RSPE Switches

Modular Managed Industrial DIN Rail Fast/Gigabit Ethernet Switches

The managed RSPE switches guarantee highly available data communication and precise time synchronization in accordance with IEEE 1588v2. They also allow flexible installations in which the network design can be quickly adapted to cope with changing application needs.

+ **Future-proof network design** and **best-possible investment protection** thanks to the maximum flexibility provided by the media modules

+ Standardized redundancy protocols comprehensive security mechanisms and precise synchronization, **ensure 100 percent availability** for systems and machines

+ **Comprehensive management, diagnostic and filtering features**, bringing all-around security to your network

Key Features

- Up to 28 Fast Ethernet or Gigabit Ethernet ports for twisted pair cable and fiber optic cable (via SFP)
- Maximum productivity for systems and machines thanks to completely interruption-free data communications
- Router redundancy, static port and VLAN based routing for increased reliability and security
- Comprehensive security mechanisms bringing all-around network protection
- Deterministic communication with TSN (Time Sensitive Networking)
- Cost-effective powering of devices via PoE/PoE+
- Broad immunity to electrostatic discharges plus high vibration resistance
- Operating temperature range from -40 °C to +70 °C (standard model: 0 °C to +60 °C)

Because media modules can be added to the basic switch devices in next to no time, practical and cost-effective solutions are guaranteed.

Be certain.
Belden.

Your Benefits

Flexible Deployment and 100 Percent Availability

The compact and extremely robust RSPE switches comprise a basic device with eight twisted pair ports and four combination ports that support Fast Ethernet or Gigabit Ethernet. The basic device – optionally available with the HSR (High-Availability Seamless Redundancy) and PRP (Parallel Redundancy Protocol) uninterruptible redundancy protocols, plus precise time synchronization in accordance with IEEE 1588 v2 – can be extended to provide up to 28 ports by adding two media modules. Different combinations of copper or fiber ports (plus PoE/PoE+) can be selected depending on the module type.

Applications

The RSPE switches are the devices of choice whenever future-proof solutions are required to deliver maximum network availability even under extreme environmental conditions. Support for Time Sensitive Networking (TSN) makes the RSPE35 and RSPE37 devices ideal for latency-critical applications. Specially certified for a range of application scenarios, the switches guarantee highly available and cost-effective applications in the energy sector.

Markets

They can be used equally well in other branches of industry, such as:

- Power transmission and distribution
- Renewable energy
- Transportation
- Road and rail traffic
- Cable cars
- Ports and airports
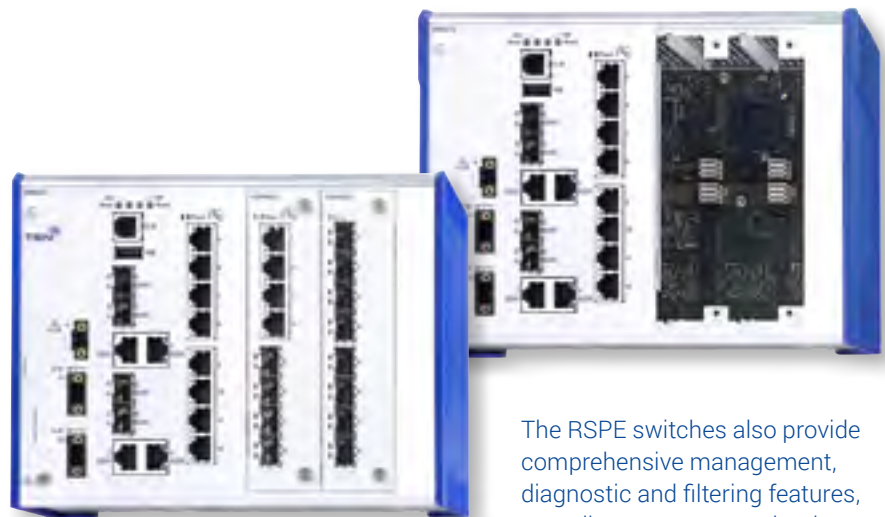
The RSPE switches also provide comprehensive management, diagnostic and filtering features, as well as numerous redundancy methods, bringing all-around security to your network.

