Booklet

One-page information

DIN Rail Mount Switches

unmanaged
- SPIDER Series

Lite Managed
- GECKO Series
- LEMUR Series

Full Managed

Compact
- RS Series
- BOBCAT BRS Series
- BXS Series

Modular
- MSP Series

Ruggedized
- RED Series
- RSP Series
- RSPE Series

Rack Mount Switches

Workgroup Environement
- MACH100 Series
- GRS100 Series Greyhound
- DRAGON MACH4x00 Series

Ruggedized Environement
- MACH1000 Series
- GRS1042 Series Greyhound

MPLS-TP Solution

XTRAN
- OTN Systems

Hirschmann - IT

Enterprise Network Switches
- MTS family

IP65/IP67 Switches

Unmanaged
- OCTOPUS Series

Managed
- OCTOPUS Series

Industrial Security

Layer 2 Firewall
- EAGLE One Series
- Tofino Xenon System

Layer 3 Firewall
- EAGLE 20/30/40 Series

Rail Data Diode
- RDD Series

Industrial Wireless

Workgroup Environement

DIN Rail
- OpenBAT Series
- BAT867-R Series

IP65/IP67
- BAT-C2 Series
- BAT450-F Series

M12
- OWL LTE M12 Series

Software

Secure Remote Access
- ProSoft
- OWL

Network Management
- Industrial HiVision
- HiView
- Provize

System Accessories

Power Supplies | PoE Injector | SFP Transceivers | Auto Configuration Adapter
Terminal Cables | Mounting Equipment | Patch Panel

The information published in this overview has been compiled as carefully as possible. It is subject to alteration without notice in technical as well as in price-related/commercial respect. The complete information and data were available on user documentation. Mandatory information can only be obtained by a concrete query.

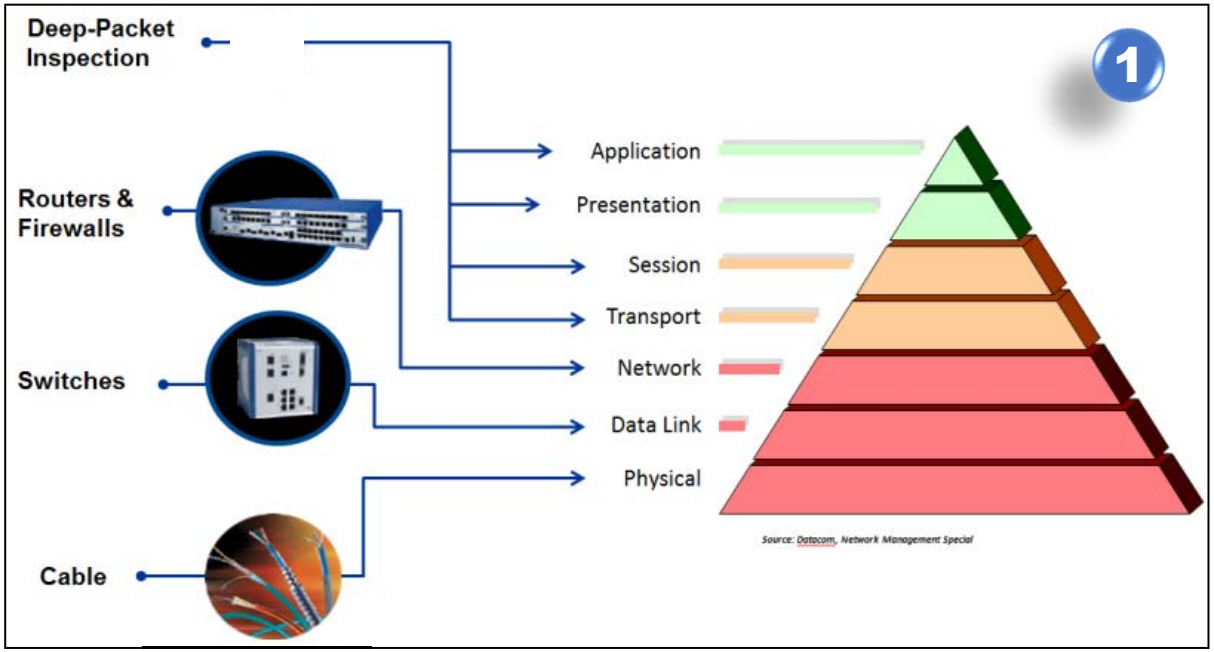
Die in dieser Übersicht veröffentlichten Informationen sind mit größtmöglicher Sorgfalt zusammengestellt. Sie unterliegen dem Vorbehalt der jederzeitigen Änderung. Die vollständigen Informationen und Daten entnehmen Sie bitte der Anwenderdokumentation. Verbindliche Aussagen können nur auf konkrete Anfragen hin abgegeben werden.

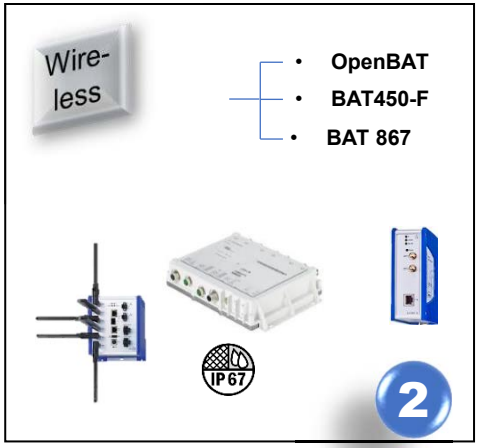
Version 2024-03

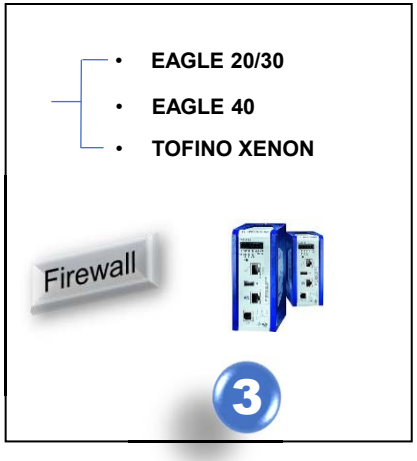
HIRSCHMANN
A BELDEN BRAND

PHYSICAL REQUIREMENTS

Steps to find the right product







SWITCHES – SEARCH CRITERIA 1/3

Steps to find the right product

4 DIN Rail

Layer 2 / Layer 3 -Switches

- SPIDER family
- GECKO family
- RPS(E) family
- Bobcat family (BRS)
- MSP family

- RS20/30/40 family
- MS20/30
- RSR20/30

5 19“ Rack mount

Layer 2 / Layer 3 -Switches

- Greyhound GRS 1020/30
- Greyhound GRS 1042
- Greyhound GRS 100
- DRAGON MACH 4000/4500

- MACH102/104
- MACH1020/1030/40
- MACH4000

6 Harsh conditions

Layer 2 / Layer 3 -Switches

- OCTOPUS 8TX
- OCTOPUS OS30/40

- OCTOPUS 8/16/32

SWITCHES – SEARCH CRITERIA 2/3

7

Speed

- 10 Mbit/s
- 100 Mbit/s
- 1,000 Mbit/s
- 10,000 Mbit/s

8

Type of ports

- Fiber
  - Singlemode
    - BFOC/ST
    - D-LC
    - D-SC
  - Multimode
    - BFOC/ST
    - D-LC
    - D-SC
    - MTRJ

Type of ports

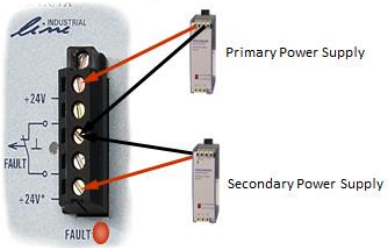
9

- Twisted Pair
  - RJ45 
  - M12, D-coded 
  - M12, X-coded 

SWITCHES – SEARCH CRITERIA 3/3

10 Type of power available

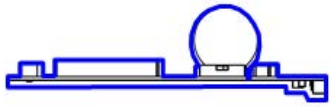
- Different power plug
- Type of power plug
- Redundancy



- 24 Volt DC
- 48 Volt DC
- 60/120/250 Volt DC
- 110/230 Volt AC
- 47 ... 57 Volt DC (PoE)
- 53 ... 57 Volt DC (PoE+)

11 Temperature

- Fanless
- Conformal coating

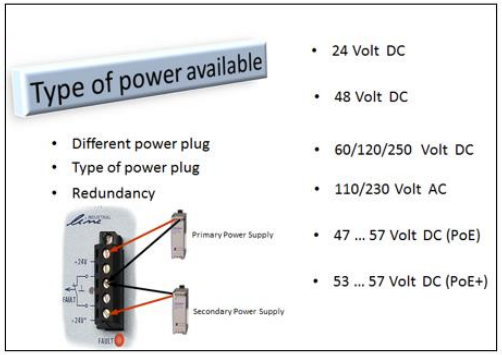


EEC – **E**xtended **E**nvironemental **C**ondition means larger temperature range

- 0° ... +60°C
- 0° ... +50°C
- -40° ... +70°C
- -40° ... +85°C

Product family	Voltage range
SPIDER	9,6 – 32V DC 9,6 – 60V DC 18 – 30V AC
RS20/30/40	9,6 – 60V DC / 18 – 30V AC 47 – 52V DC (PoE)
OCTOPUS	16,8 – 30V DC 25,2 – 60V DC 53 – 57V DC (PoE+) 16,8 – 60V DC 50,4 – 138V DC 88 – 265V AC
MSP	18 – 60V DC 47 – 57V DC (PoE) 53 – 57V DC (PoE+)
BRS	9,6 – 32V DC 18 – 60V DC / 18 – 30V AC 2x 18 – 30V DC 2x 48V DC (PoE) / 54V DC (PoE+)
RSP	18 – 60V DC 48 – 320V DC or 88 – 265V AC 12 – 24V DC
RSPE	18 – 60V DC 48 – 320V DC or 88 – 265V AC 47 -57V DC (PoE); 53 – 57V DC (PoE+)
GRS1042	24 – 48V DC or 48 – 54V DC 60 – 250V DC and 110 – 240V AC
GRS10x	110 – 240V AC 110 – 250V AC 24 – 48V DC
DRAGON MACH	90V AC – 264V AC

10



NORMS AND STANDARDS

9

Safety

- cUL508 Safety of industrial control equipment
- UL61010-1/2-201
- EN60950-1 Safety of industrial technology equipment
- EN61131-2

Vehicle

- e1/E13

Transportation

- NEMA TS2 Traffic control

Marine

- ABS (American Bureau of shiping)
- BV (Bureau Veritas)
- ~~DNV (Det Norske Veritas)~~
- ~~GL (German Lloyd)~~
- DNVGL

Fusion to

- LR (Lloyd Register)
- KR (Korean Register)
- RINA (Italy)
- BSH (Compass Distance)

Country specific

- EC (European Union)
- FCC (US)
- C-Tick (Australia)
- GOST-R (Russia)

Railway

- EN50121-4 Railway along track
- EN50155 Railway on vehicle
- EN5510-2 Fire test to railway components
- prEN45545
- NF F 16-101
- NF F 16-102

Substation

- IEC61850-3
- IEEE1613

Hazardous Locations

- ISA 12.12.01
- ATEX Zone2
- cUL1604 Class1 Div 2

ETHERNET PRODUCTS AT A GLANCE

Unmanaged DIN Rail Mount Switches

SPIDER family

Light managed DIN Rail Mount Switches

GECKO family

Managed DIN Rail Mount Switches

RS20/30/40 family
Bobcat BRS family

Managed DIN Rail Mount Switches

RSP(E) family

Managed DIN Rail Mount Modular Switches

MSP family

Managed DIN Rail Mount Switches

IP67 – OCTOPUS family

19“ Mount managed Switches

MACH100 family
MACH1040 family
Greyhound GRS10x family
Greyhound GRS1042 family
DRAGON MACH4x00 family

Modular Industrial Patch-Panel

MIPP family

Industrial Wireless LAn

BAT family

Network Management Solution

Industrial HiVision

Network visualization and configuration software with integrated OPC server.

- Automatic topology dectection
- MultiConfig™ for simultaneous configuration of multiple devices
- Security Status Visualization
- Network dashboard
- Annual Maintenance Plan

Security, Firewall and VPN Appliance

EAGLE One Router

- Compliance with global standards and certifications, including approvals for hazardous locations and marine certifications
- Ease of integration through unique “firewall learning mode” that reduces traditional installation risks
- Advanced redundancy features for maximum security, including layer 2 & layer 3 functions that ensure switchov to a standby device in the event of a fault or failure

EAGLE20/30 Firewalls

- Customizable design with interface configuration options for Fast Ethernet, Gigabit Ethernet & Symmetrical High-speed Digital Subscriber Line (SHDSL)
- Advanced Graphical User Interface helps you create custom rules for fast, easy configuration
- Operating system HiSecOS 3.0 security features, includin Deep Packet Inspection (DPI), ensure the highest level of security

Tofino Xenon Security Appliance

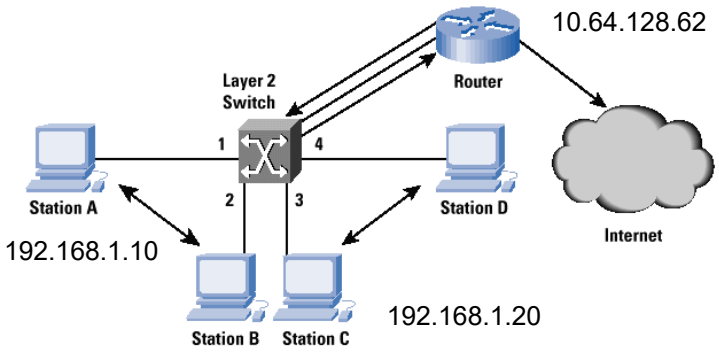
- Protect PLCs, RTUs and other control devices with this stealth industrial firewall that provides stateful and industrial protocol deep packet inspection at Layer 2 (data link)
- Simplify installation: Zero-impact Plug-n-Protect technology requires no pre-configuration, no network changes and no disruption to the control system
- Configure-Test-Deploy: Zero-day vulnerability protection with deep protocol awareness that is not dependent upor vulnerability updates

Rail Data Diode

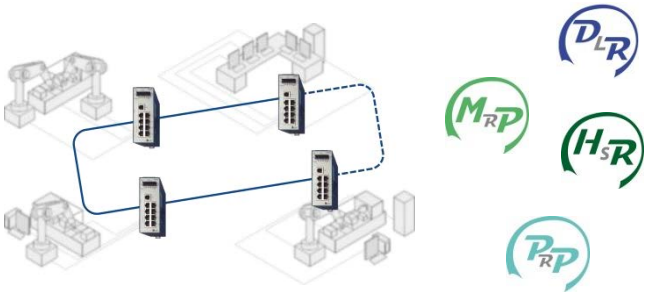
- Reliably protects networks from external cyber threats through singular data flow
- Securely transfers Ethernet data to the public internet without putting the system at risk
- Easy-to-explain product functionality for governmental or regulatory approval processes

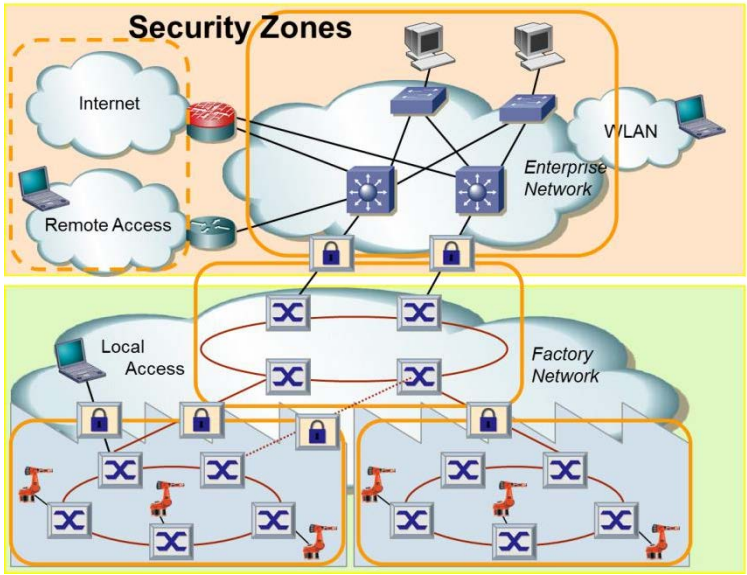
You want to know, which products are on status „discontinued“, click on:
https://beldensolutions.com/en/Service/long-term-product-support/index.phtml

TECHNOLOGY TERMS



- L2 (switching) / L3 (routing)
- Unmanaged / Managed
- Redundancy Protocols
- PoE (Power over Ethernet)
- LAN / WLAN / (W)WAN
- Security and Firewalls

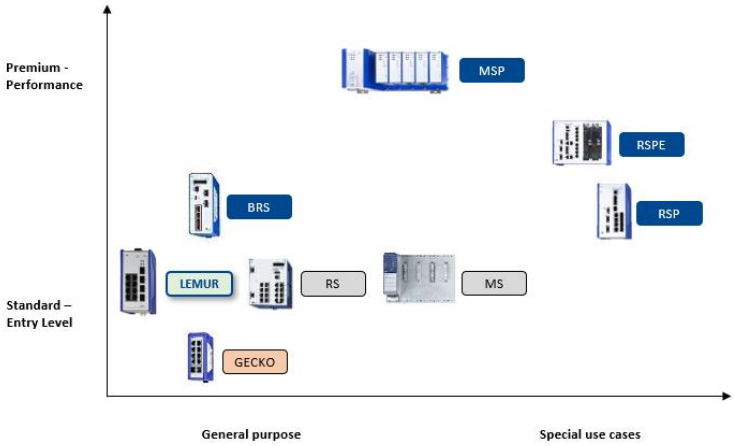


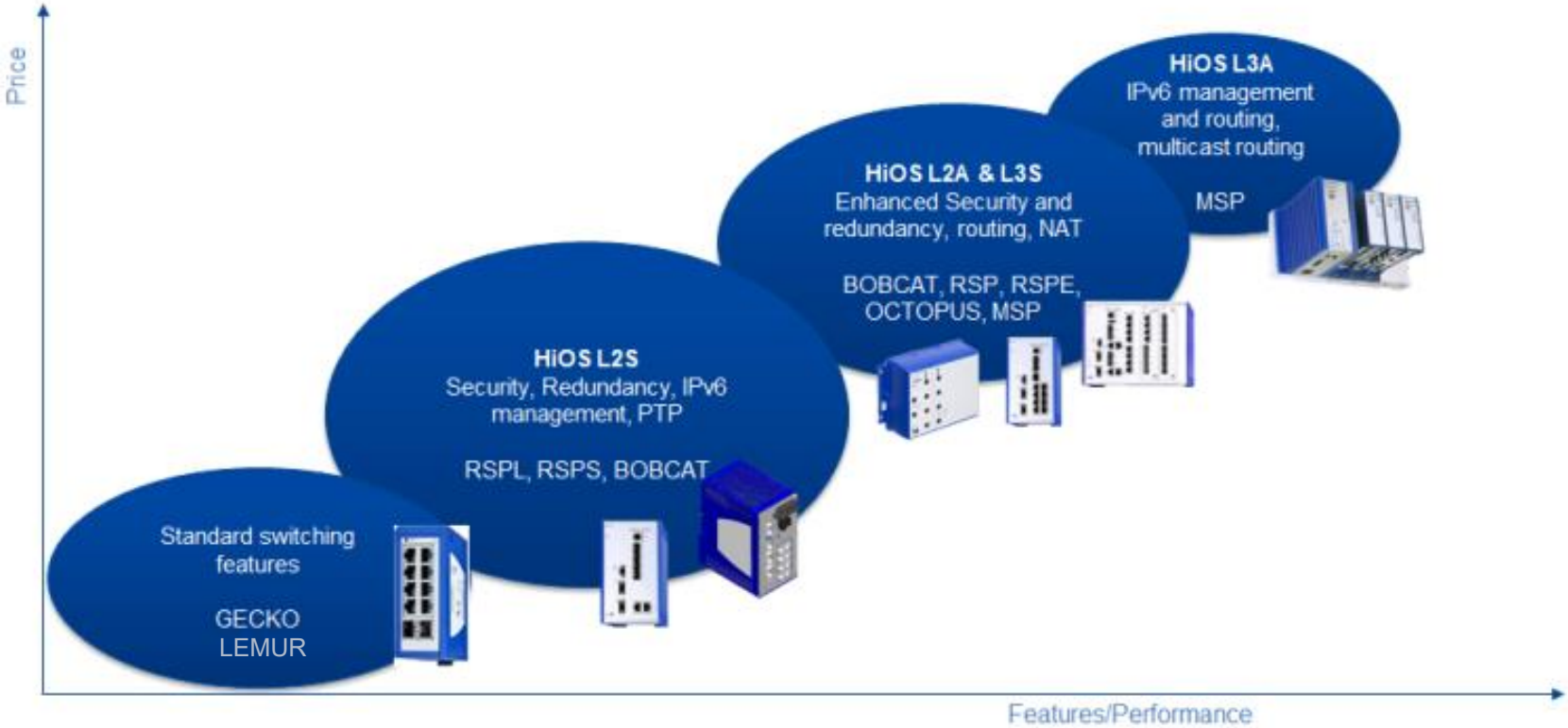


ETHERNET VS. INDUSTRIAL ETHERNET

- DIN rail, rack mount, embedded
- Extended operating temperature range
- Designed for passive cooling
- Industrially rugged design, especially the case
- Industrial connectors in addition to RJ45
- Higher International Protection (IP) Rating
- Redundant Components (Power Supplies, etc.)
- Support for industrial network protocols
- Deployed at the network edge
- Protection from Electromagnetic Interference (EMI)

PRODUCT POSITIONING





HiOS

Classic SW

HiEOS

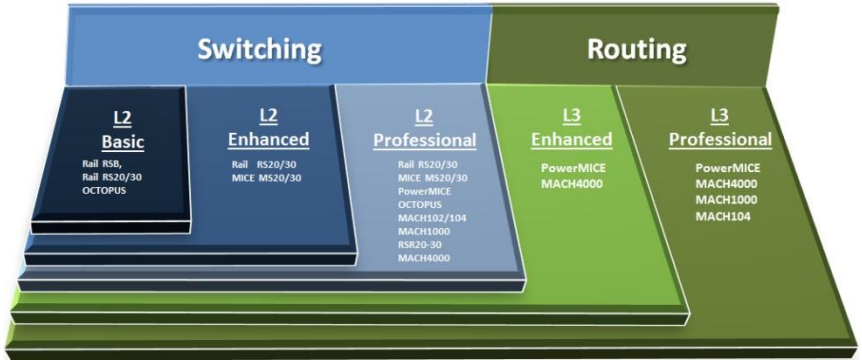
GECKO SW

Classic

Platform 4

The Classic Switch Software (Release 8)

Software Platform for Hirschmann™ **managed** MACH, MICE, Rail and OCTOPUS families



Switching	
Layer 2 Basic	Suitable for **RSB20, OCTOPUS**. The cost-effective entrance into managed switch capabilities. Includes statistics, Filters and redundancy technologies. The alternative for unmanaged switches.
Layer 2 Enhanced	Suitable for **RS20/30/40, MS20/30**. Basic level plus a wide range of management, filter and diagnostic functions. Fast redundancy mechanisms, industrial profiles like EtherNet/IP and PROFINET and security features are also supported. Ideally suited for standard industrial
Layer 2 Professional	Suitable for **MACH100, MACH1000, MACH4000, RS20/30/40, MS20/30, RSR** Enhanced software plus extended diagnostic, filter properties, security and redundancy features. A software package for applications where great value is placed on uncompromising plant safety and the highest level of availability
Routing	
Layer 3 Enhanced	Suitable for **PowerMICE, MACH4000** Professional L2 software plus additional security, static routing, dynamic routing protocols (RIP), router- and link redundancy. The Layer 3 software for smaller networks and applications with extended security requirements.

