS30, 8 ports of M12 D-code and 2 Gigabit multimode or singlemode ports
- OCTOPUS OS24, unmanaged or basic managed, 10 or 9 ports, 8 of which are PoE, 24 V DC or 110 V DC powered
- OCTOPUS OS20, unmanaged or basic managed, 10 or 9 ports, M12 D-code, 24 V DC or 110 V DC powered
- OCTOPUS OS32, 8 or 16 FE-ports, M12 D-code, 8 of which are PoE, 2 Gigabit M12 X-code or FO IEC V1

Ethernet Cord Sets

Ethernet Cord Sets 34

Hardened pre-terminated and factory tested cordsets using Belden's patented Bonded-Pair technology complement the active hardware

- RJ45-RJ45, RJ45-M12, M12-M12
- Unshielded and Shielded Versions
- PVC, TPE and TPE High-Flex Cat 5e UTP
- 17 lengths - from 0.3 to 50 meters
- M12 bulkhead termination also available



19" Rack Mount Switches

MACH100 37

Hardened Enterprise-grade switches with Hirschmann™ interface and MTBF

- MACH102-8TP modular switch, up to 26 ports, 10 fixed ports, two of which are Gigabit (modules available for MM/SM fiber, RJ45, PoE/PoE+ and SFP)
- MACH102-8TP-F 10 fixed ports, two of which are Gigabit
- MACH102-24TP-F 26 fixed ports, two of which are Gigabit
- MACH104 - All Gigabit, 4 RJ45/SFP combo ports and 20 RJ45 ports (4 of which can be PoE)
- MACH104 - All Gigabit, 4 RJ45/SFP combo ports, 16 RJ45 PoE+ ports (optional with 2 XFP 10G uplink ports)



Be Certain with Belden



Be Certain with Belden

19" Rack Mount Switches

MACH1000 **39**



Ultra-hardened switches w/-40°C to +85°C operating range

- MAR1020, up to 24 ports, optionally 4 can be PoE (MAR1022)
- MAR1030, up to 28 ports, up to four of which are Gigabit, optionally 4 of the 10/100 ports can be PoE (MAR1032)
- MAR1120, up to 20 ports on rear of switch, with 4 being optional PoE (MAR1122)
- MAR1130, up to 24 ports on rear of switch, with 4 being optional PoE (MAR1132) plus 2 or 4 ports Gigabit
- MAR1040, 16 Gigabit RJ45/SFP combo

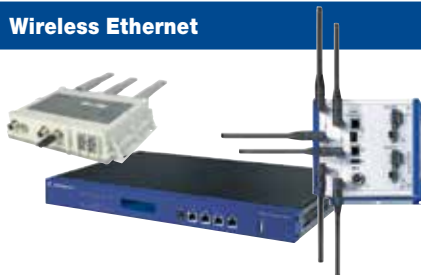
MACH4000 **43**



High density and high speed backbone switch w/Layer 3/routing and speeds up to 10 Gigabit

- MACH4002-24G up to 24 Gigabit ports
- MACH4002-24G+3X, up to 24 Gigabit ports and three 10 Gigabit XFP ports
- MACH4002-48G up to 48 Gigabit ports
- MACH4002-48G+3X up to 48 Gigabit ports and three 10 Gigabit XFP ports)

Wireless Ethernet



BAT Access Point/Client/Bridge **47**

- OpenBAT Rugged wireless LAN access point and/or client for use in industrial environments.
- BAT-C WLAN client
- BAT54 DIN Rail or IP67 mount Access Point/Client/Bridge, one or two integrated radios, 802.11 a/b/g

- BAT300 DIN Rail or IP67 mount Access Point/Client/Bridge, one integrated radio, 802.11 a/b/g/n
- Extensive antenna and accessory offering
- BAT-Planner software suite
- Wireless Local Area Network (WLAN) Controllers

Security, Firewall and VPN Appliance

EAGLE/EAGLE Tofino **54**



Network segmentation, VPN and deep packet inspection.

- EAGLE20: Transparent or router firewall with VPN functionality. Configurable by web interface or Industrial HiVision
- EAGLE Tofino: Graphical drag and drop device management enables configuration with little IT knowledge. Supports deep packet inspection for major industrial protocols
- EAGLE20-0400 and EAGLE30-0402: Multi-port firewalls in convection-cooled metal DIN Rail housings which support six LAN ports – two of which are Gigabit

Fiber Transceivers/Modems

FiberINTERFACES **62**



Extending the reach of copper for serial and fieldbus protocols via fiber.

Embedded Ethernet

Modules and Switches **66**



- EEM Profinet IO, EtherNet/IP, EtherCAT
- EEM Development Kit
- EES Embedded Ethernet Switches
- EES Development Kit

Modular Industrial Patch Panel

MIPP – Modular Industrial Patch Panel **67**



- Single Modules: 6 x SC Duplex, 6x LC Duplex, 12x LC Duplex, 4 x RJ45 Keystone Jack unshielded or shielded
- Double Modules: 12 x SC Duplex and 12 x LC Duplex
- Accessories: Pigtails

Network Management Software

Industrial HiVision **70**



Network visualization and configuration software with integrated OPC server.

- Supports 32 and 64 bit Windows and Linux operating systems
- Optimized for Hirschmann™ devices
- Integration of third-party devices
- Enhanced Auto-Topology Discovery
- Path availability calculator
- User-defined menus
- Configuration check
- Client/Server architecture
- Asset Management
- OPC read/write
- Configurable scan rate
- Supports multiple languages
- MultiConfig™ for simultaneous configuration of multiple devices
- Password-protected remote access
- Reporting Tools (PDF or Microsoft® Excel)
- Licenses are available for multiple user nodes: 25, 50, 100, 250, and 500
- Node count licenses are cumulative – they can be combined to obtain the optimum fit for your application

Product Overview





SPIDER Series Unmanaged DIN Rail Mount Ethernet Switches



Entry-level Industrial Unmanaged Switches

The SPIDER family of switches provides users with an economical, yet highly reliable hardened Ethernet switch. Models are available with Gigabit and PoE ports.

All copper/RJ45 ports are auto-negotiating and auto-crossing -- the SPIDERS will work with either patch or cross-over cables. The 100 Mbps fiber ports are available in multimode (MM) and singlemode (SM) with either SC or ST sockets (Gigabit fiber is via SFPs - see page 65). All SPIDER switches are extremely compact and have LED indicators that provide information on power status, link status, and data rate.



Technical Information

Product Description						
Type	SPIDER Series xTX-x	SPIDER Series 1TX/1FX-x	SPIDER Series 4TX/1FX-x	SPIDER Series 8TX-x	SPIDER Series 5TX-Giga	SPIDER Series 8TX-PoE
Switching/Routing	Unmanaged					
Available Ports	3, 5	2	5	8 – 10	5, 7	8
Construction						
Mounting	DIN Rail					
Protection Class	IP30					
Dimensions (WxHxD)	25 x 114 (126 for ST fiber models) x 79 mm			35 x 154 (168 for ST fiber models) x 121 mm		
Weight	113 g	105 g	120 g	less than 270 g	560 g	
Ambient Conditions						
Operating Temperature	0 °C to +60 °C, -40 °C to +70 °C for EEC models					-10°C to +60°C
Storage/Transport Temperature	-40°C to +70°C, -40°C to +85°C for EEC models					-20°C to +70°C
Relative Humidity (non-condensing)	0% to 95%					
Conformal Coating	n/a					
Interfaces						
V.24 Interface	n/a					
USB Interface	n/a					
Power Requirements						
Operating Voltage	9.6 to 32 V DC					
PoE (802.3af) Ports Supported	Yes (Powered Device)		Yes (Powered Device)		n/a	Yes
PoE Plus (802.3at) Ports Supported	n/a					
Regulatory Approvals						
Safety of Industrial Control Equipment	cUL508					
Hazardous Locations	n/a					
Germanischer Lloyd	n/a					
Transportation	n/a					
Railway (track)	n/a					
Substation	n/a					
Reliability						
MTBF Range	239 to 360 years	138 to 265 years	129 to 194 years	88 to 185 years	114.3 years	–
Warranty	5 years standard					

NOTE: These are the prominent technical specifications. For complete technical specifications visit: www.hirschmann.com



SPIDER Series Unmanaged DIN Rail Mount Ethernet Switches

All Copper/RJ45		
Part No.	Order No.	Ports
SPIDER 3TX-TAP	943 899-001	3 x RJ45
SPIDER 5TX	943 824-002	5 x RJ45
SPIDER 5TX EEC	943 824-102	5 x RJ45
SPIDER II 8TX	943 957-001	8 x RJ45
SPIDER II 8TX EEC	943 958-001	8 x RJ45
SPIDER II 8TX POE	942 008-001	8 x RJ45 and 4 X PoE, with metal housing and 24 V DC input



All Copper/RJ45 and FIBER		
Part No.	Order No.	Ports
SPIDER 1TX/1FX	943 890-001	1 x RJ45 and 1 x MM, SC
SPIDER 1TX/1FX EEC	943 927-101	1 x RJ45 and 1 x MM, SC
SPIDER 1TX/1FX-SM	943 891-001	1 x RJ45 and 1 x MM, SC
SPIDER 1TX/1FX SM EEC	943 928-001	1 x RJ45 and 1 x SM, SC
SPIDER 4TX/1FX	943 221-001	4 x RJ45 and 1 x MM, SC
SPIDER 4TX/1FX EEC	943 221-101	4 x RJ45 and 1 x MM, SC
SPIDER 4TX/1FX-ST EEC	943 914-001	4 x RJ45 and 1 x MM, ST
SPIDER 4TX/1FX SM EEC	943 880-001	4 x RJ45 and 1 x SM, SC
SPIDER II 8TX/1FX EEC	943 958-111	8 x RJ45 and 1 x MM, SC
SPIDER II 8TX/1FX-ST EEC	943 958-121	8 x RJ45 and 1 x MM, ST
SPIDER II 8TX/2FX EEC	943 958-211	8 x RJ45 and 2 x MM, SC
SPIDER II 8TX/2FX-ST EEC	943 958-221	8 x RJ45 and 2 x MM, ST
SPIDER II 8TX/1FX-SM EEC	943 958-131	8 x RJ45 and 1 x SM, SC
SPIDER II 8TX/2FX-SM EEC	943 958-231	8 x RJ45 and 2 x SM, SC

FAST Ethernet Switches via PoE		
Part No.	Order No.	Ports
SPIDER 5TX PD EEC	942 051-001	5 x 10/100BaseTX Ports, one of which is 1 x PoE PD integrated port
SPIDER 1TX/1FX-MM PD EEC	942 051-002	1 x 10/100BaseTX PoE PD Port and 1 x 100BaseFX multimode SC
SPIDER 1TX/1FX-SM PD EEC	942 051-003	1 x 10/100BaseTX PoE PD Port and 1 x 100BaseFX singlemode SC

FULL GIGABIT		
Part No.	Order No.	Ports
SPIDER II Giga 5T EEC	943 962-002	5 x RJ45 (10/100/1000)
SPIDER II Giga 5T/2S EEC	943 963-002	5 x RJ45 (10/100/1000) and 2 x SFP Socket (1000)
SPIDER II Giga 5T EEC Pro	943 962-102	5 x RJ45 (10/100/1000), QoS support IEEE 802.1D
SPIDER II Giga 5T/2S EEC Pro	943 963-102	5 x RJ45 (10/100/1000) and 2 x SFP Socket (1000), QoS support IEEE802.1D
SPIDER II Giga 5T EEC Jumbo	943 962-202	5 x RJ45 (10/100/1000), Jumbo Frame support with up to 9014 Byte user data
SPIDER II Giga 5T/2S EEC Jumbo	943 963-202	5 x RJ45 (10/100/1000) and 2 x SFP Socket (1000), Jumbo Frame support with up to 9014 Byte user data

NOTE: EEC stands for extended environmental conditions (-40°C to +70°C).



RS2 Unmanaged DIN Rail Mount Ethernet Switches



Feature-rich Unmanaged Switches

The RS2 Series of switches offer advanced features such as redundant power inputs and most offer fault relay (triggerable by loss of power and/or port-link).

Standard features include 10/100 auto-negotiating and auto-crossing (either patch or cross-over cables will work in the ports), a 0° C to +60° C operating range (-40° C to +70 deg C available), a 24 VDC power input and an average MTBF exceeding 100 years.

All of the multimode (MM) and singlemode (SM) fiber optic ports are 100 Mbps and are available in a variety of connector options.

All Copper/RJ45 – RS2		
Part No.	Order No.	Ports/Features
RS2-4TX EEC	943 819-001	4 x 10/100 Mbit/s RJ45, link loss alarm, power loss alarm, fault relay output, ext. temp. -40° C to +70° C
RS2-5TX	943 732-003	5 x 10/100 Mbit/s RJ45, rugged die-cast metal housing offering wall-mount option
RS2-TX	943 686-003	8 x 10/100 Mbit/s RJ45, link loss alarm, power loss alarm, fault relay output

Copper/RJ45 and FIBER Mix		
Part No.	Order No.	Ports/Features
RS2-3TX/2FX EEC	943 771-001	3 x 10/100 Mbit/s RJ45 and 2 x 100 Mbit/s MM-SC, link loss alarm, power loss alarm, fault relay output, ext. temp. -40° C to +70° C
RS2-3TX/2FX-SM EEC	943 772-001	3 x 10/100 Mbit/s RJ45 and 2 x 100 Mbit/s SM-SC, link loss alarm, power loss alarm, fault relay output, ext. temp. -40° C to +70° C
RS 2-5TX/FX	943 732-103	4 x 10/100 Mbit/s RJ45 and 1 x 100 Mbit/s MM-MTRJ, rugged die-cast metal housing offering wall-mount option
RS 2-4TX/1FX EEC	943 773-001	4 x 10/100 Mbit/s RJ45 and 1 x 100 Mbit/s MM-SC, link loss alarm, power loss alarm, fault relay output, ext. temp. -40° C to +70° C
RS 2-4TX/1FX-ST EEC	943 119-002	4 x 10/100 Mbit/s RJ45 and 1 x 100 Mbit/s MM-ST, link loss alarm, power loss alarm, fault relay output, ext. temp. -40° C to +70° C
RS 2-4TX/1FX-SM EEC	943 774-001	4 x 10/100 Mbit/s RJ45 and 1 x 100 Mbit/s SM-SC, link loss alarm, power loss alarm, fault relay output, ext. temp. -40° C to +70° C



RS20 Unmanaged DIN Rail Mount Ethernet Switches

Standard and Customizable Unmanaged Switches

The RS20 Unmanaged Ethernet switches are ideal for applications that are less dependent upon the features of switch management while maintaining the highest feature-set for an unmanaged switch.

Features include: 8 x, 9 x, 16 x, 17 x, 24 x and 25 x ports in a 4.25" or less footprint, up to 3 x fiber ports, redundant power inputs via dual 24 V DC, fault relay (triggerable by loss of one power input and/or the loss of the link(s) specified), 10/100 auto-negotiating and auto crossing, variety of connector options for Multimode (MM) and Singlemode (SM) fiber optic ports, choice of operating temperatures and conformal coating (standard is 0°C to +60°C, with -40°C to +70°C also available), and variety of approvals including IEC 61850-3, IEEE 1613, EN 50121-4 and ATEX 100a Zone 2.



All Copper/RJ45		
Part No.	Order No.	Ports/Features
RS20-1600T1T1SDAU	943 434-047	16 x 10/100 Mbit/s RJ45

Multimode (MM)		
Part No.	Order No.	Ports/Features
RS20-0900NNM4TDAU	943 434-058	3 x 100 Mbit/s MM fiber (ST) and 6 x 10/100 Mbit/s RJ45
RS20-0900MMM2TDAU	943 434-059	3 x 100 Mbit/s MM fiber (SC) and 6 x 10/100 Mbit/s RJ45
RS20-1600M2T1SDAU	943 434-049	1 x 100 Mbit/s MM fiber (SC) and 15 x 10/100 Mbit/s RJ45
RS20-1600M2M2SDAU	943 434-048	2 x 100 Mbit/s MM fiber (SC) and 14 x 10/100 Mbit/s RJ45
RS20-1600S2M2SDAU	943 434-052	1 x 100 Mbit/s MM fiber (SC) 1 x 100 Mbit/s SM fiber (SC) and 14 x 10/100 Mbit/s RJ45
RS20-1600L2M2SDAU	943 434-055	1 x 100 Mbit/s MM fiber (SC) 1 x 100 Mbit/s Long Haul SM fiber (SC) and 14 x 10/100 Mbit/s RJ45

Singlemode (SM)		
Part No.	Order No.	Ports/Features
RS20-0900VVM2TDAU	943 434-060	3 x 100 Mbit/s SM fiber (SC) and 6 x 10/100 Mbit/s RJ45
RS20-1600S2T1SDAU	943 434-051	1 x 100 Mbit/s SM fiber (SC) and 15 x 10/100 Mbit/s RJ45
RS20-1600S2S2SDAU	943 434-053	2 x 100 Mbit/s SM fiber (SC) and 14 x 10/100 Mbit/s RJ45
RS20-1600L2T1SDAU	943 434-054	1 x 100 Mbit/s Long Haul SM fiber (SC) and 15 x 10/100 Mbit/s RJ45
RS20-1600L2S2SDAU	943 434-056	1 x 100 Mbit/s Long Haul SM fiber (SC) 1 x 100 Mbit/s SM fiber (SC) and 14 x 10/100 Mbit/s RJ45
RS20-1600L2L2SDAU	943 434-057	2 x 100 Mbit/s Long Haul SM fiber (SC) and 14 x 10/100 Mbit/s RJ45
RS20-1600S2M2SDAU	943 434-052	1 x 100 Mbit/s MM fiber (SC), 1 x 100 Mbit/s SM fiber (SC) and 14 x 10/100 Mbit/s RJ45
RS20-1600L2M2SDAU	943 434-055	1 x 100 Mbit/s MM fiber (SC), 1 x 100 Mbit/s Long Haul SM fiber (SC) and 14 x 10/100 Mbit/s RJ45

RS20 Compact OpenRail Managed Ethernet Switches



Fast Ethernet Uplink Ports with/without PoE, All Copper, 1-2 Fiber Ports, or 3 Fiber Ports

The RS20 compact OpenRail managed Ethernet switches can accommodate from 4- to 25-port densities and are available with Fast Ethernet Uplink Ports, All Copper, or 1- to 2-Fiber Ports, or 3-Fiber ports. The fiber ports are available in multimode and/or singlemode.



Technical Information

Product Description			
Type	RS20 Series 4 Ports	RS20 Series 8 and 9 Ports	RS20 Series 16, 17, 24 and 25 Ports
Available Ports	4 to 25		
Construction			
Mounting	DIN Rail		
Protection Class	IP20		
Dimensions (WxHxD)	47 x 131 x 111 mm	74 x 131 x 111 mm	110 x 131 x 111 mm
Weight	400 g	410 g	630 g
Ambient Conditions			
Operating Temperature	0°C to +60°C or -40°C to +70°C		
Storage/Transport Temperature	-40°C to +70°C		
Relative Humidity (non-condensing)	10% to 95%		
Conformal Coating	Yes (variant dependent)		
Interfaces			
V.24 Interface	1 x RJ11 Socket		
USB Interface	1 x USB (ACA21-USB Adaptor)		
Power Requirements			
Operating Voltage	12/24/48 V DC (9.6 to 60 V) and 24 V AC (18 to 30 V) (redundant)		
Regulatory Approvals			
Safety of Industrial Control Equipment	cUL508		
Hazardous Locations	ISA12.12.01 Class 1 Div 2		
Germanischer Lloyd	Germanischer Lloyd		
Transportation	NEMA TS2		
Railway (track)	EN 50121-4		
Substation	IEC 61850-3, IEEE 1613		
Reliability			
MTBF Range	65.5 to 74.9 years	43.9 to 62.5 years	22.1 to 44.8 years
Warranty	5 years standard		

NOTE: These are the prominent technical specifications. For complete technical specifications visit: www.hirschmann.com



RS30 Compact OpenRail Managed Ethernet Switches

Gigabit Ethernet Uplink Ports with/without PoE and Full Gigabit Ethernet Ports

The RS30 compact OpenRail managed Ethernet switches can accommodate from 8- to 24-port densities with 2 Gigabit Ports and 8- 16- or 24- Fast Ethernet Uplink Ports. The Full Gigabit configuration includes 9 Gigabit ports, 2 x SFP Combo GE Type 1 Uplink Ports and 2 x SFP Combo GE Type 2 Uplink Ports.



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Technical Information

Product Description		
Type	RS30 Series 8 Ports	RS30 Series 16 and 24 Ports
Available Ports	8 to 24	
Construction		
Mounting	DIN Rail	
Protection Class	IP20	
Dimensions (WxHxD)	74 x 131 x 111 mm	110 x 131 x 111 mm
Weight	410 g	630 g
Ambient Conditions		
Operating Temperature	0°C to +60°C, -40°C to +70°C, or -40°C to +70°C (optional Conformal Coating)	
Storage/Transport Temperature	-40°C to +70°C	
Relative Humidity (non-condensing)	10% to 95%	
Conformal Coating	Yes (variant dependent)	
Interfaces		
V.24 Interface	1 x RJ11 Socket	
USB Interface	1 x USB (ACA21-USB Adaptor)	
Power Requirements		
Operating Voltage	12/24/48 V DC (9.6 to 60 V) and 24 V AC (18 to 30 V) (redundant)	
Regulatory Approvals		
Safety of Industrial Control Equipment	cUL508	
Hazardous Locations	ISA12.12.01 Class 1 Div 2	
Germanischer Lloyd	Germanischer Lloyd	
Transportation	NEMA TS2	
Railway (track)	EN 50121-4	
Substation	IEC 61850-3, IEEE 1613	
Reliability		
MTBF Range	30.6 to 51.9 years	22.9 to 39.1 years
Warranty	5 years standard	

NOTE: These are the prominent technical specifications. For complete technical specifications visit: www.hirschmann.com

RS20/RS22/RS30/RS32 Compact OpenRail Managed Ethernet Switch Configurations

Configurator



Fast Ethernet Uplink Ports/Fast Ethernet Uplink Ports with PoE
 Gigabit Ethernet Uplink Ports/Gigabit Ethernet Uplink Ports with PoE

RS32-16 02 00 ZZ SPAPH FX.X

Design/Models

RS20 = Fast-Ethernet Uplink Ports
 RS30 = Gigabit Ethernet Uplink Ports
 RS22 = Fast-Ethernet Uplink Ports with PoE
RS32 = Gigabit Ethernet Ports with PoE

Fast Ethernet Port Configurations

04 = 04 x 10/100 Mbit/s
 08 = 08 x 10/100 Mbit/s
 09 = 09 x 10/100 Mbit/s
16 = 16 x 10/100 Mbit/s
 17 = 17 x 10/100 Mbit/s
 24 = 24 x 10/100 Mbit/s
 25 = 25 x 10/100 Mbit/s

Gigabit Ethernet Ports

00 = none (not present)
02 = 02 x 1000 Mbit/s

Type 1 Uplink Port

T1 = 1 x Twisted-Pair RJ45
 M2 = 1 x Multimode SC
 M4 = 1 x Multimode ST
 S2 = 1 x Singlemode SC
 S4 = 1 x Singlemode ST
 L2 = 1 x Long Haul SC
 G2 = 1 x Long Haul + SC
 O6 = 1 X SFP-Slot GE
00 = 2 x SFP-Slot GE
 MM = 2 x Multimode SC
 NN = 2 x Multimode ST
 VV = 2 x Singlemode S
 UU = 2 x Singlemode ST

Type 2 Uplink Port

T1 = 1 x Twisted-Pair RJ45
 M2 = 1 x Multimode SC
 M4 = 1 x Multimode ST
 S2 = 1 x Singlemode SC
 S4 = 1 x Singlemode ST
ZZ = 2 X SFP-Slot FE

Temperature Range Options

S = 0°C up to +60°C
 T = -40°C up to +70°C (+60°C PoE)
 E = -40°C up to +70°C (+60°C PoE) inclusive Conformal Coating

Power Supply

D = 9.6 to 60 V DC and 18 to 30 V AC
P = 47 to 52 V DC (PoE)

Approvals

A = cUL508, cUL1604 Class 1 Div 2
H = cUL508, cUL1604, Class 1 Div 2, GL: German Lloyd, IEC 61850-3: Substation, IEEE 1613: Substation - EN 50121-4: Railway (track)
B = cUL508, cUL1604, Class 1 Div 2, GL: German Lloyd, IEC 61850-3: Substation, IEEE 1613: Substation - EN 50121-4: Railway (track)/ATEX100a, Zone 2: Hazardous Location

Software Version (see page 43 for additional Management Software Functionality details)

E = Enhanced, additional filters and redundancy
P = Professional, DHCP server, additional security and diagnostics, advanced filtering and redundancy

Configuration

H = Standard
E = Ethernet/IP Pre Settings
P = PROFINET Pre Settings

OEM Type

H = Standard
F = Steel Cabinet (PoE)

Software Release

XX.X = Current Software Release

NOTE: The last three part number categories (Configuration, OEM Type and Software Release) are optional.