Technical Information

Product Description

Type	RSPE30-xx, RSPE32-xx	RSPE35-xx, RSPE37-xx
Description	Modular Managed Industrial Switch DIN Rail, fanless design	
Switching/Routing	HiOS Hirschmann Operating System	
Port Type and Quantity	Ports in total up to 28, Basic unit: 4 x FE/GE Combo ports plus 8 FE TX ports, expandable with two slots for media modules with 8 FE ports each	
Number of Fiber Ports	16 fiber ports: 4 GE/FE basic unit plus 12 FE with media modules	
Power over Ethernet (PoE)	PoE, PoE+ option with up to 24 Ports and 120 Watt	

More Interfaces

V.24 Interface	1 x RJ11 socket
USB and SD Card Slot	1 x to connect auto-configuration adapter ACA22 (USB) or ACA31 (SD-card)

Power Requirements

Operating Voltage	24 to 48 V DC redundant, or 60 to 250 V DC and 110 to 230 V AC optional redundant, PoE/PoE+ with 48/54 V DC	
Power Consumption	Maximum 34 W plus PoE	Maximum 36 W plus PoE

Mechanical Construction

Mounting	DIN Rail
Protection Class	IP30
Dimensions (W x H x D)	209 (217) x 164 x 120 mm (EEC)
Weight	2.2 kg; 2.5 kg EEC, plus media modules

Software

Supported HiOS Software Levels	Layer 2 Standard (L2S), Layer 2 Advanced (L2A) or Layer 3 Standard (L3S)

Software Layer 2 Standard

Management	V.24 web-interface, Telnet, SSHv2, HTTP, HTTPS, TFTP, SCP, SFTP client, SNMP v1/v2/v3, Traps, LLDP-MED, SSH client	
Diagnostics	LED, persistent logging, syslog, signal contact, device status indication, port mirroring N:1, RMON (1,2,3,9), TCPDump, LLDP, SFP management (temperature, optical input and output power), switch dump, configuration check dialog, system information, self tests on cold start, Management Address Conflict Detection, Copper cable test, Port Monitor, duplex mismatch detection, snapshot configuration feature, SFLOW	
Configuration	Command line interface (CLI), WEB based management, fully featured MIB support, BOOTP/DHCP client with auto configuration, DHCP option 82, DHCP server per port and pool per VLAN, HiDiscovery, auto-configuration adapter ACA31 and ACA21, Automatic configuration undo (roll-back), text based configuration file, CLI scripting, Telnet	
Security	MAC based port security, Port-based access control with 802.1x, 802.1x enhancements with Guest/Unauthenticated VLAN and RADIUS VLAN assignment, Integrated Authentication Server (IAS), Basic wired-speed Ingress ACLs (MAC,IPv4) per port and per VLAN, Automatic Denial-of-Service Prevention, Restricted Management Access (ACLs), Different privilege levels, configurable password policies, configurable number of login attempts, account locking, HTTPS certificate management, CLI/SNMP logging, Security Status Monitor, Audit Trail, Remote Authentication via RADIUS, Local User Management	
Redundancy Functions	MRP (Media Redundancy Protocol IEC62439-2), RSTP 802.1D-2004 (IEC62439-1), Link Aggregation, Link backup	
Enhanced Redundancy Functions	–	IEC 62439-3 redundancy Fast MRP, PRP (Parallel Redundancy Protocol) and HSR (High-Availability Seamless Redundancy)
Industrial Profiles	EtherNet/IP protocol, IEC61850 protocol (MMS Server, Switch Model), Modbus TCP, PROFINET IO protocol	
Filter	QoS (8 classes), CoS queue management, interface trust mode, TOS/DSCP prioritization, port priority (IEEE 802.1D/p), VLAN (IEEE802.1Q), Voice VLAN, IGMP snooping/querier per VLAN (v1/v2/v3), unkown multicast filtering, independent VLAN learning, static unicast/multicast address entries, fast aging, MVRP (Multiple VLAN Registration Protocol), MMRP (Multiple MAC Registration Protocol), MRP (Multiple Registration Protocol)	
Time Synchronization	PTPv2 TC two-step, SNTP server and client, Buffered RTC, TSN	
Flow Control	Flow control (IEEE 802.3X), egress interface shaping, ingress storm protection, Queue-Shaping/max. Queue Bandwidth	
Miscellaneous	Port power down, cable crossing, dual software image support, VLAN unaware mode, access to management restricted by VLAN	