Detail information page 165 - ….

HiOS

Platform 5

HiOS - Hirschmann™ Operating System

Software Platform for Hirschmann™ **managed** RSP, MSP and Embedded Ethernet Switch families

Further step to find the right product

Switching	
Layer 2 Standard	Suitable for **RSP, GRS** series. In addition to numerous management and diagnostic options, HiOS provides precise time synchronization compliant with IEEE 1588v2 plus a variety of redundancy protocols. With zero switchover times, the PRP (Parallel Redundancy Protocoll) and HSR (High-Availabilty Seamless Redundancy) redundancy methods ensure smooth production processes. Comprehensive security mechanisms protect your network against attacks and operatinng errors, so also contributing to high network availability
Layer 2 Advanced	Suitable for **MSP and RSP series.** The Advanced Level includes all features of the Standard Level plus additional redundancy enhancements with MRP over Link Aggregation and Quality of Service functions such as DiffServ, MAC and IP based VLANs, protocol based VLANs and security mechanisms like enhanced Access Control Lists (ACL). Flow based ACL, RADIUS-based poilicy assignment, IP source guard, dynamic ARP inspection and IEEE 802.1x multi client authentication.
Routing	
Layer 3 Standard	Suitable for OCTOPUS, RSP and RSPE series. Layer 3 software includes the functionality of L2 software plus additional functionality such as static routing, 1:1 Network Address Translation, Router Redundancy and multicast forwarding. Ethernet Train Backbone is available for OCTOPUS.
Layer 3 Advanced	Suitable for **MSP** series Layer 3 software includes the functionality of L3 Standard software plus additional functionality plus a wide range of dynamic routing protocols for unicast- and multicast protocols

MANAGED DIN-RAIL SWITCH PORTFOLIO

GECKO LEMUR

The **Lite Managed** Industrial Ethernet switch offers easy-to-implement management functionality at an **outstanding price-performance** ratio.

BOBCAT

Next Generation Compact Managed Switches.
first industrial switch to provide advanced security and real-time communication through time-sensitive networking (TSN) technology.

RSPx (RSP/RSPS/ RSPE/RED25)

RSP family offers a **robust hardware and a powerful operating system** optional supporting new redundancy protocols for uninterrupted data communication.

Modular Switches (MICE and MSP)

Configurable modular switches for mission critical applications with **unique security features** and **innovative hardware redundancy methods** to ensure complete protection
of the network and max. network availability.

LITE MANAGED SWITCH --- LEMUR

HiEOS
Hirschmann™ Entry Operating System

	LRS30-7TX/3SFP/1C	LRS32-7TX/3SFP/1C	LRS40-7TX/3SFP/1C	LRS42-7TX/3SFP/1C
Product Code	**942 328-005**	**942 328-006**	**942 328-003**	**942 328-004**
Port Type and Quantity	7 x 10/100BASE-TX, 3x 100/1000BASE-FX SFP, 1x Combo (10/100/1000BASE-TX and 100/1000BASE-FX SFP)	7 x 10/100BASE-TX, 3x 100/1000BASE-FX SFP, 1x Combo (10/100/1000BASE-TX and 100/1000BASE-FX SFP), PoE/PoE+	7 x 10/100/1000BASE-TX, 3x 100/1000BASE-FX SFP, 1x Combo (10/100/1000BASE-TX and 100/1000BASE-FX SFP)	7 x 10/100/1000BASE-TX, 3x 100/1000BASE-FX SFP, 1x Combo (10/100/1000BASE-TX and 100/1000BASE-FX SFP), PoE/PoE+
Temp Range	-40 °C to +60 °C			
Voltage Range	9.6 - 32 VDC	46-57 VDC	9.6 - 32 VDC	46-57 VDC

Port control
Port Speed/Duplex Mode/Flow Ctrl
Port Frame Size (Jumbo frames)
Port State (administrative status
Port Status (link monitoring)
Port Statistics (MIB counters)
On-the-fly SFP detection
DDMI
SFP Hirschmann vendor lock without allowedlist
Auto/manual MDI-X/MDI

L2 Switching
Auto MAC addr. Learning/Ageing
MAC Addresses - Static
Virtual LAN 802.1Q
VLAN Trunking
Rapid Spanning Tree RSTP, STP
BPDU Guard & Restricted Role
IGMPv2 snooping
IGMPv3 snooping
IGMP filtering profile
IPMC throttling, filtering, leave proxy
Port Mirroring

QoS
Traffic Classes (4/8 active priorities)
Port Default Priority
User Priority
Input Priority mapping (DSCP)
Global Storm Control for UC, MC and BC
Port egress shaper
Queue egress shapers
Scheduler mode

Protection
G.8032 - Ring protection
G.8032 - Ring protection v2
MRP Client (Media redundancy protocol)
RSTP

Hirschmann Features
HiDiscoveryV2 including Provize Integration
FPC / Force Password Change
Hirschmann Web Interface

Management
JSON-RPC
RFC 2131 DHCP Client
CLI - Telnet
Management access filtering
SSHv2
Syslog Server
System Syslog
Software Upload via web/CLI (Upgrade/Downgrade
SNMPv1 / v2c Agent - Note: No SNMPv1 trap support
SNMPv3 Agent
RMON (Group 1, 2, 3 & 9)
RMON alarm and event(CLI, web)
Alarm Module
IEEE 802.1AB-2005 Link Layer Discovery LLDP
TFTP for Software Upgrades
Configuration Management (Clear factory/config)

Security
MAC Address Limit
Persistent MAC learning
Web & CLI Authentication
Authorization (15 user levels)

Synchronization
NTPv4 Client

Industrial Protocols
Ethernet/IP (Mid 2024)
Profinet (End of 2024)

LITE MANAGED SWITCH

GECKO

- **4 x 10/100BaseTX** (942 104-003)
- **5 x 10/100BaseTX** (942 104-002)
- **8x 10/100BaseTX**
- **8x 10/100BaseTX + 2x 1 GE SFP slot**
- SPIDER 5TX housing (25mm x 114mm x 79mm)
- Operating temperature 0°C to +60°C
- Power input 24V DC
- CE, FCC, cUL 508, UL61010-1/-2-201

Name	Order number
GECKO 4TX	942 104-003
GECKO 4TX-PN	942 104-301
GECKO 4TX-EIP	942 104-401
GECKO 5TX	942 104-002
GECKO 5TX-PN	942 104-302
GECKO 5TX-EIP	942 104-402
GECKO 8TX	942 291-001
GECKO 8TX-PN	942 291-301
GECKO 8TX-EIP	942 291-401
GECKO 8TX/2SFP	942 291-002
GECKO 8TX/2SFP-PN	942 291-302
GECKO 8TX/2SFP-EIP	942 291-402

- Basic Settings
  - Device Information
  - Network
  - Software
  - Load/Save
  - Port
    - Configuration
    - Statistics
- Device Security
  - Password
  - HTTPS
  - SNMP
- Time
  - Basic Settings
  - SNTP
- Switching
  - Global
  - Filter for MAC-Addresses
  - QoS/Priority
    - Port Configuration
    - 802.1D/p Mapping
    - IP DSCP Mapping
  - VLAN
    - Configuration
    - Port
  - L2 Redundancy
    - MRP-Client
    - Spanning Tree
      - Global
      - Port
- Secure Remote Access
  - SiteManager GECKO
  - About
- Diagnostics
  - Alarms (Traps)
  - LLDP
  - System Log
  - Syslog
- Advanced
  - Industrial Protocols
    - PROFINET

Management
- SNMP v1, v2c, v3 (security level: authNoPriv)
- SNMP traps
- Web based management (HTTPS), HTML5
- HTTPS server
- LLDP (802.1AB)

Diagnostic
- Device status indication (LEDs)
- RMON (1) statistics
- Simple interface statistics (MIB-2)
- Error logging local → Log-File
- Topology Discovery according to IEEE 802.1AB (LLDP)
- TFTP client

Configuration
- DHCP
- Via HiDiscovery
- Via Industrial HiVision
- WEB based management

Security
- HTTPS certificate management
- Different privilege levels
- Local user accounts
- SNMPv3 (authNoPriv)
- Possibility to disable each port
- Secure Boot

Redundancy
- RSTP according to IEEE 802.1D-2004 (IEC62439-1)
- MRP client

Filter
- Store and Forward switching
- TOS/DSCP prioritization (Mapping TOS/DSCP to 802.1D/p)
- Prioritization through 4 queues
- Static unicast/multicast address entries (up to 100)
- VLAN

Switching
- Static unicast/multicast address entries
- QoS / Port priority (802.1D/p)
- TOS/DSCP prioritization

Industrial Protocols
- PROFINET, Ethernet/IP

Time Synchronization
- SNTP client

Secure remote Access
- Site Manager GECKO (4TX and 5TX)

Software Packet 1 (v2.3)

OCTOPUS

IP67 switch – unmanaged

OCTOPUS 8TX-EEC (942 150-001)
unmanaged ruggedized IP67-Switch 8
Configurable, like SPIDER PL
8x 10/100 BASE-TX

OCTOPUS 8TX-EEC PoE (942 151-001)
unmanaged ruggedized IP67-Switch 8
Configurable, like SPIDER PL
8x 10/100 BASE-TX, incl. 7 PoE ports
The max. **PoE output** of the device is **35 Watt**

IP67 switch –managed

OCTOPUS 8TX-EEC-M-2S (942 301-001)
OCTOPUS 8TX-EEC-M-2A (942 301-002)

		Layer 2 standard	Layer 2 advanced
Management	DNS Client	–	✔
	LLDP	✔	✔
	SSHv2	✔	✔
	HTTPS	✔	✔
Diagnostics	Syslog	✔	✔
	E-Mail notification	–	✔
	Port mirroring	✔	✔
	VLAN mirroring	–	✔
Security	Radius VLAN assingment	✔	✔
	Denial of service prevention	✔	✔
	Radius policy assignment	–	✔
	DHCP snooping	–	✔
	MAC based ACL	–	✔
Redundancy	MRP	✔	✔
	MRP over link aggregation	–	✔

Power Supply	
Power Supply Connector	M12 "A"-coded connector
Nominal Voltage	2 * 24 / 36 VDC, redundant
Voltage Range incl. max. Tolerances	16.8 to 45.0 VDC
Power Consumption	6 W
Power Output (Power Dissipation) in Btu (IT)/h	20 Btu (IT)/h
Power Loss Buffer	10 ms
Internal Fuse	Non-replaceable fuse
Recommended External Fuse	2 A slow blow

Reliability	
Mean Time Between Failure	400 000 h (GB, 25 °C)

Accessories to Order Separately

ACA22-M12-C (942 306-001); Adapter Cable, M12-5pin male to USB (942 309-001)

Software

HiOS

Platform 5

Switching

HiOS L2 Standard

Comprehensive Security,
Seamless Redundancy*
Basic ACLs (limited functions) #

**RSP*#, RSPE*#, RED25
RSPL, RSPS*, GRS1X20/1X30,
OCTOPUS OS, Bobcat BRS**

HiOS L2 Advanced

Enhanced QoS,
Basic ACLs (full functions)

**RSP, RSPE, MSP,
OCTOPUS OS,
GRS1X42, Bobcat BRS,
DRAGON MACH**

Routing

HiOS L3 Standard

Static IPv4 Routing
ACL, NAT

**RSP, RSPE,
OCTOPUS OS**

HiOS L3 Advanced

IPv4 Routing
MC-Routing

**MSP
GRS1X42
OS3,
DRAGON MACH**

Detail information page 165 - ….

OCTOPUS II IP67 switch

OS						T5	T			99	HH	S	E
1. Design	2. PoE	3. Fast Ethernet	4. Gigabit	5. Uplink port Typ 1	6. Uplink port Typ 1	7. Local ports	8. Temp. range	9. Voltage range	10. Approvals	11. SW Pck.	12. OEM type	13. HW Config	14. SW Conf

1. Design

OS20	Fast Ethernet Ports
OS24	Fast Ethernet Ports with PoE
OS30	FE and GE Ports
OS34	FE and GE Ports with PoE

2. PoE ports

00	No PoE ports
08	8x FE PoE ports
10	10x FE PoE ports
11	11x FE PoE ports
12	12x FE PoE ports
14	14x FE PoE ports
15	15x FE PoE ports

3. 10/100 Mbit/s ports

08	8x 10/100 Mbit/s
12	12x 10/100 Mbit/s
16	16x 10/100 Mbit/s
20	20x 10/100 Mbit/s
24	24x 10/100 Mbit/s
28	28x 10/100 Mbit/s

4. 10/100/1000 Mbit/s ports

00	none
02	2x 10/100/1000 Mbit/s
04	4x 10/100/1000 Mbit/s

5. / 6. Uplink port Typ 1 / Typ 2

T5	TP FE, M12/D-coded	1A	M-SFP SX/LC, EEC/V1
1M	M-Fast SFP-MM/LC, EEC/V1	1B	M-SFP LX/LC, EEC/V1
1S	M-Fast SFP-SM/LC, EEC/V1	1C	M-SFP LH/LC, EEC/V1
1P	M-Fast SFP-SM+/LC, EEC/V1	1D	M-SFP LH+/LC, EEC/V1
1L	M-Fast SFP-LH/LC, EEC/V1	4A	M-SFP SX/LC, EEC/V4
4M	M-Fast SFP-MM/LC, EEC/V4	4B	M-SFP LX/LC, EEC/V4
4S	M-Fast SFP-SM/LC, EEC/V4	4C	M-SFP LH/LC, EEC/V4
4P	M-Fast SFP-SM+/LC, EEC/V4	4D	M-SFP LH+/LC, EEC/V4
4L	M-Fast SFP-LH/LC, EEC/V4	5A	M-SFP SX/EEC, QODC
99	Not assembled	5B	M-SFP LX/EEC, QODC
R5	TP FE, M12/D-coded with Bypass-Relay	5C	M-SFP LH/EEC, QODC
R6	TP GE, M12/X-coded with Bypass-Relay	5D	M-SFP LH+/EEC, QODC
T6	TP GE, M12/X-coded		

7. Local ports

T5	M12, D-coded

8. Temperature range

T	Extended -40°C ... +70°C

9. Voltage range

	BB	2x 24V DC (16,8 to 30V DC) !!! Included M12; ELWIKA 5012; 933 175-100
	HH	2x 36/48V DC (25,2 to 60V DC) !!! Included M12 voltage plug
60W	N9	1x 72/110V DC (50,4 to 138V DC) !!! Included 7/8"; RKC40/9 - 4-pole connector; 942 086-004
60W	M9	1x 110/120/220/230V AC (88 to 265V AC), 7/8" 3-poles voltage plug !!! Included 7/8"; RKC30/9 - 3-pole connector; 942 086-003
	FF	2x 24V DC ... 48V DC !!! Included 7/8"; RKC50/9 - 5-pole connector; 942 086-005
60W	QQ	2x 24/36/48V DC (16,8 to 60V DC) !!! Included M12 voltage plug
120W	PP	2x 48/54V DC (PoE or PoE+, 47 to 57V DC) !!! Included M12 voltage plug

5-pole M12 „A-coded" connector: BB, HH

4-pole „T"- coded connector: QQ, PP

3-pole „T"- coded connector: M9

4-pole 7/8" connector: N9

5-pole 7/8" connector: FF

10. Approvals

Z9 - CE, FCC, EN 61131, EN 60950-1
U9 - CE, FCC, EN 61131, EN 60950-1, GL
UT - CE, FCC, EN 61131, EN 60950-1, GL, UL60950-1, EN 50121-4
T9 - CE, FCC, EN 61131, EN 60950-1, EN 50121-4
S9 - CE, FCC, EN 61131, EN 60950-1, EN 50121-4, EN 50155, EN 45545
R9 - CE, FCC, EN 61131, EN 60950-1, E1
Y9 - CE, FCC, EN 61131, EN 60950-1, UL60950-1
UY - CE, FCC, EN 61131, EN 60950-1, GL, UL60950-1
US - CE, FCC, EN 61131, EN 60950-1, GL, UL60950-1, EN 50121-4, EN 50155
TY - CE, FCC, EN 61131, EN 60950-1, EN 50121-4, UL60950-1
SY - CE, FCC, EN 61131, EN 60950-1, EN 50121-4, EN 50155, EN 45545, UL60950-1

11. Software Packages

99	reserved

12. OEM type

HH	Standard

13. HW config

S	Standard	D	DLR (Port 1/2)
M	Fast MRP (Port 1/2)	N	NAT (Port 1/2)
P	PRP (Port 1/2)	T	Prepared for Train backbone (port 1-4)
H	HSR (Port 1/2)		

14. SW config

E	reserved	B	BDEW configuration
I	Ethernet / IP configuration	D	DLR configuration
P	ProfiNet / IO configuration		

15. SW level

2S	HiOS Layer 2 Standard	3S	HiOS Layer 3 Standard
2A	HiOS Layer 2 Advanced		

V1: IP67-connector acc. IEC61076-3-106; Variar

V4: IP67-connector acc. IEC61076-3-106; Variant

Q-ODC Huber + Suhner

Accessorie
OCTOPUS Dust cap
(942 057-001; 25 pieces)

OCTOPUS III

IP67 switch

OS3 | HH | S | XX.X | XX

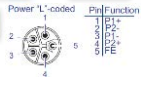
1. Product	OS3	OCTOPUS III
2. Data rate	3	10/100 **and** 10/100/1.000 Mbit/s
	4	10/100/1.000 Mbit/s
3. Hardware type	0	No PoE
	4	Including PoE/PoE+
4. PoE ports total	00	No PoE/PoE+
	08	8x PoE/PoE+
	16	16x PoE/PoE+
	24	24x PoE/PoE+
5. PoE ports 100 Mbit/s	00	No PoE/PoE+
	08	8x 100 Mbit/s PoE/PoE+
	16	16x 100 Mbit/s PoE/PoE+
6. PoE ports 1.000 Mbit/s	00	No PoE/PoE+
	08	8x 1.000 Mbit/s PoE/PoE+
	16	16x 1.000 Mbit/s PoE/PoE+
	24	24x 1.000 Mbit/s PoE/PoE+
7. 100 Mbit/s ports	00	0x 100 Mbit/s
	08	8x 100 Mbit/s
	16	16x 100 Mbit/s
8. 1.000 Mbit/s ports	00	8x 100 Mbit/s
	08	16x 100 Mbit/s
	24	24x 100 Mbit/s
9. 10 Gbit/s ports	00	0x 1.000 Mbit/s
10. 1rst pair of uplink ports	T6	2x 1GE M12; x-coded
	R6	2x 1GE M12; x-coded, relay
11. 2nd pair of uplink ports	T6	2x 1GE M12; x-coded
	R6	2x 1GE M12; x-coded, relay

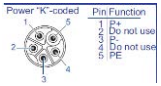
Typ	Kodierung/coding		Kontaktbelegung/contact assignment	
			Pin	Farbe/color
RKCCS 5K	K	PE	1	schwarz 1/ black No. 1
			2	schwarz 2/ black No. 2
			3	schwarz 3/ black No. 3
			4	schwarz 4/ black No. 4
			PE	grüngelb/ green yellow
RKCCS 5L	L	FE	1	braun/ brown
			2	weiß/ white
			3	blau/ blue
			4	schwarz/ black
			FE	grau / grey
RSCCS 5K	K	PE	1	schwarz 1/ black No. 1
			2	schwarz 2/ black No. 2
			3	schwarz 3/ black No. 3
			4	schwarz 4/ black No. 4
			PE	grüngelb/ green yellow
RSCCS 5L	L	FE	1	braun/ brown
			2	weiß/ white
			3	blau/ blue
			4	schwarz/ black
			FE	grau / grey

12. Temperature range	V	-40°C ... 60°C
	T	-40°C ... 70°C
13. Voltage range	BB	2x 24VDC (16,8 – 30VDC)
	HH	2x 36/48VDC (25,2 - 60VDC)
	PP	2x 47 - 57VDC (PoE); 53 - 57VDC (PoE+)
	QQ	2x 24/36/48 (16,8 -60VDC)
	N9	1x 72/110 VDC (50,4 – 138 VDC)
	M9	1x 110/120/220/230 VAC (88-265 VAC)

BB | HH | PP | QQ

5-pole „L"- coded M12 connector





N9 | M9

5-pole „K"- coded M12 connector

14. Approvals	Z9	CE; FCC; EN61131; EN62368-1
	Y9	„Z9" + cUL61010
	S9	„Z9" + EN50121-4 +EN50155 + EN45545 + EMV06
15. Software Packages	99	reserved
	UR	Unicast Routing
	MR	Multicast Routing
16. Customized	HH	Hirschmann Standard – IP67
	HS	Hirschmann Standard – IP54
17. Hardware Config.	S	Standard
18. Software Config.	E	Standard
	P	Profinet/IO configuration
	I	Ethernet/IP configuration
	B	BDEW configuration
19. Software level	2A	HiOS Layer 2 Advanced
	3A	HiOS Layer 3 Advanced
20. Software version	XX.X	Newest version
21. Maintenance version	XX	Newest maintenance version