RS40 Compact OpenRail Managed Ethernet Switches

All Ports are Gigabit

The RS40 compact OpenRail managed ethernet switch has 9 Gigabit ports. The switch offers 5 x 10/100/1000 RJ45 and 4 x 100/1000 RJ45/SFP combo ports (function of one RJ45 combo port is lost for each SFP utilized). Fiber uplink ports are available in multimode and/or singlemode by using Gigabit or 100 Mbit/s SFP transceivers.



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Technical Information

Product Description		
Type	RS40 Series Standard Temperature	RS40 Series Extended Temperature
Switching/Routing	Software Version Layer 2	
Available Ports	9	
Construction		
Mounting	DIN Rail	
Protection Class	IP20	
Dimensions (WxHxD)	74 x 131 x 111 mm	110 x 131 x 111 mm
Weight	530 g	600 g
Ambient Conditions		
Operating Temperature	0°C to +60°C, -40°C to +70°C	-40°C to +70°C (optional Conformal Coating)
Storage/Transport Temperature	-40°C to +70°C	
Relative Humidity (non-condensing)	10% to 95%	
Conformal Coating	Yes (variant dependent)	
Interfaces		
V.24 Interface	1 x RJ11 Socket	
USB Interface	1 x USB (ACA21-USB Adaptor)	
Power Requirements		
Operating Voltage	12/24/48 V DC (9.6 to 60 V) and 24 V AC (18 to 30 V) (redundant)	
Regulatory Approvals		
Safety of Industrial Control Equipment	cUL508	
Hazardous Locations	ISA12.12.01 Class 1 Div 2	
Germanischer Lloyd	Germanischer Lloyd	
Transportation	n/a	
Railway (track)	n/a	
Substation	IEC 61850-3	
Reliability		
MTBF Range	25.8 to 27.1 years	
Warranty	5 years standard	

NOTE: These are the prominent technical specifications. For complete technical specifications visit: www.hirschmann.com

RS40 Compact OpenRail Managed Ethernet Switch Configurations

Full Gigabit Ethernet Switches RS40



RS40-00 09 CC CC S D-A P E H XX.X

Design/Model

RS40 = Full Gigabit Ethernet Switch

Fast Ethernet Port Configurations

00 = 00 x 10/100 Mbit/s

Gigabit Ethernet Ports

09 = 09 x 1000 Mbit/s

Type 1 Uplink Port

CC = 2 x SFP Combo Port GE

Type 2 Uplink Port

CC = 2 x SFP Combo Port GE

Temperature Range Options

S = 0°C up to +60°C

T = -40°C up to +70°C

E = -40°C up to +70°C inclusive Conformal Coating

Power Supply

D = 9.6 to 60 V DC and 18 to 30 V AC

Approvals

A = cUL508, cUL1604 Class 1 Div 2

H = cUL508, cUL1604, Class 1 Div 2, GL: German Lloyd, IEC 61850-3: Substation/IEEE 1613: Substation - EN 50121-4: Railway (track)

B = cUL508, cUL1604, Class 1 Div 2, GL: German Lloyd, IEC 61850-3: Substation IEEE 1613: Substation - EN 50121-4: Railway (track), ATEX100a, Zone 2: Hazardous Location

Software Version (see page 43 for additional Management Software Functionality details)

E = Enhanced, additional filters and redundancy

P = Professional, DHCP server, additional security and diagnostics, advanced filtering and redundancy

Configuration

H = Standard

E = Ethernet/IP Pre Settings

P = PROFINET Pre Settings

OEM Type

H = Standard

Software Release

XX.X = Current Software Release

NOTE: The last three part number categories (Configuration, OEM Type and Software Release) are optional.



RSB20 Series Basic Managed DIN Rail-Mount Switches

Fast Ethernet Uplink Ports

The RSB20 series of managed switches consists of 8 core models, each of which are optionally available in high temperature configurations and/or preconfigured with IGMP Snooping initially active (multicast filtering) for EtherNet/IP use. These switches offer redundant DC power inputs and a variety of multimode (SC), singlemode (SC), and SFP socket options.

The RSB20 portfolio offers users a quality, hardened, reliable communications solution that provides an economically attractive entry into the segment of managed switches.



Technical Information

Product Description	
Type	RSB20 Series
Switching/Routing	Software Version Layer 2
Available Ports	8 to 9
Construction	
Mounting	DIN Rail
Protection Class	IP20
Dimensions (WxHxD)	47 x 131 x 111 mm
Weight	400 g
Ambient Conditions	
Operating Temperature	0°C to +60°C, -40°C to +70°C
Storage/Transport Temperature	-40°C to +85°C
Relative Humidity (non-condensing)	10% to 95%
Conformal Coating	No
Interfaces	
V.24 Interface	1 x RJ11 Socket
USB Interface	n/a
Power Requirements	
Operating Voltage	24 V DC (18 to 32 V)
PoE (802.3af) Ports Supported	n/a
PoE Plus (802.3at) Ports Supported	n/a
Regulatory Approvals	
Safety of Industrial Control Equipment	cUL508
Hazardous Locations	ISA12.12.01 Class 1 Div 2
Germanischer Lloyd	n/a
Transportation	n/a
Railway (norm)	n/a
Substation	n/a
Reliability	
MTBF Range	58.8 to 88 years
Warranty	5 years standard

NOTE: These are the prominent technical specifications. For complete technical specifications visit: www.hirschmann.com



RSB20 Series Basic Managed DIN Rail-Mount Switch Configurations

Fast Ethernet Uplink Ports



All Copper/RJ45

Part No.	Order No.	Ports/Features
RSB20-0800T1T1SAAB	942 014-001	8TX
RSB20-0800T1T1SAABE	942 014-017	8TX E, pre-configured MC filtering for EtherNet/IP
RSB20-0800T1T1TAABE	942 014-025	8TX EEC E, pre-configured MC filtering for EtherNet/IP
RSB20-0800T1T1TAAB	942 014-009	8TX EEC

Multimode (MM)

Part No.	Order No.	Ports/Features
RSB20-0800M2M2SAAB	942 014-002	6TX/2FX MM
RSB20-0800M2M2SAABE	942 014-018	6TX/2FX MM E, pre-configured MC filtering for EtherNet/IP
RSB20-0800M2M2TAABE	942 014-026	6TX/2FX MM EEC E, pre-configured MC filtering for EtherNet/IP
RSB20-0800M2M2TAAB	942 014-010	6TX/2FX MM EEC
RSB20-0900M2TTSAAAB	942 014-005	8TX/1FX MM
RSB20-0900M2TTSAAABE	942 014-021	8TX/1FX MM E, pre-configured MC filtering for EtherNet/IP
RSB20-0900M2TTAAABE	942 014-029	8TX/1FX MM EEC E, pre-configured MC filtering for EtherNet/IP
RSB20-0900M2TTAAAB	942 014-013	8TX/1FX MM EEC
RSB20-0900MMM2SAAB	942 014-007	6TX/3FX MM
RSB20-0900MMM2SAABE	942 014-023	6TX/3FX MM E, pre-configured MC filtering for EtherNet/IP
RSB20-0900MMM2TAABE	942 014-031	6TX/3FX MM EEC E, pre-configured MC filtering for EtherNet/IP
RSB20-0900MMM2TAAB	942 014-015	6TX/3FX MM EEC

Singlemode (SM) Fiber and Copper

Part No.	Order No.	Ports/Features
RSB20-0800S2S2SAAB	942 014-003	6TX/2FX SM
RSB20-0800S2S2SAABE	942 014-019	6TX/2FX SM E, pre-configured MC filtering for EtherNet/IP
RSB20-0800S2S2TAABE	942 014-027	6TX/2FX SM EEC E, pre-configured MC filtering for EtherNet/IP
RSB20-0800S2S2TAAB	942 014-011	6TX/2FX SM EEC
RSB20-0900S2TTSAAAB	942 014-006	8TX/1FX SM
RSB20-0900S2TTSAAABE	942 014-022	8TX/1FX SM E, pre-configured MC filtering for EtherNet/IP
RSB20-0900S2TTAAABE	942 014-030	8TX/1FX SM EEC E, pre-configured MC filtering for EtherNet/IP
RSB20-0900S2TTAAAB	942 014-014	8TX/1FX SM EEC

Singlemode (SM)/Multimode (MM) Fiber and Copper

Part No.	Order No.	Ports/Features
RSB20-0900VVM2SAAB	942 014-008	6TX/2FX SM/1 FX MM
RSB20-0900VVM2SAABE	942 014-024	6TX/2FX SM/1 FX MM E, pre-configured MC filtering for EtherNet/IP
RSB20-0900VVM2TAABE	942 014-032	6TX/2FX SM/1 FX MM EEC E, pre-configured MC filtering for EtherNet/IP
RSB20-0900VVM2TAAB	942 014-016	6TX/2FX SM/1 FX MM EEC

SFP

Part No.	Order No.	Ports/Features
RSB20-0900ZZZ6SAAB	942 014-004	6TX/3SFP
RSB20-0900ZZZ6SAABE	942 014-020	6TX/3SFP E, pre-configured MC filtering for EtherNet/IP
RSB20-0900ZZZ6TAABE	942 014-028	6TX/3SFP EEC E, pre-configured MC filtering for EtherNet/IP
RSB20-0900ZZZ6TAAB	942 014-012	6TX/3SFP EEC



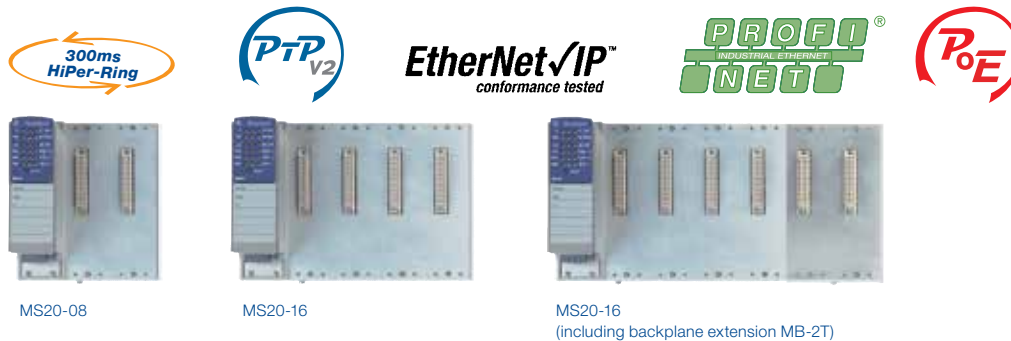
MS20 Managed Modular DIN Rail Mount Ethernet Switches

The MS20 series of Ethernet switches have eight to twenty-four 100 Mbit/s max ports. Fully managed (web, SNMP and CLI) IGMP snooping (multicast filtering), VLAN, port mirroring, port control, port security, link alarms, broadcast limiter, traffic diagnostics, HIPER-Ring redundancy, RSTP, etc.

Features include: available in a 2- and 4-slot version (4-slot can be expanded to a 6 slot using MB-2T), requires the use of hot-swappable media modules for any combination of copper/fiber ports, dual power inputs and dual fault relay outputs, USB configuration backup/restore and fast device replacement), standard 0°C to +60°C (-40°C to +70°C and conformal coating available), differentiator between similar switches listed is the firmware level/features.



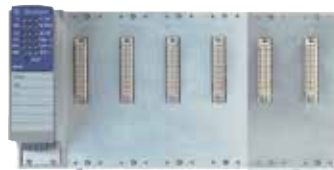
(E = Enhanced, P = Professional). Last digit in part number category software version (see page 43 for additional Management Software Functionality details).



MS20-08



MS20-16



MS20-16
(including backplane extension MB-2T)

All Ports are 10/100 Mbit/s		
Part No.	Order No.	Ports/Features
MS20-0800SAAE	943 435-001	2 x any MM2/MM3 (2 slots, max. 8 x 10/100 Mbit/s ports)
MS20-0800SAAP	943 435-002	2 x any MM2/MM3 (2 slots, max. 8 x 10/100 Mbit/s ports)
MS20-0800ECCP	943 956-001	2 x any MM2/MM3 (2 slots, max. 8 x 10/100 Mbit/s ports), -40°C to +70°C, conformal coated, 24/48 V DC, EN 50155
MS20-1600SAAE	943 435-003	4 x any MM2/MM3 (6 slots max. 16 x 10/100 Mbit/s ports/24 ports w/ MB-2T)
MS20-1600SAAP	943 435-004	4 x any MM2/MM3 (6 slots max. 16 x 10/100 Mbit/s ports/24 ports w/ MB-2T)
MS20-1600ECCP	943 956-002	4 x any MM2/MM3 (6 slots max. 16 x 10/100 Mbit/s ports/24 ports w/ MB-2T), -40°C to +70°C, conformal coated, 24/48 V DC, EN 50155



MS30 Managed Modular DIN Rail Mount Ethernet Switches



MS30-08

The MS30 series of Ethernet switches have the same functionality and features as the MS20 series, with the exception of an added slot for a Gigabit Media Module (for 2 x 10/100/1000 RJ45/Gigabit SFP combo ports).

Features include: uplink ports are 10/100/1000 Mbit/s, all other ports are 10/100 Mbit/s, MS30-08 can have a max of 8 x 10/100 Mbit/s ports and 2 x 10/100 RJ45/Gigabit SFP combo port, ports can be any combination of copper and/or fiber, and Gigabit RJ45/SFP combo ports compatible with Gigabit SFPs).



MS30-16



All Ports are 10/100 Mbit/s		
Part No.	Order No.	Ports/Features
MS30-0802SAAE	943 435-005	2 x any MM2/MM3 and 1 x MM4-2TX/SFP (max 10 ports)
MS30-0802SAAP	943 435-006	2 x any MM2/MM3 and 1 x MM4-2TX/SFP (max 10 ports)
MS30-1602SAAE	943 435-007	4 x any MM2/MM3 (6 x w/MB-2T) and 1 x MM4-2TX/SFP (max 26 ports)



MS30-16 (including backplane extension MB-2T)

MS Backplane Extensions

MICE 2-slot backplane extensions are used for MS20-16, MS30-16 and MS4128, Only one per switch may be used for a maximum of six total slots.



Backplane Extensions		
Part No.	Order No.	Ports/Features
MB-2T	943 733-102	MS20-16, MS30-16, and MS4128
MB20-2TAHH	943 435-002	Same as above but with -40°C to +70°C

Be Certain with Belden



Managed Modular DIN Rail Mount Switches

PowerMICE Gigabit Layer 2/3 Switches

For applications that require a more powerful and feature-rich switch, Hirschmann™ offers its MS4128 modular switches. Similar in functionality and features to the MS30-16. The MS4128 offers up to 24 ports of any copper/fiber mix, but adds two additional Gigabit ports (for a total of four) and an option to have Layer 3 routing capabilities.



Modular Managed Industrial Ethernet Layer 2/3 Switches with Professional or Enhanced Management				
Part No.	Order No.	Layer/Management	Ports	Configurations
MS4128-L2P	943 009-102	Layer 2/Professional	20 –28	4 x any MM2/MM3 (6 x w/MB-2T) and 1 x any MM4 (max 28 ports)
MS4128-L2P EEC	943 009-103	Layer 2/Professional	20 –28	Same as 002 except extended temperature range
MS4128-L3E	943 009-202	Layer 3/Enhanced	20 –28	4 x any MM2/MM3 (6 x w/MB-2T) and 1 x any MM4 (max 28 ports)
MS4128-L3E EEC	943 009-203	Layer 3/Enhanced	20 –28	Same as 202 except extended temperature range
MS4128-L3P	943 009-302	Layer 3/Professional	20 –28	4 x any MM2/MM3 (6 x w/MB-2T) and 1 x any MM4 (max 28 ports)
MS4128-L3P EEC	943 009-303	Layer 3/Professional	20 –28	Same as 302 except extended temperature range
MS4128-L2P ATEX	943 009-101	Layer 2/Professional	20 –28	4 X 1000 BASE-SX with SFP modules or 4 x 10/100/1000 BASE-TX and 24 Fast ETHERNET (100 Mbit/s) ports (with MB-2T)
MS4128-L3E ATEX	943 009-201	Layer 3/Enhanced	20 –28	Same as 101 except Layer 3 enhanced software
MS4128-L3P ATEX	943 009-301	Layer 3/Professional	20 –28	Same as 201 except professional software

MICE Media Modules

Any combination of the following hot-swappable media modules may be used to attain the desired port density/type on a MS switch. The only restriction is the number of slots that the MS backplane has (one media module per slot).



Modules: All Copper		
Part No.	Order No.	Ports/Speed
MM2-4TX1	943 722-101	4 x 10/100 Mbit/s RJ45
MM2-4TX1-EEC	943 722-151	4 x 10/100 Mbit/s RJ45, extended temperature range