Software Layer 2 Advanced in Addition

Security	Further 802.1x enhancements (Multi-client authentication per port, MAC Authentication Bypass, RADIUS Policy Assignment), DHCP Snooping, Dynamic ARP Inspection, Extended wired speed Ingress ACLs (MAC,IPv4) per port and per VLAN, ACL flow based limiting, Time based ACL
Redundancy Functions	MRP over Link Aggregation, Sub Ring Manager
Filter	Protocol based VLAN, MAC based VLAN, IP subnet based VLAN, IP Ingress DiffServ classification and policing

Software Layer 3 Standard in Addition

Layer 3	Full Wire-Speed routing with lowest latency; Port-based Router Interfaces; VLAN-based Router Interfaces; IP/UDP Helper; Loopback Interface; ICMP Filter; Net-directed Broadcasts; OSPFv2; RIP v1/v2; ICMP Router Discovery (IRDP); Static Unicast Routing; Proxy ARP; Static Route Tracking; 1:1 NAT (RSPE35/37 type)

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

Technical Information

Product Description Media Modules for RSPE

Type	RSPM20-4Z64Z6xx	RSPM20-4T14Z6xx RSPM22-4T14Z6xx (PoE type)	RSPM20-4T14T1xx RSPM22-4T14T1xx (PoE type)
Port Type and Quantity	8 FE SFP slots	4 FE SFP slots/4 FE TX ports (PoE option)	8 FE TX ports (PoE option)
Weight	290 g	220 g	130 g

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

Common Technical Data Basic Units and Media Modules

Type	RSPE30, RSPE32, RSPE35, RSPE37, RSPM20, RSPM22

Gigabit ETHERNET Network Size

Twisted Pair (TP)	0-100 m
Multimode Fiber (MM) 50/125 µm	0-550 m, 7.5 dB link budget; 62.5/125 µm, 0-275 m, 7.5 dB link budget (with M-SFP-SX/LC)
Singlemode Fiber (SM) 9/125 µm	0-20 km, 11 dB link budget (with M-SFP-LX/LC); 14-42 km, 5-20 dB link budget (with M-SFP-LX+/LC)
Singlemode Fiber (LH) 9/125 µm	23-80 km, 5-22 dB link budget (with M-SFP-LH/LC); 71-128 km, 15-30 dB link budget (with M-SFP-LH+/LC)

Fast ETHERNET Network Size

Twisted Pair (TP)	0-100 m
Multimode Fiber (MM) 50/125 µm	0-5000 m, 8 dB link budget; 62.5/125 µm, 0-4000 m, 11 dB link budget (with M-Fast SFP-MM/LC)
Singlemode Fiber (SM) 9/125 µm	0-25 km, 13 dB link budget (with M-Fast SFP-SM/LC); 25-65 km, 10-29 dB link budget (with M-Fast SFP-SM+/LC)
Singlemode Fiber (LH) 9/125 µm	47-104 km, 10-29 dB link budget (with M-Fast SFP-LH/LC)

Network Size – Cascadibility

Line-/star Topology	Any
Ring Structure	>200 switches MRP
Fault Recovery Time	0 ms with PRP or HSR

Ambient Conditions

Operating Temperature	0 °C to +60 °C, or -40 °C to +70 °C, IEC 60068-2-2 Dry Heat Test +85 °C 16 Hours, optional Conformal Coating
Storage/Transport Temperature	-40 °C to +85 °C
Relative Humidity (non-condensing)	5% to 95%