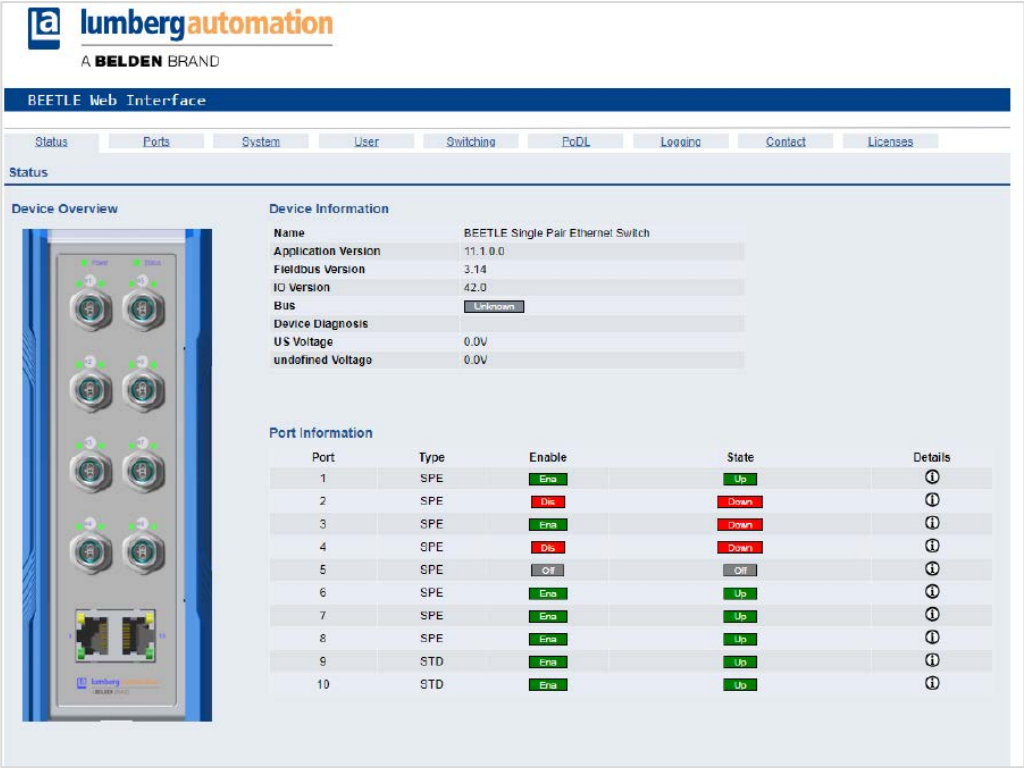
PoE/PoE+

Voltage range: „PP": 120Watt

Voltage range: „M9|N9|QQ": 60Watt

Lite managed switch – Single Pair Ethernet

Web Server



Features:

- Password Management
- 2 session OPC-UA Server with different profiles
- Switch configuration via OPC-UA
- Firmware update via HTTP (HTTPS planned)
- Rapid Spanning Tree for Uplink RJ45 ports (SPE ports planned)
- VLAN
- QoS (trustDot1p, trustIpDscp, untrusted)
- Traffic control (bandwidth control)
- Broadcast & Multicast Strom Protection
- Static Unicast/Multicast MAC addresses entries
- Port Power down
- Auto-negotiation
- LLDP (diagosticts)
- Copper cables testing
- Persistent local error logging
- PoDL (enable/disable, Priorities)

Fast Ethernet
100 MBit/s per twisted pair, unidirectional

GBit Ethernet
250 MBit/s or 2.5 GBit/s per twisted pair, bi-directional

Single Pair Ethernet
100 MBit/s or 1 GBit/s per twisted pair, bi-directional

THE BEETLE is…

… our first SPE capable lite managed switch

… based on the 10BASE-T1L SPE standard (10 Mbit/s over 1.000m)

… utilizing 8x M8 connectors based on the IEC 63171-6 connector standard for SPE and 2x RJ45 for standard Ethernet

… supporting PoDL class 12 and is using a IP40 housing

… also offer a webserver for the configuration

… supporting EtherNet/IP, Modbus TCP and OPC UA

BXS Bobcat- Train switch

	942302001	942302002	942302003	942302004	942302005	942302006	942302007	942302008
Description	BXS 4GE 8FE LV	BXS 4GE 8FE HV	BXS 4GE 8FE PoE LV	BXS 4GE 8FE PoE HV	BXS 12GE LV	BXS 12GE HV	BXS 12GE PoE LV	BXS 12GE PoE HV
Hardware Type	Standard		Standard with PoE(+)		Standard		Standard with PoE(+)	
# 100 Mbit/s Ports	8 x 100 Mbit/s Ports				0 x 100 Mbit/s Ports			
# 1000 Mbit/s Ports	4 x 1000 Mbit/s Ports				12 x 1000 Mbit/s Ports			
Temp Range	-40°C --> +70°C, conf.coating							
Voltage Range	2 x (24VDC (16,8-30VDC)) M12 L-coded	72/110VDC (50,4V-138VDC) M12 K-coded	2x(24/36/48VDC(16,8-60VDC)) M12 L-coded	110/120/220/230(88-265)(VAC) M12 K-coded	2 x (24VDC (16,8-30VDC)) M12 L-coded	72/110VDC (50,4V-138VDC) M12 K-coded	2x(24/36/48VDC(16,8-60VDC)) M12 L-coded	110/120/220/230(88-265)(VAC) M12 K-coded
Approvals	CE, FCC, EN61131-2, EN62368-1, EN50121, EN50155							
Software Level	HiOS Layer 2 Advanced							

BXS-30-12TX-EECC-LV-2A	942 302-001
BXS30-12TX-EECC-HV-2A	942 302-002
BXS32-12TX-EECC-LV-2A	942 302-003
BXS32-12TX-EECC-HV-2A	942 302-004
BXS32-12TX-EECC-LV-2A	942 302-005
BXS40-12TX-EECC-HV-2A	942 302-006
BXS42-12TX-EECC-LV-2A	942 302-007
BXS42-12TX-EECC-HV-2A	942 302-008

Product Description

- Managed switch
- **4 GE** (X-coded) ports and **8 FE Ports** (D-coded)
- M12 connectors (4x X-coded, 8x D-coded)
- 60 W PoE
- 24 VDC, 110 VDC and 230 VAC supply voltage
- Metal housing
- IP40
- Train approvals

- Managed switch
- **12 GE ports**
- M12 connectors (X-coded)
- 60 W PoE
- 24 VDC, 110 VDC and 230 VAC supply voltage
- Metal housing
- IP40
- Train approvals

Value Proposition

- HiOS L2S or L2A
- Vibration proof
- Conformal coating

Accessoire

V.24 port: BXS, Adapter Cable ,
M12-5pin male to USB (942 309-001)

ACA22-M12-C (EEC) with 512MB (942 306-001)

High performance 10 GE switch for the rolling stock market

General Feature Overview

- 12, 20 or 28 port variants, IP40 housing, M12
- Fast Ethernet & Full Gigabit & 10 Gigabit port options
  - Up to 6x 10 Gigabit ports
- PoE++ with 120 W power budget
- L2A and L3A software level
- TSN ready
- Support of seamless redundancy protocols (HSR / PRP)
- 24VDC – 110 VDC wide range power supply

Features of initial release (Q4/2023):

- 28 ports
  - 6x 10 GE, 22x 1 GE
  - PoE++
- L2A software level
- 110 VDC power supply

High performance 10 GE switch for the rolling stock market

Variant	PoE+	Total port count
BXP60 28TX-EECC-L2A*	No	28
BXP64 28TX-EECC-L2A*	Yes (20 ports)	28
BXP60 28TX-EECC-L3A*	No	28
BXP64 28TX-EECC-L3A*	Yes (20 ports)	28
BXP60 20TX-EECC-L2A*	No	20
BXP64 20TX-EECC-L2A*	Yes (14 ports)	20
BXP60 20TX-EECC-L3A*	No	20
BXP64 20TX-EECC-L3A*	Yes (14 ports)	20

BAS Building Automation Switch

- BAS20-8TX (942 307-001)

  8 FE ports unmanaged
  Operating voltage: 9,6V DC … 60V DC
  18V AC … 30V AC

- BAS20-8TX-HV (942 307-002)

  8 FE ports unmanaged;
  Operating voltage: 85V AC … 264V AC

- BAS22-8TX-HV-55 (942 307-003)

  8 FE ports unmanaged providing PoE;
  → support max. 55W
  Operating voltage: 85V AC … 264V AC

- BAS22-8TX-110 (942 307-004)

  8 FE ports unmanaged
  → support max. 110W
  Operating voltage: 9,6V DC … 60V DC
  18V AC … 30V AC

BRS Bobcat- Railswitch

1

BRS20-04009999-STCZ99HHSES
4x 10/100 Mbit/s, RJ45

2

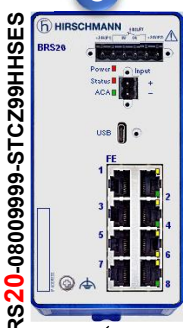
BRS20-0500M299-STCZ99HHSES
4x 10/100 Mbit/s, RJ45
1x 100 Mbit/s, Fiber, D-SC

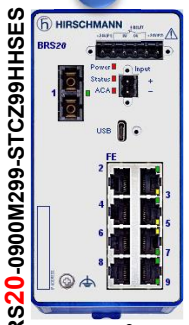
3

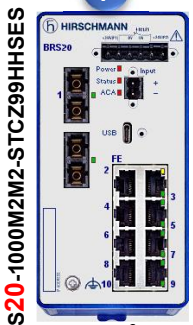
BRS20-0500M499-STCZ99HHSES
4x 10/100 Mbit/s, RJ45
1x 100 Mbit/s, Fiber, ST

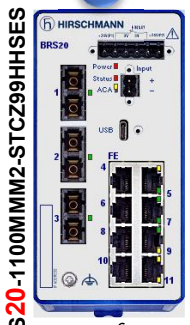
4

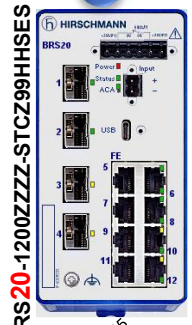
BRS20-0600M2M2-STCZ99HHSES
4x 10/100 Mbit/s, RJ45
2x 100 Mbit/s, Fiber, ST/D-SC

5

BRS20-08009999-STCZ99HHSES
8x 10/100 Mbit/s, RJ45

6

BRS20-0900M299-STCZ99HHSES
8x 10/100 Mbit/s, RJ45
1x 100 Mbit/s, Fiber, ST/D-SC

7

BRS20-1000M2M2-STCZ99HHSES
8x 10/100 Mbit/s, RJ45
2x 100 Mbit/s, Fiber, ST/D-SC

8

BRS20-1100MMM2-STCZ99HHSES
8x 10/100 Mbit/s, RJ45
3x 100 Mbit/s, Fiber, ST/D-SC

9

BRS20-1200ZZZZ-STCZ99HHSES
8x 10/100 Mbit/s, RJ45
4x 100 Mbit/s, SFP slots

10

BRS30-0804OOOO-STCZ99HHSES
8x 10/100 Mbit/s, RJ45
4x 100/1.000 Mbit/s, SFP slots

11

BRS40-00089999-STCZ99HHSES
8x 10/100/1.000 Mbit/s, RJ45

12

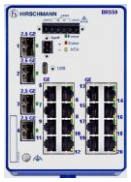
BRS40-00129999-STCZ99HHSES
12x 10/100/1.000 Mbit/s, RJ45

13

BRS40-0012OOOO-STCZ99HHSES
8x 10/100/1.000 Mbit/s, RJ45
4x 100/1.000 Mbit/s, SFP slots

14

BRS50-00122Q2Q-STCZ99HHSES
8x 10/100/1.000 Mbit/s, RJ45
4x 100/1.000/2.500 Mbit/s/SFP slots
Tri-speed


Product Code	Order number	Speaking name
BRS20-04009999-STCY99HHSESXX.X.XX	942-170-001	BRS20-4TX
BRS20-04009999-TTCY99HHSESXX.X.XX	942-170-011	BRS20-4TX-EEC
BRS20-0600M2M2-STCY99HHSESXX.X.XX	942-170-003	BRS20-4TX/2FX
BRS20-0600M2M2-TTCY99HHSESXX.X.XX	942-170-013	BRS20-4TX/2FX-EEC
BRS20-0600S2S2-STCY99HHSESXX.X.XX	942-170-005	BRS20-4TX/2FX-SM
BRS20-0600S2S2-TTCY99HHSESXX.X.XX	942-170-015	BRS20-4TX/2FX-SM-EEC
BRS20-08009999-STCY99HHSESXX.X.XX	942-170-002	BRS20-8TX
BRS20-08009999-TTCY99HHSESXX.X.XX	942-170-012	BRS20-8TX-EEC
BRS20-1000M2M2-STCY99HHSESXX.X.XX	942-170-004	BRS20-8TX/2FX
BRS20-1000M2M2-TTCY99HHSESXX.X.XX	942-170-014	BRS20-8TX/2FX-EEC
BRS20-1000S2S2-STCY99HHSESXX.X.XX	942-170-006	BRS20-8TX/2FX-SM
BRS20-1000S2S2-TTCY99HHSESXX.X.XX	942-170-016	BRS20-8TX/2FX-SM-EEC
BRS30-0804OOOO-STCY99HHSESXX.X.XX	942-170-007	BRS30-8TX/4SFP
BRS30-0804OOOO-TTCY99HHSESXX.X.XX	942-170-017	BRS30-8TX/4SFP-EEC
BRS40-00089999-STCY99HHSESXX.X.XX	942-170-008	BRS40-8TX
BRS40-00089999-TTCY99HHSESXX.X.XX	942-170-018	BRS40-8TX-EEC
BRS40-0012OOOO-STCY99HHSESXX.X.XX	942-170-009	BRS40-8TX/4SFP
BRS40-0012OOOO-TTCY99HHSESXX.X.XX	942-170-019	BRS40-8TX/4SFP-EEC
BRS50-00122Q2Q-STCY99HHSESXX.X.XX	942-170-010	BRS50-8TX/4SFP
BRS50-00122Q2Q-TTCY99HHSESXX.X.XX	942-170-020	BRS50-8TX/4SFP-EEC

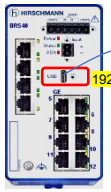
Bobcat **PoE/PoE+** variants

- BRS22/32/42/52

PoE/PoE+ support
48V/54V: 120W/240W; 8 ports
24V: 90W; 8 ports

Variants support up to 240 Watts @54VDC across up to 8 ports without load sharing, with each port able to provide the maximum per-port output power of 30 Watts (PoE+) simultaneously.

Type of the voltages that can be connected	Specification of the supply voltage
When using PoE: DC voltage	Rated voltage DC: 48 V DC
	Voltage range DC incl. maximum tolerances: 46 V DC ... 57 V DC
When using PoE+:	Rated voltage DC: 54 V DC
	Voltage range DC incl. maximum tolerances: 52 V DC ... 57 V DC
Without using PoE or PoE+: DC voltage	Rated voltage range DC: 24 V DC ... 48 V DC
	Voltage range DC incl. maximum tolerances: 19 V DC ... 60 V DC



Note:
Device runs DHCP server on Out-of-Band interface
Option:
Automatic Recognition/Solving of address conflicts

Accessories on pages 138ff

SFP 125ff

BRS Bobcat- Railswitch

BRS		type					-					9	HH	S	E		xx.x
1. Product	2. Data rate		4. FE ports	5. GE ports	6. 1rst uplink group	7. 2nd uplink group		8. Temp. range	9. Voltage range	10. Housing	11. Approvals	12. Approvals	13. SW	14.	15. Tech	16.	17. SW	16.SW Vers

1. Product

BRS	Bobcat Rail Switch

2. Data rate

2	10/100 Mbit/s ports	4	10/100/1.000 Mbit/s ports
3	10/100/2x 1.000 Mbit/s ports	5	10/100/1.000/2.500 Mbit/s ports Tri-speed

3. HW type

0	- Standard	2	- PoE
1	- Standard + MACSec	3	- Standard + MACSec + PoE

4. Numbers of FE ports

00	0x	10/100 Mbit/s	10	10x	10/100 Mbit/s
04	4x	10/100 Mbit/s	11	11x	10/100 Mbit/s
05	5x	10/100 Mbit/s	12	12x	10/100 Mbit/s
06	6x	10/100 Mbit/s	16	16x	10/100 Mbit/s
08	8x	10/100 Mbit/s	20	20x	10/100 Mbit/s
09	9x	10/100 Mbit/s	24	24x	10/100 Mbit/s

5. Numbers of GE ports

00	0x	100/1.000 Mbit/s	16	16x	100/1.000 Mbit/s
04	4x	100/1.000 Mbit/s	20	20x	100/1.000 Mbit/s or 16x 100/1.000 Mbit/s + 4x 1G/2.5G depending on 2./3. - Tri-Speed
08	8x	100/1.000 Mbit/s	24	24x	100/1.000 Mbit/s or 20x 100/1.000 Mbit/s + 4x 1G/2.5G depending on 2./3. - Tri-Speed
12	12x	100/1.000 Mbit/s or 8x 100/1.000 Mbit/s + 4x 1G/2.5G depending on 2./3. - Tri-Speed			

6. First uplink group

M2	1x MM /SC	2T	2x TP /RJ45 (10/100/1.000 Mbit/s)
M4	1x MM /ST	VV	2x SM /SC
S2	1x SM /SC	UU	2x SM /ST
S4	1x SM /ST	EE	2x SM+ /SC
E2	1x SM+ /SC	LL	2x SM-LH /SC
L2	1x SM-LH /SC	GG	2x SM-LH+ /SC
G2	1x SM-LH+ /SC	ZZ	2x SFP slot
Z6	1x SFP slot	OO	2x SFP slot; dual speed- FE/GE
MM	2x MM /SC	2Q	2x SFP slot; 100MB/1G/2.5G
NN	2x MM /ST	99	Not configurable

6. Second uplink group

M2	1x MM /SC	2T	2x TP /RJ45 (10/100/1.000 Mbit/s)
M4	1x MM /ST	Z6	1x SFP slot
S2	1x SM /SC	ZZ	2x SFP slot
S4	1x SM /ST	OO	2x SFP slot; dual speed – FE/GE
E2	1x SM+ /SC	2Q	2x SFP slot; 100MB/1G/2.5G
L2	1x SM-LH /SC	99	Not configurable
G2	1x SM-LH+ /SC		

8. Temp. range

S	Standard 0°C ... +60°C	E	Extended -40°C ... +70°C incl. Conformal Coating
C	Standard C 0°C ... +60°C incl. Conformal Coating	G	Extended -40°C ... +70°C incl. Conformal Coating, glued
T	Extended -40°C ... +70°C		

9. Voltage range

T	2x 9,6 – 32 VDC	U	2x 18 – 30 VDC (PoE: max. 90W)
F	2x 18 – 60 VDC /18-30 VAC	P	2x 48 VDC (PoE) / 54 VDC (PoE+) Max 240W

10. Housing

C	C - IP20 Plastic	E	E - IP40 Metall	D	D - IP30 Metall

11. Approvals

Declarations Part A

Z	Z – CE; FCC; EN61131; EN62368-1
Y	Y – „Z“ + cUL61010 - UL
X	X – „Z“ + cUL61010 + ISA12.12.01 – UL + hazardous location US
V	V - „Z“ + IEC61850; IEEE1613 - Substation
U	U - „Z“ + DNVGL - Navy
T	T – „Z“ + EN50121; NEMA TS2 - Rail
S	U - „Z“ + DNVGL – extended ship approval Navy
W	W - „Z“ + ATEX/IECEx hazardous location

12. Approvals

Declarations Part B

Y	Y – cUL61010 - UL
X	X – cUL61010 + ISA12.12.01 – UL + hazardous location US
V	V - IEC61850; IEEE1613 - Substation
U	U - DNVGL - Navy
T	T – EN50121; NEMA TS2 - Rail
9	9 – no additional approval
S	U - „Z“ + DNVGL – extended ship approval Navy
W	W - „Z“ + ATEX/IECEx hazardous location

13. SW package	9	reserved	14. Customization	HH	Hirschmann
15. SW Techn.	Standard				

16. SW- Level	S	S - L2 -Standard	A	A - L2 -Advanced
17. SW Configuration	E	- Empty	P	- Profinet

17. SW Level

2S	HiOS Layer 2 Standard
2A	HiOS Layer 2 Advanced

18. SW version	XX.X	Latest software version

Accessories on pages 127ff

SFP 120ff

RSP VARIANTS OVERVIEW

RSP ---- RSPE

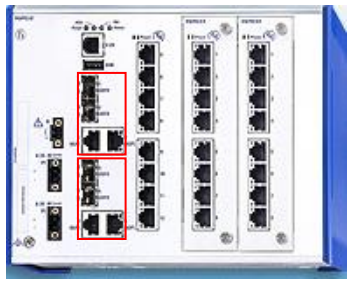
- all-round carefree package for the highest level of security
- Option for “0ms” recovery (PRP, HSR)
- Option Fast MRP
- Prepared for add-on software packages (L3, NAT,…)
- Precise time stamping based on IEEE1588v2
- **RSP: 3x GE ports, plus 8 FE ports**
- **RSPE: Modular, up to 4x GE and 24x FE**

RSP3X 08 03 306 TT
3 SFP (GE/FE)
8x FE ports, RJ45

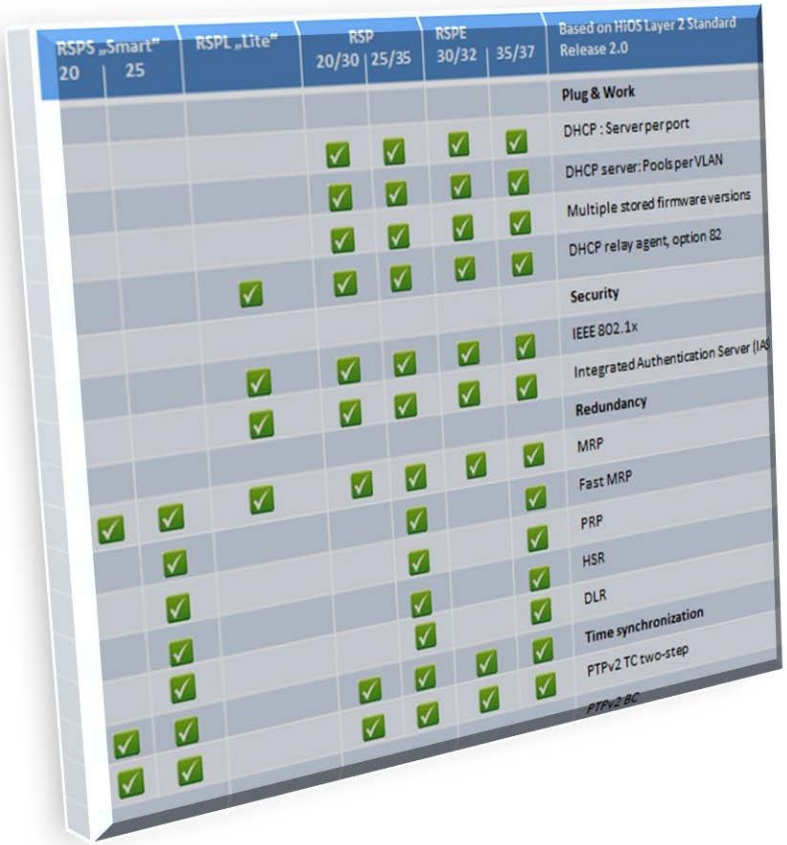
RSP3X 08 03 306 ZT
3 SFP (GE/FE)
4x FE ports, RJ45
4x FE SFP-slots

RSP2X 11 00 3Z6 TT
3 SFP (FE)
8x FE ports, RJ45

RSP2X 11 00 3Z6 ZT
3 SFP (FE)
4x FE ports, RJ45
4x FE SFP-slots



RSPE3X 24 04 407 T99
4 Combo ports (GE/FE)
8x FE ports, RJ45
-- Extension with media modules



RSPS „Smart” 20	RSPS „Smart” 25	RSPL „Lite”	RSP 20/30	RSP 25/35	RSPE 30/32	RSPE 35/37	Based on HiOS Layer 2 Standard Release 2.0
							Plug & Work
			✓	✓	✓	✓	DHCP : Server per port
			✓	✓	✓	✓	DHCP server: Pools per VLAN
			✓	✓	✓	✓	Multiple stored firmware versions
		✓	✓	✓	✓	✓	DHCP relay agent, option 82
							Security
		✓	✓	✓	✓	✓	IEEE 802.1x
		✓	✓	✓	✓	✓	Integrated Authentication Server (IAS)
							Redundancy
		✓	✓	✓	✓	✓	MRP
		✓	✓	✓	✓	✓	Fast MRP
✓	✓			✓		✓	PRP
	✓			✓		✓	HSR
	✓			✓		✓	DLR
	✓			✓	✓	✓	**Time synchronization**
	✓		✓	✓	✓	✓	PTPv2 TC two-step
✓	✓		✓	✓			PTPv2 BC
✓	✓						

RSPS the Smart type

- Reduced security features set but still on a high level
- Option for “0ms” recovery (PRP, HSR) and Fast MRP
- Precise time stamping based on IEEE1588v2

FE type, 6 ports, 3 different port versions:

- 6x 10/100 TX,
- 2x 10/100 TX / 4x FE-SFP
- 4x 10/100 TX / 2x FE-SFP

- Applications which require an uninterrupted redundancy technology (smart Red.-Box) and/or precise time stamping PTP IEEE1588v2

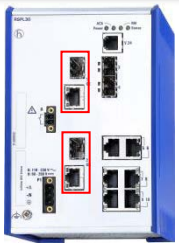
RSPS2X 06 00 2Z6 YT
4x FE SFP-slots
2x FE TP, RJ45

RSPS2X 06 00 2Z6 TT
2x FE SFP-slots
4x FE TP, RJ45

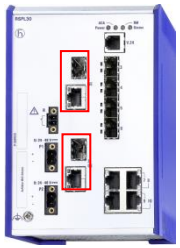
RSPS2X 06 00 2T1 TT
6x FE TP, RJ45

RSPL20 08 00 2Z6 TT
2x FE SFP-slots
6x FE TP, RJ45

RSPL20 08 00 2Z6 YT
4x FE SFP-slots
4x FE TP, RJ45



RSPL30 08 02 207 YT
2x Combo ports (GE/FE)
2x FE SFP-slots
6x FE TP, RJ45



RSPL30 08 02 207 ZT
2x Combo ports (GE/FE)
4x FE SFP-slots
4x FE TP, RJ45

RSPL Lite version of RSP

- all-round carefree package for the highest level of security (similar to RSP)
  - **2x GE Combo ports (option), plus 8 FE ports**
  - **FE port options: 2x SFP / 6x TX, 4x SFP / 4x TX**
- No add-on software packages and IEEE1588 support
- No PRP and HSR
- Applications which require a comprehensive feature range including e.g. diagnostic and a high level of security, but no uninterrupted redundancy and PTP IEEE1588 support.