Managed Modular DIN Rail Mount Switches

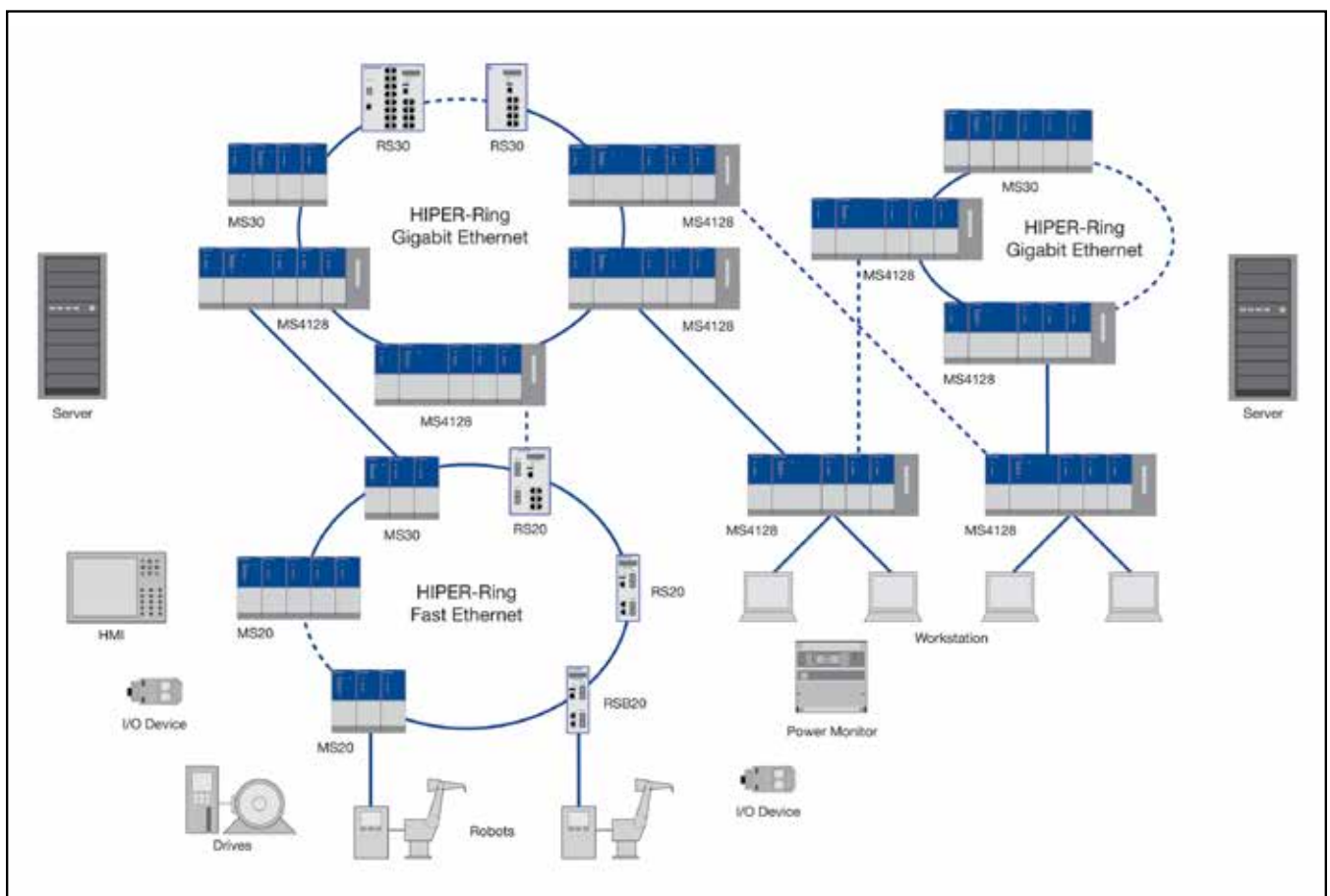


Modules: Multimode			
Type	Part No.	Order No.	Ports/Features
MM	MM2-2FXM2	943 718-101	2 x 100 Mbit/s MM SC
MM	MM3-4FXM2	943 764-101	4 x 100 Mbit/s MM SC
MM	MM3-4FXM4	943 835-101	4 x 100 Mbit/s MM ST
MM	MM3-1FXM2/3TX1	943 839-101	1 x 100 Mbit/s MM SC, 3 x RJ45
MM	MM3-2FXM4/2TX1	943 837-101	2 x 100 Mbit/s MM ST, 2 x RJ45
MM	MM3-4FLM4	943 760-101	4 x 10 Mbit/s MM ST
MM	MM3-2FXM2/2TX1	943 761-101	2 x 100 Mbit/s MM SC, 2 x RJ45
MM	MM3-2FXM2/2TX1-EEC	943 761-151	2 x 100 Mbit/s MM SC, 2 x RJ45, ext. temperature range
MM	MM3-1FXM2/1FXS2/2TX1	943 929-101	2 x 100 Mbit/s SC (1 x MM and 1 x SM), 2 x RJ45
MM	MM2-4FXM3	943 721-101	4 x 100 Mbit/s MM MTRJ
MM	MM2-2FXM3/2TX1	943 720-101	2 x 100 Mbit/s MM MTRJ, 2 x RJ45
SFP	MM20-Z6Z6Z6SAHH	943 938-001	4 x 100 Mbit/s SFP sockets (SFPs are sold separately), for MS20, MS30 and MS4128
Modules: Singlemode			
Type	Part No.	Order No.	Ports/Speed
SM	MM2-2FXS2	943 719-101	2 x 100 Mbit/s SM SC
SM	MM3-2FXS2/2TX1	943 762-101	2 x 100 Mbit/s SM SC, 2 x RJ45
SM	MM3-2FXS2/2TX1-EEC	943 762-151	2 x 100 Mbit/s SM SC, 2 x RJ45, ext. temperature range
SM	MM3-1FXS2/3TX1	943 838-101	1 x 100 Mbit/s SM SC, 3 x RJ45
SM	MM3-4FXS2	943 836-101	4 x 100 Mbit/s SM SC
SM	MM3-1FXL2/3TX1	943 763-101	1 x 100 Mbit/s SM, SC Long Haul, 3 x RJ45
SM	MM3-1FXLH/3TX1	943 930-101	1 x 100 Mbit/s SM SC Long Haul+, 3 x RJ45
SM	MM3-1FXS2/3TX1-EEC	943 838-151	1 x 100 Mbit/s SM SC, 3 x RJ45, ext. temperature range
SFP	MM20-Z6Z6Z6SAHH	943 938-001	4 x 100 Mbit/s SFP sockets (SFPs are sold separately), for MS20, MS30 and MS4128
Modules: Gigabit			
Type	Part No.	Order No.	Ports/Speed
Gigabit	MM4-2TX/SFP	943 622-001	2 x Gigabit RJ45/SFP combo ports for use with MS30 and MS4128
Gigabit	MM4-4TX/SFP	943 010-001	4 x Gigabit RJ45/SFP combo ports for use with MS4128 only
Modules: Special Purpose			
Type	Part No.	Order No.	Ports/Speed
Realtime	MM23-T1T1T1T1SAAH PTPv2	–	IEEE1588 Version 2 PTP module, 4 x 10/100 RJ45, replacement for 943 117-001
Realtime	MM23-M2M2T1T1SAAH PTPv2	–	IEEE1588 Version 2 PTP module, 2 x multimode, SC sockets, replacement for 943 117-002
Realtime	MM23-S2S2T1T1SAAH PTPv2	–	IEEE1588 Version 2 PTP module, 2 x singlemode, SC sockets, replacement for 943 117-003
Realtime	MM23-F4F4T1T1SAAH PTPv2	–	IEEE1588 Version 2 PTP module, 2 x multimode, ST sockets, replacement for 943 117-004
Realtime	MM33-07079999SA PTPv2	–	IEEE1588 Version 2 PTP module, SFP sockets
Realtime	MM3-4TX1-RT-EEC	943 955-001	4 x RJ45, railway certifications EN 50155, EN 50121-4, IEEE 1588 Version 1
Realtime	MM3-2FXM2/2TX1-RT-EEC	943 955-002	2 x 100 Mbit/s MM SC, 2 x RJ45, IEEE 1588 Version 1, railway certifications EN 50155, EN 50121-4
Realtime	MM3-2FXS2/2TX1-RT-EEC	943 955-003	2 x 100 Mbit/s SM SC, 2 x RJ 45, IEEE 1588 Version 1, railway certifications EN 50155, EN 50121-4
AUI	MM20-A8A89999SAHH	943 840-101	2 x AUI SUB-D 15-pin male D-sub
M12	MM3-4TX5	943 841-101	4 x M12 socket (D-code), for connectors see OCTOPUS family
PoE	MM22-T1T1T1T1SAHH	943 938-002	4 x RJ45 PoE (external PoE power supply)
SFP	MM20-Z6Z6Z6SAHH	943 938-001	4 x 100 Mbit/s SFP sockets (SFPs are sold separately), for MS20, MS30 and MS4128



Managed Modular DIN Rail Mount Switches

Fast Ethernet MICE Media Modules, Digital I/O		
Part No.	Order No.	Ports
MM24-10101010SZHH	MM24-10101010SZHH	Port 1: 1 x digital input, 1 x digital output Port 2: 1 x digital input, 1 x digital output Port 3: 1 x digital input, 1 x digital output Port 4: 1 x digital input, 1 x digital output
MM24-10101010TZHH	MM24-10101010TZHH	Same as above, except with extended temperature range -40°C to +70°C
MM24-10101010EZHH	MM24-10101010EZHH	Same as above, except with extended temperature range and conformal coating



Example of media redundancy utilizing a ring topology. Hirschmann™ switches support Spanning Tree, Rapid Spanning Tree, HiPer-Ring, MRP-Ring, PRP, and HSR (high-availability seamless redundancy) ring redundancy protocols.

NOTE: All of Hirschmann™'s managed switches have the ability of being designed into a redundant ring with 300 ms resiliency at 100 Mbit/s and 30 ms at 1000 Mbit/s (each with 100 switches in the ring).



RSR Series Über-Rugged™ Managed DIN Rail Mount Ethernet Switches



Fast Ethernet Uplink Ports and Gigabit Ethernet Uplink Ports

RSR series switches are available with optional gigabit ports and an extended temperature range of -40°C to +85°C. Ultra-fast ring recovery times under 10 ms are possible using HIPER-Ring redundancy protocol and the switch's robust metal housing offers extended RFI/EMI and vibration immunity.

The term "Über-Rugged" is the only way to describe a switch that goes above and beyond the already rugged capabilities of Hirschmann™ switches by being extremely immune to noise and able to provide maximum uptime in extreme environmental conditions.



Technical Information

Product Description		
Type	RSR20 Series	RSR30 Series
Switching/Routing	Software Version Layer 2	
Available Ports	8 to 9	9 to 10
Construction		
Mounting	DIN Rail	
Protection Class	IP30	
Dimensions (WxHxD)	120 x 145 x 115 mm	
Weight	appr. 1 kg	
Ambient Conditions		
Operating Temperature	0°C to +60°C, -40°C to +85°C, or -40°C to +85°C (optional Conformal Coating)	
Storage/Transport Temperature	-40°C to +85°C	
Relative Humidity (non-condensing)	10% to 95%	
Conformal Coating	Yes (variant dependent)	
Interfaces		
V.24 Interface	1 x RJ11 Socket	
USB Interface	1 x USB (ACA21-USB Adaptor)	
Power Requirements		
Operating Voltage	24/36/48 V DC or 60/120/250 V DC, 110/230 V AC	
PoE (802.3af) Ports Supported	n/a	
PoE Plus (802.3at) Ports Supported	n/a	
Regulatory Approvals		
Safety of Industrial Control Equipment	cUL508	
Hazardous Locations	Class 1 Div 2 (cUL1604)	
Germanischer Lloyd	Germanischer Lloyd	
Transportation	NEMA TS2	
Railway (norm)	EN 50121-4	
Substation	IEC 61850-3, IEEE 1613	
Reliability		
MTBF Range	45.6 to 61.8 years	49.2 to 57.9 years
Warranty	5 years standard	

NOTE: These are the prominent technical specifications. For complete technical specifications visit: www.hirschmann.com



RSR20/RSR30 Über-Rugged™ Managed DIN Rail Mount Ethernet Switch Configurations

Configurator



Fast Ethernet DIN Rail Switch RSR20 and Gigabit Ethernet DIN Rail Switch RSR30

RS30-0602T1ZZZ6SCCHPHHX.X

Design/Models
 RSR20 = Rail Switch Rugged Fast Ethernet
RSR30 = Rail Switch Rugged Gigabit Ethernet

Fast Ethernet Port Configurations
06 = 6 x 10/100 Mbit/s 08 = 8 x 10/100 Mbit/s
 07 = 7 x 10/100 Mbit/s 09 = 9 x 10/100 Mbit/s

Gigabit Ethernet Ports
 00 = 0 x 1000 Mbit/s 03 = 3 x 1000 Mbit/s
02 = 2 x 1000 Mbit/s (only RSR30-08)

Type 1 Uplink Port
T1 = 1 x Twisted-Pair RJ45 06 = SFP Slot Gigabit
 M2 = 1 x Multimode SC 07 = Combo Port Gigabit
 M4 = 1 x Multimode ST MM = 2 x Multimode SC
 S2 = 1 x Singlemode SC JJ = 2 x Multimode MTRJ
 S4 = 1 x Singlemode ST NN = 2 x Multimode ST
 L2 = 1 x Long Haul SC UU = 2 x Singlemode SC
 G2 = 1 x Long Haul + SC VV = 2 x Singlemode ST
 CC = 2 x Combo Port Gigabit LL = 2 x Singlemode Long Haul SC
 00 = 2 x SFP Slot Gigabit GG = 2 x Singlemode Long Haul+ SC (200 km)

Type 2 Uplink Port
 T1 = 1 x Twisted-Pair RJ45 S2 = 1 x Singlemode SC
 (only if T1 is selected S4 = 1 x Singlemode ST
 for Type 1 Uplink Port) L2 = 1 x Singlemode Long Haul SC
 M2 = 1 x Multimode SC G2 = 1 x Singlemode Long Haul+ SC (200 km)
 M3 = 1 x Multimode MTRJ 06 = SFP Slot Gigabit
 (only if JJ selected above) 07 = Combo Port Gigabit
 M4 = 1 x Multimode ST **ZZ** = 2 x SFP Slot Gigabit (only RSR30-08)

Remaining Ports
 T1 = 1 x Twisted-Pair RJ45 **Z6** = SFP Slot (100 Mbit/s) (only RSR30-07)

Temperature Range Options
S = 0°C up to +60°C F = -40°C up to +85°C
U = -40°C up to +85°C inclusive Conformal Coating

Voltage Range 1
C = 24/36/48 V DC K = 60/120/250 V DV and 110/230 V AC

Voltage Range 2
C = 24/36/48 V DC K = 60/120/250 V DC and 110/230 V AC
 9 = None (only if K is selected above) (only if K is selected for Voltage Range 1)

Approvals
H = cUL508, GL, IEC 61850, IEEE 1613, EN 50121

Software Version (see page 43 for additional Management Software Functionality details)
P = Professional

Configuration
H = Standard

OEM Type
H = Standard

Software Release
XX.X = Current Software Release

NOTE: The last three part number categories (Configuration, OEM Type and Software Release) are optional.



RSP Series Managed Industrial DIN Rail Switch with Fanless Design



Fast and Gigabit Ethernet Networks

The new RSP family of switches with robust hardware and a powerful operating system, are able to withstand extremely harsh environmental conditions. For the first time, the integration of new redundancy protocols allows uninterrupted data communication. These new techniques, PRP (Parallel Redundancy Protocol) and HSR (High-availability Seamless Redundancy), are based on the international IEC 62439 standard and therefore guarantee future security and interoperability. Precision time synchronization in accordance with IEEE 1588v2, synchronizes sensors, drives, and measuring equipment. Gigabit ethernet provides for a fast connection to the backbone, while connections to terminal equipment use 100 BASE-TX – either alone or in combination with 100 BASE-FX.



Technical Information

Product Description		
Type	RSP Series Standard Temperature	RSP Series Extended Temperature
Switching/Routing	Software Version Layer 2	
Available Ports	11	
Enhanced Redundancy Functions	Fast MRP, HSR, PRP (variant dependent)	
Construction		
Mounting	DIN Rail	
Protection Class	IP30	
Dimensions (W x H x D)	90 x 164 x 120 mm	98 x 164 x 120 mm
Weight	1.2 kg	1.5 kg
Ambient Conditions		
Operating Temperature	0°C to +60°C, -40°C to +70°C, or -40°C to +70°C (inclusive Conformal Coating), IEC 60068-2-2 Dry Heat Test +85°C 16 Hours	
Storage/Transport Temperature	-40°C to +85°C	
Relative Humidity (non-condensing)	10% to 95%	
Conformal Coating	Yes (variant dependent)	
Interfaces		
V.24 Interface	1 x RJ11 Socket	
USB Interface	1 x to connect auto-configuration adapter ACA31 (SD-card)	
Power Requirements		
Operating Voltage	24/36/48 V DC redundant, or 60/120/250 V DC and 110/230 V AC	
PoE (802.3af) Ports Supported	n/a	
PoE Plus (802.3at) Ports Supported	n/a	
Regulatory Approvals		
Safety of Industrial Control Equipment	cUL508 (pending)	
Hazardous Locations	n/a	
Germanischer Lloyd	n/a	
Transportation	NEMA TS2 (pending)	
Railway (norm)	EN 50121-4 (pending)	
Substation	IEC 61850-3, IEEE 1613	
Reliability		
MTBF Range	Pending	
Warranty	5 years standard	

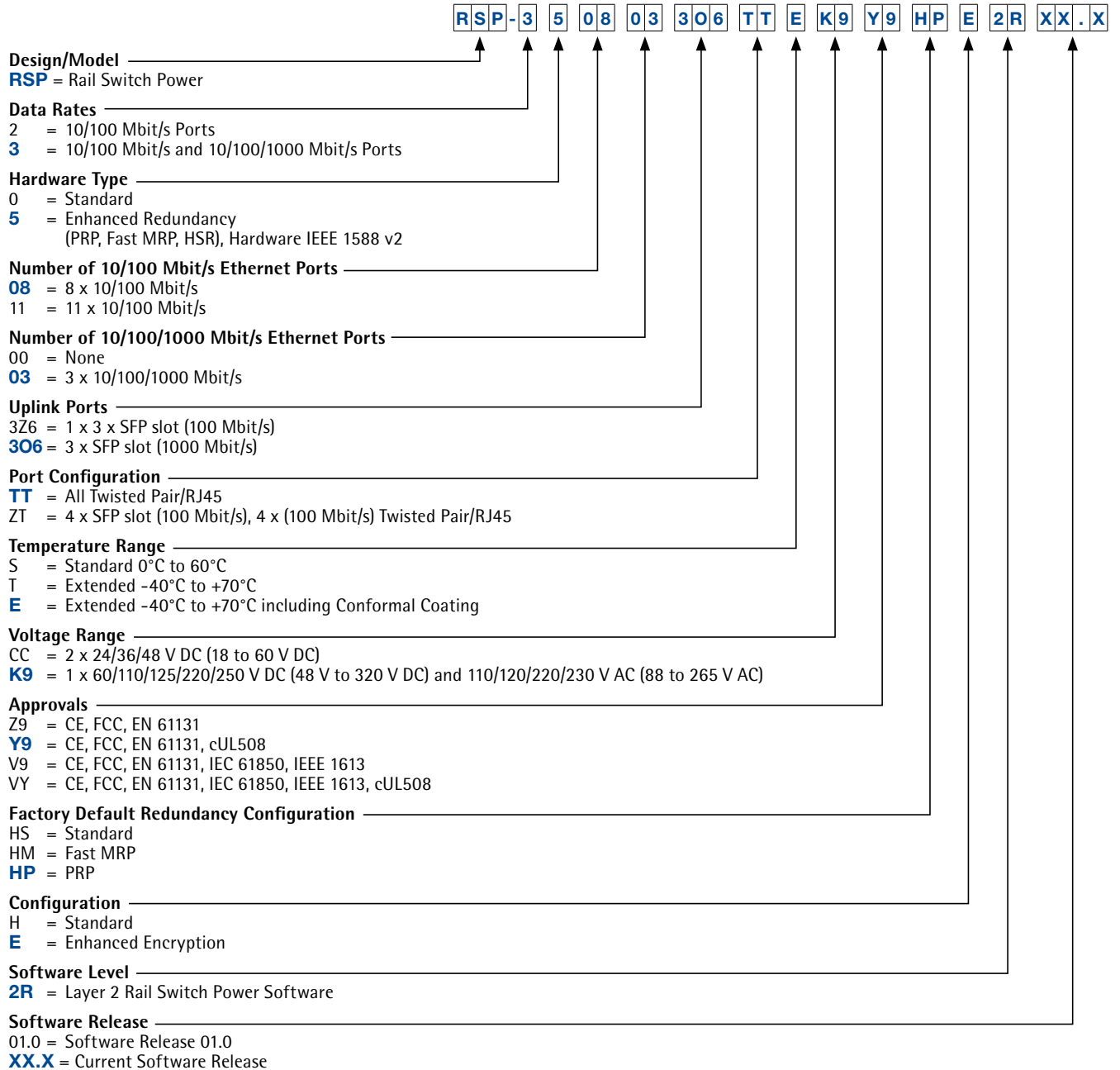
NOTE: These are the prominent technical specifications. For complete technical specifications visit: www.hirschmann.com



RSP Series Managed Industrial DIN Rail Switch Configurations

Fast and Gigabit Ethernet Networks

Configurator



NOTE: The part number categories (Configuration and Software Release) are optional.



OCTOPUS IP67/IP54 Industrial Ethernet Switches





The OCTOPUS family of switches meets all relevant industry standards and provide the most robust switches in the market. With Power over Ethernet, Professional firmware standard on most models and Gigabit connectivity for where a higher bandwidth connection is required.

All products in the OCTOPUS family can be mounted on the wall or directly on the machine. The IP67 variants offer 8/16/24 Twisted Pair ports (each with up to 8 PoE ports), using standardized 4-pin M12 D-code technology. As the switches are freely cascadable, it is simple to build decentralized structured networks with the shortest possible patch cables to the end devices. The OS20 and OS30 switches utilize IP67 fiber connections per the IEC 61076-3-106 standard – variant 1 is approved by ODVA for use with EtherNet/IP, variant 4 is approved for use with PROFINET.


Standard features include: totally enclosed IP67 design, standardized 4-pin M12 D-code IP67 Ethernet connector, OCTOPUS M is the industry's first managed IP67 switch, management via SNMP v1, v2, v3, web GUI or Telnet, redundancy via HIPER-Ring, MRP and Rapid Spanning Tree, redundant power supply for high availability, operating temperatures as low as -40°C to +70°C, and external signaling of alarms via signal contact or network messaging.



OCTOPUS Fast Ethernet Unmanaged Waterproof IP67/IP54 Switches






Product	Part No.	Order No.	Ports/Features
	OCTOPUS 5TX EEC	943 892-001	5 x 10/100 Mbit/s M12-coding, Unmanaged
	OCTOPUS OS20-001000T5T5TAFUHB	942 025-001	10 x 10/100 BASE-TX, M12 D coding, 4-pole
	OCTOPUS OS20-001000T5T5TNEUHB	942 025-004	10 x 10/100 BASE-TX, M12 D coding, 4-pole (110 V version)


OCTOPUS PoE Fast Ethernet Unmanaged Waterproof IP67/IP54 Switches

Product	Part No.	Order No.	Ports/Features
	OCTOPUS OS24-081000T5T5TFFUHB	942 025-003	8 x 10/100 Base-TX PoE (Phantom Power) and 2 x 10/100 Base-TX (24 V version)
	OCTOPUS OS24-081000T5T5TNEUHB	942 025-004	8 x 10/100 Base-TX PoE (Phantom Power) and 2 x 10/100 Base-TX (110 V version)



OCTOPUS IP67/IP54 Industrial Ethernet Switches



OCTOPUS Fast Ethernet Managed Waterproof IP67/IP54 Switches			
Product	Part No.	Order No.	Ports/Features
	OCTOPUS 8M	943 931-001	8 x 10/100 BASE-TX, M12 D-coding, 4-pole
	OCTOPUS 8M-Train	943 983-001	8 x 10/100 BASE-TX, M12 D-coding, 4-pole (EN 50155)
	OCTOPUS 8M-Train-BP	942 091-001	8 x 10/100 BASE-TX, M12 D-coding, 4-pole (EN 50155), Bypass-Relais
	OCTOPUS OS20-000900T5T5TAFBHH	942 025-005	9 x 10/100 BASE-TX, M12 D-coding, 4-pole
	OCTOPUS OS20-000900T5T5TNEBHH	942 025-006	9 x 10/100 BASE-TX, M12 D-coding, 4-pole (110 V version)
	OCTOPUS OS20-0010001M1MTREPHH	943 988-001	8 x 10/100 BASE-TX, M12 D coding, 4-pole, 2 x 100 BASE FX Multimode Ports IAW IEC 63076-3-106, Version 1
	OCTOPUS OS20-0010004M4MTREPHH	943 988-003	8 x 10/100 BASE-TX, M12 D coding, 4-pole, 2 x 100 BASE FX Multimode Ports IAW IEC 63076-3-106, Version 4
	OCTOPUS OS20-0010001S1STREPHH	943 988-002	8 x 10/100 BASE-TX, M12 D coding, 4-pole, 2 x 100 BASE FX Singlemode Ports IAW IEC 63076-3-106, Version 1
	OCTOPUS OS20-0010004S4STREPHH	943 988-004	8 x 10/100 BASE-TX, M12 D coding, 4-pole, 2 x 100 BASE FX Singlemode Ports IAW IEC 63076-3-106, Version 4
	OCTOPUS 16M	943 912-001	16 x 10/100 BASE-TX, M12 D-coding, 4-pole
	OCTOPUS 16M-Train	943 984-001	16 x 10/100 BASE-TX, M12 D-coding, 4-pole (EN 50155)
	OCTOPUS 16M-Train-BP	942 092-001	16 x 10/100 BASE-TX, M12 D-coding, 4-pole (EN 50155), Bypass-Relais
	OCTOPUS 24M	943 923-001	24 x 10/100 BASE-TX, M12 D coding, 4-pole
	OCTOPUS 24M-Train	943 985-001	24 x 10/100 BASE-TX, M12 D coding, 4-pole (EN 50155)
	OCTOPUS 24M-Train-BP	942 093-001	24 x 10/100 BASE-TX, M12 D-coding, 4-pole (EN 50155), Bypass-Relais

OCTOPUS PoE Fast Ethernet Managed Waterproof IP67/IP54 Switches			
Product	Part No.	Order No.	Ports/Features
	OCTOPUS 8M-6PoE	943 967-101	6 x 10/100 BASE-TX PoE (phantom power) and 2 x 10/100 BASE-TX , M12 D coding, 4-pole
	OCTOPUS 8M-8PoE	943 967-001	8 x 10/100 BASE-TX PoE (phantom power), M12 D coding, 4-pole




OCTOPUS IP67/IP54 Industrial Ethernet Switches



OCTOPUS PoE Fast Ethernet Managed Waterproof IP67/IP54 Switches

Product	Part No.	Order No.	Ports/Features
	OCTOPUS OS24-080900T5T5TFFBHH	942 025-007	8 x 10/100 Base-TX PoE-Plus (Phantom Power) and 1 x 10/100 Base-TX (24 V version)
	OCTOPUS OS24-080900T5T5TNEBHH	942 025-008	8 x 10/100 Base-TX PoE-Plus (Phantom Power) and 1 x 10/100 Base-TX (110 V version)
	OCTOPUS 16M-8PoE	943 960-001	8 x 10/100 BASE-TX PoE (phantom power) and 8 x 10/100 BASE-TX, M12 D coding, 4-pole
	OCTOPUS 24M-8 PoE	942 063-001	8 x 10/100 BASE-TX PoE (phantom power) and 16 x 10/100 BASE-TX, M12 D-coding, 4 pole

OCTOPUS Gigabit Ethernet Managed Waterproof IP67/IP54 Switches

Product	Part No.	Order No.	Ports/Features
	OCTOPUS OS30-0008021A1ATREPHH	943 988-005	8 x 10/100 BASE-TX, 2 x Gigabit Multimode Ports IAW IEC 63076-3-106, Version 1
	OCTOPUS OS30-0008024A4ATREPHH	943 988-007	8 x 10/100 BASE-TX, 2 x Gigabit Multimode Ports IAW IEC 63076-3-106, Version 4
	OCTOPUS OS30-0008021B1BTREPHH	943 988-006	8 x 10/100 BASE-TX, 2 x Gigabit Singlemode Ports IAW IEC 63076-3-106, Version 1
	OCTOPUS OS30-0008024B4BTREPHH	943 988-008	8 x 10/100 BASE-TX, 2 x Gigabit Singlemode Ports IAW IEC 63076-3-106, Version 4