Approvals Configurable

Safety of industrial Control Equipment	EN 60950-1, EN 61131-2 , UL61010-1/-2-201
Substation	IEC 61850-3, IEEE 1613
Ship	DNV-GL
Hazardous Locations	ISA-12.12.-01 Class 1 Div. 2 Group A, B, C, D; ATEX Zone 2; IECEx Zone 2
Transportation	NEMA TS2, EN 50121-4

Scope of Delivery and Accessories

Device Replacement and Logging	ACA31 (SD card) 942 074-001, ACA22-USB EEC 942 124-001
Empty Module Slot Cover	RSPM-cover, Order No. 942 131-001

Reliability

Warranty	5 years (standard)

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

RSPE30/RSPE32/RSPE35/RSPE37 Switch Configurations

| R S P E 3 5 | - 2 4 | 0 4 | 4 O 7 | T 9 9 | - T | K 9 | V T | 9 9 | H H | P | E | 2 A | 0 8 . 1 |

Design

RSPE30	=	Standard Version
RSPE32	=	Standard Version with PoE(+) Capability
RSPE35	=	Standard Version with Enhanced Redundancy HSR, PRP, Fast MRP
RSPE37	=	Standard Version with Enhanced Redundancy HSR, PRP, Fast MRP and PoE(+)

Number of Fast Ethernet Ports

24 = 24 x 10/100 Mbit/s

Number of Gigabit Ethernet Ports

04 = 04 x 10/100/1000 Mbit/s

Uplink Ports

4O7 = 04 x Combo Ports (10/100/1000 Mbit/s)

Port Configuration

T99 = 04 x Combo Ports (10/100/1000 Mbit/s)

Temperature Range

| S | = | 0 °C to +60 °C | **T** | = | -40 °C to +70 °C |
| E | = | -40 °C to +70 °C inclusive Conformal Coating |

Power Supply

| CC | = | 02 x 24 to 60 V DC | **K9** | = | 01 x 60 to 250 V DC and 110 to 230 V AC |
| KK | = | 02 x 60 to 250 V DC and 110 to 230 V AC | PP | = | 02 x 47 to 57 V DC (PoE) or 53 to 57 V DC (PoE+) |

Approvals

Z9	= CE, FCC, EN 61131
P9	= Z9 + UL61010 (UL)
T9	= Z9 + EN 50121 (Train)
TY	= Z9 + UL61010, EN 50121 (UL, Train)
U9	= Z9 + GL (Ship)
UT	= Z9 + GL, cUL61010, EN 50121 (UL, Ship, Train)
UW	= Z9 + ATEX, UL61010, GL (EU-haz. loc, UL, Ship)
UX	= Z9 + UL61010, ISA12.12, GL (UL, US-haz.loc, Ship)
UY	= Z9 + UL61010, GL (UL, Ship)
V9	= Z9 + IEC 61850, IEEE 1613 (Substation)
VP	= Z9 + IEC 61850, IEEE 1613, UL61010 (Substation, UL)
VT	= Z9 + IEC 61850, IEEE 1613, cUL61010, EN50121 (Substation, UL, Train)
VU	= Z9 + IEC 61850, IEEE 1613, UL61010, GL (Substation, UL, Ship)
W9	= Z9 + ATEX (EU-haz.loc)
WA	= Z9 + ATEX, IECEx (EU/Int. Haz. Loc)
WB	= Z9 + ATEX, IECEx, GL (EU/Int. Haz.loc, Ship)
WC	= Z9 + ATEX, IECEx, UL61010, ISA12.12 (EU/US/Int. Haz.loc, UL)
WD	= Z9 + ATEX, IECEx, UL61010, ISA12.12, GL (EU/US/Int. Haz.loc, UL, Ship)
WU	= Z9 + ATEX, UL61010, ISA12.12, GL (EU/US-haz.loc, UL, Ship)
WX	= Z9 + ATEX, UL61010, ISA12.12 (EU/US haz.loc)
X9	= Z9 + UL61010, ISA12.12 (UL,US haz.loc)

Software Packages

99 = Reserved

OEM Type

HH = Standard

Hardware Configuration

| S | = Standard | M | = Fast MRP | D = DLR |
| **P** | = PRP | H | = HSR | R = TSN |

Software Configuration

| **E** | = Hirschmann Standard Configuration | B = Diagnositc User (BDEW) | P = Profinet | I = Ethernet/IP | D = DLR (preconfigured) |

Software Version

| 2S | = HiOS Layer 2 Standard | **2A** | = HiOS Layer 2 Advanced | 3S | = HiOS Layer 3 Standard |

Software Release

| **08.1** | = Software Version 08.1 |
| XX.X | = Current Software Release |

NOTE: The last five categories (OEM type, hardware configuration, software configuration, software version and software release) are optional.