End of life

Accessories on pages 127ff

SFP 120ff

RSP Rail Switch Power

RSP			-					-					E		XX.X
1. Product	2. Data rate	3. HW type		4. 10/100 Mbit/s ports	5. 10/100/1000 Mbit/s ports	6. Uplink port configuration	7. Port configuration		8. Temperature range	9. Voltage range	10. Approvals	11. Customi-zation	12. Software configuration	13. Software level	14. Software version

1. Product

RSP	Rail Switch Power

2. Data rate

2	- 10/100 Mbit/s ports
3	- 10/100/1000 Mbit/s ports

3. HW type

0	- Standard
5	- Enhanced Redundancy (PRP, HSR, Fast MRP)

4. 10/100 Mbit/s ports

08	- 8x 10/100 Mbit/s
11	- 11x 10/100 Mbit/s

5. 10/100/1000 Mbit/s ports

00	- none
03	- 3x 10/100/1000 Mbit/s

6. Uplink port config

3Z6	- 3x SFP slot (100Mbit/s)
306	- 3x SFP slot (100/1000 Mbit/s)

7. Port configuration

TT	- All Twisted Pair /RJ45
ZT	- 4x SFP slot (100 Mbit/s) 4x Twisted Pair/RJ45 (100Mbit/s)

RSP25 11 00 3Z6 TT | RSP25 11 00 3Z6 ZT | RSP35 08 03 306 TT | RSP35 08 03 306 ZT

8. Temp. range

S	Standard	0°C ... +60°C	E: Extended -40°C ... +70°C including Conformal Coating
T	Extended	-40°C ... +70°C	

9. Operating voltage

CC	2x terminal block: 24 – 48 VDC (18-60 VDC)
K9	1x terminal block supporting 60 -250 VDC (48-320 VDC) **or** 110 – 230 VAC (88-265 VAC)
KK	2x terminal blocks supporting 60-250 VDC (48-320 VDC) **or** 110-230 VAC(88-265 VAC)
TT	2x terminal block: 12 – 24 VDC

10. Approvals & certifications

Z9 - CF; FCC; EN61131
Y9 - Z9 + cUL508 (UL)
V9 - Z9 + IEC 61850; IEEE1613 (Substation)
VY - Z9 + IEC 61850, IEEE1613 + cUL508 (Substation, UL)
T9 - Z9 + EN50121-4 (Train)
TY - Z9 + EN50121-4 + cUL508 (Train, UL)
U9 - Z9 + GL (ship)
UX - Z9 + GL, cUL508, ISA12.12 (ship, UL, US Haz. Loc.)
UY - Z9 + GL, cUL508 (ship, UL)
WA - Z9 + ATEX, IECEx (EU/Int. Haz.Loc)
WB - Z9 + ATEX, IECEx, GL (EU/US/Int. Haz.Loc, Ship)
WC - Z9 + ATEX, IECEx, ISA12.12(EU/US/Int. Haz.Loc, UL)
WD - Z9 + ATEX, IECEx, ISA12.12, GL (EU/US/Int. Haz.loc,UL, Ship)
X9 - Z9 + cUL508, ISA12.12(UL, US Haz.Loc)

11. Customization

HD	- DLR	RSP25/35
HM	- Fast MRP	RSP25/35
HP	- PRP	RSP25/35
HH	- HSR	RSP25/35
HN	- 1:1 NAT	RSP25/35
HS	- Standard (MRP/RSTP)	RSP20/30

100 Mbit/s

12. SW configuration

E	- Enhanced encryption (<56 Bit, up to 256 Bit DES) Management access	I	- Ethernet/IP
B	- Diagnostic User (BDEW)	D	- DLR (pre-configured)
P	- Profinet		

13. SW level

2S	- HiOS Layer 2 Standard
2A	– HiOS Layer 2 Advanced
3S	- HiOS Layer 3 Standard

14. SW version

xx.x	XX.X - Latest software version

Accessories on pages 127ff

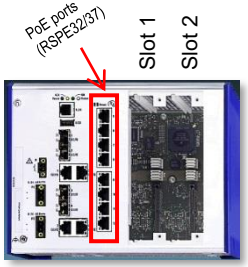
SFP 120ff

RSPE Rail Switch Power- Enhanced

RSPE	3		-	24	04	407	T99	-				99	HH		E		xx.x
1. Product	2. Data rate	3. HW type		4. 10/100 Mbit/s ports	5. 10/100/1000 Mbit/s ports	6. Uplink port configuration	7. Port configuration		8. Temp. range	9. Volt.range	10. Approvals	11. SW pack	12. Custom	13. HW Conf	14.	15.	16.SW Vers

1. Product	RSPE	Rail Switch Power Enhanced
2. Data rate	3	10/100/1000 Mbit/s ports
3. HW type	0	- Standard
	2	- Standard with PoE
	5	- Enhanced Redundancy (PRP, HSR, Fast MRP)
	7	- Enhanced Redundancy with PoE
4. 10/100 Mbit/s ports	24	24x 10/100 Mbit/s
5. 10/100/1000 Mbit/s ports	04	4x 10/100/1000 Mbit/s (no PoE option)
6. Uplink port config	407	4x Combo ports (10/100/1000 Mbit/s) (no PoE option)
7. Port configuration	T99	8x Twisted Pair /RJ45 (in type RSPE32/37: max. 62 W)
8. Temperature range	S	Standard 0°C ... +60°C
	T	Extended -40°C ... +70°C
	E	Extended -40°C ... +70°C including Conformal Coating

9. Voltage range	CC	2x 24 – 48 VDC (18-60 VDC)
	K9	1x 60 – 250 VDC (48- 320 VDC) **or** 1x 110 -230 VAC (88-265 VAC)
	KK	2x 48- 320 VDC **or** 2x 88-265 VAC
	PP	2x 47 – 57 VDC (PoE); 53 – 57 VDC (PoE+); **RSPE 32/37**
10. Approvals	Z9 - CE, FCC, EN61131 - (Basic) W9 - Z9 + ATEX Zone2 - (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 Safety) WD - Z9 + ATEX, IECEx, UL61010, ISA12.12, GL - (EU/US/Int. haz.loc, UL Safety, Ship) UW - Z9 + ATEX, UL61010, GL - (EU-haz.loc., UL Safety, Ship) WX - Z9 + ATEX, UL61010, ISA12.12 - (EU/US haz.loc.) WU - Z9 + ATEX, UL61010, ISA12.12, GL - (EU/US-haz.loc., UL Safety, Ship) T9 - Z9 + EN50121 - (Train) U9 - Z9 + GL - (Ship) VP - Z9 + IEC 61850, IEEE1613, UL61010 - (Substation, UL Safety) V9 - Z9 + IEC 61850, IEEE1613 - (Substation) P9 - Z9 + UL61010 - (UL Safety) UX - Z9 + UL61010, ISA12.12, GL - (UL Safety, US-haz.loc., Ship) TY - Z9 + UL61010, EN50121 - (UL Safety, Train) UY - Z9 + UL61010, GL - (UL Safety, Ship) UT - Z9 + UL61010-1/-2-201; GL; EN50121-4, NEMA TS2 - (UL Safety, Ship, Train) VT - Z9 + UL61010-1/-2-201; IEC61850, IEEE1613; EN50121-4, NEMA TS2 - (UL Safety, Substation, Transportation) VU - Z9 + IEC 61850, IEEE1613, UL61010, GL - (Substation, UL Safety, Ship)	
11. SW package	99	reserved
	NA	1:1 NAT — 100 Mbit/s
12. Customization	HH	Hirschmann Standard
13. HW Configuration	D	- DLR
	M	- Fast MRP
	P	- PRP
	H	- HSR
	R	- TSN
	RSPE35/37	RSPE30 S - Standard (MSP/RSTP)
14. SW Configuration	E	Entry (without configuration
	B	Diagnostic User (BDEW)
	P	Profinet
	I	Ethernet/IP
	D	DLR (preconfigured)
15. SW Level	2S	HiOS Layer 2 Standard
	2A	HiOS Layer 2 Advanced
	3S	HiOS Layer 3 Standard
16. SW version	XX.X	Latest software version



Not used slots:
Accessoire –
RSPM-cover
942 131-001

Slot 1: for all media module RSPM
All media modules are pluggable except RSPM20-4Z64Z6… (8 FO ports)
Slot 2: all media modules are pluggable

PoE--- **RSPE32/RSPE37** max. 124 Watt
RSPM22 max. 62 Watt

Accessories on pages 127ff

SFP 120ff

RSPM Rail Switch Power - Moduls

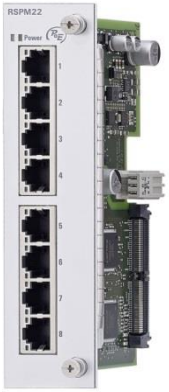
RSPM	2		-								
1. Product	2. Data rate	3. HW type		4. Port 1	5. Port 2	6. Temperature range	7. Approvals	8. Custom	9. HW Conf	10. SW Config	16.SW Vers

1. Product	RSPM	RSPE Module
2. Data rate	2	10/100 Mbit/s ports
3. HW type	0	Standard
	2	Standard with PoE
4. Port Configuration Part 1	4Z6	4Z6 – 4x SFP slots (100 Mbit/s)
	4T1	4T1 – 4x TP-RJ45 (10/100 Mbit/s)
5. Port Configuration Part 2	4Z6	4Z6 – 4x SFP slots (100 Mbit/s)
	4T1	4T1 – 4x TP-RJ45 (10/100 Mbit/s)
6. Temperature range	S	Standard 0°C ... +60°C
	T	Extended -40°C ... +70°C
	E	Extended -40°C ... +70°C including Conformal Coating
7. Approvals	Z9 - CE, FCC, EN61131 - (Basic) W9 - Z9 + ATEX Zone2 - (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 Safety) WD - Z9 + ATEX, IECEx, UL61010, ISA12.12, GL - (EU/US/Int. haz.loc, UL Safety, Ship) UW - Z9 + ATEX, UL61010, GL - (EU-haz.loc., UL Safety, Ship) WX - Z9 + ATEX, UL61010, ISA12.12 - (EU/US haz.loc.) WU - Z9 + ATEX, UL61010, ISA12.12, GL - (EU/US-haz.loc., UL Safety, Ship) T9 - Z9 + EN50121 - (Train) U9 - Z9 + GL - (Ship) VP - Z9 + IEC 61850, IEEE1613, UL61010 - (Substation, UL Safety) V9 - Z9 + IEC 61850, IEEE1613 - (Substation) P9 - Z9 + UL61010 - (UL Safety) UX - Z9 + UL61010, ISA12.12, GL - (UL Safety, US-haz.loc., Ship) TY - Z9 + UL61010, EN50121 - (UL Safety, Train) UY - Z9 + UL61010, GL - (UL Safety, Ship) UT - Z9 + UL61010-1/-2-201; GL; EN50121-4, NEMA TS2 - (UL Safety, Ship, Train) VT - Z9 + UL61010-1/-2-201; IEC61850, IEEE1613; EN50121-4, NEMA TS2 - (UL Safety, Substation, Transportation) VU - Z9 + IEC 61850, IEEE1613, UL61010, GL - (Substation, UL Safety, Ship)		

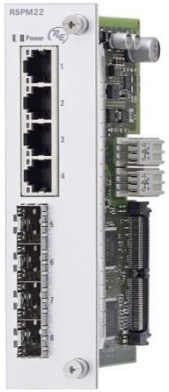
8. Customization	HH	Hirschmann Standard
9. HW Configuration	S	Standard (no FPGA)
10. SW Configuration	9	without software configuration
11. SW version	99.9	no software

8 SFP slots

8 TP ports



4 TP ports / 4 SFP slots



RSPM-cover
942 131-001

Note: For purposes of heat dissipation, if using an 8x SFP module, the max. number of SPF in the other module cannot exceed 4, for a total of 12.
Does not include chassis GE combo ports.

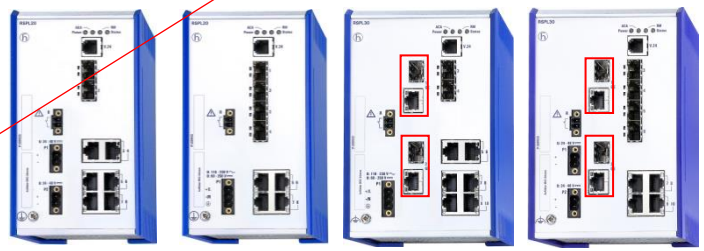
RSPL Rail Switch Power - Lite

End of life
Last order date: 30. April 2020
Last service date: 31. October 2025

RSPL		0	-	08				-				HS	E	2S	
1. Product	2. Data rate	3. HW type		4. 10/100 Mbit/s ports	5. 10/100/1000 Mbit/s ports	6. Uplink port configuration	7. Port configuration		8. Temperature range	9. Voltage range	10. Approvals	11. Redundancy configuration	12. Software configuration	13. Software level	14. Software version

1. Product	RSPL	Rail Switch Power - Lite
2. Data rate	2	10/100 Mbit/s ports
	3	10/100/1000 Mbit/s ports
3. HW type	0	Standard
4. 10/100 Mbit/s ports	08	8x 10/100 Mbit/s
5. 10/100/1000 Mbit/s ports	00	none
	02	2x GE combo ports
6. Uplink port config	2Z6	2x SFP slot (100Mbit/s)
	207	2x GE combo ports
7. Port configuration	TT	- All Twisted Pair /RJ45
	YT	-2x SFP slot (100 Mbit/s) 6x Twisted Pair/RJ45 (100 Mbit/s)
	ZT	- 4x SFP slot (100 Mbit/s) 4x Twisted Pair/RJ45 (100Mbit/s)

8. Temperature range	S	Standard 0°C ... +60°C
	T	Extended -40°C ... +70°C
	E	Extended -40°C ... +70°C including Corformal Coating
9. Voltage range	CC	- 2x 24 - 48 VDC (18 – 60 VDC)
	M9	- 1x 110 – 250 VDC (88V -320 VDC) & 110 - 230 VAC (88-265 VAC)
	TT	- 2x 12 -24 VDC
10. Approvals	Z9	CE, FCC, EN61131
	V9	„**Z9**“ + IEC 61850, IEEE1613
	Y9	„**Z9**“ + cUL508
	VY	„**V9**“ + cUL508
	VT	„**V9**“ + cUL508; EN50121
	T9	„**Z9**“ + EN50121, NEMA TS2S2
	TY	„**T9**“ + cUL508
11. Redundancy configuration	HS	Standard
12. SW configuration	E	Hirschmann Standard
13. SW level	2S	HiOS Layer 2 Standard
14. SW version	xx.x	Latest software version



2024-03

Accessories on pages 127ff

SFP 120ff

RSPS Rail Switch Power - Smart

RSPS	2		-	06	00			-					E	2S	
1. Product		3. HW type		4. 10/100 Mbit/s ports	5. 10/100/1000 Mbit/s ports	6. Uplink port configuration	7. Port configuration		8. Temperature range	9. Voltage range	10. Approvals	11. Redundancy configuration	12. Software configuration	13. Software level	14. Software version

1. Product	RSPS	Rail Switch Power - Smart
2. Data rate	2	10/100 Mbit/s ports
3. HW type	0	Standard
	5	Enhanced redundancy PRP Fast MRP, HSR
4. 10/100 Mbit/s ports	06	6x 10/100 Mbit/s
5. 10/100/1000 Mbit/s ports	00	none
6. Uplink port config	2T1	2x 10/100Mbit/s
	2Z6	2x SFP slots (100 Mbit/s)
7. Port configuration	TT	All Twisted Pair /RJ45
	YT	2x SFP slot (100 Mbit/s); 4x Twisted Pair/RJ45 (100 Mbit/s)

2024-03

8. Temperature range	S	Standard 0°C ... +60°C
	T	Extended -40°C ... +70°C
	E	Extended -40°C ... +70°C including Corformal Coating
9. Voltage range	CC	2x 24 – 48 V DC (18 – 60 V DC)
	K9	1x 60 – 250 V DC or 1x 110 – 230 V AC (88 -265 V AC)
	M9	1x 110 – 250 V DC (88V -320 V DC) & 110 - 230 V AC (88-265 V AC)
10. Approvals	Z9	CE, FCC, EN61131
	V9	„Z9“ + IEC 61850, IEEE1613
	Y9	„Z9“ + cUL508
	VY	„V9“ + cUL508
	VT	„V9“ + EN50121
	T9	„Z9“ + EN50121
	TY	„Z9“ + EN50121, cUL508
11. Redundancy configuration	RSPS25	
	HD	- DLR
	HM	- Fast MRP
	HP	- PRP
	HH	- HSR
	RSPS20	
	HS	- Standard
12. SW configuration	E	Hirschmann Standard
13. SW level	2S	HiOS Layer 2 Standard
14. SW version	xx.x	Latest software version

Accessories on pages 127ff

SFP 120ff

RED25 Redundancy Switch

RED25	04	00		TT					E	2S	
1. Product	2. FE ports	3. 10/100/1000 Mbit/s ports	4. Uplink port configuration	5. Port configuration	6. Temperature range	7. Voltage range	8. Approvals	9. Redundancy configuration	10. Software configuration	11. Software level	12. Software version

1. Product	RED25	Redundancy Switch
2. 10/100 Mbit/s ports	04	4x 10/100 Mbit/s
3. 10/100/1000 Mbit/s ports	00	none
4. Uplink port config	2T1	2x 10/100Mbit/s, RJ45
	2Z6	2x SFP slots (100 Mbit/s)
5. Port config	TT	2x 10/100Mbit/s, RJ45

RED25 04 00 2T1 TT

RED25 04 00 2Z6 TT

6. Temperature range	S	Standard 0°C ... +60°C
	T	Extended -40°C ... +70°C
	E	Extended -40°C ... +70°C including Corformal Coating
7. Voltage range	DD	2x 24 – 48 V DC (16,8 – 60 V DC)
8. Approvals	Z9	CE, FCC, EN61131
	Y9	„**Z9**“ + UL61010-1/-2-210
9. Redundancy configuration	HD	DLR
	HH	HSR
	HM	Fast MRP
	HP	PRP
10. SW configuration	E	Hirschmann Standard
11. SW level	2S	HiOS Layer 2 Standard
12. SW version	xx.x	Latest software version

Accessories on pages 127ff

SFP 120ff

OVERVIEW – POWERMICE, MSP30/40

		PowerMICE	MSP30	MSP40
Ports	Max. port count	28	28	28
FE Ports	No. of Fast Ethernet ports	24	24	00
GE Ports	No. of Gigabit ports	04	04	28
Power over Ethernet	PoE / PoE+	✓/ ✗	✓/✓	✓/✓
	Port count	28	28	24
	PoE power	60W per module	Up to 120W	Up to 120W (supported by backplane) 62 Watt per module with MSM46
Port count & types	FE-SC-ST, SFP - MM, SM	✓	✓	✓
	Dual speed SFP slot (1000/2500)	✗	✗	✓
	Max TX port support	28	28	24
	Max fiber port support	28	28	28
USB/SD Card	ACA21/22 and ACA31	✓/ ✗	✓/✓	✓/✓
IEEE1588v2	Hardware support	✓	✓	✓
Levels	Software Levels	Classic L2P/L3E/L3P	HiOS L2A/L3A	HiOS L2A/L3A
Software Features	MRP, RSTP, VRRP, HiperRing, Ring coupling	✓	✓	✓
Security	Extensive security features	✗	✓	✓

MSP32/42
integrates PoE / PoE+
- optional for all ports
- max. 120W per MSP32/42
- max. 62W per module

Extra PoE+ ports with **MSM46-T1T1T1T1**

Options of power supplies

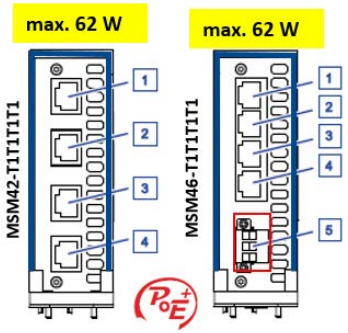
RPS260/PoE EEC 260 Watt
942 200-001

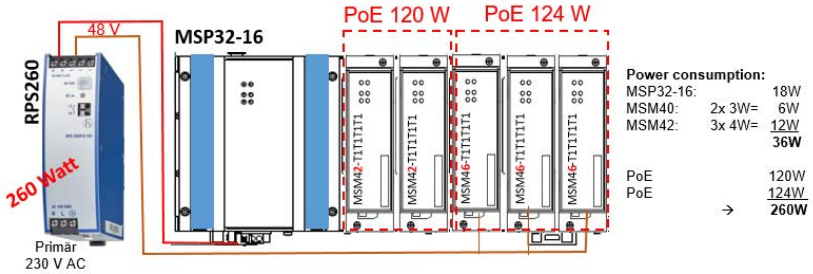
Input data	**100-240V AC**; 50-60Hz or 110-150V DC
Output data	48-56V DC
Current consumption	Input inrush current: 6/9A (120/230V AC)
Temp. range	-25° to +70°C