OCTOPUS PoE Gigabit Ethernet Managed Waterproof IP67/IP54 Switches

Product	Part No.	Order No.	Ports/Features
	OCTOPUS OS32-080802T6T6TPEPHH	942 069-002	8 x 10/100 BASE-TX PoE (phantom power) and 2 x 1000 BASE-TX
	OCTOPUS OS32-081602T6T6TPEPHH	942 069-001	8 x 10/100 BASE-TX PoE (phantom power) and 8 x 10/100 BASE-TX, 2 x 1000 BASE-TX
	OCTOPUS OS32-0808020606TPEPHH	942 069-004	8 x 10/100 BASE-TX PoE (phantom power) and 2 x SFP- sockets for 10/100 BASE-FX and 1000, BASE-X housing IEC 63076-3106 v1
	OCTOPUS OS32-0816020606TPEPHH	942 069-003	8 x 10/100 BASE-TX PoE (phantom power) and 8 x 10/100 BASE-TX and 2 x SFP- sockets for 10/100 BASE-FX and 1000 BASE-X housing IEC 63076-3106 v1

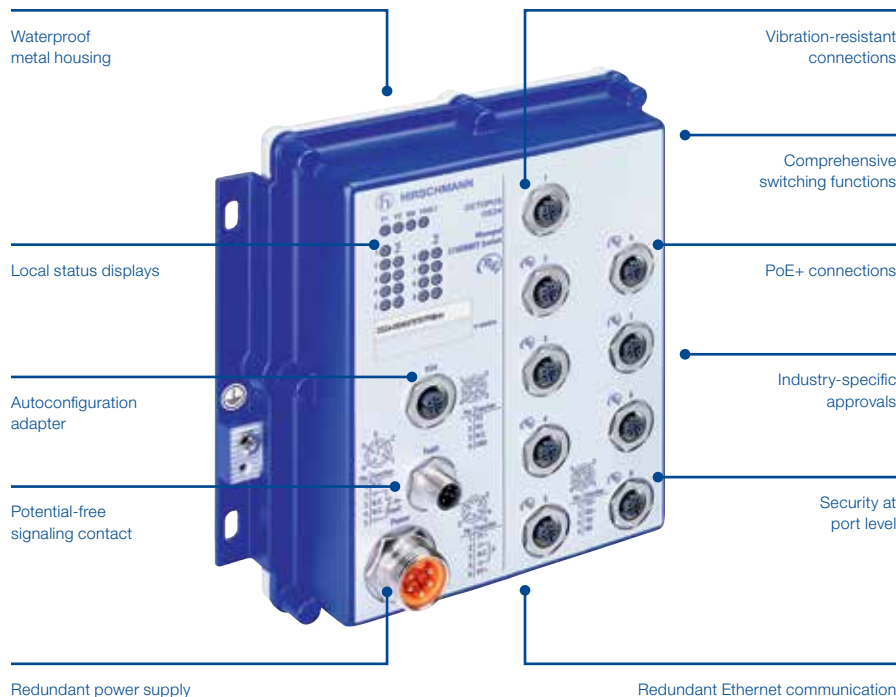


OCTOPUS IP67/IP54 System Accessories

OCTOPUS IP67/IP54 Connectivity Solutions		
Part No.	Order No.	Description
EF12RJ45 OCTOPUS	934 498-001	Bulkhead M12 to RJ45
ACA21-M12 EEC	943 913-002	ACA 21 auto configuration adapter for OCTOPUS managed switches
OCTOPUS Terminal Cable	943 902-001	M12 4-pin to Sub-D 9-pin terminal cable
EM12S 001L0200 OCTOPUS	934 578-001	2 m Fast Ethernet patch cord 2 x M12 D-code
EM12S 001L0500 OCTOPUS	934 578-002	5 m Fast Ethernet patch cord 2 x M12 D-code
EM12S 001L1000 OCTOPUS	934 578-003	10 m Fast Ethernet patch cord 2 x M12 D-code
EM12G 001L0100 OCTOPUS	942 081-001	1 m Gigabit Ethernet patch cord 2 x M12 X-code
EM12G 001L0200 OCTOPUS	942 081-002	2 m Gigabit Ethernet patch cord 2 x M12 X-code
EM12G 001L0500 OCTOPUS	942 081-003	5 m Gigabit Ethernet patch cord 2 x M12 X-code
EM12S OCTOPUS	934 445-001	Field attachable FE M12 connector D-code
EM12G OCTOPUS	942 083-001	Field attachable GE M12 connector X-code



Railway Approved Ethernet Data Cables		
Part No.	Order No.	Description
Ethernet Rail Transit Cable BE43769	942 037-001	500 m Railway Approved Ethernet Data Cable 100 Mbit/s, Cat 5e, AWG 22/19 Stranded
Ethernet Rail Gigabit Cable BE43800	942 075-500	500 m Railway Approved Ethernet Data Cable 1000 Mbit/s, Cat 5e, AWG 26/19 Stranded





Industrial Ethernet Media Cord Sets



Prior to the advent of Industrial Ethernet (standardized Ethernet communications via hardened networking infrastructure), office grade Ethernet cabling and connectors were the only available options. Unfortunately, these traditional media solutions proved unable to withstand the harsh environment of the factory floor or other industrial applications.

The Hirschmann product family of Industrial Ethernet Media Solutions eliminates these issues by combining standard RJ45 connection technology with the proven industrial Micro (M12) connection technology typically found in sensor/actuator machine applications - also available on all OCTOPUS, MICE, and MACH1000 Switches.

With the integration of Bonded-Pair technology by Belden, these industrial ethernet media cordsets have the highest level of signal quality making them one-of-a-kind..

TPE - Bonded-Pair, CAT 5e, 24 AWG Unshielded, 2- and 4-Pair		
Part No.	Configuration	Description
J424TPESTJT...M	RJ45 to RJ45	Industrial Ethernet CAT 5E, TPE unshielded, 2- and 4-pair, 24 AWG cable, bonded-pairs, stranded (7x32) tinned copper conductors, polyolefin insulation, and industrial grade sunlight and oil-resistant, teal jacket.
M224TPESTJT...M	RJ45 to M12	
M224TPESTMT...M	M12 to M12	
J224TPESTPT...M	RJ45 to M12 (Panel Receptacle)	

Example of completed part number: J424TPESTJT00.3M is a 00.3 meter cable.

TPE High-Flex - Bonded-Pair, CAT 5e, 24 AWG Unshielded, 2- and 4-Pair		
Part No.	Configuration	Description
J424THFSTJT...M	RJ45 to RJ45	Industrial Ethernet High-Flex CAT 5E, TPE High-Flex, unshielded, 2-and 4 pair, 24 AWG cable, stranded copper alloy conductors, polyolefin insulation, teal jacket. Warranted to 10 million flex cycles @ 20X OD and 1M flex cycles @ 10X OD.
M224THFSTJT...M	RJ45 to M12	
M224THFSTMT...M	M12 to M12	
J224THFSTPT...M	RJ45 to M12 (Panel Receptacle)	

Example of completed part number: J424THFSTJT00.3M is a 00.3 meter cable.

PVC - Bonded-Pair, CAT 5e, 24 AWG Unshielded, 2- and 4-Pair		
Part No.	Configuration	Description
J424PVCSTJT...M	RJ45 to RJ45	Industrial Ethernet CAT 5E, PVC unshielded, 2- and 4-pair, 24 AWG cable, bonded-pairs, stranded (7x32) tinned copper conductors, polyolefin insulation, and industrial grade sunlight and oil-resistant, teal jacket.
M224PVCSTJT...M	RJ45 to M12	
M224PVCSTMT...M	M12 to M12	
J224PVCSTPT...M	RJ45 to M12 (Panel Receptacle)	

Example of completed part number: J424PVCSTJT00.3M is a 00.3 meter cable.

TPE - Bonded-Pair, CAT 5e, 24 AWG Shielded, 2-Pair		
Part No.	Configuration	Description
J224TPETLJT...M	RJ45 to RJ45	Industrial Ethernet CAT 5E, TPE Shielded, 2-pair, 24 AWG cable, bonded-pairs, stranded (7x32) tinned copper conductors, polyolefin insulation, and industrial grade sunlight and oil-resistant, teal jacket.
M224TPETLJT...M	RJ45 to M12	
M224TPETLMT...M	M12 to M12	
J224TPETLPT...M	RJ45 to M12 (Panel Receptacle)	

Example of completed part number: J224TPETLJT00.3M is a 00.3 meter cable.

TPE High-Flex - Bonded-Pair, CAT 5e, 24 AWG Shielded, 2- and 4-Pair		
Part No.	Configuration	Description
J424THFTLJT...M	RJ45 to RJ45	Industrial Ethernet CAT 5E, TPE, High-Flex shielded, 2- and 4-pair, 24 AWG cable, bonded-pairs, stranded (7x32) tinned copper conductors, polyolefin insulation, and industrial grade sunlight and oil-resistant, teal jacket.
M224THFTLJT...M	RJ45 to M12	
M224THFTLMT...M	M12 to M12	
J224THFTLPT...M	RJ45 to M12 (Panel Receptacle)	

Example of completed part number: J424THFTLJT00.3M is a 00.3 meter cable.

Be Certain with Belden



Industrial Ethernet Media Cord Set Configurator

Hirschmann by Belden

J 2 24 PVC ST J T 00.3M

Connector Type 1 —————→

J = RJ45
M = M12

Number of Conductors (Pairs) —————→

2 = 2 pair
4 = 4 pair

Wire Gauge —————→

24 = 24 AWG cable

Cable Type —————→

PVC = PVC cable type - Bonded-Pair
TPE = TPE cable type - Bonded-Pair
THF = TPE High-Flex cable type - Bonded-Pair

Stranding/Shielding —————→

ST = Stranded, Unshielded
TL = Stranded, Shielded

Connector Type 2 —————→

J = RJ45
M = M12
P = M12 Panel Mount Receptacle

Cable Jacket Color —————→

T = Teal
B = Black*
G = Grey*
R = Red*
U = Blue*
N = Orange*

Cable Lengths —————→

00.3M = 0.3 meters	10.0M = 10 meters	60.0M = 60 meters
00.5M = 0.5 meters	12.0M = 12 meters	65.0M = 65 meters
01.0M = 1 meter	15.0M = 15 meters	70.0M = 70 meters
02.0M = 2 meters	20.0M = 20 meters	75.0M = 75 meters
03.0M = 3 meters	25.0M = 25 meters	80.0M = 80 meters
04.0M = 4 meters	30.0M = 30 meters	90.0M = 90 meters
05.0M = 5 meters	40.0M = 40 meters	
06.0M = 6 meters	50.0M = 50 meters	
07.0M = 7 meters	55.0M = 55 meters	

* Denotes special order. Minimum quantities apply.



RJ45 to RJ45



RJ45 to M12



M12 to M12



RJ45 to M12 (Panel Receptacle)



About Belden Bonded-Pair Cable

Cable Designed for Maximum Durability

The cable itself is also designed for maximum durability. We chose the finest technology on the market for our products – Bonded-Pairs from Belden. This patented technology absolutely ensures that Hirschmann media is the most rugged and dependable product available. A wide variety of cable and jacket construction is also available, including:

- Copper 2- and 4-pair, 24 AWG Bonded-Pairs
- Stranded construction
- Polyolefin insulation
- PVC or ultra-rugged TPE jackets

Non-Bonded-Pair versus Bonded-Pair Cable for Mission Critical Industrial Ethernet Applications

What is Bonded-Pair Technology?

Bonded-Pair technology was developed to ensure superior electrical performance in twisted pair Ethernet cable installations. This design physically bonds the individual insulated conductors together along their longitudinal axes which assure uniform conductor-to-conductor spacing and electrical integrity.

How Does Bonded-Pair Cable Help You?

1) Bonded-Pairs are less susceptible to noise. Cables with nonbonded-pairs tend to separate due to movement during installation, flexing or handling. Each pair can be pictured as an antenna that can receive or transmit signals.

Variations in non-bonded conductor-to-conductor spacing are cumulative and result in susceptibility to EMI and RFI that degrades signal transmission and network performance.

In addition, the cable will emit more noise that can adversely affect surrounding instrumentation. Bonded-Pairs lock conductor-to-conductor spacing in place. "Physicals Equals Electricals" is a statement that describes why Bonded-Pairs are critical.

2) Bonded-Pairs improve impedance and return loss performance. Impedance irregularities, due to non-bonded-pair separation, cause signal reflections (return loss). Any impedance variation is cumulative along the length of the cable. Bonded-Pairs maintain conductor-to-conductor spacing, thus improving impedance stability and return loss performance.

3) Minimizes pair-to-pair crosstalk. All twisted pair Ethernet cables have crosstalk or pair-to-pair coupling. Each pair has different twists/ inch (lay length) to minimize crosstalk. Lay length variation can increase the crosstalk that is cumulative down the length of the cable. Bonded-Pairs reduce crosstalk by minimizing lay length variation.

4) Improved termination quality. Bonded-Pairs maintain the electrical characteristics all the way into the connector. Bonded-Pairs increase installation consistency and signal integrity while reducing maintenance calls.

5) Superior mechanical robustness. Bonded-Pairs improve the pulling strength of a cable by up to 60% over non-bonded designs by equalizing the tension on each conductor. This is especially critical during the installation process, flexing or handling where the conductors may be severed due to the pulling forces.

TPE - High Flex (THF) Applications

Hirschmann by Belden is the first to offer High Flex Industrial Ethernet Cordsets with bonded pairs.

We warrantee these products (THF) to no less than 10 million flex cycles @ 20X OD and 1M flex cycles @ 10X OD.



Illustration 1: Example of Non-Bonded Pair. As cable is stretched and pulled, pairs begin to separate, causing a degradation in signal quality.

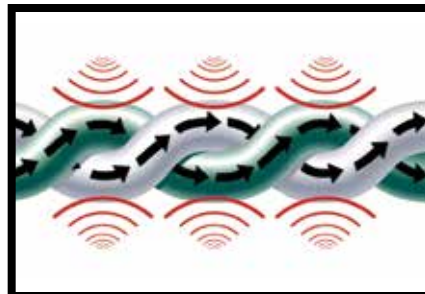


Illustration 2: Example of Bonded Pair. As cable is stretched and pulled, pairs stay intact.

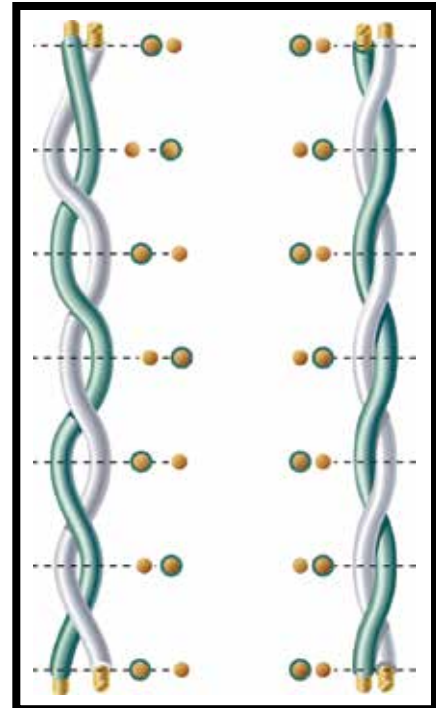


Illustration 3: Side-by-side comparison. Non-Bonded Pair versus Bonded-Pair cable.



MACH100 19" Industrial Workgroup Rack-Mount Switches

Fast Ethernet Uplink Ports, Gigabit Ethernet Uplink Ports, and 10 Gigabit Uplink Ports

The MACH100 series of switches are offered in versions with 8, 20, or 24 permanently installed 10/100 Mbit/s RJ45 Ethernet ports, or as modular switches with 8 permanent ports and slots for 2 additional 8-port media modules that are hot-swappable. All versions offer RJ45/SFP combo ports for connection to the network backbone. An all-Gigabit version with 24 10/100/1000 ports is also available.



The MACH104-16TX-PoEP models offer 16 TX ports that support PoE and PoE Plus. Versions of this switch are also available with two 10-Gigabit XFP uplinks or a redundant power supply as well as a fanless variant with an external power supply unit.



Technical Information

Product Description				
Type	MACH102 Series 102-8TP-x	MACH102 Series 102-24TP-x	MACH102 Series 104-20TX-x	MACH102 Series 104-16TX-PoEP-x
Available Ports	10-26	26	24	20-22
Construction				
Mounting	19" Control Cabinet			
Protection Class	IP20			
Dimensions (WxHxD)	448 x 44 x 310 mm			448 x 44 x 345 mm
Weight	appr. 3.75 kg	appr. 4 kg	appr. 4.4 kg	appr. 4.5 kg
Ambient Conditions				
Operating Temperature	0°C to +50°C			
Storage/Transport Temperature	-20°C to +85°C			
Relative Humidity (non-condensing)	10% to 95%			
Conformal Coating	n/a			
Interfaces				
V.24 Interface	1 x RJ11 Socket			
USB Interface	1 x USB (ACA21-USB Adapter)			
Power Requirements				
Operating Voltage	110 to 240 V AC			
PoE (802.3af) Ports Supported	Yes (variant applicable)			16 ports
PoE Plus (802.3at) Ports Supported	Yes (variant applicable)			8 ports
Regulatory Approvals				
Safety of Industrial Control Equipment	cUL508			Pending
Hazardous Locations	n/a			
Germanischer Lloyd	n/a			
Transportation	n/a			
Railway (norm)	n/a			
Substation	n/a			
Reliability				
MTBF Range	21.6 to 26.5 years	19.1 to 22.8 years	13.7 to 24 years	14.6 to 21.4 years
Warranty	5 years standard			

NOTE: These are the prominent technical specifications. For complete technical specifications visit: www.hirschmann.com



MACH100 19" Industrial Workgroup Rack-Mount Switch Configurations

Fast Ethernet Uplink Ports, Gigabit Ethernet Uplink Ports, and 10 Gigabit Uplink Ports



Modular: MACH100 Fast/Gigabit Industrial Workgroup Switches

Part No.	Order No.	Ports/Functions
MACH102-8TP	943 969-001	8 x 10/100 BASE-TX RJ45 ports, 2 x GE combo ports (100 or 1000 Mbit/s SFPs) and 2 x 8 port media module slots
MACH102-8TP-R	943 969-101	Same as 943 969-001, but with redundant 110/220 V AC power supply

Fixed Ports: MACH100 Fast/Gigabit Industrial Workgroup Switches

Part No.	Order No.	Ports/Functions
MACH102-8TP-F	943 969-201	8 x 10/100 BASE-TX RJ45 ports and 2 x GE combo ports (100 or 1000 Mbit/s SFPs)
MACH102-8TP-FR	943 969-301	Same as 943 969-201, but with redundant 110/220 V AC power supply
MACH102-24TP-F	943 969-401	24 x 10/100 BASE-TX RJ45 ports and 2 x GE combo ports (100 or 1000 Mbit/s SFPs)
MACH102-24TP-FR	943 969-501	Same as 943 969-401, but with redundant 110/220 V AC power supply

Fixed Ports: MACH100 Gigabit Industrial Workgroup Switches

Part No.	Order No.	Ports/Functions
MACH104-20TX-F	942 003-001	20 x GE TX Ports, 4 x GE RJ45/SFP combo ports (100 or 1000 Mbit/s SFPs)
MACH104-20TX-FR	942 003-101	Same as 942 003-001, but with redundant power supply

Fixed Ports: MACH100 Gigabit Industrial Workgroup Switches with PoE

Part No.	Order No.	Ports/Functions
MACH104-20TX-F-4PoE	942 003-201	Same as MACH104-20TX-F, 4 of the 20 10/100/1000 ports are 802.11af PoE

Fixed Ports: MACH100 Gigabit Industrial Workgroup Switches with PoE-Plus

Part No.	Order No.	Ports/Functions
MACH104-16TX-PoEP	942 030-001	20 Ports in total; 16 x (10/100/1000 BASE-TX, RJ45) PoEPlus and 4 Gigabit Combo Ports (10/100/1000 BASE-TX, RJ45 or 100/1000 BASE-FX, SFP)
MACH104-16TX-PoEP -R	942 026-001	Same as MACH104-16TX-PoEP but with redundant power supply
MACH104-16TX-PoEP -E	942 027-001	Same as MACH104-16TX-PoEP but fanless without power supply
MACH104-16TX-PoEP +2X	942 031-001	22 Ports in total; 16 x (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
MACH104-16TX-PoEP +2X -R	942 033-001	Same as MACH104-16TX-PoEP +2X but with redundant power supply
MACH104-16TX-PoEP +2X -E	942 032-001	Same as MACH104-16TX-PoEP +2X but fanless without power supply

Media Modules

Part No.	Order No.	Ports/Functions
M1-8TP-RJ45	943 970-001	8 x 10/100BASE-TX, RJ45 media module
M1-8TP-RJ45 PoE	942 028-001	8 x 10/100BASE-TX, RJ45 media module PoEPlus
M1-8MM-SC	943 970-101	8 x 100BASE-FX MM, SC media module
M1-8SM-SC	943 970-201	8 x 100BASE-FX SM, SC media module
M1-8SFP	943 970-301	8 x 100BASE-X SFP media module

NOTE: SFPs need to be purchased separately.





MACH1000 19" Über-Rugged™ Rack-Mount Switches

Fast Ethernet Uplink Ports, Gigabit Ethernet Uplink Ports, and Full Gigabit Uplink Ports

The MACH1000 is available in a 24-port custom configurable design with two or four additional Gigabit uplink (RJ45 and/or SFP for fiber) and PoE ports. The MACH1000 is also available in an all-Gigabit version, offering 16 10/100/1000 RJ45/SFP combo ports to provide countless copper/fiber combinations. These Über-Rugged™ switches are available with Layer 2 or Layer 3 capabilities. The fan-less design and extremely efficient components are optimized for minimal heat generation and high MTBF (mean time between failure). The switches offer sub-10 second boot times and select variants offer PTP IEEE 1588V2 with BCand TC, precision 30 ns.