RSPM20/RSPM22 Media Module Configurations

```
R S P M 2 2 - 4 T 1   4 T 1 - T   Z 9   H H   S   E   X X . X
```

Design

RSPM20 = Standard Version
RSPM22 = Standard Version with PoE(+) Capability

Port Configuration A

4Z6 = 4 x SFP Slot (100 Mbit/s)
4T1 = 4 x (100 Mbit/s) Twisted Pair (TX)/RJ45

Port Configuration B

4Z6 = 4 x SFP Slot (100 Mbit/s)
4T1 = 4 x (100 Mbit/s) Twisted Pair (TX)/RJ45

Temperature Range

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

Approvals

Z9 = CE, FCC, EN 61131
P9 = Z9 + UL61010 (UL)
T9 = Z9 + EN 50121 (Train)
TY = Z9 + UL61010, EN 50121 (UL, Train)
U9 = Z9 + GL (Ship)
UT = Z9 + GL, cUL61010, EN 50121 (UL, Ship, Train)
UW = Z9 + ATEX, UL61010, GL (EU-haz. loc, UL, Ship)
UX = Z9 + UL61010, ISA12.12, GL (UL, US-haz.loc, Ship)
UY = Z9 + UL61010, GL (UL, Ship)
V9 = Z9 + IEC 61850, IEEE 1613 (Substation)
VP = Z9 + IEC 61850, IEEE 1613, UL61010 (Substation, UL)
VT = Z9 + IEC 61850, IEEE 1613, cUL61010, EN 50121 (Substation, UL, Train)
VU = Z9 + IEC 61850, IEEE 1613, UL61010, GL (Substation, UL, Ship)
W9 = Z9 + ATEX (EU-haz.loc)
WA = Z9 + ATEX, IECEx (EU/Int. Haz. Loc)
WB = Z9 + ATEX, IECEx, GL (EU/Int. Haz.loc, Ship)
WC = Z9 + ATEX, IECEx, UL61010, ISA12.12 (EU/US/Int. Haz.loc, UL)
WD = Z9 + ATEX, IECEx, UL61010, ISA12.12, GL (EU/US/Int. Haz.loc, UL, Ship)
WU = Z9 + ATEX, UL61010, ISA12.12, GL (EU/US-haz.loc, UL, Ship)
WX = Z9 + ATEX, UL61010,ISA12.12 (EU/US haz.loc)
X9 = Z9 + UL61010, ISA12.12 (UL,US haz.loc)

OEM Type

HH = Customization

Hardware Configuration

S = Standard

Software Configuration

E = Entry (without configuration)

Software Release

**XX.X** = Current Software Release
99.9 = No Software Release

NOTE: The last four categories (OEM type, hardware configuration, software configuration and software release) are optional.

HiOS – Hirschmann Operating System

A new Operating System Generation for Managed Switches Specially developed to meet requirements in the automation sector, this operating system is available in two Layer 2 versions (Standard and Advanced) and two Layer 3 versions (Standard and Advanced). The RSPE family supports the versions L2S, L2A and L3S. In addition to numerous management and diagnostic options, both Layer 2 Standard and Advanced versions provide precise time synchronization compliant with IEEE 1588v2, plus a variety of redundancy protocols. With no data loss technologies, the PRP (Parallel Redundancy Protocol) and HSR (High-Availability Seamless Redundancy) redundancy methods ensure smooth production processes. Comprehensive security mechanisms protect networks against attacks and operating errors, so also contributing to high network availability.