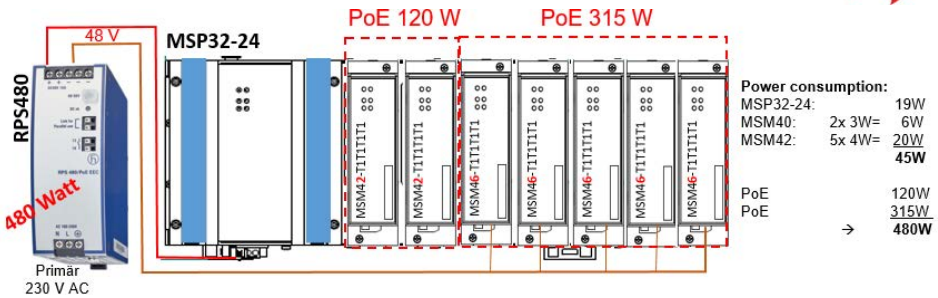
RPS480/PoE EEC 480 Watt
942 201-001

Input data	**100-240V AC**; 50-60Hz or 110-150V DC
Output data	48-56V DC
Current consumption	-25° to +70°C

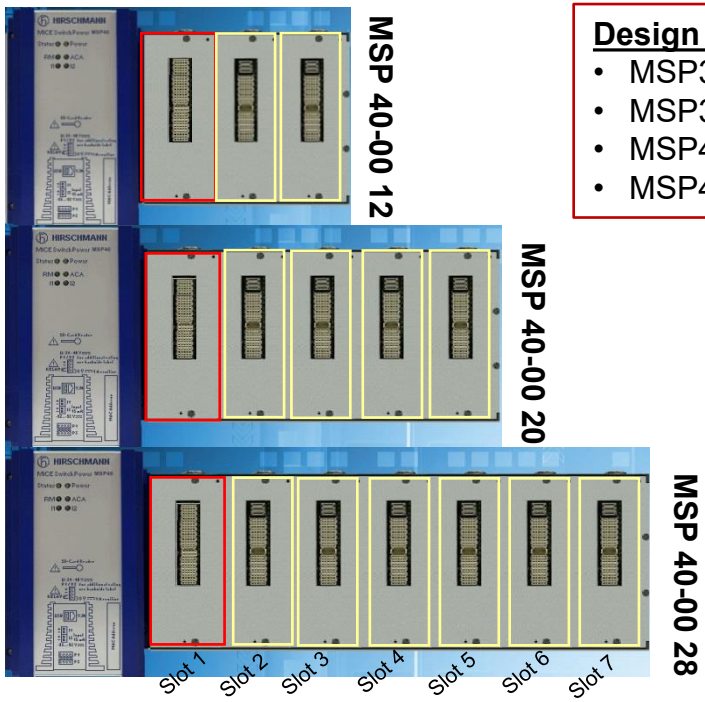
1 Port 1 (RJ45)
2 Port 2 (RJ45)
3 Port 3 (RJ45)
4 Port 4 (RJ45)
5 3-pin terminal block for the PoE supply voltage





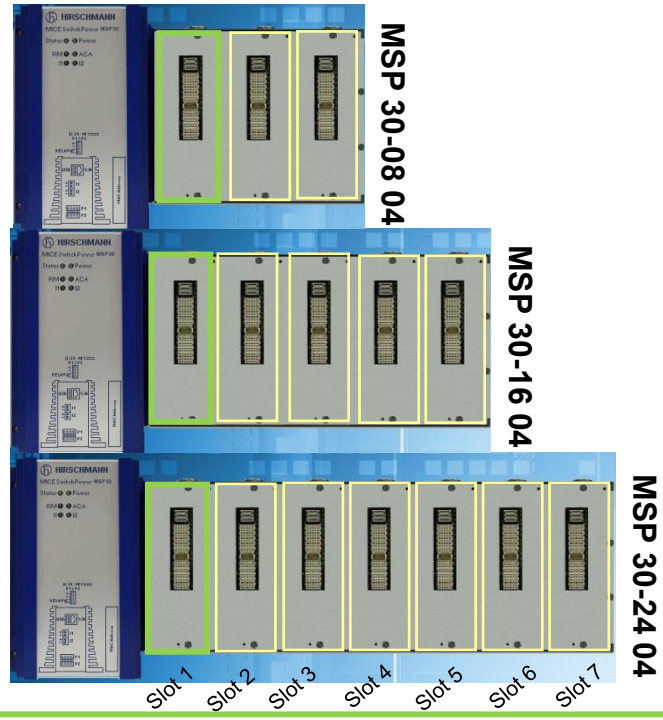


MSP30 – MSP40 CONFIGURATION CONCEPT



Design variants

- MSP30 – GE/FE
- MSP32 – GE/FE with PoE+
- MSP40 – Full GE
- MSP42 – Full GE with PoE+



Slot 1 on MSP40

- MSM50 – 1GE or 2.5 GE SFP module (4 ports)
- MSM60 – 1GE or 10 GE SFP module (2 ports); TP-SFPs are not supported

Slot 1 on MSP30

- MSM40 – 4x 10/100/1.000 Mbit/s; RJ45
  4x 100/1.000 Mbit/s; SFP slots
- MSM20/22 – 10/100 Mbit/s; TP-M12; 100 Mbit/s; fiber

Slot 2 – 7 on MSP40

- MSM40 – 4x 10/100/1.000 Mbit/s; RJ45 (T1); 100 Mbit/s; SFP slots; Combo ports (C1)
- MSM42/46 – 4x 10/100/1.000 Mbit/s; RJ45 PoE/PoE+ module
- MSM22 T5. – 4x 10/100 Mbit/s PoE/PoE+ module (M12 D-coded)
- MSM20 T5. - 4x 10/100 Mbit/s (M12 D-coded)
- MSM20… - max. 100 Mbit/s

Slot 2 – 7 on MSP30

- MSM40 – 4x 10/100/1.000 Mbit/s; RJ45 (T1);
  →**10/100 Mbit/s**;RJ45 I SFP slots **100 Mbit/s**; Combo ports (C1)
- MSM42/46 – 4x 10/100 Mbit/s; RJ45 PoE/PoE+ module
- MSM22 T5. – 4x 10/100 Mbit/s PoE/PoE+ module (M12 D-coded)
- MSM20 T5. - 4x 10/100 Mbit/s (M12 D-coded)
- MSM20 - max. 100 Mbit/s

MSP-FAMILY MICE Switch Power

MSP__	-			0					HH	E		xx.x
1. Design		2. 10/100 Mbit/s Ports	3. 10/100/1000 Mbit/s Ports	4. 10/100/1000/10.000 Mbit/s Ports	5. Temp. range	6. Operating voltage	7. approvals	8. SW-Paket	9. customized version	10. SW-config.	11. SW-Level	12. SW-version

1. Design

MSP30	**Fast-Ethernet** incl. 4x Gigabit uplinks * *(only TP- and Combo ports in slot 1), SFP slots are dualspeed. Max. 4 GE ports
MSP32	**Fast-Ethernet** incl. 4x Gigabit uplinks suitable for PoE or PoE+
MSP40	**Full Gigabit** incl. 4x 2.5 GB uplinks
MSP42	**Full Gigabit** incl. 4x 2.5 GB uplinks Suitable for PoE or PoE+

MSP32 /42
integrates PoE/PoE+
optional for all ports
max. 120W per MSP32/42
max. 60W per module

Extra PoE+ ports with MSM46

2. numbers ports FastEthernet 10/100 Mbit/s

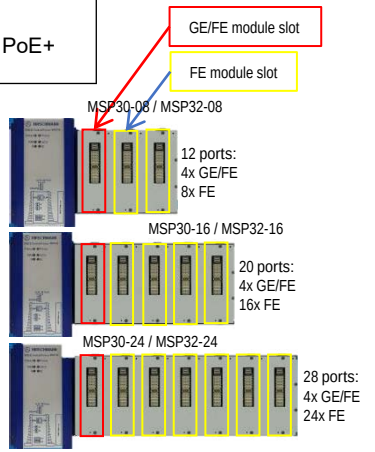
08	8 ports
16	16 ports
24	24 ports
00	No excl. FE ports, all ports Full GE (MSP4_)

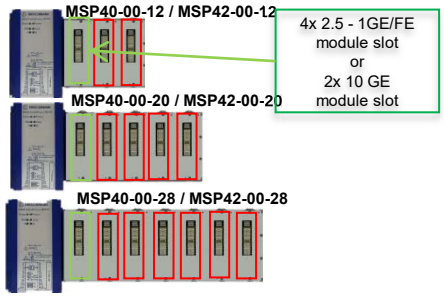
3. numbers ports 10/100/1000 Mbit/s

04	4 Ports
12	12 Ports
20	20 Ports
28	28 Ports

4. numbers ports 10/100/1000/10.000 Mbit/s

0	0 Ports





5. Temperature range

S	Standard 0°C ... +60°C
T	Extended -40°C ... +70°C
E	Extended -40°C ... +70°C including Corformal Coating

6. Operating voltage

2 plugs operating voltage for redundant power supplies

C	18V ... 60VDC (at MSP30, MSP40)
P	47V ... 57VDC PoE (at MSP32/42) 53V ... 57VDC PoE+ (at MSP32/42)

7. approvals & certifications

Z9 - CE; FCC; EN61131; (EN60950)
Y9 - "Z9" + cUL508
V9 - "Z9" + IEC 61850; IEEE1613 - [Substation application]
VY - "V9" + cUL508 - [Substation application]
VU - "V9" + cUL508 + GL; (ABS; BV; DNS; LR) #1 - [Substation & Navy application]
VT - "V9" + cUL508 + EN50121 - [Substation & Rail application]
T9 - "Z9" + EN50121 - [Rail application]
TY - "T9" + cUL508 - [Rail application]
U9 - "Z9" + GL; (ABS; BV; DNS; LR) #1 - [Navy application]
UY - "U9" + cUL508 - [Navy application]

8. SW - packets

99	– reserved	(L2 A)
UR	– Unicast-Routing	(L3 A)
MR	– Multicast-Routing (incl. UR)	(L3 A)

9. customized version

HH	– Hirschmann Standard
HX	– Hirschmann Extreme

10. SW configuration

E	– Hirschmann Standard Configuration

11. SW level

2A	– HiOS Layer 2 Advanced
3A	– HiOS Layer 3 Advanced

12. SW version

xx.x	– actual software-version

Accessories on pages 127ff

SFP 120ff

MSP- FAMILY

MICE Switch Media Moduls MSM

MSM			-					-			HH	9	E	xx.x
1. Product	2. Data rate	3. HW Type		4. Port 1	5. Port 2	6. Port 3	7. Port 4		8. Temperature range	9. approvals	10. Customized version	11. HW configuration	12. SW-config.	13. SW-release

1. Product

MSM	MICE media modul

2. Data rate

2	- 10/100 Mbit/s ports
4	- 10/100/1.000 Mbit/s ports
5	- 1.000/2.500 Mbit/s ports (only for MSP40/42)
6	- 1.000/ 10.000 Mbit/s ports (**MSM60 Q6Q6 9999** only for MSP40/42)

3. HW Type

0	Standard
2	suitable for PoE or PoE+ (only in MSM42 T1T1T1T1, supported in MSP32/42)
4	suitable for I/O operation (only in MSM24 IOIOIOIO)
6	PoE+ capable **with ext. power supply**

4. Port 1

T1	Twisted Pair; RJ45 MSM4.....	S4	Singlemode; ST MSM20.....
T5	Twisted Pair; M12 MSM2....	L2	Long Haul; SC MSM20.....
M2	Multimode; SC MSM20.....	G2	Long Haul+; SC MSM20.....
M4	Multimode; ST MSM20.....	C1	Combo port; SFP/RJ45 MSM40..... Dualspeed 1GB/100MB
S2	Singlemode; SC MSM20.....	IO	Digital Input/Output (only in MSM24)
Q6	SFP slot 1.000/2.500 Mbit/s (only in MSM50; Dualspeed 1GB/2.5GB) (only in MSM60; 10GB)		

5. Port 2

See port type 1. Uplink

6. Port 3

See port type 1. Uplink

7. Port 4

See port type 1. Uplink

8. Temperature range

S	Standard 0°C ... +60°C
T	Extended -40°C ... +70°C
E	Extended -40°C ... +70°C including Corformal Coating

9. approvals & certifications

Z9 – CE; FCC; EN61131; (EN60950)
Y9 – „Z9" + cUL508; (UL60950)#1
X9 – „Z9" + cUL508;(UL60950)#1;ISA12.12
W9 – „Z9" + ATEX Zone2
WY – „Y9" + ATEX Zone 2
V9 – „Z9" + IEC61850; IEEE1613 (Substation application)
VY – „V9" + cUL508; (UL60950)#1 (Substation application)
VU – „V9" + cUL508; (UL60950)# +GL; (ABS; BV; DNS; LR)#1 (Substation & Navy appl.)
VT – „V9" + cUL508; (UL60950)#1 + EN50121 (Substation & Rail application
T9 – „Z9" + EN50121 (Rail application)
TY – „T9" + cUL508; (UL60950)#1 (Rail application)
U9 – „Z9" + GL; (ABS; BV; DNS; LR)#1 (Navy application)
UY – „U9" + cUL508; (UL60950)#1 (Navy application)
UW – „U9" +cUL508; (UL60950)#1 + ATEX Zone 2 (Navy application)
UX – „U9" + cUL508; (UL60950)#1 + ISA12.12 (Navy application

10. customized version

HH – Hirschmann Standard

11. HW configuration

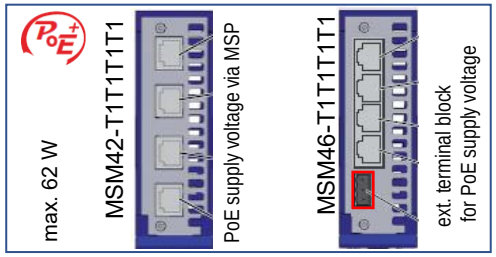
9 - no FPGA

12. SW configuration

E - Hirschmann; Standard Configuration

13. SW version

xx.x – actual software-version



Accessories on pages 127ff

SFP 120ff

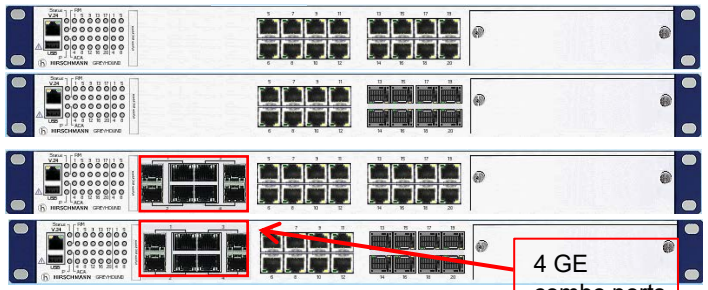
GREYHOUND FAMILY

19-inch switch --- GRS1X20/1X30

GRS	1			0	—						HH	S	H	2S	xx.x
1. Product	2. Series	3. Port Position	4. Data rate	5. PoE		6. fixed Ports	7. Temp. range	8. PS 1	9. PS 2	10. Approvals	11. Cust. conf.	12. HW conf.	13. SW conf.	14. SW Level	15. SW version

1. Chassis type	GRS	Greyhound Switch
2. Series	1	Greyhound Series
3. Port position	0	Ports front, power supply rear
	1	Ports rear, power supply rear
4. Data rate	2	FE Switch
	3	FE Switch with GE Uplink ports
5. PoE Support	0	no PoE support
6. Configuration of fixed ports	16T9	16x FE Twisted Pair ports, RJ45
	8T8Z	8x FE Twisted Pair ports, RJ45 8x FE SFP slots
7. Temperature range	S	Standard 0°C ... +60°C
	C	Standard 0°C ... +60°C including Corformal Coating
	T	Extended -40°C ... +70°C
	E	Extended -40°C ... +70°C including Corformal Coating

8. Power supply 1	C	24 ... 48 VDC (2-pin terminal block)
	M	110…250VDC / 110…240VAC (3-pin terminal block)
9. Power supply 2	C	24 ... 48 VDC (2-pin terminal block)
	M	110…250VDC / 110…240VAC
	9	No second power supply
10. Approvals	Z9	CE, FCC, EN61131, EN60950
	Y9	„Z9“ + cUL60950
	X9	„Z9“ + cUL60950, ISA 12.12
	V9	„Z9“ + IEC61850-3, IEEE1613
	VY	„V9“ + cUL60950
	VU	„V9“ + cUL60950 + GL
	VT	„V9“ + cUL60950 + EN50121-4
	U9	„Z9“ + GL
	UY	„U9“ + cUL60950
	UX	„U9“ + cUL60950, ISA 12.12, GL
	UT	„U9“ + cUL60950, EN50121-4
	T9	„Z9“ + EN50121-4
	TY	„T9“ + cUL60950
11. Customer configuration	HH	Hirschmann - Standard
12. HW configuration	S	Standard
13. SW Configuration	H	Hirschmann
14. SW version	2S	HiOS Layer 2 Standard
15. SW Version	xx.x	Newest software



GRS1020-16T9

GRS1020-8T8Z

GRS1030-16T9

GRS1030-8T8Z

Accessories on pages 127ff

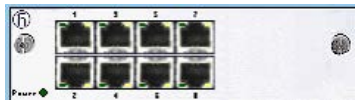
SFP 120ff

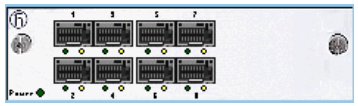
GREYHOUND FAMILY

GRM - Media Module --- GRS1X20/1X30

GRM	2	0	–							HH	S
1. Product	2. Data rate	3. PoE		4. Configuration ports 1 and 3	5. Configuration ports 5 and 7	6. Configuration ports 2 and 4	7. Configuration ports 6 and 8	8. Temp. range	9. Approvals	10. Cust. conf.	11. HW conf.

1. Product	GRM	Greyhound Switch Media Module
2. Data rate	2	10/100 Mbit/s ports
3. PoE Support	0	no PoE support
4. Configuration of ports 1 and 3	ZZ	2x SFP slot, 100 Mbit/s
	TT	2x TP, RJ45, 100 Mbit/s
	VV	2x SM, D-SC, 100 Mbit/s
	UU	2x SM, BFOC, 100 Mbit/s
	MM	2x MM, D-SC, 100 Mbit/s
	NN	2x MM, BFOC, 100 Mbit/s
5. Configuration of ports 5 and 7	ZZ TT VV UU MM NN	* not all variations are possible to configure
6. Configuration of ports 2 and 4	ZZ TT VV UU MM NN	* not all variations are possible to configure
7. Configuration of ports 6 and 8	ZZ TT VV UU MM NN	* not all variations are possible to configure





8. Temperature range	S	Standard 0°C ... +60°C
	C	Standard 0°C ... +60°C including Corformal Coating
	T	Extended -40°C ... +70°C
	E	Extended -40°C ... +70°C including Corformal Coating
9. Approvals	Z9	CE, FCC, EN61131, EN60950
	Y9	„Z9“ + cUL60950
	X9	„Z9“ + cUL60950, ISA 12.12
	V9	„Z9“ + IEC61850-3, IEEE1613
	VY	„V9“ + cUL60950
	VU	„V9“ + cUL60950 + GL
	VT	„V9“ + cUL60950 + EN50121-4
	U9	„Z9“ + GL
	UY	„U9“ + cUL60950
	UX	„U9“ + cUL60950, ISA 12.12, GL
	UT	„U9“ + cUL60950, EN50121-4
	T9	„Z9“ + EN50121-4
	TY	„T9“ + cUL60950
10. Customer configuration	HH	Hirschmann - Standard
11. HW configuration	S	Standard

Accessories on pages 127ff

SFP 120ff

GREYHOUND FAMILY

19-inch switch — GRS1042/1142

Full- Gigabit; max. 28 ports

GRS1		4	2	–								HH	S	H			xx.x
1. Product	2. Port Position	3. Data rate	4. PoE		5. fixed Ports	6. Temp. range	7. PS 1	8. PS 2	9. CP PS	10. CP MM	11. Approvals	12. Cust. conf.	13. HW conf.	14. SW conf.	15. SW Level	16. SW Pack	17. SW version

1. Chassis type	GRS1	Greyhound 19“ Switch
2. Port position	0	Ports front, power supply rear
	1	Ports rear, power supply rear
3. Data rate	4	FE/GE Switch
4. PoE Support	2	PoE / PoE+ support Please configure PoE power supply and PoE media modules separately
5. Configuration of fixed ports	AT2Z	2x 2,5 GE/2.5 or 2x 1 GE SFP slots, 10x FE/GE TX ports
	6T6Z	4x 2,5 GE or 4x 1 GE SFP slots, 2x FE/GE SFP, 6x FE/GE TX
6. Temperature range	S	Standard 0°C ... +60°C
	C	Standard 0°C ... +60°C including Corformal Coating
	T	Extended -40°C ... +70°C
	E	Extended -40°C ... +70°C including Corformal Coating
7. Power supply 1 Slot for power supply	L	24 ... 48 VDC **or** 48 ... 54 VDC (PoE/PoE+)
	H	60 ... 250 VDC **and** 110 ... 240VAC
8. Power supply 2 Slot for power supply	L	24 ... 48 VDC **or** 48 ... 54 VDC (PoE/PoE+)
	H	60 ... 250 VDC **and** 110 ... 240VAC

Attention ! Power supplies need to be configured and ordered separately.