Technical Information

Product Description			
Type	MAR1020 Series 1x2x	MAR1030 Series 1x3x	MAR1040 Series 1x4x
Switching/Routing	Software Version Layer 2	Software Version Layer 2	Software Version Layer 2 or 3
Available Ports	2-24	2-28	16 (Full Gigabit)
Construction			
Mounting	19" Control Cabinet		
Protection Class	IP30		
Dimensions (WxHxD)	445 x 44 x 308 mm		
Weight	appr. 5 kg		
Ambient Conditions			
Operating Temperature	0°C to +60°C, -40°C to +85°C, or -40°C to +85°C (inclusive Conformal Coating)		
Storage/Transport Temperature	-40°C to +85°C		
Relative Humidity (non-condensing)	10% to 95%		
Conformal Coating	Yes (variant dependent)		
Interfaces			
V.24 Interface	1 x RJ11 Socket		
USB Interface	1 x USB (ACA21-USB Adapter)		
Power Requirements			
Operating Voltage	24/36/49 V DC or 110/250 V DC/110/230 V AC		
PoE (802.3af) Ports Supported	Yes (variant applicable)		
PoE Plus (802.3at) Ports Supported	n/a		
Regulatory Approvals			
Safety of Industrial Control Equipment	cUL508		
Hazardous Locations	Pending	Pending	cULus ISA12.12.01
Germanischer Lloyd	Germanischer Lloyd		
Transportation	NEMA TS2 (non-PoE models)		
Railway	EN 50121-4, 50155 (non-PoE models)	EN 50121-4, 50155 (non-PoE models)	EN 50121-4
Substation	IEC 61850-3, IEEE 1613 (non-PoE models)		
Reliability			
MTBF Range	21.5 to 38.9 years	20 to 47.6 years	27.1 to 27.8 years
Warranty	5 years standard		

NOTE: These are the prominent technical specifications. For complete technical specifications visit: www.hirschmann.com

MACH1000 19" Über-Rugged™ Rack-Mount Switch Configurations

Fast Ethernet Uplink Ports: [MAR1020-](#) | [MAR1022-](#) | [MAR1120-](#) | [MAR1122](#)

Configurator



MAR1020-99 **MMMMMMVVZZTTTTTTTTTT99** **U** **G** **C** **H** **P** **E** **H** **XX.X**

Design/Models

- MAR1020** = Fast Ethernet uplink
- MAR1022** = Fast Ethernet uplink with 4 ports PoE
- MAR1120** = Fast Ethernet uplink with ports at the back (20 ports max. 100 meg)
- MAR1122** = Fast Ethernet uplink with ports at the back and 4 ports PoE (20 ports max.100 meg)

Gigabit Ethernet Ports

99 = none (not present)

Fast Ethernet Port Configurations (1 to 24 Ports)

- | | |
|--|---|
| MM = 2 x Multimode 100 Mbit/s SC | RR = 2 x Twisted Pair (TX) 10/100 Mbit/s M12 |
| VV = 2 x Singlemode 100 Mbit/s SC | FF = 2 x Multimode 10 Mbit/s ST |
| ZZ = 2 x SFP Slot 100 Mbit/s SFP | JJ = 2 x Multimode 100 Mbit/s MTRJ |
| TT = 2 x Twisted Pair (TX) 10/100 Mbit/s RJ45 | UU = 2 x Singlemode 100 Mbit/s ST |
| 99 = none (not present) | LL = 2 x Singlemode LH 100 Mbit/s SC |
| | GG = 2 x Singlemode LH+ 100 Mbit/s SC |

Temperature Range Options

- | | |
|------------------------------|------------------------------|
| S = 0°C up to +60°C | F = -40°C up to +85°C |
| U = -40°C up to +85°C | inclusive Conformal Coating |

Power Supply 1 (options)

- | | |
|---|--|
| C = 24/36/48 VDC (spring clip) | L = 24/36/48 V DC (plug-in connector) |
| G = 110/250 V DC, 110/230 V AC (spring clip) | M = 110/250 V DC/110/230 V AC (plug-in connector) |

Power Supply 2 (options)

- C** = 24/36/48 V DC (spring clip)
- G** = 110/250 V DC/110/230 V AC (spring clip)
- 9** = none (not present)

Approvals

H = cUL508, cUL1604 Class 1 Div2, German Lloyd, IEC 61850-3, IEEE 1613, EN 50121

Software Version (see page 43 for additional Management Software Functionality details)

P = Layer 2 Professional: extended diagnostics, redundancy and security features

Configuration

- | | |
|--------------------------------------|-----------------------------------|
| H = Standard | P = PROFINET (pre-setting) |
| E = Ethernet/IP (pre-setting) | |

OEM Type

- | | |
|---------------------|------------------------------|
| H = Standard | X = Customer Specific |
|---------------------|------------------------------|

Software Release

XX.X = Current Software Release

NOTE: The last three part number categories (Configuration, OEM Type and Software Release) are optional.



MACH1000 19" Über-Rugged™ Rack-Mount Switch Configurations

Gigabit Ethernet Uplink Ports: [MAR1030-](#) | [MAR1032-](#) | [MAR1130-](#) | [MAR1132](#)

Configurator



MAR1030-CC MMMMMMVVZZTTTTTTTTTT99 U C C H P H H XX.X

Design/Models

- MAR1030** = Gigabit Ethernet uplink
- MAR1032** = Gigabit Ethernet uplink with 4 ports PoE
- MAR1130** = Gigabit Ethernet uplink with ports at the back (20 ports max.100 meg)
- MAR1132** = Gigabit Ethernet uplink with ports at the back and 4 ports PoE (20 ports max.100 meg)

Gigabit Ethernet Ports

- CC** = 2 ports combo (2 x 10/100/1000TX or 2 x GE SFP)
- 40** = 4 ports GE SFP
- 4T** = 4 ports 10/100/1000TX
- 0T** = 2 ports GE SFP and 2 ports 10/100/1000TX

Fast Ethernet Port Configurations (1 to 24 Ports)

- MM** = 2 x Multimode 100 Mbit/s SC
- VV** = 2 x Singlemode 100 Mbit/s SC
- ZZ** = 2 x SFP Slot 100 Mbit/s SFP
- TT** = 2 x Twisted Pair (TX) 10/100 Mbit/s RJ45
- 99** = none (not present)
- RR** = 2 x Twisted Pair (TX) 10/100 Mbit/s M12
- FF** = 2 x Multimode 10 Mbit/s ST
- JJ** = 2 x Multimode 100 Mbit/s MTRJ
- UU** = 2 x Singlemode 100 Mbit/s ST
- LL** = 2 x Singlemode LH 100 Mbit/s SC
- GG** = 2 x Singlemode LH+ 100 Mbit/s SC

Temperature Range Options

- S** = 0°C up to +60°C
- U** = -40°C up to +85°C
- F** = -40°C up to +85°C inclusive Conformal Coating

Power Supply 1 (options)

- C** = 24/36/48 V DC (spring clip)
- G** = 110/250 V DC/110/230 V AC (spring clip)
- L** = 24/36/48 V DC (plug-in connector)
- M** = 110/250 V DC/110/230 V AC (plug-in connector)

Power Supply 2 (options)

- C** = 24/36/48 V DC (spring clip)
- G** = 110/250 V DC/110/230 V AC (spring clip)
- 9** = none (not present)

Approvals

- H** = cUL508, cUL1604 Class 1 Div2, German Lloyd, IEC 61850-3, IEEE 1613, EN 50121

Software Version (see page 43 for additional Management Software Functionality details)

- P** = Layer 2 Professional: extended diagnostics, redundancy and security features

Configuration

- H** = Standard
- E** = Ethernet/IP (pre-setting)
- P** = PROFINET (pre-setting)

OEM Type

- H** = Standard
- X** = Customer Specific

Software Release

- XX.X** = Current Software Release

NOTE: The last three part number categories (Configuration, OEM Type and Software Release) are optional.

MACH1000 19" Über-Rugged™ Rack-Mount Switch Configurations

Full Gigabit Ethernet Switches: **MAR1040** - | **MAR1042** - | **MAR1140** - | **MAR1142**

Configurator



MAR1040 - **4C4C4C4C999** **S** **M** **L** **H** **R** **H** **H** **XX.X**

Design/Models

- MAR1040** = Full Gigabit Ethernet Switch
- MAR1042** = Full Gigabit Ethernet Switch with PoE
- MAR1140** = Full Gigabit Ethernet Switch with Ports on the rear
- MAR1142** = Full Gigabit Ethernet Switch with Ports on the rear, PoE

Gigabit Ethernet Ports

4C4C4C4C999 = 16 RJ45/SFP combo ports (supports 100 and 1000 Mbit/s SFPs)

Temperature Range Options

- S** = Standard, 0°C up to +60°C
- T** = Extended, -40°C up to +70°C
- E** = Extended, -40°C up to +70°C inclusive Conformal Coating

Power Supply 1 (options)

- L** = 24/36/48 V DC (plug-in connector)
- M** = 110/250 V DC, 110/230 V AC (plug-in connector)

Power Supply 2 (options)

- L** = 24/36/48 V DC (plug-in connector)
- M** = 110/250 V DC, 110/230 V AC (plug-in connector)
- 9** = none (not present)

Approvals

- H** = cUL508 (pending), cUL1604 Class 1 Div 2 (pending), GL (pending), EN 50121-4, EN 50155 (pending), NEMA TS, IEC 61850-3, IEEE 1613

Software Version (see page 43 for additional Management Software Functionality details)

- P** = Layer 2 Professional: extended diagnostics, redundancy and security features
- R** = Layer 3 Professional: Routing capabilities

Configuration

- H** = Standard

OEM Type

- H** = Standard

Software Release

XX.X = Current Software Release

NOTE: The last three part number categories (Configuration, OEM Type and Software Release) are optional.



MACH4000 Gigabit Backbone Layer 2/3 Rack-Mount Switches

Fast Ethernet Ports, Gigabit Ethernet Uplink Ports, and 10 Gigabit Uplink Ports

The MACH4000 series of high density managed switches is capable of providing as many as 48 Gigabit ports and 3 10-Gigabit ports. Each model comes standard with over 8–16 ports and can be configured with as many as 32 additional ports. Choose from 5 MACH4000 models that allow either 2 or 4 hot-swappable media modules.

NOTE: A fan module is included in each chassis. For a complete switch, please be sure to specify media modules and power supply separately.




Technical Information


Product Description	
Type	MACH4000 Series
Switching/Routing	Software Version Layer 2 or 3
Available Ports	8 to 51
Construction	
Mounting	19" Control Cabinet
Protection Class	IP20
Dimensions (WxHxD)	480 x 88 x 435 mm
Weight	7.5 kg
Ambient Conditions	
Operating Temperature	0°C to +60°C
Storage/Transport Temperature	-25°C to +70°C
Relative Humidity (non-condensing)	10% to 95%
Conformal Coating	n/a
Interfaces	
V.24 Interface	1 x RJ11 Socket
USB Interface	1 x USB (ACA21-USB Adapter)
Power Requirements	
Operating Voltage	24 V DC or 48 V DC or 110-240 V AC (variant applicable)
PoE (802.3af) Ports Supported	Yes (variant applicable)
PoE Plus (802.3at) Ports Supported	n/a
Regulatory Approvals	
Safety of Industrial Control Equipment	cUL508
Hazardous Locations	n/a
Germanischer Lloyd	Germanischer Lloyd
Transportation	n/a
Railway (norm)	n/a
Substation	n/a
Reliability	
MTBF Range	11.1 to 18.9 years
Warranty	5 years standard


NOTE: These are the prominent technical specifications. For complete technical specifications visit: www.hirschmann.com



MACH4000 Power Supplies and Accessories

MACH4000 Internal Power Supplies			
Product	Part No.	Order No.	Voltage
	M4-S-AC/DC 300W	943 870-001	110 – 240 V AC internal power module (redundancy in combination with M4-POWER chassis and power supply)
	M4-S-24VDC 300W	943 871-001	24 V DC internal power module (redundancy power input)
	M4-S-48VDC 300W	943 872-001	48 V DC internal power module (redundancy power input)

MACH4000 External Power Supplies			
Product	Part No.	Order No.	Voltage
	M4-POWER	943 874-001	Rack-mounted external power chassis. Requires at least one M4-P power supply (more for redundant power), with a maximum of 3 power supplies
	M4-P AC/DC 300W	943 875-001	110 – 240 V AC power module for use with external M4-POWER chassis
	M4-P DC 24V 300W	943 876-001	24 V DC power module for use with external M4-POWER chassis (redundant power input)
	M4-P DC 48V 300W	943 877-001	48 V DC power module for use with external M4-POWER chassis (redundant power input)
	M4-POWERCABLE II	943 922-001	Spare power cable to connect M4-POWER and MACH4002, 1 m

MACH4000 Accessories			
Product	Part No.	Order No.	Voltage
	M4-AIR	943 869-001	Fan module (included with chassis), has 4 redundant fans with fault notification
	M4-AIR-L	942 005-001	Fan module for MACH4002 chassis, four redundant fans with reduced speed, lower noise level, only for 0°C to +40°C
	M4-RACKMOUNT-50mm	943 951-001	19" fixing brackets offer 50 mm more space in the front of the switch for cables
	M4-RACKMOUNT	943 951-101	19" spare fixing brackets


Management Software Functionality

L2 Basic	L2 Enhanced	L2 Professional	L3 Enhanced	L3 Professional		
		●	●	●	DHCP server per port	Plug & Work
		●	●	●	Port monitor	
		●	●	●	Multiple stored firmware versions	
		●	●	●	Automatic configuration	
	●	●	●	●	IP address conflict detection	
●	●	●	●	●	External flash memory	
●	●	●	●	●	DHCP relay agent, option 82	Security
●	●	●	●	●	Automatic configuration undo	
		●	●	●	IEEE 802.1x	
		●	●	●	SSH	
		●	●	●	SNMP v2c, v3 encryption	
	●	●	●	●	Port security IP/MAC, multiple addresses	
	●	●	●	●	Telnet	Switching
	●	●	●	●	Port security MAC	
	●	●	●	●	Port security IP	
●	●	●	●	●	SNMP v2c, v3 (password encryption)	
		●	●	●	GVRP	
		●	●	●	Multicast GMRP – 802.1D	
		●	●	●	Optimized for video multicasting	Redundancy
		●	●	●	Voice VLAN	
		●	●	●	LLDP MED	
	●	●	●	●	Double VLAN tagging	
	●	●	●	●	Broadcast, unicast, multicast limiter	
	●	●	●	●	Static VLAN, Q-MIB – 802.3ac, 802.1Q	
●	●	●	●	●	Multicast IGMP querier	Pro-file
●	●	●	●	●	Multicast IGMP snooping	
●	●	●	●	●	Port priority – 802.1D/p	
		●	●	●	Link aggregation – 802.3ad	
	●	●	●	●	MSTP	
	●	●	●	●	Redundant network coupling	
●	●	●	●	●	RSTP and MRP in parallel	Routing
●	●	●	●	●	HIPER-Ring redundancy manager	
●	●	●	●	●	HIPER-Ring	
●	●	●	●	●	MRP-Ring	
●	●	●	●	●	RSTP – 802.1w	
	●	●	●	●	PROFINET Profile	
	●	●	●	●	EtherNet/IP Profile	Diagnostics
			●	●	OSPF	
			●	●	RIP v1/v2	
			●	●	Static routing	
			●	●	VRRP, HiVRRP (<500 ms) router redundancy	
			●	●	Layer 3 ACL	
		●	●	●	DVMRP/PIM DM/PIM SM multicast routing	Diagnostics
		●	●	●	Text configuration file	
		●	●	●	Cable diagnostics TX	
	●	●	●	●	Automatic configuration check	
	●	●	●	●	Error Diagnostics: Port Wizard	
	●	●	●	●	Hub functionality (disable learning)	
	●	●	●	●	Syslog	Diagnostics
●	●	●	●	●	Log file	
●	●	●	●	●	Port mirroring	
●	●	●	●	●	Topology discovery 802.1ad	



Wireless Ethernet Access Point/Clients

OpenBAT Series

The new family of OpenBAT hardware is the latest generation of WLAN devices, representing a new evolutionary stage in WLAN technology, increasing WLAN network speed by up to 50% compared to the BAT300 devices. Designed, developed and patented by Hirschmann™, the OpenBAT platform allows you to select the device you need from a nearly unlimited range of interfaces, power supplies, housing types and specific certifications. The platform offers additional flexibility by allowing you to design a wireless network by either using the OpenBAT devices as standalone Access Point or managing the network centrally by the BAT-Controller.

The new BAT generation delivers up to 30% cost savings and reduces the installation complexity and time as formerly external accessories, including ESD protection, power supply and fibre ports are now directly integrated into the OpenBAT hardware. Furthermore, the ESD discharge protection guarantees a longer lifetime of radios, delivering further cost savings.



Clear Space® Wireless

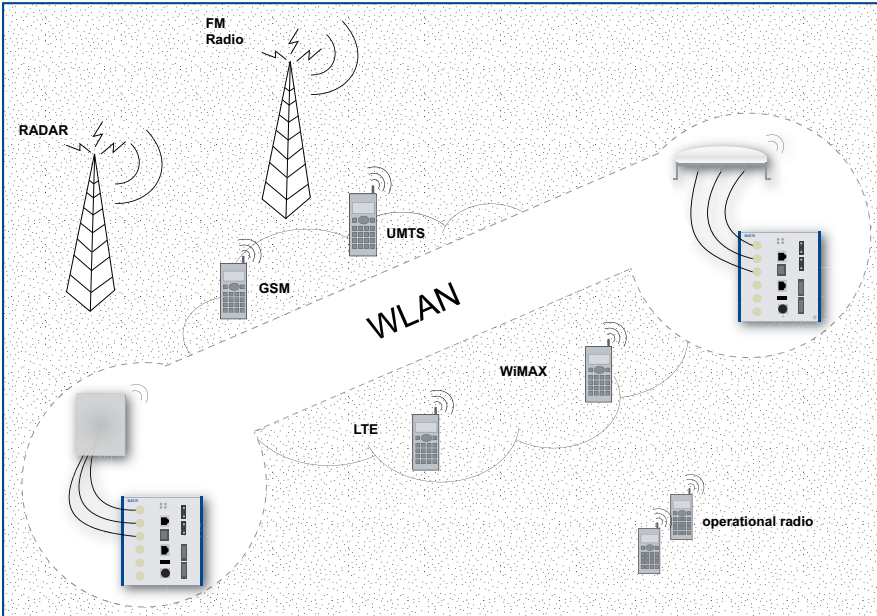
The application of bandpass filters helps to eliminate all interference caused by competing radio signals. The resulting Clear Space® wireless delivers greater transmission stability over longer distances without interruptions. The highest performance speed of 450 Mbit/s facilitates new applications such as HD video streaming.



Product Features

- Extended temperature range
- Enhanced shock and vibration stability
- New CPU platform with Gigabit Ethernet support
- Selectable type of power supply fits the device to the application
- Supporting all types of certifications needed for vertical applications
- Newest technology designed for harsh and demanding industrial environment
- Long lasting devices, high MTBF guarantee low failure rate
- Best radio technology enabling new applications and reliable connections
- Redundant design enables high availability and network stability
- Flexibility to either run with or without the BAT-Controller
- Powerful operating system that guarantees solutions in every application
- Supporting highest security standards for guaranteed safe and reliable networking

Wireless Ethernet Access Point/Clients



Clear Space® technology delivers reliable radio connections, even in locations such as ports, where many competing radio technologies are used. The new patented Hirschmann radios will not be affected, so that for instance a video transmission over WLAN supervising the building of a ship will remain stable and high quality. Overall, video installation costs are lower and less complex. This also applies to installations in trains. Hirschmann™ BAT devices can withstand electrical discharges.

Technical Information

Product Description	
Type	OpenBAT
Description	Rugged wireless LAN access point and/or client for use in industrial environments. Robust metal housing for mounting on DIN rails.
Available Ports	One or two WLAN interfaces, IEEE 802.11a/b/g/n, one or two Gigabit LAN ports, Power over Ethernet, GigabitCombo Port with optional SFP
Construction	
Mounting	DIN Rail (BAT-R), Wall and Mast (BAT-F)
Protection Class	IP30, IP67
Dimensions (WxHxD)	120/150 x 136 x 120 mm (BAT-R), ~ 311 x 322 x 75 mm (BAT-F)
Ambient Conditions	
Operating Temperature	0°C to +60°C, -40°C to +70°C (with and without conformal coating) selectable
Storage/Transport Temperature	-40°C to +85°C
Relative Humidity (non-condensing)	mind. 10% to 95%
Radio Technology	
Antenna Connector	3 x MiMo antenna connectors, Reverse SMA socket (BAT-R), N-socket (BAT-F)
Frequency Band	Supports 2.4 GHz and 5 GHz: 2400 to 2483.5 MHz (ISM) and 5170 to 5850 MHz
Power Requirements	
Operating Voltage	Different types of power supplies selectable, 24 V DC, 48 V DC, 90 to 230 V AC, 48 to 320 V DC
Current Consumption at 24 V DC	9 W
Regulatory Approvals	
Safety of Industrial Control Equipment	EN 60950-1, EN 6950-22
Radio	EN 300 328 (2.4 GHz), EN 301 893 (5 GHz), EN 301 489-1, EN 301 489-17
Environmental	EN 50155, EN 61850, Atex Zone II, Class 1 Div 2
For Use in Vehicles and Cars	E1
Reliability	
Warranty	5 years standard

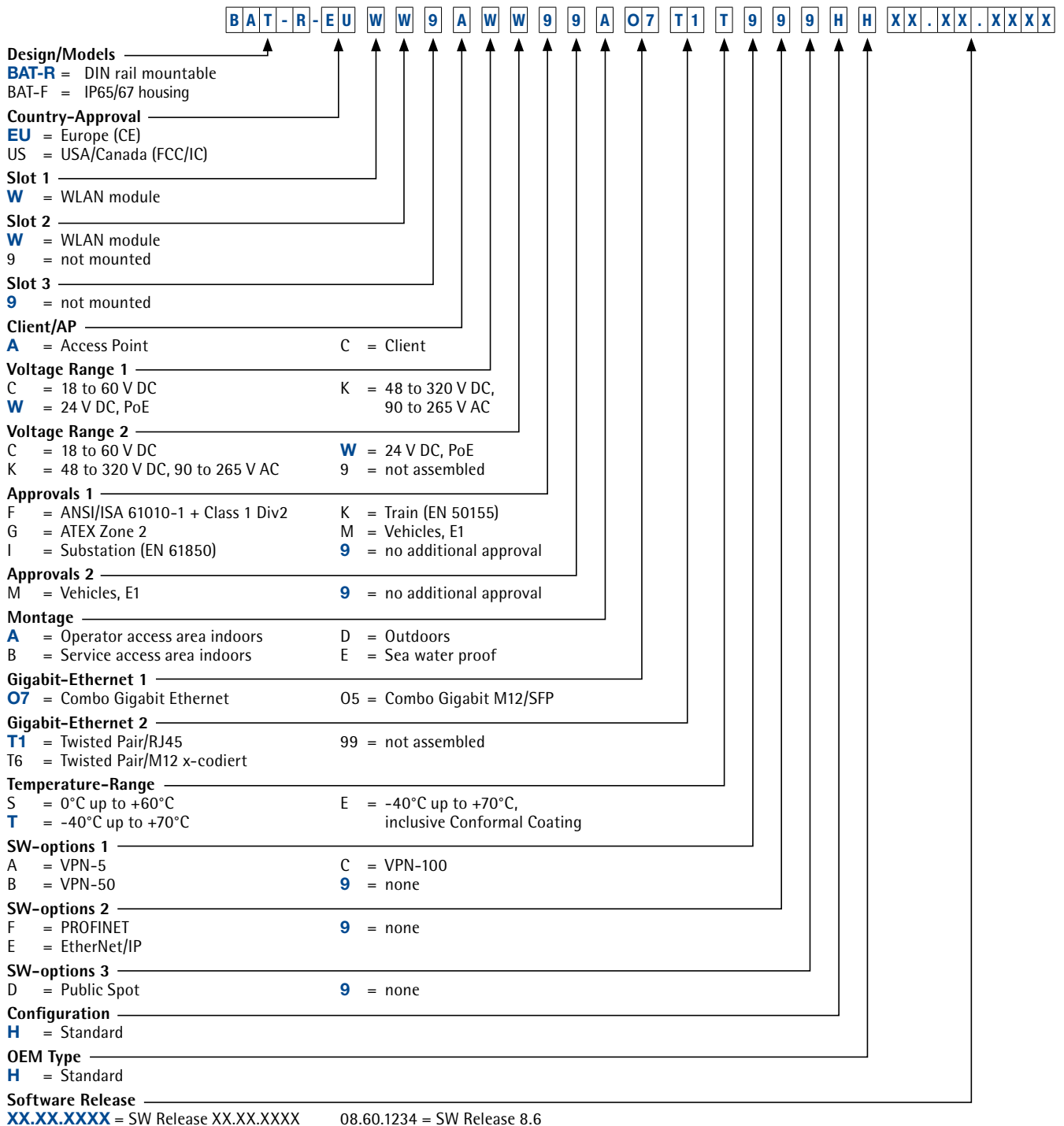
NOTE: These are the prominent technical specifications. For complete technical specifications visit: www.hirschmann.com



OpenBAT Configurations

BAT-R DIN Rail Mountable/BAT-F IP65/67 Housing

Configurator





Wireless Ethernet Access Clients



BAT-C

BAT-C WLAN Client delivers a wireless solution that is both practical and cost effective. The client was designed for industrial use and is able to operate within an extended temperature range. Its IP67 housing and 24 V power supply make it suitable for most industrial environments and can be used together with Belden cables; switches; routers; and connectors.