Supported by both the Standard and Advanced versions, management protocols include Telnet, SSHv2, HTTP, HTTPS, TFTP, SFTP, and SNMP v1/v2/v3. In addition to PRP and HSR, redundancy protocols also include MRP (Media Redundancy Protocol), Fast MRP and RSTP (Rapid Spanning Tree Protocol). Security mechanisms comprise MAC-based Port Security, Authentication (IEEE 802.1x), Guest/unauthenticated VLAN, Radius Client, Restricted Management Access, Local User Accounts, various Privilege Levels, Management Authentication via Radius, Account Locking, configurable Password Policy and Login Attempts, Audit Trail, CLI/SNMP Logging and HTTPScertified Management.

The Advanced L2 version provides additional "Quality of Service" functions such as DiffServ, VLAN extensions, security mechanisms, such as Access Control List (ACL) and IEEE 802.1x Multi Client Authentication, additional redundancy features like Sub Ring Manager, MRP over Link Aggregation, and Time Sensitive Networking. The Layer 3 version offers full wired speed IPv4 routing with lowest latency, Router redundancy, static port and VLAN based routing. Details can be found in the data sheet.

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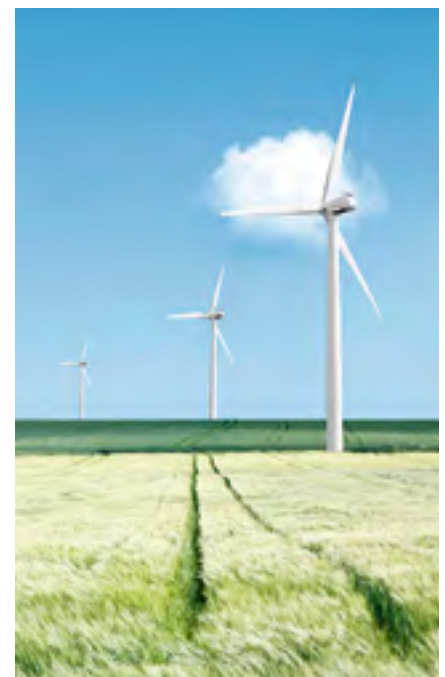
Belden Competence Center

As the complexity of communication and connectivity solutions has increased, so have the requirements for design, implementation and maintenance of these solutions. For users, acquiring and verifying the latest expert knowledge plays a decisive role in this. As a reliable partner for end-to-end solutions, Belden offers expert consulting, design, technical support, as well as technology and product training courses, from a single source: Belden Competence Center. In addition, we offer you the right qualification for every area of expertise through the world's first certification program for industrial networks. Up-to-date manufacturer's expertise, an international service network and access to external specialists guarantee you the best possible support for products.

Irrespective of the technology you use, you can rely on our full support – from implementation to optimization of every aspect of daily operations.

Always Stay Ahead with Belden

In a highly competitive environment, it is crucial to have reliable partners who add value to your business. When it comes to signal transmissions, Belden is the No. 1 solutions provider. We know your business and want to understand your specific challenges and goals to show how effective signal transmission solutions can push you ahead of the competition. By combining the strengths of our five leading brands, Belden, GarrettCom, Hirschmann, Lumberg Automation and Tofino Security, we are able to offer the integrated solution you need. Today, it may be a single cable, switch or connector, to solve a specific issue; tomorrow, it can be a complex range of integrated applications, systems and solutions. With the rise in smart, connected devices brought on by the Industrial Internet of Things (IIoT), together, we can make sure your infrastructure is ready to handle and make sense of the influx of data. Transform your business now with instant access to information, and make your vision a reality. Visit info.belden.com/iiot to learn more.

About Belden

Belden Inc., a global leader in high quality, end-to-end signal transmission solutions, delivers a comprehensive product portfolio designed to meet the mission-critical network infrastructure needs of industrial, enterprise and broadcast markets. With innovative solutions targeted at reliable and secure transmission of rapidly growing amounts of data, audio and video needed for today's applications, Belden is at the center of the global transformation to a connected world. Founded in 1902, the company is headquartered in St. Louis, USA, and has manufacturing capabilities in North and South America, Europe and Asia.

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