9. Cover Plate Power Supply Input 2	0	No cover
	1	Cover plate assembled
10. Cover Plate Media Module Slot	0	No cover
	1	1x Cover plate assembled
	2	2x Cover plate assembled
11. Approvals	Z9	CE, FCC, EN61131, EN60950
	Y9	„Z9“ + cUL60950
	X9	„Z9“ + cUL60950, ISA 12.12 Class 1 Div. 2
	W9	„Z9“ + ATEX Zone 2
	V9	„Z9“ + IEC61850-3, IEEE1613
	VY	„Z9“ + cUL60950, IEC61850, IEEE1613
	U9	„Z9“ + GL
	UY	„Z9“ + cUL60950, GL
	UX	„Z9“ + cUL60950, ISA12.12 Class 1 Div.2, GL
	UW	„Z9“ + cUL60950, ATEX Zone 2, GL
	T9	„Z9“ + EN50121-4, NEMA TS2
	TY	„Z9“ + cUL60950, EN50121-4, NEMA TS2
	S9	„Z9“ + EN50121-4, EN50155, NEMA TS2
	SY	„Z9“ + cUL60950, EN50121-4, EN50155, NEMA TS2
12. Customer configuration	HH	Hirschmann - Standard
13. HW configuration	S	Standard
14. SW Configuration	E	Standard
15. SW Level	2A	HiOS Layer 2 Advanced
	3A	HiOS Layer 3 Advanced
16. SW Packages	99	No package
	UR	Unicast Routing
	MR	Unicast + Multicast Routing
17. SW Version	xx.x	Newest software

O-o-B-Port 192.168.1.1/24

Accessories on pages 127ff

SFP 120ff

GREYHOUND FAMILY

GMM - Media Module GRS1042/1142

GMM	2	0	–							HH	S
1. Product	2. Data rate	3. HW Type		4. Configuration ports 1 and 3	5. Configuration ports 5 and 7	6. Configuration ports 2 and 4	7. Configuration ports 6 and 8	8. Temp. range	9. Approvals	10. Cust. conf.	11. HW conf.

1. Product

GMM	Greyhound Switch Media Module

2. Data rate

2	FE Fiber ports
3	FE Fiber ports + FE/GE TX ports
4	FE/GE SFP slots + FE/GE TX ports

3. Hardware Type

0	Standard
2	PoE/PoE+ support Please configure PoE power supply separately

4. Configuration of ports 1 and 3

TT	2x TP, RJ45, 10/100/1000 Mbit/s
00	2x SFP slot, 100/1000 Mbit/s
MM	2x MM, D-SC, 100 Mbit/s
NN	2x MM, BFOC, 100 Mbit/s
VV	2x SM, D-SC, 100 Mbit/s
UU	2x SM, BFOC, 100 Mbit/s

5. Configuration of ports 5 and 7

TT | 00 | MM | NN | VV | UU

* not all variations are possible to configure

6. Configuration of ports 2 and 4

TT | 00 | MM | NN | VV | UU

* not all variations are possible to configure

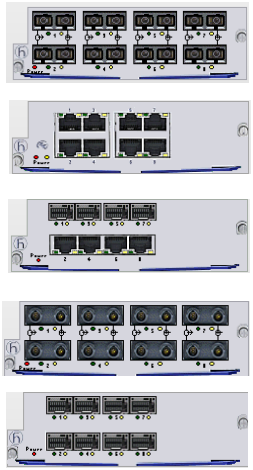
7. Configuration of ports 6 and 8

TT | 00 | MM | NN | VV | UU

* not all variations are possible to configure

8. Temperature range

S	Standard	0°C ... +60°C
C	Standard including Corformal Coating	0°C ... +60°C
T	Extended	-40°C ... +70°C
E	Extended including Corformal Coating	-40°C ... +70°C



9. Approvals

Z9	CE, FCC, EN61131, EN60950
Y9	„Z9“ + cUL60950
X9	„Z9“ + cUL60950, ISA 12.12 Class 1 Div. 2
W9	„Z9“ + ATEX Zone 2
V9	„Z9“ + IEC61850-3, IEEE1613
VY	„Z9“ + cUL60950, IEC61850, IEEE1613
U9	„Z9“ + GL
UY	„Z9“ + cUL60950, GL
UX	„Z9“ + cUL60950, ISA12.12 Class 1 Div.2, GL
UW	„Z9“ + cUL60950, ATEX Zone 2, GL
T9	„Z9“ + EN50121-4, NEMA TS2
TY	„Z9“ + cUL60950, EN50121-4, NEMA TS2
S9	„Z9“ + EN50121-4, EN50155, NEMA TS2
SY	„Z9“ + cUL60950, EN50121-4, EN50155, NEMA TS2

10. Customer configuration

HH	Hirschmann - Standard

11. HW configuration

S	Standard

Power Supplies

GPS					HH
1. Design	2. HW Type	3. PS	4. Temp.range	5. Approvals	6. Cust. conf.

1. Design

GPS	Greyhound Power Supply

2. HW Type

1	Standard (Switch only)
2	PoE (PoE only) (later release)
3	PoE and switch

3. Power Supply

C	24 ... 48 VDC
P	48 VDC (PoE) and 54 VDC (PoE+)
K	60 ... 250 VDC and 110 ... 240 VAC

4. Temp.-range

See above

5. Approvals

See above

6. Customization

HH	Standard

PoE-power supply supports 185W;
No load sharing:
max. PoE support: 185W
per modul are 124W supported.
→ **Fixed ports don't support PoE**

Accessories on pages 127ff

SFP 120ff

GREYHOUND FAMILY

19-inch switch --- GRS1042/1142

Main Differences MACH1040/1042/1140/1142 and GREYHOUND 1042/1142

		MACH1x4y	GREYHOUND1x42
Ports	Max. port count	16	28
	GE ports	16	28
	FE ports	16	28
Power Supplies	HV power supply	both	
	LV power supply	both	
	Redundant power supply	both	
	field exchangeable	X	✓
Mounting Options	Ports front, power supply rear	both	
	Ports rear, power supply rear	both	
Power over Ethernet	PoE / PoE+	✓/X	✓/✓
	Port count	4	16
	PoE power	Up to 60W	Up to 185W
Temperature Range	Standard	0°C to +60°C	0°C to +60°C
	Extended	-40°C to +70°C*	-40°C to +70°C*
Software		Classic L2P/L3P	HiOS L2A/L3A
IEEE1588	Hardware support	✓	✓

*IEC 60068-2-2 Dry Heat Test +85°C 16 Hours

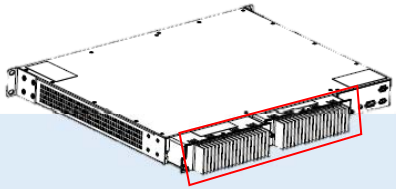
		MACH1x4y	GREYHOUND1x42
Port Types	FE-SC MM	X	✓
	FE-SC SM	X	✓
	FE-ST MM	X	✓
	FE-ST SM	X	✓
	FE-SFP slot	✓	✓
	GE SFP slot	✓	✓
	Dual speed SFP slot (100/1.000Mbit/s)	✓	✓
	Dual speed SFP slot (1.000/2.500Mbit/s)	X	✓
	Max TX port support	16	26 /28*
	Max fiber port support	16	22
Design	Fanless	both	
	EMC interference immunity	same	
	Shock and vibration	same	
	Device replacement	ACA21	ACA22 +SD card
	Serial interface	RJ11	RJ45
	Configurable	both	
	Modular	X	✓

*28 TX ports with 2 additional TX SFP

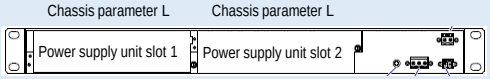
GREYHOUND FAMILY 19-inch switch --- GRS1042/1142

GRS1042 6T6Z…

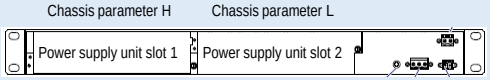
Out-of-band Management port Default settings: 192.168.1.1



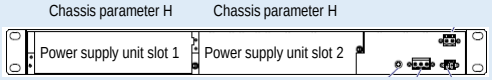
Example (Power supply)



Slot 1: GPS1C or GPS3P (Low Voltage)
Slot 2: GPS1C or GPS3P (Low Voltage)

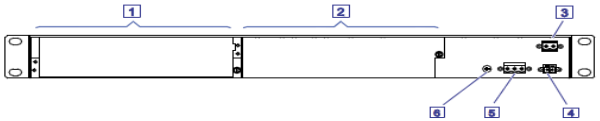


Slot 1: GPS1K (High Voltage)
Slot 2: GPS1C or GPS3P (Low Voltage)



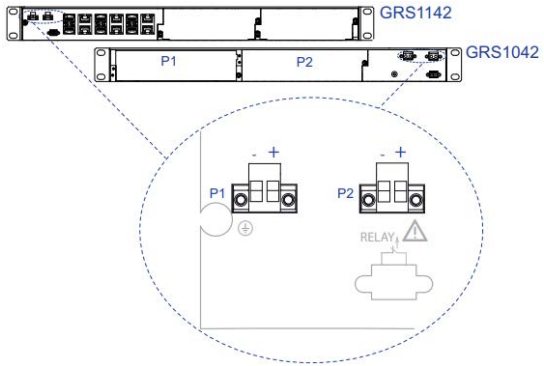
Slot 1: GPS1K (High Voltage)
Slot 2: GPS1K (High Voltage)

Pay attention: If you need PoE, you need min. one chassis slot „**L**“ including power supply (GPS3P) which offers PoE.
Fixed ports don‘t support PoE, only ports on media modules.

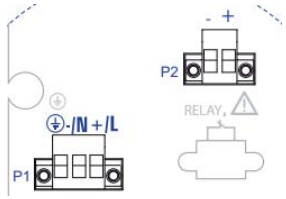


Rear view - 6TX/6FX and 10TX/2FX	
1	Cover panel for power supply unit slot 1
2	Cover panel for power supply unit slot 2
3	2-pin terminal block for the supply voltage, characteristic value L
4	Connection for the signal contact
5	3-pin terminal block for the supply voltage, characteristic value H
6	Grounding screw

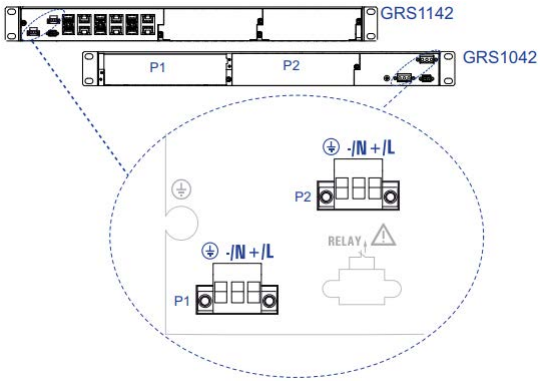
*Supply voltage with characteristic value **LL***



*Supply voltage with characteristic value **HL***



*Supply voltage with characteristic value **HH***



!!! Attention:
Additional order of the power supply !!!

GREYHOUND FAMILY

19-inch switch --- GRS103

The **GRS103** product family is a modular system with **4 GE combo** ports and up to **22 FE ports**, designed for the special requirements of industrial automation.

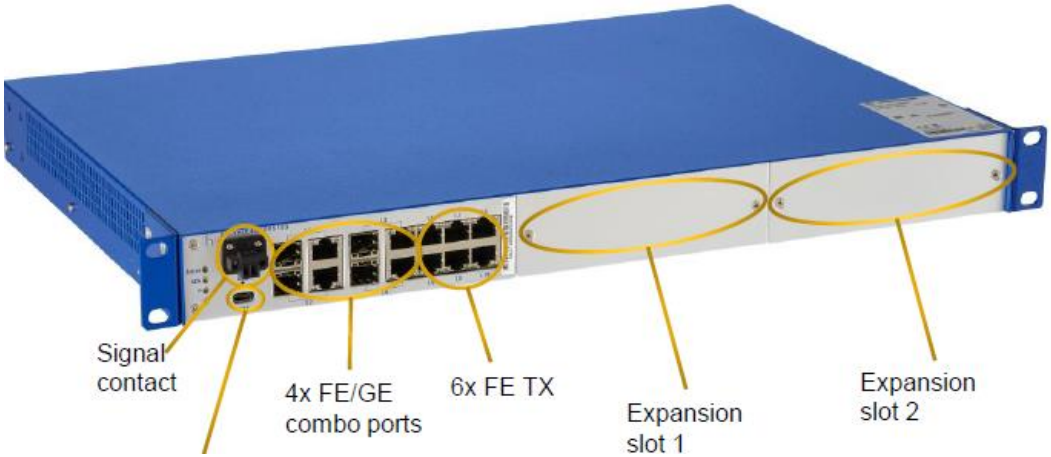
Order number	Product name	Description
942 298-001	GRS103-6TX/4C-1HV-2S	4x GE/FE combo + 6x FE TX + 2 empty slots for expansion modules (8 ports each), **1x HV PSU**, HiOS L2S
942 298-003	GRS103-6TX/4C-2HV-2S	4x GE/FE combo + 6x FE TX + 2 empty slots for expansion modules (8 ports each), **2x HV PSU**, HiOS L2S
942 298-002	GRS103-6TX/4C-1HV-2A	4x GE/FE combo + 6x FE TX + 2 empty slots for expansion modules (8 ports each), **1x HV PSU,** HiOS L2A
942 298-004	GRS103-6TX/4C-2HV-2A	4x GE/FE combo + 6x FE TX + 2 empty slots for expansion modules (8 ports each), **2x HV PSU**, HiOS L2A
942 298-005	GRS103-22TX/4C-1HV-2S	4x GE/FE combo + 22x FE TX , **1x HV PSU**, HiOS L2S, → no slots, everything is fix
942 298-007	GRS103-22TX/4C-2HV-2S	4x GE/FE combo + 22x FE TX , **2x HV PSU**, HiOS L2S, → no slots, everything is fix
942 298-006	GRS103-22TX/4C-1HV-2A	4x GE/FE combo + 22x FE TX , **1x HV PSU**, HiOS L2A → no slots, everything is fix
942 298-008	GRS103-22TX/4C-2HV-2A	4x GE/FE combo + 22x FE TX , **2x HV PSU**, HiOS L2A, → no slots, everything is fix

Modular version

Fixed version

Two versions:

- Modular version: 4x FE/GE Combo ports + 6x FE TX ports + 2 empty slots for expansion modules
- Fixed version: 4x FE/GE Combo ports + 22x FE TX ports



USB-C interface for ACA22-USB-C AutoConfiguration adapter and for Management access

- Support of PoE via external power source
- Fanless design
- Operating temperature range: -10 … 60°C
- Signal contact
- UL61010, EN50121-4 (track side)

Power Cord Europe (CEE 7/4 plug)
942 271-001
to be ordered separately

19-inch switch --- GRS103

Media Modules from MACH102 usable also for GRS103

M1-8TP-RJ45-PoE 942 028-001
Expansion module
8 Ports PoE / PoE Plus
if PoEP is used, only 4 Ports will be supported
(Limitation on Power: 124W)
external Power supply → 48VDC (min. 46V ; max. 57V)
(>50VDC for PoE Plus)

M1-8TP-RJ45 943 970-001
Expansion module
with 8 ports TP 10/100 BASE-TX

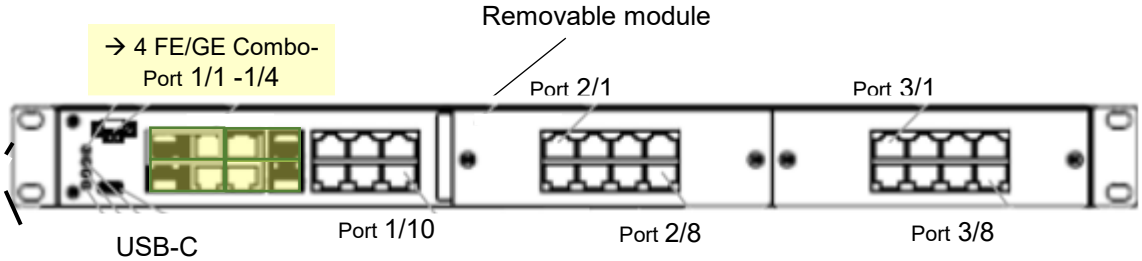
M1-8SFP 943 970-301
Expansion module
with 8 empty slots for SFP transceivers 100BASE-FX
Interface SFP slots for 100BASE-FX
Distance see SFP transceivers (M-FAST SFP-xx)

M1-8MM-SC 943 970-101
Expansion module
with 8 ports Fiber Optic multimode 100BASE-FX
Distance MM (50/125µm): 0-5000m, 11 dB link budget
MM (62.5/125µm): 0-4000m, 8 dB link budget

M1-8SM-SC 943 970-201
Expansion module
with 8 ports Fiber Optic singlemode 100BASE-FX
Distance SM (9/125µm): 0-32.5km, 16 dB link budget

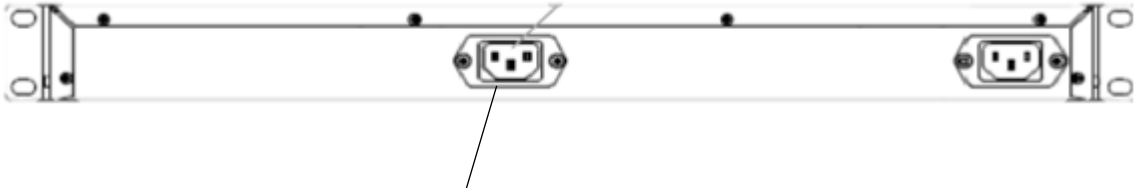
Front

22 ports 10/100 Mbit/s



Signal contact

Rear



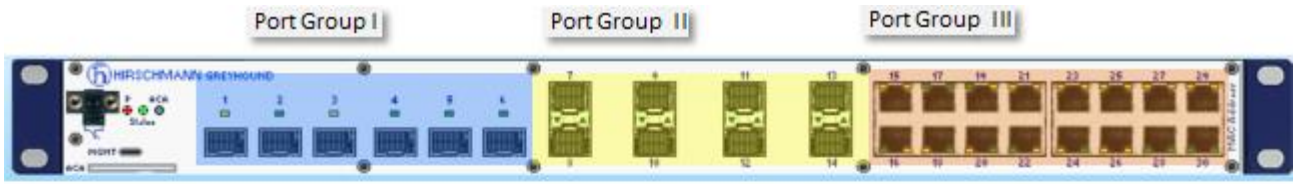
Power Cord Europe (CEE 7/4 plug)
942 271-001
to be ordered separately

GREYHOUND FAMILY

19-inch switch --- GRS10x

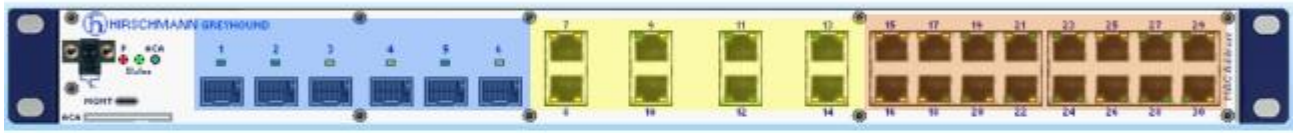
Full- Gigabit; max. 30 ports

Fan-less design



GRS105-6F8F16T

PG I : 6x 1/2.5GE (SFP slots)
PG II : 8x 1GE (SFP slots)
PG III : 16x 10/100/1.000 Mbit/s (RJ45))

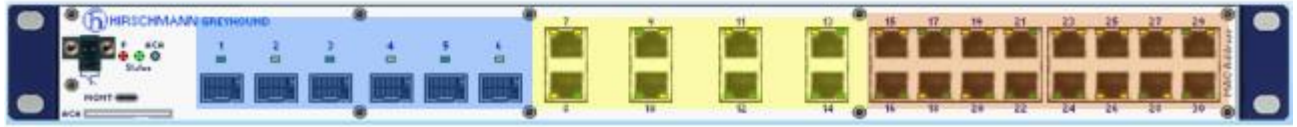


GRS105-6F8T16T

PG I : 6x 1/2.5GE (SFP slots)
PG II : 8x 100/1.000 Mbit/s (RJ45)
PG III : 16x 10/100/1.000 Mbit/s (RJ45))

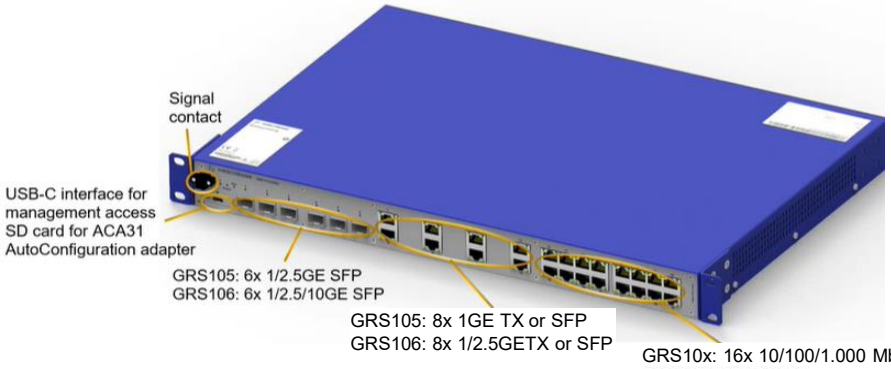
GRS106-6F8F16T

PG I : 6x 1/2.5/10GE (SFP slots)
PG II : 8x 1/2.5GE (SFP slots)
PG III : 16x 10/100/1.000 Mbit/s (RJ45)



GRS106-6F8T16T

PG I : 6x 1/2.5/10GE (SFP slots)
PG II : 8x 100/1.000/2.500 Mbit/s (RJ45)
PG III : 16x 10/100/1.000 Mbit/s (RJ45)



Product name	Order code
GRS106-16TX/14SFP-1HV-2A	942 287-010
GRS106-16TX/14SFP-2HV-2A	942 287-011
GRS106-16TX/14SFP-2HV-3A	942 287-012
GRS106-24TX/6SFP-1HV-2A	942 287-007
GRS106-24TX/6SFP-2HV-2A	942 287-008
GRS106-24TX/6SFP-2HV-3A	942 287-009

Product name	Order code
GRS105-16TX/14SFP-1HV-2A	942 287-004
GRS105-16TX/14SFP-2HV-2A	942 287-005
GRS105-16TX/14SFP-2HV-3A	942 287-006
GRS105-24TX/6SFP-1HV-2A	942 287-001
GRS105-24TX/6SFP-2HV-2A	942 287-002
GRS105-24TX/6SFP-2HV-3A	942 287-003

Power Cord Europe (CEE 7/4 plug)
942 271-001
to be ordered separately

GREYHOUND FAMILY

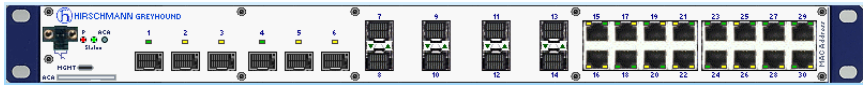
19-inch switch --- GRS10x

Full- Gigabit; max. 30 ports

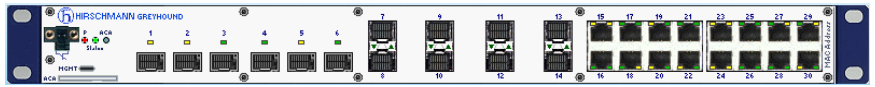
GRS1	0		6F		16T	S				HH	S	E			xx.x
1. Product	2. Technology	3. Data rate	4. PG I	5. PG II	6. PG III	7. T - range	8. PS 1	9. PS 2	10. Approvals	11. Cust. spec	12. HW conf.	13. SW conf	14. SW Level	15. SW p.	16. SW version