Product Features

- WLAN according to 802.11n, one antenna connector
- Power supply 24 V
- Integrated web interface for basic configurations
- Max. security level is WPA2/PSK
- Fast roaming support

Technical Information

Product Description	
Type	BAT-C
Description	Industrial Wireless LAN Client for 2.4 GHz and 5 GHz operation
Available Ports	1 x 802.11n/a/b/g/h/i; 1 x 24 V DC; 1 x 100 Mbit/s Ethernet (M12)
Order No.	942 072-001
Construction	
Mounting	Wall or table mounting
Protection Class	IP67
Dimensions (WxHxD)	approx. 11 x 6 x 5 cm
Ambient Conditions	
Operating Temperature	-40°C to +70°C
Storage/Transport Temperature	-40°C to +85°C
Relative Humidity (non-condensing)	5% to 90%
Radio Technology	
Antenna Connector	N-Type female
Frequency Band	2.4 GHz and 5 GHz
Power Requirements	
Operating Voltage	9 to 30 V
Current Consumption at 24 V DC	max. 81 mA
Regulatory Approvals	
Safety of Industrial Control Equipment	EN 60950-1:2006 and/or IEC 60950-1:2005 (2nd Edition)
Radio	R&TTE (Europe), FCC/CFR 47 part 15; IC (Industrie Canada)
Environmental	R&TTE Directive 1999/5/EC <ul style="list-style-type: none"> • EN 300 328 V1.7.1 (2006-10), EN 301 893 V1.5.1 • EMC: EN 301 489-1 V1.8.1 (2008-04), EN 301 489-17 V2.1.1 (2009-05), EN 61000-6-2 (2005)
For Use in Vehicles and Cars	E1/e1
Reliability	
Warranty	5 years standard

NOTE: These are the prominent technical specifications. For complete technical specifications visit: www.hirschmann.com



Wireless Ethernet Access Points/Clients



BAT54/300 Series

BAT54 products support WLAN standards IEEE 802.11a/b/g/h, and operate at up to 108 Mbit/s (raw data rate).

BAT300 devices support WLAN standards IEEE 802.11a/b/g/h/n and IEEE 802.11n, and they operate at up to 300 Mbit/s (raw data rate).

BAT-Rail devices are supplied in a metal enclosure for mounting on DIN rails in automation or vehicle applications.

BAT-F devices are supplied in IP65/67 metal housings. They are designed for field-level applications or harsh industrial environments.

For complete technical specifications visit: www.hirschmann.com

BAT-Planner and BAT-Planner Pro

Software Suite that Provides Effective Support for Planning WLAN Projects



BAT-Planner

Planning software to plan WLAN projects quickly and easily. Using the free BAT-Planner you can draw up a rough plan of your industry-standard network quickly and reliably without needing to have any profound WLAN knowledge. It provides you quickly and easily with the material list of all the components you need for your solution, comprising access points, antennas, cables and lightning protection. The plan and the material list are produced in the form of an overview and can thus be used as the basis for planning your WLAN project. That gives you an easy and reliable start to a project, and you can implement the next steps together with Hirschmann or a Hirschmann partner.

BAT-Planner Pro

Planning software for professional detailed planning of your network. BAT-Planner pro allows detailed calculation of the coverage among other things, taking account of wall damping, interference, antenna adjustment and channel distribution.

BAT-Planner 
The Hirschmann™ Wireless Planning Suite



Wireless Ethernet Antennas

BAT Series



BAT-ANT-N-6ABG-IP65



BAT-ANT-N-MiMoDB-5N-IP65



BAT-ANT-N-MiMo5-9N-IP65



BAT-ANT Protector

BAT Series, Dual-Frequency Antennas/802.11a/b/g/n (2.4 GHz and 5 GHz)			
Part No.	Order No.	Type	Standards
BAT-ANT-N-6ABG-IP65	943 981-004	Dual Band Omni-Directional	802.11a/b/g
BAT-ANT-N-MiMoDB-5N-IP65	943 981-012	Dual Band Omni-Directional, 2.4 GHz 3.5 dBi, 5 GHz 5.5 dBi, MiMo	802.11a/b/g/n

BAT Series, Antennas/802.11a/n (5 GHz)			
Part No.	Order No.	Type	Standards
BAT-ANT-N-5A-IP65	943 981-003	5 GHz Omni-Directional, 5 dBi gain	802.11a
BAT-ANT-N-9A-DS-IP65	943 981-010	5 GHz, Directional antenna, 8 dBi gain w/polarization diversity	802.11a/n
BAT-ANT-N-MiMo5-9N-IP65	943 981-013	5 GHz, Directional antenna, 9 dBi gain, MiMo	802.11a/n
BAT-ANT-N-18A-IP65	943 981-006	5 GHz, Directional antenna, 18 dBi gain	802.11a
BAT-ANT-N-23A-V-IP65	943 981-007	5 GHz, Directional antenna, 23 dBi gain	802.11a
BAT-ANT-N-23A-VH-IP65	943 981-008	5 GHz, Directional antenna, 23 dBi gain w/polarization diversity	802.11a/n

BAT Series, Antennas/802.11b/g/n (2.4 GHz)			
Part No.	Order No.	Type	Standards
BAT-ANT-N-6G-IP65	943 981-002	2.4 GHz Omni-Directional, 6 dBi gain	802.11b/g
BAT-ANT-N-8G-DS-IP65	943 981-009	2.4 GHz Directional, 8 dBi gain w/polarization diversity	802.11b/g/n
BAT-ANT-N-14G-IP23	943 981-005	2.4 GHz Directional, 14 dBi gain	802.11b/g
BAT-ANT-N-LC-G-50m-IP65	943 981-001	2.4 GHz Leaky Coax, 50 meter (1 x N connector)	802.11b/g
BAT-ANT-N-LC-G-100m-IP65	943 981-101	2.4 GHz Leaky Coax, 100 meter (2 x N connectors)	802.11b/g

BAT Series, Accessories			
Part No.	Order No.	Type	Standards
BAT54-F MAST MOUNT	943 966-001	Mast Mounting Kit for BAT (IP67) products	-
BAT-CLB-2 N m-m	943 903-513	Antenna cable 2 m, N male to N male	802.11a/b/g/n
BAT-CLB-2 N m-f	943 903-514	Antenna cable 2 m, N male to N female	802.11a/b/g/n
BAT-CLB-5 N m-f	943 903-516	Antenna cable 5 m, N male to N female	802.11a/b/g/n
BAT-CLB-15 N m-f	943 903-515	Antenna cable 15 m, N male to N female	802.11a/b/g/n
BAT-PIGTAIL	943 903-360	Used to adapt BAT Rail products to N-style connector	802.11a/b/g/n
BAT-ANT Protector m-f	943 903-373	RF Surge Arrestor, N male to N female	802.11a/b/g/n
BAT-LAN Protector IP68	943 903-374	IP68 RF Surge arrestor, N male to N female	802.11a/b/g/n



Wireless Local Area Network (WLAN) Controllers




Wireless Local Area Network (WLAN) applications are becoming more prevalent in the field of industrial automation. The new IEEE 802.11n standard enables data rates of up to 300 Mbit/s while simultaneously extending the range and stability of wireless transmissions. Centralized management guarantees secure operation in an industrial network and provides the necessary overview. The new Hirschmann™ BAT-Controller Wireless LAN Controller (WLC) was especially developed for this purpose.



Product Features

- Automatic configuration and central management of all the access points in the WLAN
- Compatible with all Hirschmann™ access points in the BAT families BAT-R and F
- Full throughput of payload data as per IEEE 802.11n for each access point
- Integrated IP router with firewall
- User authentication compliant with IEEE 802.1x, RADIUS and LEPS
- Roaming possible across a number of subnetworks
- Automatic frequency management in the 2.4 and 5 GHz waveband
- High availability achieved through redundancy and backup mechanisms
- A number of WLAN networks can be linked using the VPN gateway function
- 19" unit for use in control rooms

Technical Information

Product Description			
Type	BAT-Controller WLC25	BAT-Controller WLC50	BAT-Controller WLC100
			
Order No.	942 034-001	942 034-002	942 034-003
Smart Controller Technology	The WLAN Controller uses wireless cell or SSID to support a number of ways of transmitting user data: <ul style="list-style-type: none"> • Bridged directly to the LAN (maximum performance e.g. for 802.11n-based access points) • Strictly separated from the LAN via VLAN (e.g. for WLAN guest access) • Tunneled centrally to the controller (layer 3 tunneling across IP networks) 		
Supported Access Points	All BAT54 and BAT300 access points and OpenBAT		
Interfaces	4 individual ports, 10/100/1000 Mbit/s Ethernet		
USB 2.0 Host Port	USB 2.0 high-speed host port for connecting USB printers (USB print server) or serial devices (COM port server) Bidirectional data exchange is also possible (max. 480 Mbit/s)		

Product Description	
Type	Management Software Included
Physical Characteristics	Serial configuration interface/COM port (8 pole mini-DIN): 9,600 to 115,000 Baud, can be used to connect an analog/GPRS modem
LANconfig	Configuration program for Microsoft Windows, including a convenient Setup Wizard. Possibilities for group configuration, simultaneous remote configuration and management of several devices via an IP connection (HTTPS, HTTP, TFTP). Project-related, user-related or global default settings for the configuration program. Automatic storage of the current configuration prior to every firmware update. Exchange of configuration files between similar devices, e.g. for migrating old configurations to new BAT products.
LANmonitor	Monitoring application for Microsoft Windows for (remote) monitoring and logging of equipment and connection status of BAT devices, including PING diagnostics and TRACE with filters and provision for storing the results in a file. Search and comparison functions for TRACE output. Wizards for standard diagnostics. Export of diagnostic files for support purposes (contain bootlog, system info and device configuration without passwords). Graphical representation of parameters (indicated by appropriate symbols in the LANmonitor view) plus chronological sequence and tabular comparison of minimum, maximum and average values in a separate window, e.g. for transmission and receiving speeds, CPU load, available memory.
WLANmonitor	Monitoring application for Microsoft Windows for visualizing and monitoring BAT WLAN installations, including Rogue AP and Rogue Client visualizations



Industrial Firewall/VPN Router System



EAGLE20 Series

Faced with an increasing number of Cyber Security threats, all industrial networks require protection, to ensure the highest availability. A high speed VPN, firewall, and routing solution all in one package, the EAGLE20 allows users to achieve the highest level of security for Industrial Ethernet networks. All security functions are integrated into the self-contained independent EAGLE20 platform, eliminating the need to reconfigure the system being protected or install additional drivers or software. Integration, regardless of the application or operating system, is easily done with the learning mode and default one-way communication.

Product Features

- Scalable security functionality: pure Stateful Inspection firewall and VPN router
- Dynamic firewall rules
- Port Forwarding, NAT, and Double NAT
- Easy integration: no need to change IP addresses in existing networks
- Simple deployment: visible in HiDiscovery and support for the USB auto configuration adapter
- Extensive diagnostics: web-based management, status LEDs, relay contact, logging to a Syslog server, integrated in Industrial HiVision
- Support for redundancy mechanisms: firewall redundancy, redundant ring coupling and network segmentation (router mode)
- Faster deployment via offline management that allows users to create EAGLE20 configuration files without having the hardware present



EAGLE SERIES, Firewall/VPN Router			
Part No.	Order No.	Trusted Port	Untrusted/Public Port
EAGLE20 TX/TX	943 987-001	10/100BASE-TX, RJ45	10/100BASE-TX, RJ45
EAGLE20 TX/MM	943 987-002	10/100BASE-TX, RJ45	100BASE-FX-MM, SC
EAGLE20 TX/SM	943 987-003	10/100BASE-TX, RJ45	100BASE-FX-SM, SC
EAGLE20 MM/TX	943 987-004	100BASE-FX-MM, SC	10/100BASE-TX, RJ45
EAGLE20 MM/MM	943 987-005	100BASE-FX-MM, SC	100BASE-FX-MM, SC

Interfaces	
Item	Description
Supply fault relay output	1 x pluggable terminal block, 6 pin
V.24 port	1 x RJ11 socket, serial interface for device configuration
USB interface	1 x USB for connection to ACA21-USB

Security	
Item	Description
Stateful Inspection Firewall	Firewall rules (incoming/outgoing, modem access, management), IP Masquerading, 1-to-1 NAT, DoS Limiter, MAC Filter, user firewall for ext. activation of firewall rules
Multipoint VPN	IPSec, IKEv2, DES, 3DES, AES (-128, -192, -256), Pre-Shared Key, X.509v3 Certificate, MD5, SHA-1, NAT-T, firewall rules for each VPN connection, configuration assistance via web interface, remote-controlled activate/deactivate connection.

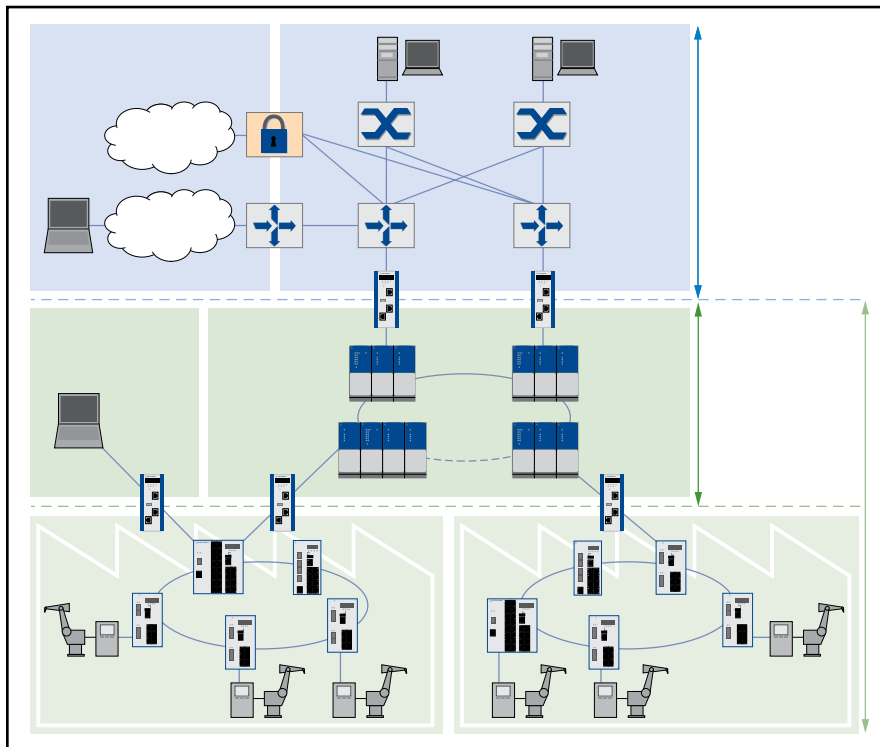


Industrial Firewall/VPN Router System

EAGLE20 Series

Service	
Item	Description
Management	Command Line Interface (CLI), web interface, auto configuration adapter (ACA21-USB), DHCP, HiDiscovery, Industrial HiVision
Diagnostics	LEDs (power, link status, data, fault, ACA (V.24), relay contact (24 V DC/1 A), Log file, Syslog
Protocols	Serial, HTTPS, SSH, SNMP v1/v2/v3), LLDP
Further features	DHCP server/client, DHCP relay/option 82, DynDNS, firewall access via V.24 (PPP), SNTP, VLAN support (IEEE 802.1pQ), port forwarding

Redundancy	
Item	Description
Redundancy functions	Use in redundant network-/ring coupling, firewall redundancy (layer 4), redundant 24 V power supply



Example of firewall/VPN router installation (EAGLE20) in a factory setting.



The Ultimate Zone Level Security For Your Control Network



EAGLE Tofino™

The Tofino Industrial Security Solution is a distributed security solution that quickly and cost effectively implements cyber security protection within your control network. Tofino's flexible architecture allows you to create security zones – Zone Level Security – throughout your control network to protect critical system components. Tofino helps you meet and exceed NERC CIP requirements and ANSI/ISA-99 Standards. And best of all, it helps you avoid expensive down time and achieve optimal performance in your plant.

Product Features

- Securely track network devices and easily create firewall rules
- Deep packet inspection for Modbus/TCP and OPC
- A security system that is easy to deploy and does not risk industrial processes
- Intuitive drag and drop configuration software
- Extends Cyber Security down to the control network
- Simplified regulatory and standards compliance
 - FERC/NERC CIP, ANSI/ISA-99, IEC 62443



EAGLE20 Tofino™ Hardware			
Part No.	Order No.	Untrusted/Public Port	Trusted Port
EAGLE20 Tofino TX/TX	943 987-501	TX	TX
EAGLE20 Tofino TX/MM	943 987-502	MM	TX
EAGLE20 Tofino MM/TX	943 987-504	TX	MM
EAGLE20 Tofino MM/MM	943 987-505	MM	MM

EAGLE Tofino™ Centralized Management Platform		
Part No.	Order No.	Description
EAGLE Tofino CMP	942 016-003	For up to 3 Tofinos
EAGLE Tofino CMP	942 016-005	For up to 5 Tofinos
EAGLE Tofino CMP	942 016-010	For up to 10 Tofinos
EAGLE Tofino CMP	942 016-020	For up to 20 Tofinos
EAGLE Tofino CMP	942 016-050	For up to 50 Tofinos
EAGLE Tofino CMP	942 016-100	For unlimited Tofinos

EAGLE20 Tofino™ Loadable Security Modules (LSM's) • One Required per EAGLE20 Tofino for Operation		
Part No.	Order No.	Description
EAGLE Tofino Firewall LSM	942 016-110	Firewall Loadable Security Module
EAGLE Tofino Security Asset Management LSM	942 016-111	Security Asset Management Loadable Security Module
EAGLE Tofino Modbus TCP Enforcer LSM	942 016-112	Modbus TCP Enforcer Loadable Security Module
EAGLE Tofino OPC Enforcer LSM	942 016-117	Modbus OPC Enforcer Loadable Security Module
EAGLE Tofino VPN Server LSM	942 016-113	Virtual Private Network Server Loadable Security Module
EAGLE Tofino VPN Client LSM	942 016-114	Virtual Private Network Client Loadable Security Module
EAGLE Tofino Event Logger LSM	942 016-115	Event Logger Loadable Security Module

EAGLE20 Tofino™ VPN License		
Part No.	Order No.	Description
EAGLE Tofino VPN PC Client License	942 016-116	Virtual Private Network PC Client license for EAGLE Tofino



Multi-port Industrial Firewall System

EAGLE20-0400 and EAGLE30-0402

The primary advantage of EAGLE20-0400 and EAGLE30-0402 over other products is the increased number of ports. This means that in some scenarios a single device can be deployed, rather than multiple EAGLE20s, saving costs and space.

The Hirschmann™ EAGLE20-0400 and EAGLE30-0402 are multi-port firewalls in convection-cooled metal DIN Rail housings. Available in two versions, the Hirschmann™ EAGLE20-0400 firewall supports 4x100 Mb/s ports, while the Hirschmann™ EAGLE30-0402 firewall supports 4x100 Mb/s ports and 2x1 Gb/s ports; the Gigabit ports are SFP ports.



Product Features

- Transmission rates and standards supported are 100 Mb/s, 1 Gb/s, Ethernet
- Integrated management functions: CLI via serial port or SSH, web interface, SNMP v3
- Routing functions: static routing
- Security mechanisms implemented: stateful inspection, packet filtering rules
- Degree of protection: IP20
- Operating temperatures: -40°C to +70°C
- Cooling system: convection cooling
- Power supply: up to two power inputs. Two power supplies are available:
18 V DC to 60 V DC or 48 V DC to 320 V DC and 88 V AC to 265 V AC
- Tools available for configuration and diagnosis: CLI (serial and SSH), web interface, Industrial HiVision
- Standards and approvals:
 - Radio Equipment: CE, FCC
 - Substation: EN 61850-3, IEEE 1613
 - Safety: EN 60950-1, UL 60950-1, EN 61131-2 (Class 1 Equipment)
 - Hazardous Locations: ISA-12.12.-01 Class 1 Div. 2 (pending)
 - Traffic Controllers: NEMA TS 2 (pending)
 - Railway: EN 50121-4 (pending)
- Can be used together with Belden cables; switches; routers; end devices
- Future-proof: additional functionality can be added via firmware upgrade
- Replacement devices can be configured using USB sticks and SD cards
- The Belden Competence Center provides consulting, training, and support for these products



Multi-port Industrial Firewall System

Technical Information

Product Description		
Type	EAGLE20-0400	EAGLE30-0402
Available Ports	4	6
Construction		
Mounting	DIN Rail 35 mm	
Protection Class	IP20	
Dimensions (WxHxD)	Width (metal housing): 100 mm, Width (plastic housing): 90 mm, Height: 165 mm, Depth: 115 mm	
Weight	Aluminium housing: 1.5 kg, Plastic housing: 1.3 kg	
Ambient Conditions		
Operating Temperature	0°C to +60°C, -40°C to +70°C, or -40°C to +70°C (inclusive Conformal Coating), IEC 60068-2-2 Dry Heat Test +85°C 16 Hours	
Storage/Transport Temperature	-40°C to +85°C	
Relative Humidity (non-condensing)	10% to 95%	
Conformal Coating	Yes (variant dependent)	
Interfaces		
V.24 Interface	1 x RJ11 socket (serial interface for device configuration)	
USB Interface	1 x USB socket (to connect auto-configuration adapter ACA21-USB) SD Interface	
SD Interface	1 x SD socket (to connect auto-configuration adapter ACA31-SD)	
Power Requirements		
Operating Voltage	18 to 60 V DC, or 48 to 320 V DC and 88 to 265 V AC	
Power Supply/Signaling Contact	1 x plug-in terminal block, 6-pin	
Current Consumption at 24 V DC	max. 14 W	
Regulatory Approvals		
Safety of Industrial Control Equipment	cUL508	
Hazardous Locations	cUL Approval according to ISA-12.12.-01 Class 1 Div. 2 Group A, B, C, D (pending)	
Germanischer Lloyd	Germanischer Lloyd (pending)	
Substation	EN 61850-3, IEEE 1613	
Manufacturer Declaration of Conformity	FCC Declaration 47CFR: 11/2009, Part 15, Subpart B, Class A Unintentional radiators, C-Tick Declaration Australian Radio communications Standard 1998	
Traffic Controller	NEMA TS 2 (pending)	
Switching/Routing		
Bridging	Yes	
Routing	Yes	
Firewall	Yes	
Reliability		
MTBF Range	63.5 to 67.1 years	
Warranty	5 years standard	

NOTE: These are the prominent technical specifications. For complete technical specifications visit: www.hirschmann.com