1. Product	GRS1	Greyhound 19“ Switch Series 100		
2. Technology	0	Standard	1	MACSec capable
3. Data rate	5	6x 1/2.5GE (**PG I**) + 8x 1GE (**PG II**) + 16x 10/100/1.000 Mbit/s, RJ45 (**PG III**)		
	6	6x 1/2.5/10GE (**PG I**) + 8x 1/2.5GE (**PG II**) + 16x 10/100/1.000 Mbit/s RJ45 (**PG III**)		
4. Port group I	6F	6x SFP slots		
5. Port group II	8F	8x SFP slots	8T	8x TX ports, RJ45
6. Port group III	16T	16x TX ports, 10/100/1.000 Mbit/s , RJ45		
7. Temp. range	S	Standard -10°C ... +60°C		
8. Power supply 1	G	88 ... 276V/AC	L	19,2 ... 60V/DC
	M	88 ... 288V/DC		
9. Power supply 2	G	88 ... 276V/AC	L	19,2 ... 60V/DC
	M	88 ... 288V/DC	9	No second power supply

10. Approvals	Z9	CE, FCC, EN61131, EN62368
	T9	„Z9“ + EN50121-4
	TY	„T9“ + cUL62368
	Y9	„Z9“ + cUL62368
11. Customer specification	HH	Hirschmann - Standard
12. HW configuration	S	Standard
13. SW Configuration	E	Empty
	B	Diagnostic User (BDEW)
14. SW Level	2S	HiOS Layer 2 Standard
	2A	HiOS Layer 2 Advanced
	3A	HiOS Layer 3 Advanced
15. SW packages	99	reserved
	UR	Unicast Routing
16. SW version	XX.X	Latest software version


GRS105 6F8F 16T


GRS105 6F8T 16T


GRS106 6F8F 16T


GRS106 6F8T 16T

Accessories:

- Bracket for fastening the casing (2 pcs.) 943 943-001
- Bracket, long (+50mm) for fastening the casing (2 pcs.) 943 943-101
- Protection cap for RJ45 socket (50 pieces) 943 936-001
- Protection cap für SFP slot (25 pieces) 943 942-001

Power Cord Europe (CEE 7/4 plug)
942 271-001
to be ordered separately

Accessories on pages 127ff

SFP 120ff

DRAGON-MACH4000/4500 FAMILY

Accessories on pages 127ff

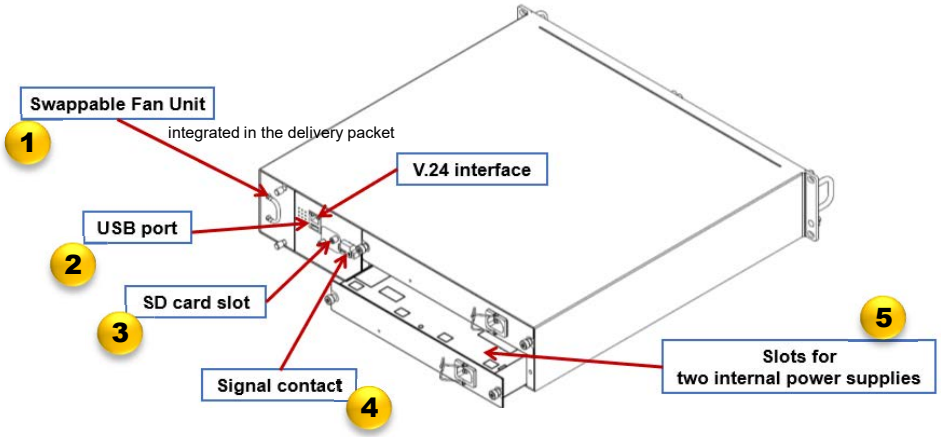
SFP 120ff

Sub-Group	Order number	Product name	description
Chassis MACH4500	942 153-001	DRAGON MACH4500-80G+8X-L2A	DRAGON MACH4500 Chassis with 8x10G (SFP+ - Fixed) + 32x1G (TX - Fixed) + 48x1G (with modules); Fan Unit Installed; HiOS L2A
	942 153-002	DRAGON MACH4500-80G+8X-L3A-UR	DRAGON MACH4500 Chassis with 8x10G (SFP+ - Fixed) + 32x1G (TX - Fixed) + 48x1G (with modules); Fan Unit Installed; HiOS L3A UR (Unicast Routing only)
	942 153-003	DRAGON MACH4500-80G+8X-L3A-MR	DRAGON MACH4500 Chassis with 8x10G (SFP+ - Fixed) + 32x1G (TX - Fixed) + 48x1G (with modules); Fan Unit Installed; HiOS L3A MR (Unicast + Multicast Routing)
Chassis MACH4000	942 154-001	DRAGON MACH4000-48G+4X-L2A	DRAGON MACH4000 Chassis with 4x10G (SFP+ - Fixed) + 48x1G (with modules); Fan Unit Installed; HiOS L2A
	942 154-002	DRAGON MACH4000-48G+4X-L3A-UR	DRAGON MACH4000 Chassis with 4x10G (SFP+ - Fixed) + 48x1G (with modules); Fan Unit Installed; HiOS L3A UR (Unicast Routing only)
	942 154-003	DRAGON MACH4000-48G+4X-L3A-MR	DRAGON MACH4000 Chassis with 4x10G (SFP+ - Fixed) + 48x1G (with modules); Fan Unit Installed; HiOS L3A MR (Unicast + Multicast Routing)
Components	942 155-001	D4K-12TP-RJ45	DRAGON MACH4K Module with 12 x RJ45 10/100/1000 Ports
	942 294-001	D4K-10TP-PoE	DRAGON MACH4K Module with 10 x RJ45 10/100/1000 Ports PoE
	942 155-501	D4K-12SFP	DRAGON MACH4K Module with 12 x 100/1000 SFP Ports
	942 156-001	D4K-PSU-300W-HV	DRAGON 4K 300-Watt High Voltage Power Suplly Unit
	942 157-001	D4K-AIR	DRAGON M4K Fan Unit; field-replaceable / hot-swappable; 5 load sharing inbuilt fans
Blank Panels	942 222-001	D4K-LC Panel	Blind Panel to cover one empty Line Card Slot if module is not used
	942 222-002	D4K-PSU-Panel	Blind Panel to cover redundant PSU Slot if second PSU is not used
10G SFP	942 210-001	M-SFP-10-SR/LC EEC	10Gigabit SFP+ Multimode (MM) 850
	942 211-001	M-SFP-10-LR/LC EEC	10Gigabit SFP+ Singlemode (SM) 1310nm
	942 212-001	M-SFP-10-ER/LC EEC	10Gigabit SFP+ Singlemode (SM) 1550nm-40km
	942 213-001	M-SFP-10-ZR/LC	10Gigabit SFP+ Singlemode (SM) 1550nm-80km
10G-DAC	942 280-001	SFP-10-DAC-05m	Copper SFP + Cable 0,5m
	942 280-002	SFP-10-DAC-1m	Copper SFP + Cable 1m
	942 280-003	SFP-10-DAC-2m	Copper SFP + Cable 2m
	942 280-004	SFP-10-DAC-4m	Copper SFP + Cable 4m

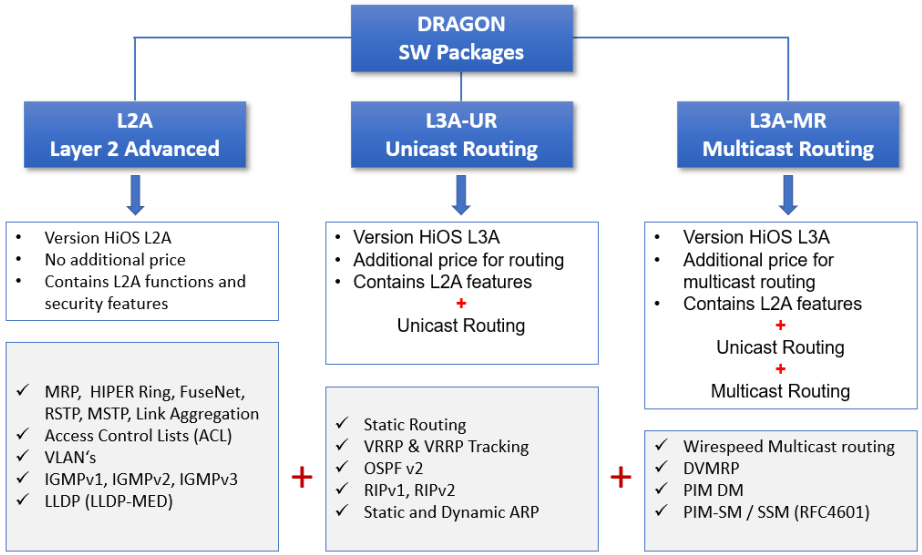
DRAGON-MACH4000/4500 FAMILY

Key facts

- **DRAGON MACH4000-48G+4X** → Up to 48x 1 GE + 4x 10 GE ports
- **DRAGON MACH4000-52G** → Up to 52x GE ports
- **DRAGON MACH4500-80G+8X** → Up to 80x 1 GE + 8x 10 GE ports
- **Internal redundant** high voltage power supply slots (power supply not included)
- **2U height** for replacement without changing cabinet design
- **Fan Module** (integrated) and standard temperature range (0°C – 60°C)
- External Interfaces on the rear side: USB, SD Card and V24
- HiOS L2A and L3A software with unicast and multicast routing options

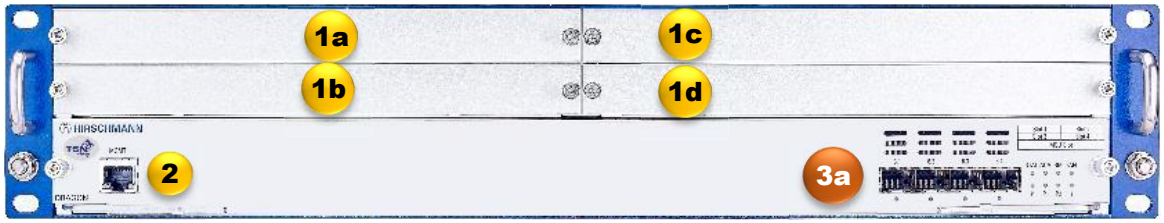


Product name	Order number
DRAGON MACH4000-48G+4X-L2A	942 154-001
DRAGON MACH4000-48G+4X-L3A-UR	942 154-002
DRAGON MACH4000-48G+4X-L3A-MR	942 154-003
DRAGON MACH4000-52G-L2A	942 318-001
DRAGON MACH4000-52G-L3A-UR	942 318-002
DRAGON MACH4000-52G-L3A-MR	942 318-003
DRAGON MACH4500-80G+8X-L2A	942 153-001
DRAGON MACH4500-80G+8X-L3A-UR	942 153-002
DRAGON MACH4500-80G+8X-L3A-MR	942 153-003

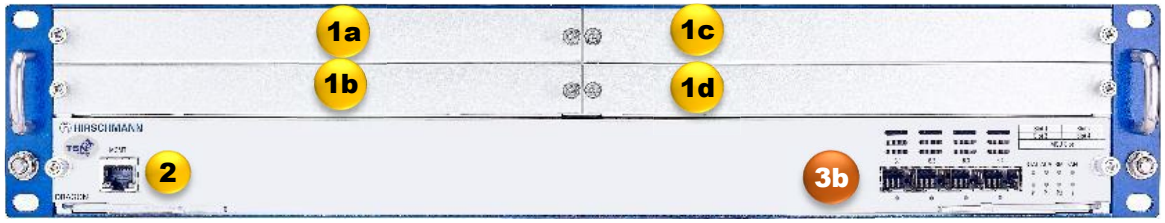


DRAGON-MACH4000/4500 FAMILY

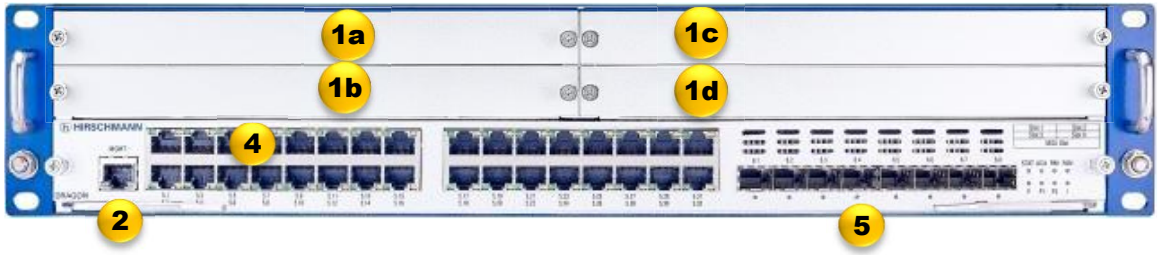
DRAGON MACH4000-52G-chassis



DRAGON MACH4000-48G+4X-chassis



DRAGON MACH4500-48G+8X-chassis



1	Slots for up to four swappable media modules
2	Out-of-band management port Default IP address: 192.168.1.1/24
3a	Fixed SFP+ ports – 4 x 1 GE (1 GE compatible)
3b	Fixed SFP+ ports – 4 x 10 GE (2.5 GE and 1 GE compatible)
4	Fixed TX ports – 32x 1 GE
5	Fixed SFP+ ports – 8 x 10 GE (2.5 GE and 1 GE compatible)

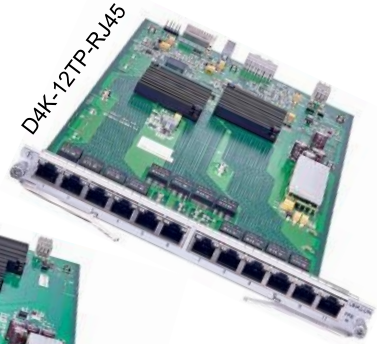
DRAGON-MACH4000/4500 FAMILY

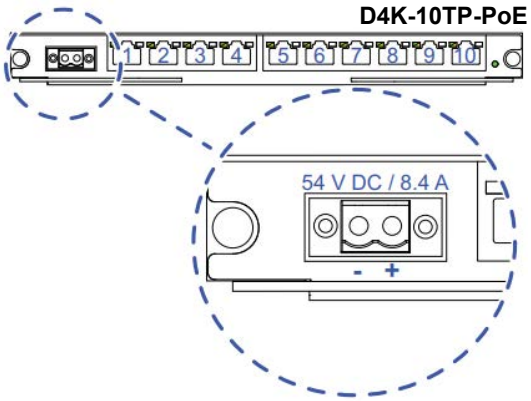
Verify that the connected supply voltage meets the requirements IEEE 802.3bt
- Rated Voltage: 54 V DC; max. voltage range: 52V DC … 57 C DC
- The power supply is potetial-free: For power supply modules capable of PoE, exclusively use a potential-free SELV power supply.

Modules

- **D4K-12TP-RJ45**→ 12x 10/100/1.000 Mbit/s TX, RJ45
  942 155-001
- **D4K-10TP-PoE**
  942 294-001

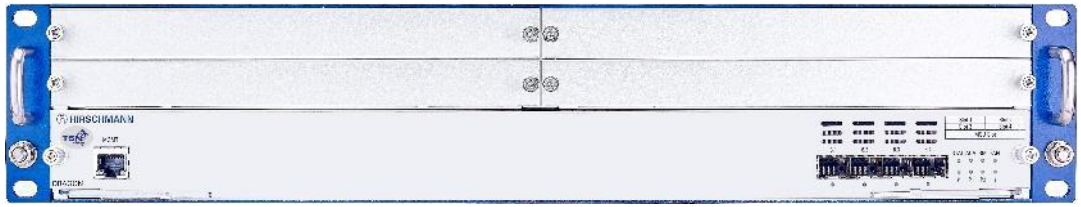
  Max. PoE power: per media module: 300 W
  total: 420 W
- **D4K-12SFP**→ 12x 100 or 1.000 Mbit/s SFP
  942 155-501
- **D4K-AIR**→ Fan Unit
  942 157-001
- **D4K-PSU-300W-HV**→ Power Supply
  942 156-001





Power Cord Europe (CEE 7/4 plug)
942 271-001
to be ordered separately

Front: **4** blank panels are in the delivery packet



Rear: **1** blank panel is in the delivery packet

Hirschmann IT: MTS Switches

MTS 2700

- Access/Aggregation switch
- 6*10Gb/s
- 48*1Gb/s
- Basic IPv4 and IPv6 routing
- PoE/PoE+
- Persistent PoE
- ERPS

MTS 2600

- Access switch
- 6*10Gb/s
- 48*1Gb/s
- Static IPv4 and IPv6 routing
- ERPS

MTS 2900

- Core switch
- 6*40Gb/s
- 48*10Gb/s
- Comprehensive IPv4 and IPv6 routing
- IP/MPLS

MTS 2800

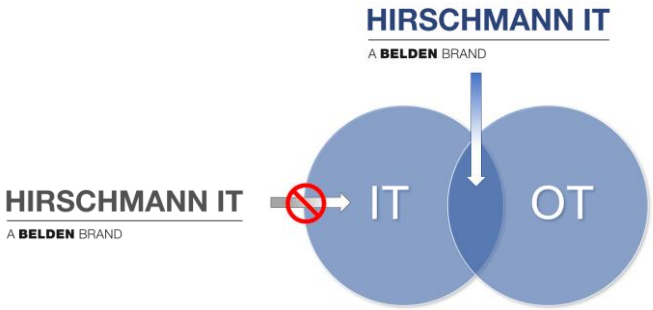
- Aggregation switch
- 6*10Gb/s
- 48*1Gb/s
- Comprehensive IPv4 and IPv6 routing
- ERPS

MTS 8000

- Core switch
- Up to 100Gb/s ports
- Dual active switching engines
- Non-blocking forwarding matrix
- Up to 10 line cards
- IP/MPLS

Hirschmann IT: MTS Switches

Benefits at a Glance



Hardware

- Line speeds at 1Gb/s, 10Gb/s, 40Gb/s and 100Gb/s
- Up to 6 x 40Gb/s ports in 1HU
- Redundant switching cores
- Modular redundant power supplies and fans
- Switch Stacking up to 8 devices
- Up to 800W PoE per 1HU chassis
- Persistent PoE

Software

- Full IPv6 static, unicast, and multicast routing
- IPv4/v6 Access Control Lists
- ERPS for rings, subrings, and ladder topologies
- Multi-Chassis Link Aggregation for resilience and load sharing
- Private VLANs for network segmentation
- VXLAN (Layer 2 tunneling over Layer 3)
- Security functions including DoS prevention

Management

- SNMPv3 for secure management
- LLDP for topology discovery
- NETCONF scalable network management
- OAM (802.3ah, 802.1ag, ITU Y.1731) fault/performance monitoring
- OpenFlow communication for SDN
- TACACS+ and ERSPAN for network administration
- NTP for precise time synchronisation

Classic to Upgrade

Equivalent Next Generation Devices

RSB Family

→

LEMUR

Essential managed switching features and advanced data rates in a cost-optimized design

OR

GECKO

Compact managed industrial Fast Ethernet switches with secure and dependable data communication

OCTOPUS Classic Family

→

OCTOPUS II

Fully manageable switch for mobile applications or cabinet-less installations on machines

OR

BXS

Designed with rolling stock in mind and built to withstand high vibrations and wide temperature ranges

OpenRail RS20/30/40 Family

→

BOBCAT BRS

Maximized performance and security with flexibility and interoperability to simplify maintenance and future-proof networks

MACH102 Family

→

GREYHOUND GRS103

Designed to connect field-level devices in extreme environments with maximum uptime and best-in-class network security

Variants of MACH104 Family

→

GREYHOUND GRS106

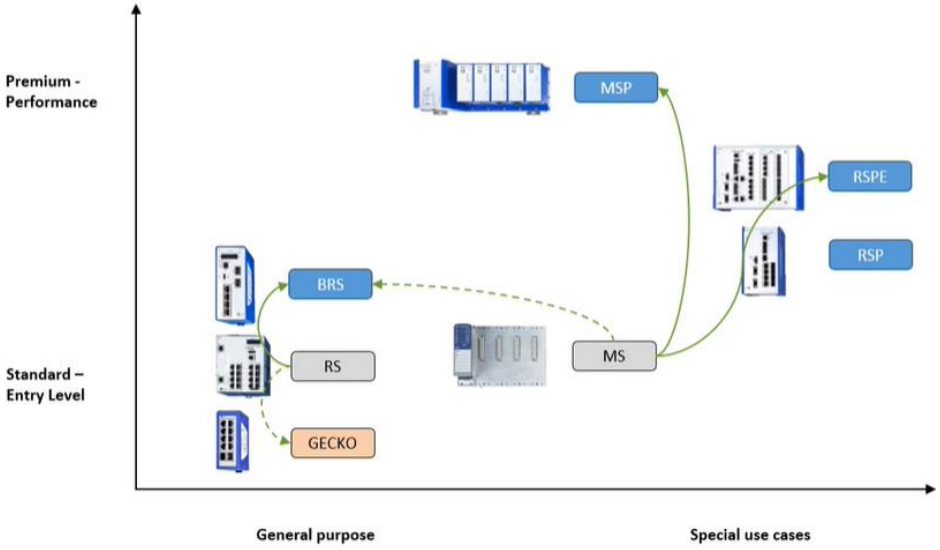
Multipurpose and configurable, serving at the backbone or aggregation layer with high port density and Gigabit Ethernet

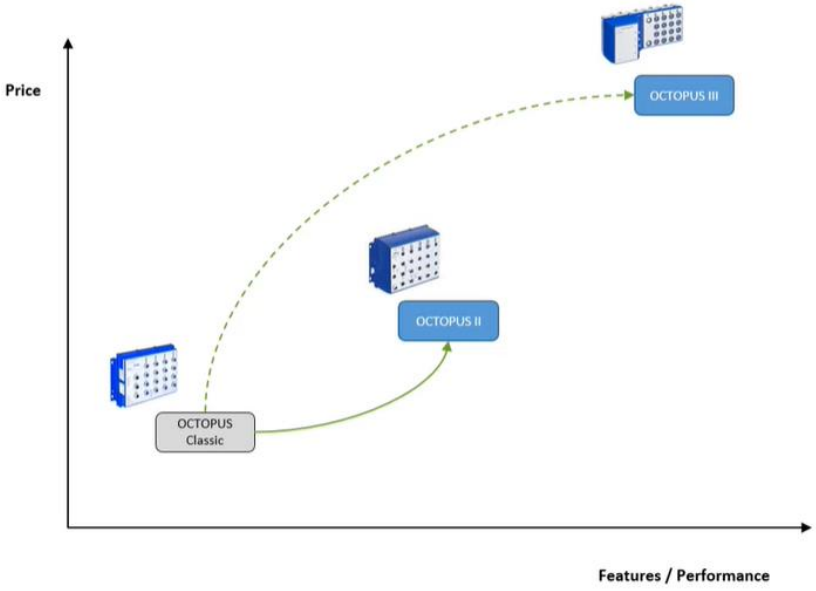
MICE Family

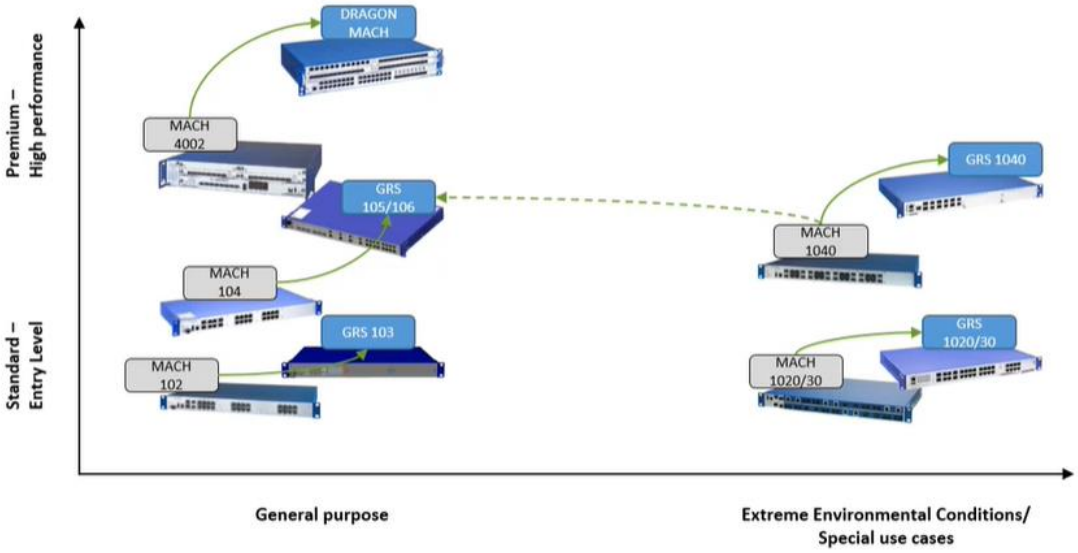
→

MSP Modular MSP30/40

Fully modular and ruggedized Gigabit switch with Layer 3 capabilities – designed to perform in harsh industrial conditions.