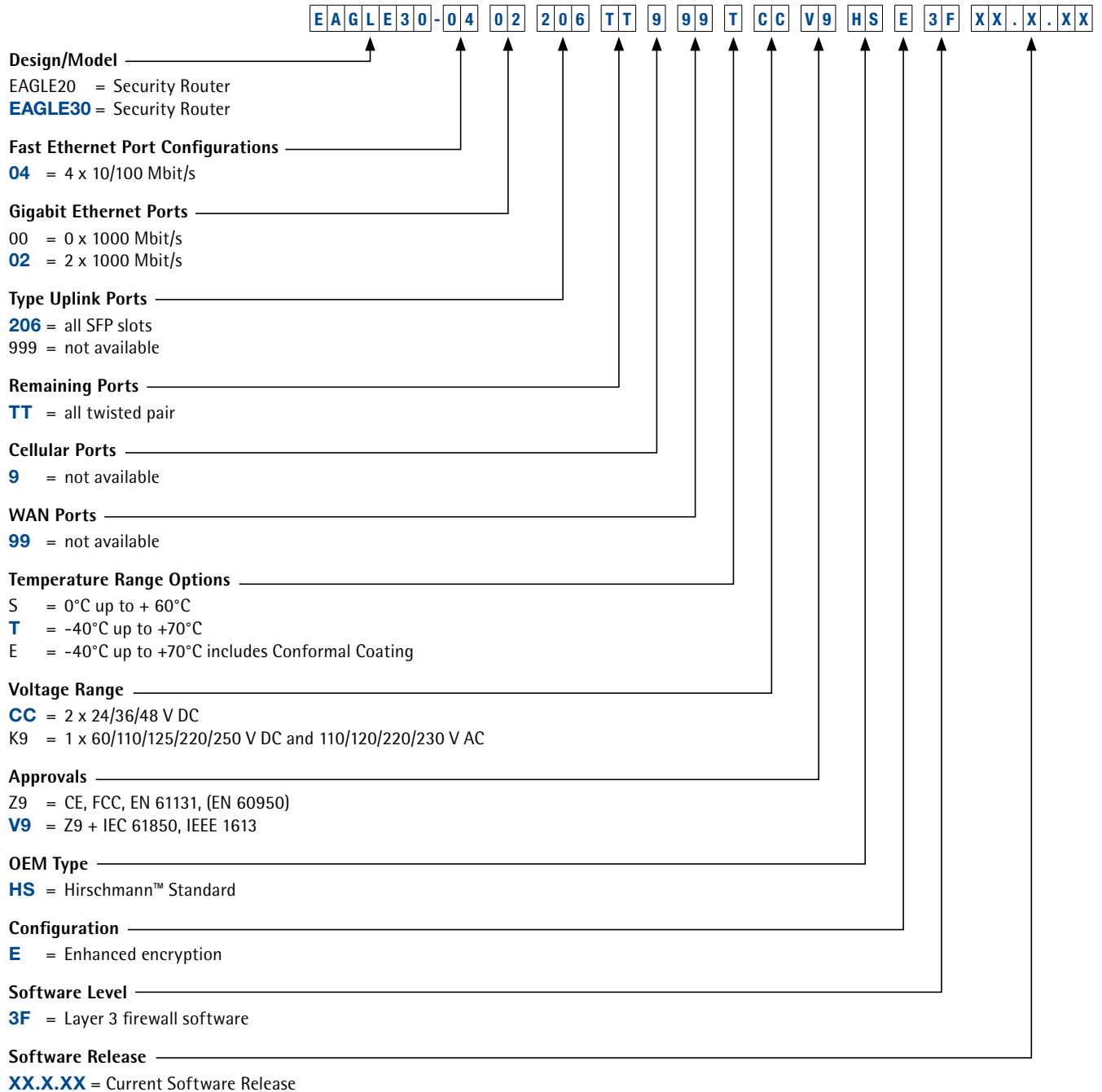


Multi-port Industrial Firewall Configurations

Configurator



EAGLE20-0400 and EAGLE30-0402



NOTE: The part number categories (OEM Type, Configuration and Software Release) are optional.



IOLAN DS/SDS Ethernet Converters with Serial Interfaces



Easy and reliable connection of end devices with serial interfaces to Ethernet networks is now possible with the new series of IOLAN DC converters. Thanks to a variety of different serial interfaces, bandwidths, security functions, protection standards, temperature ranges and special approvals, the IOLAN DC converters provide ideal solutions for a variety of applications, including factory and process automation, building automation, and automation for new energy applications.

Product Features

- Meets high security and EMC standards
- Approval for Ex Zone 2
- RS 232/422/485 interfaces selectable via software
- Fast or Gigabit Ethernet ports
- Redundant Ethernet connection
- V.92/V.90 modem for connection to wide area networks
- IP40 or IP30 protection standard
- Robust metal housing
- Fanless cooling

Technical Information

Product Description				
Type	IOLAN DS1 T	IOLAN SDS3 M	IOLAN SDS4 HL	IOLAN SDS16C HV
Available Ports	1	3	4	16
Order No.	942 036-001	942 036-201	942 036-101	942 036-301
Ambient Conditions				
Operating Temperature	-40°C to +70°C	0°C to +55°C	-40°C to +70°C	-40°C to +70°C
Interfaces				
Serial Port Interface	Software selectable RS-232/422/485 on DB9M	Software selectable EIA-232/422/485 on RJ45	Software selectable EIA-232/422/485 on RJ45	Software selectable RS232/RS485/RS422 DTE on RJ45 – RS485: full and half duplex
Serial Port Speeds	50 bps to 230 Kbps with customizable baud rate support			
Data Bits	5, 6, 7, 8, 9-bit protocol support			
Parity	Odd, Even, Mark, Space, None			
Flow Control	Hardware, Software, Both			
Local Console Port	RS232 on Serial Port	RS232 on RJ45 with DB9 Adapter (provided)	RS232 on RJ45 with DB9 Adapter (provided)	RS232 on RJ45 with DB9 Adapter (provided)
Network	1 x 10/100-base TX Ethernet RJ45			2 x 10/100/1000-base TX Ethernet RJ45
Power Supply				
Input Voltage Range	9 to 30 V DC			88 to 300 V DC or 85 to 265 V AC (47 to 63 Hz)
Approvals				
FCC	FCC			
Safety Standard for IT Equipment	IEC 60950-1			
Substation	n/a			IEC 61850-3, IEEE 1613
Hazardous Locations	n/a		ATEX Class 1 Zone 2, ANSI/ISA - 12.12.01 - 2007 Class 1 Division 2	n/a



IOLAN DS/SDS Ethernet Converters with Serial Interfaces

Adapter for IOLAN DS, SDS			
Type	Order No.	Description	Application
DBA0010	942 048-001	DB25F	–
DBA0011	942 048-002	DB25M	Cisco/HP/IBM/Sun
DBA0013	942 048-003	DB25M PC-Pinout	Modem
DBA0020	942 048-004	DB9F	APC/Checkpoint/Dell/Extreme Networks/F5/Juniper/Nortel/Sun/HP/IBM
DBA0021	942 048-005	DB9M	Sun/Zyxel
DBA0023	942 048-006	DB9M PC-Pinout	All manufacturers with provided cable for PC/notebook
DB9 to PRL/config connector	942 048-007	DB9F	Perle IOLAN and IOLAN C Console*
DBA0031	942 048-008	RJ45M-RJ45F Cisco/Sun	Cisco/Sun/Juniper

* Included in delivery with all variants with RJ45 on serial side or RJ45 device console. Conform to DBA0020.

Adapter for IOLAN SDS C			
Type	Order No.	Description	Application
DBA0010C	942 048-009	DB25F	–
DBA0011C	942 048-010	DB25M	Cisco/HP/IBM/Sun
DBA0013C	942 048-011	DB25M PC-Pinout	Modem
DBA0020C	942 048-012	DB9F	APC/Checkpoint/Dell/Extreme Networks/F5/Juniper/Nortel/Sun/HP/IBM
DBA0021C	942 048-013	DB9M	Sun/Zyxel
DBA0023C	942 048-014	DB9M PC-Pinout	All manufacturers with provided cable for PC/notebook
DBA0031C	942 048-015	RJ45M-RJ45F Cisco/Sun	Cisco/Sun/Juniper

DIN Rail Adapter		
Type	Order No.	Application
DIN Rail Mount Kit 1	942 048-016	DIN Rail Mounting Kit for 1 port IOLAN DS
DIN Rail Mount Kit 2	942 048-017	DIN Rail Mounting Kit for 4 port IOLAN SDS wall mount models and Stand-Alone Media Converter





Hardened Rail Transceivers, Hubs, and Fieldbus Transceivers/Modems



SPIDER Ethernet Transceivers

Part No.	Order No.	Description
SPIDER 1TX/1FX MM	943 890-001	1 x 10/100Base-TX RJ45, 1 x 100Base-FX Multimode, SC sockets
SPIDER 1TX/1FX SM	943 891-001	1 x 10/100Base-TX RJ45, 1 x 100Base-FX Singlemode, SC sockets

RS232 Media Converters

Part No.	Order No.	Description
OZDV 2451P	943 316-021	1 electrical and 1 optical port, bus-powered, POF 0 to 60 m
OZDV 2451G	943 299-021	1 electrical and 1 optical port, bus-powered, Multimode 0 to 2000 m
OZDV 2471P	943 340-021	1 electrical and 1 optical port, POF 0-100M, HCS 0 to 2100 m
OZDV 2471G	943 341-021	1 electrical and 1 optical port, Multimode 0 to 6700 m
OZDV 2471G-1300	933 990-021	1 electrical and 1 optical port, Singlemode 0 to 32 km

Hardened Fiber Modems/Repeaters



RS485 Repeaters

Part No.	Order No.	Description
OZD 485 G12 BASIC	943 893-321	1 electrical and 2 optical ports, Multimode-line capable
OZD 485 G12 PRO	943 894-321	1 electrical and 2 optical ports, predictive maintenance, Multimode, redundant ring capable
OZD 485 G12-1300 PRO	943 895-321	1 electrical and 2 optical ports, predictive maintenance, Singlemode, redundant ring capable

PROFIBUS Repeaters

Part No.	Order No.	Description
OZD PROFIBUS 12M P11	943 728-221	For plastic fiber, 1 electrical, 1 optical port
OZD PROFIBUS 12M P12	943 728-321	For plastic fiber, 1 electrical, 2 optical ports redundant ring capable
OZD PROFIBUS 12M G11	943 727-221	1 electrical, 1 optical port, multimode
OZD PROFIBUS 12M G12	943 727-321	1 electrical, 2 optical ports, multimode – redundant ring capable
OZD PROFIBUS 12M G12 EEC	943 730-321	1 electrical, 2 optical ports, multimode – redundant ring capable, EEC*
OZD PROFIBUS 12M G11 1300	943 729-221	1 electrical, 1 optical port, singlemode
OZD PROFIBUS 12M G12 1300	943 729-321	1 electrical, 2 optical ports, singlemode – redundant ring capable
OZD PROFIBUS 12M G12 1300 EEC	943 256-321	1 electrical, 2 optical ports, singlemode – redundant ring capable, EEC*
OZD PROFIBUS 12M P11 PRO	943 904-221	1 electrical, 1 optical port, predictive maintenance, POF
OZD PROFIBUS 12M P12 PRO	943 904-321	1 electrical, 2 optical ports, predictive maintenance, POF, redundant ring capable
OZD PROFIBUS 12M G11 PRO	943 905-221	1 electrical, 1 optical port, predictive maintenance, multimode

NOTE: *Devices showing EEC above can operate in extended environmental conditions: -20°C to +60°C, 100% humidity



Hardened Fiber Modems/Repeaters

PROFIBUS Repeaters (continued)		
Part No.	Order No.	Description
OZD PROFIBUS 12M G12 PRO	943 905-321	1 electrical, 2 optical ports, predictive maintenance, multimode, redundant ring capable
OZD PROFIBUS 12M G12 EEC PRO	943 907-321	1 electrical, 2 optical ports, predictive maintenance, multimode, redundant ring capable, EEC*
OZD PROFIBUS 12M G11-1300 PRO	943 906-221	1 electrical, 1 optical port, predictive maintenance, singlemode
OZD PROFIBUS 12M G12-1300 PRO	943 906-321	1 electrical, 2 optical ports, predictive maintenance, singlemode, redundant ring capable
OZD PROFIBUS 12M G12-1300 EEC PRO	943 908-321	1 electrical, 2 optical ports, predictive maintenance, singlemode, redundant ring capable, EEC*

NOTE: *Devices showing EEC above can operate in extended environmental conditions: -20°C to +60°C, 100% humidity



PROFIBUS ATEX Zone 1 Repeaters		
Part No.	Order No.	Description
OZD PROFIBUS G12DU ATEX 1	943 881-321	1 electrical, 2 optical ports, predictive maintenance, multimode, redundant ring capable, cabinet assembly
OZD PROFIBUS G12DK ATEX 1	943 882-321	1 electrical, 2 optical ports, predictive maintenance, multimode, redundant ring capable, plastic IP67 housing for mounting in ATEX-certified housing
OZD PROFIBUS G12DE ATEX 1	943 883-321	1 electrical, 2 optical ports, predictive maintenance, multimode, redundant ring capable, stainless steel IP67 housing



Geniusbus Repeaters		
Part No.	Order No.	Description
OZD GENIUS G12	933 989-021	1 electrical, 2 optical ports, redundant ring capable
OZD GENIUS G12 1300	934 233-021	1 electrical, 2 optical ports, singlemode, redundant ring capable



Modbus+ Repeaters		
Part No.	Order No.	Description
MODBUS PLUS G12	943 740-021	1 electrical, 2 optical ports, redundant ring capable
MODBUS PLUS G12 1300	943 821-021	1 electrical, 2 optical ports, singlemode, redundant ring capable



WorldFIP Repeaters		
Part No.	Order No.	Description
OZD FIP G3	933 847-321	1 electrical, 2 optical ports, multimode, redundant ring capable
OZD FIP G3 T	933 847-521	1 electrical, 2 optical ports, multimode, redundant ring capable, bus termination included





SFP + XFD Transceiver Modules



Fast Ethernet Transceivers		
Part No.	Order No.	Description
M-FAST SFP-MM/LC	943 865-001	100BASE-FX, 5 km 50/125 µm MM, 4 km 62.5/12.5 µm MM
M-FAST SFP-MM/LC EEC	943 945-001	100BASE-FX, 5 km 50/125 µm MM, 4 km 62.5/12.5 µm MM
M-FAST SFP-SM/LC	943 866-001	100BASE-FX, 25 km 9/125 µm SM
M-FAST SFP-SM/LC EEC	943 946-001	100BASE-FX, 25 km 9/125 µm SM
M-FAST SFP-SM+/LC	943 867-001	100BASE-FX, 25 to 65 km 9/125 µm SM
M-FAST SFP-SM+/LC EEC	943 947-001	100BASE-FX, 25 to 65 km 9/125 µm SM
M-FAST SFP-LH/LC	943 868-001	100BASE-FX, 55 to 140 km 9/125 µm SM
M-FAST SFP-LH/LC EEC	943 948-001	100BASE-FX, 55 to 140 km 9/125 µm SM



Gigabit Ethernet Transceivers		
Part No.	Order No.	Description
M-SFP-SX/LC	943 014-001	1000Base-SX, 550 m 50/125 µm MM, 275 m 62.5/125 µm MM
M-SFP-SX/LC EEC	943 896-001	1000Base-SX, 550 m 50/125 µm MM, 275 m 62.5/125 µm MM
M-SFP-LX/LC	943 015-001	1000Base-LX, 550 m 50/125 µm MM, 550 m 62.5/125 µm MM, 20 km 9/125 µm SM
M-SFP-LX/LC EEC	943 897-001	1000Base-LX, 550 m 50/125 µm MM, 550 m 62.5/125 µm MM, 20 km 9/125 µm SM
M-SFP-MX/LC	942 035-001	1000Base-MX, 2 km with good quality 50/125u (62.5u) MM
M-SFP-LX+/LC	942 023-001	1000Base-LX, 40 km with 9/125u SM
M-SFP-LX+/LC EEC	942 024-001	1000Base-LX, 40 km with 9/125u SM, -40°C to +85°C
M-SFP-LH/LC	943 042-001	1000Base-LX, 16 to 80 km 9/125 µm SM-LH
M-SFP-LH/LC-EEC	943 898-001	1000Base-LX, 70 km with 9/125u SM, -40°C to +85°C
M-SFP-LH+/LC	943 049-001	1000Base-LX, 44 to 120 km 9/125 µm SM-LH
M-SFP-TX/RJ45	943 977-001	Gigabit RJ45 SFP



Gigabit Ethernet Bi-Directional Transceivers (Single Fiber Strand)		
Part No.	Order No.	Description
M-SFP-BIDI-Bundle LX/LC EEC	943 974-101	1000Base-LX, 20 km 9/125 µm SM
M-SFP-BIDI-Bundle LH/LC EEC	943 975-101	1000Base-LX, 23 to 80 km 9/125 µm SM-LH
M-SFP-BIDI Type A LH/LC EEC	943 975-001	1000Base-LX Type A with LC connector, extended temperature range, -40°C to +85°C
M-SFP-BIDI Type A LX/LC EEC	943 974-001	1000Base-LX Type A with LC connector, extended temperature range, -40°C to +85°C
M-SFP-BIDI Type B LH/LC EEC	943 975-002	1000Base-LX Type B with LC connector, extended temperature range, -40°C to +85°C
M-SFP-BIDI Type B LX/LC EEC	943 974-002	1000Base-LX Type B with LC connector, extended temperature range, -40°C to +85°C



10 Gigabit Ethernet Transceivers		
Part No.	Order No.	Description
M-XFP-ZR/LC	943 921-001	10GBASE-SX, 40 to 80 km 9/125 µm SM
M-XFP-ER/LC	943 920-001	10GBASE-SX, 10 to 40 km 9/125 µm SM
M-XFP-LR/LC	943 919-001	10GBASE-SX, 2 to 10 km 9/125 µm SM
M-XFP-SR/LC	943 917-001	10GBASE-SX, 33 m 50/125 µm MM or 300 m w/modal bandwidth 2000 [MHz x km] fiber



Accessories

Power Supplies and Programming/Configuration Tools

Power Supplies		
Part No.	Order No.	Description
RPS15	943 662-015	24 V DC rail power supply unit 1.3 A at 100 to 240 V AC
RPS30	943 662-003	24 V DC rail power supply unit 1.3 A
RPS80 EEC	943 662-080	24 V DC rail power supply unit 3.0 A, -25°C up to +70°C
RPS120 EEC (CC)	943 662-121	24 V DC rail power supply unit 4.5 A, -25°C up to +70°C with conformal coating
RPS60/48 V EEC	943 952-001	48 V DC rail power supply unit 1.25 A, -10°C up to +70°C
RPS90/48V HV, PoE	943 979-001	48 V DC PoE rail power supply unit 1.9 A, -40°C up to +50°C
RPS90/48V LV, PoE	943 980-001	48 V DC PoE rail power supply unit 1.9 A, -25°C up to +60°C
PSW 5-24	943 008-001	5 V DC Plug-in rail power supply 0°C up to +40°C
PC150/36V/48V-IP67	943 968-001	DC/DC converter with 36 V/48 V power output, IP67 rated 24 V/48 V input
PC150/72V/48V-IP67	943 968-001	DC/DC converter with 72 V/48 V power output, IP67 rated 72 V/110 V input
Power Cord	942 000-001	Power Cord for pluggable connection for the power supply of the MACH1000 family and RSR20/RSR30 family. Cable length 2 meters.



ACA – Programming and Configuration Backup

Programming and Configuration Backup		
Part No.	Order No.	Description
ACA21-USB EEC	943 271-002	USB configuration adapter for storage/backup and device replacement of (managed) RS, MS and MACH switches as well as EAGLE firewalls
ACA21-M12 EEC	943 913-002	M12 configuration adapter for storage/backup and device replacement of (managed) Octopus switch devices
ACA11 EEC	943 751-002	Similar to above ACA adapters, but communication via the device's RJ11 RS232 interface
ACA11-M12 (EEC)	943 972-001	M12 configuration adapter for storage/backup and device replacement of IP67 BAT (wireless) devices
ACA11-miniDIN (EEC)	943 973-001	Mini DIN configuration adapter for storage/backup and device replacement of DIN rail mounted BAT (wireless) devices
ACA31 (EEC)	942 074-001	Adapter for storage/backup and device replacement of switches and firewalls (RSP, MSP, EAGLE30)
Serial/Terminal Cable	943 301-001	Terminal cable for managing and configuring managed switches via the RJ11 RS232 interface



ACA31 (EEC)



ACA11-miniDIN (EEC)



Serial/Terminal Cable



ACA21-USB EEC



ACA11 EEC



ACA11-M12 (EEC)



Embedded Ethernet Modules and Switches



The Hirschmann Embedded Ethernet Modules (EEMs) combine advanced networking expertise with state-of-the-art industrial Ethernet technology and innovative automation hardware. Embedded Ethernet offers manufacturers of intelligent automation devices a ready solution to the Ethernet needs of their products. Hirschmann's Embedded Ethernet Modules incorporate network access right into the unit. Simultaneous integration in a network management system further increases the value, and offers the following benefits for:

- Intelligent sensors
- Measuring instruments
- I/O modules
- Distribution boxes
- Displays
- Valve clusters
- Motor starters, etc.



Example of Embedded Ethernet Switch EES25 on development kit

Embedded Ethernet Modules		
Type	Order No.	Description
EEM Profinet IO	942 019-001	Embedded Ethernet Module for integration of PROFINET functionality in automation devices
EEM EtherNet/IP	942 019-002	Embedded Ethernet Module for integration of EtherNet/IP functionality in automation devices
EEM EtherCAT	942 019-003	Embedded Ethernet Module for integration of EtherCAT functionality in automation devices
EEM Development Kit	942 017-001	Baseboard development kit for Embedded Ethernet Modules (EEM)
EEM XC161 Adaptor	942 018-001	Optional Adaptor for Phytect CPU

Embedded Ethernet Switches		
Type	Order No.	Description
EES20-0600UHIHSH2E	942 050-001	Managed Fast Ethernet Switch according to IEEE 802.3, store-and-forward-switching. 6 x Fast Ethernet ports, configurable as 100BaseTX or 100BaseFX, RX+/RX- and TX+/TX- signals per port. RSTP, Media Redundancy Protocol (MRP, IEC 62439-2), 200 ms recovery. PTPv2 (IEEE 1588-2008) transparent clock and boundary clock.
EES25-0600UHIHMH2E	942 050-002	Managed Fast Ethernet Switch according to IEEE 802.3, store-and-forward-switching. 6 x Fast Ethernet ports, configurable as 100BaseTX or 100BaseFX, RX+/RX- and TX+/TX- signals per port. RSTP, Fast Media Redundancy Protocol (Fast-MRP, IEC 62439-2), 10 ms recovery. PTPv2 (IEEE 1588-2008) transparent clock and boundary clock, IRIG-B output.
EES25-0600UHIHPH2E	942 050-003	Managed Fast Ethernet Switch according to IEEE 802.3, store-and-forward-switching. 6 x Fast Ethernet ports, configurable as 100BaseTX or 100BaseFX, RX+/RX- and TX+/TX- signals per port. RSTP, Media Redundancy Protocol (MRP, IEC 62439-2), 200 ms recovery, Parallel Redundancy Protocol (PRP, IEC 62439-3) RedBox. PTPv2 (IEEE 1588-2008) transparent clock and boundary clock, IRIG-B output.
EES Development Kit	942 049-001	Development Kit for Embedded Ethernet Switches (EES)



Modular Industrial Patch Panel (MIPP)







The new MIPP is a termination panel for cables that need connecting to active equipment such as switches. Thanks to the modular design, MIPP can be linked to create a large single patch panel, to which, for the first time ever, both fiber and copper cables can be connected. The MIPP is a completely new solution that provides the ideal connection between Belden cables and Hirschmann switches. Available in a choice of modules suitable for both fiber and copper cables, up to 6 modules can be connected to create a single panel that can accommodate both types of cable at the same time for maximum system flexibility. Using patchcords to connect to active equipment, cables can be terminated outside the cabinet in an organized and structured manner to ensure the highest level of reliability.



Product Features

- Accommodating various media and connectors
- LC, SC, ST and E-2000™ fiber duplex adapters
- RJ45 copper keystone jacks (Shielded and Unshielded, Cat 5e, Cat 6, Cat 6A)
- RJ45 copper coupler (Shielded and Unshielded, Cat 6A)
- High port density for maximum use of available space
- Easy to use, allows space for handling cable and module is removable from unit to facilitate connection/splicing
- Splice tray and multiple fingers for easy fiber management
- Cable entries in two places (top or bottom), for ease of use and choice of placement in cabinet
- Three cable entries for single fiber module, for ring topology applications
- Double fiber module accommodates hybrid fiber cables, with single mode and multi mode fibers
- Resilient for protection against the harsher industrial environments
- Wide temperature range from -20°C to +70°C
- Available as part of a system with market leading Hirschmann switches and high performance Belden cabling for optimum reliability in Industrial Ethernet networks
- UL approval (UL 1863)

Technical Information

Housing Type and Description						
Description	Modular Industrial Patch Panel, DIN Rail					
Number of Single Modules	1	2	3	4	5	6
						
Mechanical Construction						
Material Housing	Aluminium					
Dimensions (WxHxD)	42 x 138 x 122 mm	72 x 138 x 122 mm	102 x 138 x 122 mm	132 x 138 x 122 mm	162 x 138 x 122 mm	192 x 138 x 122 mm
Dimensions with Adapters and Gland, max. (HxD)	165 x 133 mm	165 x 133 mm	165 x 133 mm	165 x 133 mm	165 x 133 mm	165 x 133 mm
Mounting	DIN Rail					
Appr. Weight Housing	360 g	530 g	697 g	865 g	1034 g	1200 g
Dimension Wallmount Plate (WxH)	38 x 157 mm	68 x 157 mm	98 x 157 mm	128 x 157 mm	158 x 157 mm	188 x 157 mm
Appr. Weight Wallmount Plate	67 g	119 g	172 g	223 g	277 g	329 g



Module Type and Description						
Type	Single Module	Single Module	Single Module	Single Module	Single Module	Single Module
Description	6 x SC Duplex	6 x LC Duplex	6 x ST Duplex	6 x E-2000™ Duplex	4 x RJ45 Keystone Jack, Unshielded	4 x RJ45 Coupler, Unshielded

Mechanical Construction						
Material	Steel					
Adapter/Keystone Types	<ul style="list-style-type: none"> Blue SC adapter OS2 UPC zirconia ceramic Beige SC adapter OM1/OM2 PC phosphor bronze Aqua SC adapter OM3/OM4 PC zirconia ceramic 	<ul style="list-style-type: none"> Blue LC adapter OS2 UPC zirconia ceramic Beige LC adapter OM1/OM2 PC phosphor bronze Aqua LC adapter OM3/OM4 PC zirconia ceramic 	<ul style="list-style-type: none"> Blue ST adapter OS2 UPC zirconia ceramic Beige ST adapter OM1/OM2 PC phosphor bronze Aqua ST adapter OM3/OM4 PC zirconia ceramic 	<ul style="list-style-type: none"> Blue E-2000™ adapter OS2 UPC zirconia ceramic Beige E-2000™ adapter OM1/OM2 PC zirconia ceramic Aqua E-2000™ adapter OM3/OM4 PC zirconia ceramic 	<ul style="list-style-type: none"> Cat 5e Modular Jack, Keyconnect AX101310, black Cat 6+ Modular Jack, Keyconnect AX101321, black Cat 6A/10GX Modular Jack, Keyconnect AX102283, black 	<ul style="list-style-type: none"> Cat 6A/10GX Modular Jack, Keyconnect Couple AX104024, black
Appr. Weight Module	218 g	218 g	218 g	218 g	516 g	516 g
Protection Class	IP40	IP40	IP40	IP40	IP20	IP20
Cable Entry	3, M16 Gland	3, M16 Gland	3, M16 Gland	3, M16 Gland	–	–
Maximum Diameter Cable	10 mm	10 mm	10 mm	10 mm	4 x 7.5 mm	4 x 7.5 mm
Cable Types	Fiber cables up to 12 fibers: loose tube, mini-breakout, breakout cables				Cat 5e unshielded, Cat 6 unshielded, Cat 6A unshielded	

Module Type and Description						
Type	Double Modules	Double Modules	Double Modules	Double Modules	Single Module	Single Module
Description	12 x SC Duplex	12 x LC Duplex	12 x ST Duplex	12 x E-2000™ Duplex	4 x RJ45 Keystone Jack, Shielded	4 x RJ45 Coupler, Shielded

Mechanical Construction						
Material	Steel					
Adapter/Keystone Types	<ul style="list-style-type: none"> Blue SC adapter OS2 UPC zirconia ceramic Beige SC adapter OM1/OM2 PC phosphor bronze Aqua SC adapter OM3/OM4 PC zirconia ceramic 	<ul style="list-style-type: none"> Blue LC adapter OS2 UPC zirconia ceramic Beige LC adapter OM1/OM2 PC phosphor bronze Aqua LC adapter OM3/OM4 PC zirconia ceramic 	<ul style="list-style-type: none"> Blue ST adapter OS2 UPC zirconia ceramic Beige ST adapter OM1/OM2 PC phosphor bronze Aqua ST adapter OM3/OM4 PC zirconia ceramic 	<ul style="list-style-type: none"> Blue E-2000™ adapter OS2 UPC zirconia ceramic Beige E-2000™ adapter OM1/OM2 PC phosphor bronze Aqua E-2000™ adapter OM3/OM4 PC zirconia ceramic 	<ul style="list-style-type: none"> Cat 5e Shielded Modular Jack, Keyconnect AX104595, metal body Cat 6+ Shielded Modular Jack, Keyconnect AX104596, metal body Cat 6A/10GX Shielded Modular Jack, Keyconnect AX104562, metal body 	<ul style="list-style-type: none"> Cat 6A/10GX Shielded Modular Jack, Keyconnect Coupler AX104501, metal body
Appr. Weight Module	450 g	450 g	450 g	450 g	636 g	636 g
Protection Class	IP40	IP40	IP40	IP40	IP20	IP20
Cable Entry	1, M20 Gland	1, M20 Gland	1, M20 Gland	1, M20 Gland	–	–
Maximum Diameter Cable	13 mm	13 mm	13 mm	13 mm	4 x 7.5 mm	4 x 7.5 mm
Cable Types	Fiber cables up to 24 fibers: loose tube, mini-breakout Hybrid Fiber cable: 6 x SM + 6 x OM1, 6 x SM + 6 x OM2, 6 x SM + 6 x OM3, 6 x SM + 6 x OM4				Cat 5e shielded, Cat 6 shielded, Cat 6A shielded, Cat 7 shielded	

Accessories						
Pigtails (1 pack of 12 pigtails, 900 micron, 0.6 m in 12 different colours)	<ul style="list-style-type: none"> SC/UPC SM 9/125, OS2 SC/PC MM 62.5/125, OM1 SC/PC MM 50/125, OM2 SC/PC MM 50/125, OM3 SC/PC MM 50/125, OM4 	<ul style="list-style-type: none"> LC/UPC SM 9/125, OS2 LC/PC MM 62.5/125, OM1 LC/PC MM 50/125, OM2 LC/PC MM 50/125, OM3 LC/PC MM 50/125, OM4 	<ul style="list-style-type: none"> ST/UPC SM 9/125, OS2 ST/PC MM 62.5/125, OM1 ST/PC MM 50/125, OM2 ST/PC MM 50/125, OM3 ST/PC MM 50/125, OM4 	<ul style="list-style-type: none"> E-2000™/UPC SM 9/125, OS2 E-2000™/PC MM 62.5/125, OM1 E-2000™/PC MM 50/125, OM2 E-2000™/PC MM 50/125, OM3 E-2000™/PC MM 50/125, OM4 		
Brilliance Field Installable Connector (900 micron)	12 brilliance connectors SC: <ul style="list-style-type: none"> SM 9/125, OS2, blue, AX104247 MM 62.5/125, OM1, beige, AX104244 MM 50/125, OM2, black, AX104245 MM 50/125, OM3/OM4, aqua, AX104246 	12 brilliance connectors LC: <ul style="list-style-type: none"> SM 9/125, OS2, blue, AX104243 MM 62.5 micron, OM1, beige, AX104240 MM 50 micron, OM2, black, AX104241 MM 50 micron, OM3/OM4, aqua, AX104242 	24 brilliance connectors ST: <ul style="list-style-type: none"> SM 9/125, OS2, blue, AX104251 MM 62.5/125, OM1, beige, AX104248 MM 50/125, OM2, black, AX104249 MM 50/125, OM3/OM4, aqua, AX104250 			



MIPP Product Configurations

MODULE 1 MODULE 2 MODULE 3 MODULE 4 MODULE 5 MODULE 6

M I P P / J D / 1 L 1 P / 2 T 9 N / X X X X / X X X X / X X X X / X X X X / X X

Design/Model —————>

MIPP = Modular Industrial Patch Panel

Housing Type (Note: A double module requires two places) —————>

X = No Housing	H = 2 x Double module fiber
A = 1 x Single module	I = 3 x Double module fiber
B = 2 x Single module	J = 1 x SM + 1 x DM fiber
C = 3 x Single module	K = 1 x SM + 2 x DM fiber
D = 4 x Single module	L = 2 x SM + 1 x DM fiber
E = 5 x Single module	M = 2 x SM + 2 x DM fiber
F = 6 x Single module	N = 3 x SM + 1 x DM fiber
G = 1 x Double module fiber	O = 4 x SM + 1 x DM fiber

Note: SM = Single module and DM = Double module

Mounting Type —————>

X = No Housing
W = Wall Mount Plate included
D = Standard DIN Rail

Module Type —————>

1 = Single module (fiber or blind)
2 = Double module (fiber or blind)
C = Single copper module

Adapter and Keystone Type —————>

T = ST/ST Duplex adapters	c = Unshielded couplers
L = LC/LC Duplex adapters	d = Shielded couplers
S = SC/SC Duplex adapters	u = Unshielded keystones
E = E-2000™/E-2000™ Duplex adapters	s = Shielded keystones
	N = Blind module

Fiber Type/Category Type for Copper —————>

1 = MM/OM1	8 = 6 x SM/OS2, 6 x OM4
2 = MM/OM2	9 = SM/OS2
3 = MM/OM3	e = Cat 5e
4 = MM/OM4	d = Cat 6
5 = 6 x SM/OS2, 6 x OM1	a = Cat 6A
6 = 6 x SM/OS2, 6 x OM2	N = Blind module
7 = 6 x SM/OS2, 6 x OM3	

Accessories and Number of Keystones/Couplers —————>

P = Pigtails
B = Brilliance Field Installable connectors
2 = 2 keystones/couplers
4 = 4 keystones/couplers
N = No accessories

Description of Parts Configured

Panel with one single module and one double module fiber:

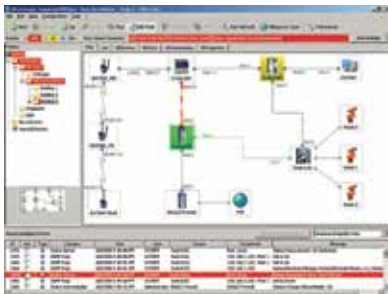
- OM1 single fiber module (three input version) with 6 LC duplex adapters including pack of 12 pigtails
- SM/OS2 double fiber module with 12 ST duplex adapters



Switch and Network Management



EtherNet/IP™
conformance tested



Industrial Profiles

Switch management within EtherNet/IP and PROFINET

Available for OpenRail, MACH and OCTOPUS, Hirschmann™'s Industrial Profiles are a valuable addition to the managed switches' firmware. The functionality provides an almost seamless integration between Hirschmann™'s managed switches and either EtherNet/IP (Allen-Bradley) or PROFINET (Siemens) platforms. Using this functionality, all switch data will be readily accessible to the PLC/HMI for easier network management, security and safety. The industrial profiles also permit PLC/HMI access to switch status, port link status, IGMP settings, network statistics – even the enabling and disabling of individual ports. OpenRail users with firmware prior to 3.0 can upgrade simply by downloading and flashing the updated firmware onto the switch. For more information or for access to the firmware, please contact your local Hirschmann™ representative.

Industrial HiVision

Network Visualization and Configuration Software

Ideally suited for auditing and monitoring network connections and throughputs, Industrial HiVision permits users to have realtime feedback from multiple switches regarding the network and link status. The application's GUI illustrates the network as it is, while providing network statistics (including bandwidth utilization) and live/lost links. Compatible with most brands of managed Ethernet devices that have an IP address.

Industrial HiVision	
Part No.	Order No.
943 156-025	Industrial HiVision, to view up to 25 nodes
943 156-050	Industrial HiVision, to view up to 50 nodes
943 156-100	Industrial HiVision, to view up to 100 nodes
943 156-250	Industrial HiVision, to view up to 250 nodes
943 156-500	Industrial HiVision, to view up to 500 nodes

Integration of Third-party Devices

Industrial HiVision makes it simple for network administrators to integrate any manageable third-party products, no matter whether these are network infrastructure products or end devices. All managed products offer a standard feature set which can be supervised, for example the status of a connection to a device. In addition, options such as device specific functions, status propagation and long term history can be made available using the standard intuitive interface. Users decide the level of supervision detail to suit their own requirements.

Enhanced Auto-topology Discovery

Industrial HiVision is able to detect unmanaged switches and hubs and display their position within the network topology. The software is also able to determine the network topology of devices which are located behind a router. This results in an unprecedented level of topology detail.

MultiConfig™

Not only will MultiConfig™ allow you to configure the same parameters across multiple devices simultaneously, but it will also show you where there is an inconsistency between parameter configurations. It even works across different types of devices, where those devices have parameters in common.

Free 30 Day Trial

Seeing is believing. Download your free 30 day trial of Industrial HiVision from our web site, and see for yourself how you can benefit from the extensive visualization, diagnostics, and reporting information provided by our network management software. Longer trial periods are available on request.

Hirschmann Competence Center

As the use and complexity of industrial networks have increased, so have the pressures on users to design, implement and maintain them. No longer are plant-level Ethernet networks simply a means of gathering data. Industrial applications now monitor and control highly sophisticated and complex operations and processes.

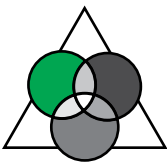
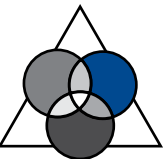
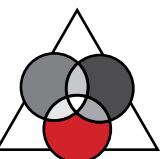
Unlike some lesser Industrial Ethernet switch vendors, Hirschmann understands industrial networks and has the global network support structure to be there when it really counts.

The Hirschmann Competence Center staff has extensive hands-on experience with real-world industrial networks – dealing with applications ranging from petrochemical, pharmaceutical and pulp/paper plants to something as simple as a small sortation machine. Each member of Hirschmann's service team has their own field of technical expertise, ensuring that customers get the best to assist them and their company.

Please feel free to contact us at info.hirschmann@belden.com with your application support, troubleshooting or design needs. To register for one of the upcoming classes, please visit the Hirschmann Competence Center at www.hicomamericas.com.

- Industrial Ethernet Fundamentals 2-days
- Advanced Ethernet 2 Days
- Wireless Ethernet 2 Days
- Layer 3/Routing 2 Days
- Network Security 3 Days



Hirschmann Competence Center	Your optimal network solution	Know-how for reliable operation of your network	Protection against downtimes	Lasting cost control
Consulting 	<ul style="list-style-type: none"> • Individual consultation, design, project management • Network design and migration concepts • Compatibility testing • Wireless site survey 	<ul style="list-style-type: none"> • Training plans • Documentation • Maintenance concepts • Security concepts (network security) 	<ul style="list-style-type: none"> • Integration of redundancy • Spare parts store concept • Emergency concepts 	<ul style="list-style-type: none"> • Service planning • Complete costing
Training 	<ul style="list-style-type: none"> • Technology and product training courses for network designers • Introduction courses for decision makers 	<ul style="list-style-type: none"> • Individual user training courses • Security training • Workshops 	<ul style="list-style-type: none"> • Qualification/certification of your employees and external service providers 	<ul style="list-style-type: none"> • Update training for technologies and products
Support 	<ul style="list-style-type: none"> • Pre-configuration and pre-assembly of systems • On-site commissioning • Application tests 	<ul style="list-style-type: none"> • Network monitoring and support by in-house experts or partners • Network security audit • Network baselining 	<ul style="list-style-type: none"> • 24 x 7 support hotline • On-site support • Remote service • Replacement hardware service 	<ul style="list-style-type: none"> • Warranty extension • Individual, product-related service packages

Be Certain with Belden



Bulk Industrial Ethernet Cable Options from Belden

DataTuff® Industrial Ethernet Category 5e and 6 Cables

Part No.	No. of Pairs	Shielding		Conductor		Installation		Environmental Issues										Industrial Grade Jacket		
		Unshielded	Shielded	Solid	Stranded	Installation Stress Resistance††	Pull Tension	Oil Resistance	UV Sunlight Resistance	Weld - Splatter Resistance	CMX/ Outdoor	Under-ground (burial)	Gasoline Resistance	LSZH	MSHA	Hi/Lo Temp	600V UL AWM Rated	Heavy	Upjacket	Armored
Category 5e Cable																				
7932A EtherDuo/IP	2	•		•		•	20	•	•											•
7933A EtherDuo/IP	2		•	•		•	20	•	•											•
7923A EtherDuo/IP	4	•		•		•	40	•	•		•				•					•
7918A	4	•		•			35	•	•		•				•					•
7924A	4	•			•	•	40	•	•		•									•
7930A	4	•			•		25	•	•		•									•
7922A PLTC	4	•		•	•	•	40	•	•		•									•
7934A EtherDuo/IP	4	•		•		•	40	•	•			•								•
7937A	4		•	•		•	40	•	•			•								•
7939A	4		•		•	•	40	•	•		•									•
7928A EtherDuo/IP	4	•		•		•	40	•	•			•			•		•			•
11700A EtherDuo/IP	4	•		•		•	40	•	•		•				•					•
11700A2 Oil Res I&II	4	•		•		•	40	•	•											•
121700A	4	•		•		•	40	•	•											•
121700R	4	•		•		•	40	•	•											•
7929A	4		•	•		•	40	•	•		•				•					•
7919A	4		•	•			25	•	•		•				•					•
7921A EtherDuo/IP	4		•	•		•	75	•	•		•									•
7957A EtherDuo/IP	4		•	•		•	75	•	•		•					•				•
7935A EtherDuo/IP	4	•		•		•	40		•						•					•
7936A	4		•	•		•	40		•						•					•
7958A EtherDuo/IP	4		•	•		•	35	•	•		•				•			•		•
7938A High Flex	4		•		•	•	40	•	•	•										•
Category 6 Cable																				
7927A	4	•		•		•	45	•	•											•
7931A	4	•		•		•	40	•	•						•					•
7940A EtherDuo/IP	4	•		•		•	40	•	•		•									•
11872A	4	•		•		•	45													•
7953A EtherDuo/IP	4		•	•		•	40	•	•		•									•
121872A	4	•		•		•	200		•											•

• Shielded products are recommended for high-noise environments.

• Stranded products are recommended where more flexibility is needed.

†† Products with Bonded-Pair technology provide Installable Performance® advantages — refer to Belden's Bonded-Pair Cable Bulletin #BP02



TrayOptic® Cable Options from Belden

TrayOptic Heavy-Duty, All-Dielectric Fiber Optic Cables

No of Fibers	Belden Part Number					Outside Diameter		Weight		Max.Install Load	
	OM1 62.5/125 um Std./1Gb	OM2 50/125 um Std./1Gb	OM3 50/125 um 10 Gb-300 m	OM4 50/125 um 10 Gb-550 m	OS2 Single-mode Enhanced	Inch	mm	lb/1000 ft.	kg/km	lb	N

TrayOptic Series

Riser (NEC/CEC OFNR/OFN FT.4) PVC Jacket (Indoor/Outdoor)											
2	I100255	I1A0255	I1C0255	I1E0255	I1W0255	0.43	11.00	92	136	600	2700
4	I100455	I1A0455	I1C0455	I1E0455	I1W0455	0.43	11.00	92	136	600	2700
6	I100655	I1A0655	I1C0655	I1E0655	I1W0655	0.43	11.00	92	136	600	2700
8	I400855	I4A0855	I4C0855	I4E0855	I4W0855	0.43	11.00	92	136	600	2700
12	I601255	I6A1255	I6C1255	I6E1255	I6W1255	0.43	11.00	92	136	600	2700
18	I601855	I6A1855	I6C1855	I6E1855	I6W1855	0.43	11.00	92	136	600	2700
24	I602455	I6A2455	I6C2455	I6E2455	I6W2455	0.43	11.00	92	136	600	2700
36	I603655	I6A3655	I6C3655	I6E3655	I6W3655	0.43	11.00	92	136	600	2700
48	I604855	I6A4855	I6C4855	I6E4855	I6W4855	0.54	13.72	128	186	600	2700
60	I606055	I6A6055	I6C6055	I6E6055	I6W6055	0.54	13.72	128	186	600	2700
72	I607255	I6A7255	I6C7255	I6E7255	I6W7255	0.54	13.72	128	186	600	2700
Riser (NEC/CEC OFNR/OFN FT.4) CPE Jacket (Indoor/Outdoor)											
2	I100266	I1A0266	I1C0266	I1E0266	I1W0266	0.43	10.90	89	124	600	2700
4	I100466	I1A0466	I1C0466	I1E0466	I1W0466	0.43	10.90	89	124	600	2700
6	I100666	I1A0666	I1C0666	I1E0666	I1W0666	0.43	10.90	89	124	600	2700
8	I400866	I4A0866	I4C0866	I4E0866	I4W0866	0.43	10.90	89	124	600	2700
12	I601266	I6A1266	I6C1266	I6E1266	I6W1266	0.43	10.90	89	124	600	2700
18	I601866	I6A1866	I6C1866	I6E1866	I6W1866	0.43	10.90	89	124	600	2700
24	I602466	I6A2466	I6C2466	I6E2466	I6W2466	0.43	10.90	89	124	600	2700
36	I603666	I6A3666	I6C3666	I6E3666	I6W3666	0.43	10.90	89	124	600	2700
48	I604866	I6A4866	I6C4866	I6E4866	I6W4866	0.54	13.72	125	192	600	2700
60	I606066	I6A6066	I6C6066	I6E6066	I6W6066	0.54	13.72	125	192	600	2700
72	I607266	I6A7266	I6C7266	I6E7266	I6W7266	0.54	13.72	125	192	600	2700

Table 2: Fiber Optic Cable Guide

For detailed specifications for each cable type reference Section 18 "Industrial Automation & Process Control Cables" in the Belden Master Catalog or visit our website: www.belden.com. For Belden Technical Support: **1-800-BELDEN-1**

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