Premium - Performance
Standard – Entry Level
MSP
RSPE
RSP
BRS
RS
MS
GECKO
General purpose
Special use cases


Price
OCTOPUS III
OCTOPUS II
OCTOPUS Classic
Features / Performance


Premium – High performance
Standard – Entry Level
DRAGON MACH
MACH 4002
GRS 105/106
MACH 104
GRS 103
MACH 102
GRS 1040
MACH 1040
GRS 1020/30
MACH 1020/30
General purpose
Extreme Environmental Conditions/ Special use cases


Classic SW
HiOS

WHY IS HIOS A MAJOR STEP FORWARD…

- Latest technology, enhanced performance + new features
- Policy engine support for enhanced packet processing (L2-L4)
- HTML5 based web interface
- A lot of new security features
  - ACL support in hardware
  - New event-log system with clear-text entries
  - Separate Audit Trail
  - New role based user management with password policies and user lockout
  - RADIUS/LDAP authentication
  - Independently certified according to the international security standard IEC 62443-4-1 Secure Development Lifecycle

CERTIFICATE

No. ITS1 075478 0005 Rev. 00

Holder of Certificate: Hirschmann Automation and Control GmbH Research & Development
Stuttgarter Str. 45-51
72654 Neckartenzlingen
GERMANY

Site(s): Hirschmann Automation and Control GmbH Research & Development
Stuttgarter Str. 45-51, 72654 Neckartenzlingen, GERMANY

Certification Mark:

Type: Industrial IT Security

Scope of Certificate: Agile Product Development Process

Applied Standard(s): IEC 62443-4-1:2018
PPP 1000A:2018 (IEC 62443-4-1 Full Process Profile)

The Certification Body of TÜV SÜD Product Service GmbH certifies that the company mentioned above has established and is maintaining a management system which meets the requirements of the listed standards. The results are documented in a report. See also notes overleaf.

Report No.: 20CR015002 Rev 1.0

Valid until: 2023-03-17

Date: 2020-03-30

(Christian Dinnerer)

Software Classic

Platform 4

Detail information page 138 - ….

RS20 managed switches

10/100 Mbit – ETHERNET Rail switch

Last order: 31. December 2023
Technical support available until 30. June 2029

RS20		00				D			H	H	XX.X
1. Design	2. FE-ports	3. GE-ports	4. Uplink port 1	5. Uplink port 2	6. Temperature	7. Power Supply	8. Approvals	9. Software	10. Configuration	11. OEM type	12. Software release

1. Design

RS20	all ports max. 100 Mbit/s
RS22	all ports max. 100 Mbit/s incl. 4 ports PoE à 15,4W

2. FE - ports

04	4x 10/100 Mbit/s
08	8x 10/100 Mbit/s
09	9x 10/100 Mbit/s
16	16x 10/100 Mbit/s
17	17x 10/100 Mbit/s
24	24x 10/100 Mbit/s
25	25x 10/100 Mbit/s

3. GE - ports

00	No Gigabit-Ethernet port

4./5. Media type uplink port 1 uplink port 2

T1	Twisted Pair /RJ45 (10/100Mbit/s -
M2	Multimode/SC (100Mbit/s) 1300nm; 50/125µm; 0 – 8 dB; 0-5km; 1.0dB/km; 800MHz*km
M4	Multimode/BFOC (ST) (100Mbit/s) 1300nm; 50/125µm; 0 – 8dB; 0-5km; 1.0dB/km; 800MHz*km
S2	Singlemode/SC (100Mbit/s) 1300nm; 9/125µm; 0 – 16 dB; 0-30km; 0,4dB/km; 3,5ps/(nm*km)
S4	Singlemode/BFOC (ST) (100Mbit/s) 1300nm; 9/125µm; 0 – 16 dB; 0-30km; 0,4dB/km; 3,5ps/(nm*km)
E2	Singlemode+/SC (100Mbit/s) 1300nm; 9/125µm; 7 – 29 dB; 20-65km; 0,4dB/km; 3,5ps/(nm*km)
L2	Singlemode LH /SC(100Mbit/s) 1550nm; 9/125µm; 7– 29 dB; 24-86km; 0,3dB/km; 19ps/(nm*km)
G2	Singlemode LH+/SC(100Mbit/s) 1550nm; 9/125µm; 14-47dB; 67-176km; 0,25dB/km; 19ps/(nm*km)

4./5. Media type Double port 1 and 2

Single port 3 Media type: M2, M4, S2, S4, E2, L2, G2

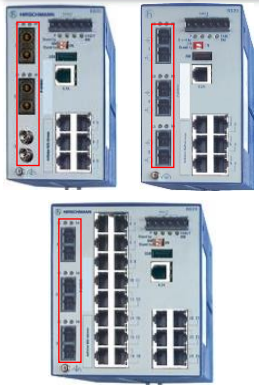
Double port 4 Media type:

MM	Multimode/SC (100Mbit/s)
NN	Multimode/BFOC (ST) (100Mbit/s)
VV	Singlemode/SC (100Mbit/s)
UU	Singlemode/ST (100Mbit/s)
EE	Singlemode+/SC (100Mbit/s)

Configurator

Dual Uplinks:
Single Port 1 + Single Port 2

Triple Uplinks:
Dual Port 1 + Single Port 2



6. Temperature range

S	Standard 0°C ... +60°C
T	Extended -40°C ... +70°C
E	Extended -40°C ... +70°C including Corformal Coating

7. Operating voltage

D	9,6 ... 60V DC and 18 – 30 V AC (RS20)
P	47 – 52 V DC – PoE (RS22)

8. Approvals & Certifications

A	cUL 508, cUL 1604 class 1 Div.2
H	A + GL, IEC 61850-3, IEEE1613, EN50121-4
B	H + ATEX 100a, Zone 2

9. Software version

P	**Professional:** Enhanced software plus security, extended diagnosis and redundancy
E	**Enhanced** Remote access, diagnosis, filters, redundancy
U	**Unmanaged**

10. Configuration

H	Standard
X	Customer specific
P	PROFINET presettings
E	EtherNet/IP presettings

11. OEM type

H	Standard
X	Customer specific
F	Metal body (RS22)
V	Improved shock resistance

12. SW release

xx.x	Newest software

RS30 managed switches

10/100 Mbit – ETHERNET Rail switch + 2 Gigabit ports

Last order: 31. December 2023
Technical support available until 30. June 2029

RS30		02				D			H	H	XX.X
1. Design	2. FE-ports	3. GE-ports	4. Uplink port 1	5. Uplink port 2	6. Temperature	7. Power Supply	8. Approvals	9. Software	10. Configuration	11. OEM type	12. Software release

1. Design

RS30	FE switch incl. 2 ports GE
RS32	FE switch incl. 2 ports GE incl. 4 ports PoE à 15,4 W

2. FE - ports

08	8x 10/100 Mbit/s
16	16x 10/100 Mbit/s
24	24x 10/100 Mbit/s

3. GE - ports

02	2 Gigabit-Ethernet ports

4. Media type uplink port 1

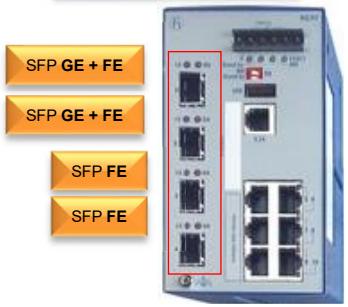
T1	Twisted Pair /RJ45 (10/100/1000 Mbit/s)
06	SFP slot (1000 Mbit/s)
00	Double SFP slot (1000 Mbit/s or 100 Mbit/s --- dual speed) *only possible combination 00 ZZ

5. Media type uplink port 2

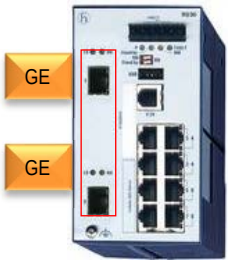
T1	Twisted Pair /RJ45 (10/100/1000 Mbit/s
06	SFP slot (1000 Mbit/s)
ZZ	Double SFP slot (100 Mbit/s)

*only possible combination 00 ZZ

Double SFP slots
RS30 >>> **00 ZZ** <<<

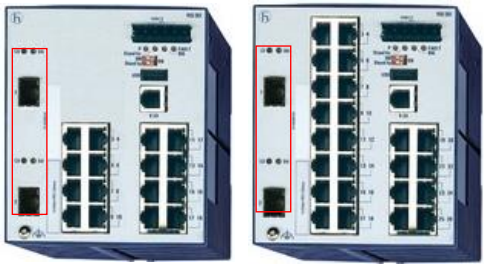


Dual Uplinks:
Single Port 1 + Single Port 2



Last order: 31.12.2013

End-of-life product	Order number	replacement
RS20/30	943 434-xxx	BRS20/30
RS40	943 935-xxx	BRS40/50



24-port type without
EEC temperature range

6. Temperature range

S	Standard 0°C ... +60°C
T	Extended -40°C ... +70°C
E	Extended -40°C ... +70°C including Corformal Coating

7. Operating voltage

D	9,6 ... 60V DC and 18 – 30 V AC (RS30)
P	47 – 52 V DC – PoE (RS32)

8. Approvals & Certifications

A	cUL 508, cUL 1604 class 1 Div.2
H	A + GL, IEC 61850-3, IEEE1613, EN50121-4
B	H + ATEX 100a, Zone 2

9. Software version

P	**Professional:** Enhanced software plus security, extended diagnosis and redundancy
E	**Enhanced** Remote access, diagnosis, filters, redundancy
U	**Unmanaged**

10. Configuration

H	Standard
X	Customer specific
P	PROFINET presettings
E	EtherNet/IP presettings

11. OEM type

H	Standard
X	Customer specific
F	Metal body (RS32)
V	Improved shock resistance

12. SW release

xx.x	Newest software

RS40 managed switches

9 ports Gigabit, max. 4 optical ports

Last order: 31. December 2023
Technical support available until 30. June 2029

RS40	00	09	CC	CC		D			H	H	XX.X
1. Design	2. FE-ports	3. GE-ports	4. Uplink port 1	5. Uplink port 2	6. Temperature	7. Power Supply	8. Approvals	9. Software	10. Configuration	11. OEM type	12. Software release

1. Design

RS40 — 9x Gigabit - ETHERNET

2. FE - ports

00 — FE – integrate in GE ports

3. GE - ports

09 — 9x 10/100/1000 Mbit/s

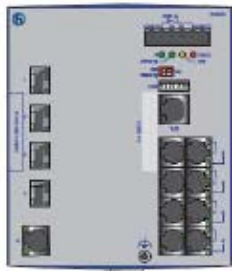
- 5x 10/100/1000 Mbit/s
- 4x Combo ports (SFP/RJ45)

4./5 Media type

uplink port 1
uplink port 2

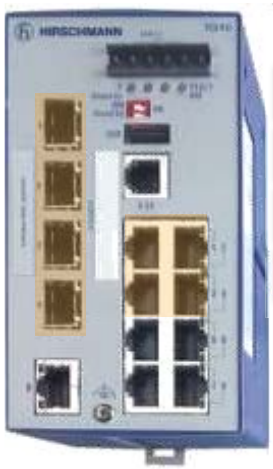
CC — **2x Combo port**
SFP port - dual speed,
RJ45

Note larger enclosure size for E and T temp variants



RS40-00 09 CC CC T D...

RS40-00 09 CC CC E D...



1. Combo SFP FE & GE
2. Combo SFP FE & GE
3. Combo SFP FE & GE
4. Combo SFP FE & GE
9. 10/100/1000BASE-TX

1. Combo 10/100/1000BASE-TX
2. Combo 10/100/1000BASE-TX
3. Combo 10/100/1000BASE-TX
4. Combo 10/100/1000BASE-TX
5. 10/100/1000BASE-TX
6. 10/100/1000BASE-TX
7. 10/100/1000BASE-TX
8. 10/100/1000BASE-TX

6. Temperature range

S	Standard	0°C ... +60°C
T	Extended	-40°C ... +70°C
E	Extended including Corformal Coating	-40°C ... +70°C

7. Operating voltage

D	9,6 ... 60V DC and 18 – 30 V AC (RS20)

8. Approvals & certifications

A	cUL 508, cUL 1604 class 1 Div.2
H	A + GL, IEC 61850-3, IEEE1613, EN50121-4
B	H + ATEX 100a, Zone 2

9. Software version

P	**Professional:** Enhanced software plus security, extended diagnosis and redundancy
E	**Enhanced** Remote access, diagnosis, filters, redundancy

10. Configuration

H	Standard
X	Customer specific
P	PROFINET presettings
E	EtherNet/IP presettings

11. OEM type

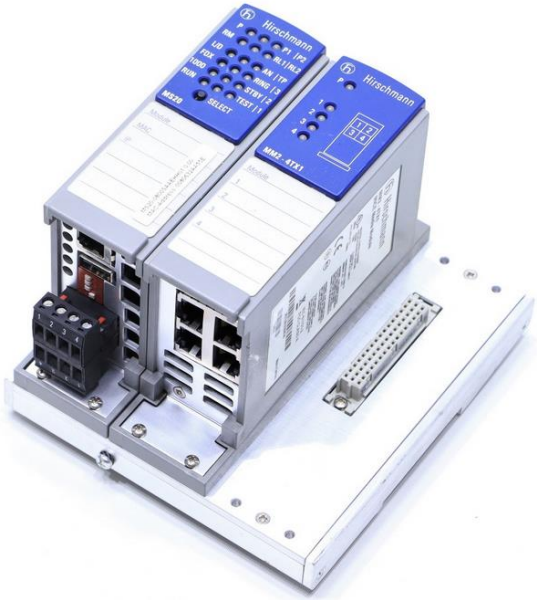
H	Standard
X	Customer specific
V	Improved shock resistance

12. SW release

xx.x	Newest software

Last order: 31.12.2013

End-of-life product	Order number	replacement
MS20/30	943 435-xxx	MSP30/40
MM2	943 718-101	MSM20
	943 719-101	
	943 720-101	
	943 721-101	
	943 722-101	
	943 722-151	
MM3	943 761-xxx	MSM40/50/60
	943 762-xxx	
	943 763-xxx	
	943 764-xxx	
	943 835-101	
	943 836-101	
	943 837-101	
	943 838-101	
	943 839-101	
	943 841-101	
	943 929-101	



MICE FAMILY modular managed switches

Last order: 31. December 2023
Technical support available until 30. June 2029

MS30		02					H	H	xx.x
1. Design	2. FE-ports	3. GE-ports	4. Temperature	5. Power Supply	6. Approvals	7. Software	8. Configuration	9. OEM type	10. Software release

1. Design

MS20	Modular switch (10/100 Mbit/s)
MS30	Modular switch (10/100 Mbit/s + 2 ports GE)

2. FE - ports

08	8x 100 Mbit/s – 2 slots for media moduls
16	16x 100 Mbit/s – 4 slots for media moduls
24	24x 100 Mbit/s – 6 slots for media moduls

3. GE - ports

00	no Gigabit-ETHERNET port • MS20
02	2x Gigabit-ETHERNET port • MS30

4. Temperature range

S	Standard	0°C ... +60°C
T	Extended	-40°C ... +70°C
E	Extended including Corformal Coating	-40°C ... +70°C

5. Operating voltage

A	18 – 32V DC
C	18 – 60V DC / 2x 4-pin plug
E	18 – 60V DC / 1x 6-pin plug

6. approvals & certifications

Z	CE
Y	CE, UL508
A	**Y +** ISA 12.12.01 class1 div.2
B	A + ATEX Zone2, GL
E	**Y +** EN 50121-4
S	**Y +** GL, IEC61850-3, IEEE 1613, EN 50121-4
H	**S +** ISA 12.12.01 class1 div.2,

2 media module slots
10/100 Mbit/s

MS20-08 00

4 media module slots
10/100 Mbit/s

MS20-16 00

6 med-mod slots
10/100 Mbit/s

MS20-24 00

2 med-mod slots
10/100 Mbit/s
1 med-mo slot
2x 1000 Mbit/s

MS30-08 02

4 med-mod slots
10/100 Mbit/s
1 med-mo slot
2x 1000 Mbit/s

MS30-16 02

MS30-024 02

7. Software version

P	**Professional:** Enhanced software plus security, extended diagnosis and redundancy
E	**Enhanced** Remote access, diagnosis, filters, redundancy

8. configuration

H	Standard
X	Customer specific
P	PROFINET presettings
E	EtherNet/IP presettings

9. OEM type

H	Standard
X	Customer specific

10. SW release

xx.x	Newest software

PowerMICE MS4128

MS 4128-5 943 009-001 out of delivery	Power MICE --- L2P, also possible for L3E 4 slots and 1 slot Gigabit (4 ports modul) L3E bis max. SW 5.x
MS 4128-L2P 943 009-101	Power MICE --- Layer 2 Professional 4 slots and 1 slot Gigabit (4 ports modul)
MS 4128-L3E 943 009-201 out of delivery	Power MICE --- Layer 3 Enhanced 4 slots and 1 slot Gigabit (4 ports modul)
MS 4128-L3P 943 009-301	Power MICE --- Layer 3 Professional 4 slots and 1 slot Gigabit (4 ports modul)

MICE FAMILY media modules

MM2 or MM3	0	-							HH
1. Product	2. Technology	3. Port Type 1	4. Port Type 2	5. Port Type 3	6. Port Type 4	7. Temp. range	8. Approvals	9. OEM type	

Last order: 31. December 2023
Technical support available until 30. June 2029

2. Technology

0 Standard; ~~1: Realtime;~~ 2 PoE; ~~3 Precisions Time Protocol 2;~~ ~~4 Digital IO~~

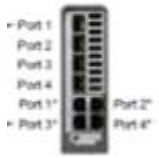
3./4./5./6. Port Type 1 to 4

MTRJ/male

Z6	SFP slot Fiber (100Mbit/s)		
G2	Singlemode Fiber Long Haul+: SM LH+ /SC (100Mbit)		14-47dB (67-176km); 1550nm
~~L2~~	~~Singlemode Fiber Long Haul: SM LH /SC (100Mbit)~~		7-29dB (24-86km); 1550nm
S2	Singlemode Fiber: SM /SC (100Mbit)		O-16dB (0-30km); 1300nm
~~S4~~	~~Singlemode Fiber: SM /BFOC (ST) (100Mbit)~~		O-16dB (0-30km); 1300nm
M2	Multimode Fiber: MM /SC (100Mbit)		O-8dB (0-5km); 1300nm
~~M3~~	~~Multimode Fiber /MM /MTRJ (100Mbit)~~	(*only in temperatur range „S" available)	O-8dB (0-5km); 1300nm
M4	Multimode Fiber: MM /BFOC (ST) (100Mbit)		O-8dB (0-5km); 1300nm
F4	Multimode Fiber: MM /BFOC (ST)(10Mbit)	(*last order date: June 30, 2017)	O-9,5dB (0-2km); 850nm
P9	Plastic optic fiber POF/SCRJ (100Mbit)	EoI - Last order date: Febr. 28,2019	O-7dB (0-140m); 650nm
T1	Twisted Pair: RJ45 (10/100Mbit)		
T5	Twisted Pair: M12 (10/100Mbit)	EoI - Last order date: Febr. 28,2019	
A8	AUI: DSub-male (10Mbit)	EoI - Last order date: Febr. 28,2019	
IO	Digital I/O (MM20 IO IO IO IO …) MM24…	EoI - Last order date: Febr. 28,2019	
99	empty		

Any MM2x or MM3x media module can be plugged into any MSxx MICE backplane.

Gigabitmodul for MS4128-xx and MS30



7. Temperature

S 0°C to +60°C; T -40°C to +70°C; E -40°V to +70°C incl. conformal coating

8. approvals & certifications

Z CE; Y CE, UL508; E Y + GL, EN 50121-4; A Y + ISA 12.12.01 class1 div.2

S Y + GL, IEC61850-3, IEEE 1613, EN 50121-4; H A + GL, IEC61850-3 – IEEE 1613, IEEE50121-4; B A + ATEX Zone2, GL

Due to changes of the standards, come of the approval ratings may no longer be met (ATEX Zone 2, ISA 12.12.01 class 1 div.2, IEC 61850, IEEE 1613). Recertification is in process. Please check latest specifications and data sheets.

MM4-2TX/SFP (943 622-001)
Now: MM30-07079999 xx
2x Gigabit RJ45/SFP Combo ports

MM4-4TX/SFP (943 010-001)
Now: MM30-07070707…
4x Gigabit RJ45/SFP Combo ports
(if using with MS30, only 2 ports active)

MACH102 fanless 19-inch switch

Last order: 31. December 2023
Technical support available until 30. June 2029

MACH102 switches with **–F** are not modular. Those with **–R** have redundant power supplies

"R" in part number suffix adds dual/redundant power inputs

All MACH102 models have 2x GE RJ45/SFP slot

- SFP sockets accept FE SPF or/and GE SPF
- Twisted Pair ports (RJ45) 10/100/1000 Mbit/s

Last order: 31.12.2013

End-of-life type	Order number	replacement
MACH102-8TP	943 969-001	GRS103
MACH102-8TP-R	943 969-101	
MACH102-8TP-F	943 969-201	
MACH102-8TP-FR	943 969-301	
MACH102-24TP-F	943 969-401	
MACH102-24TP-FR	943 969-501	

MACH102-8TP-F 943 969-201

fixed, not modular ---- continuous front plate
8 ports 10/100BASE-TX
2 FE/GE Combo ports
1 power supply 100 up to 240 VAC

MACH102-8TP-FR 943 969-301

fixed, not modular ---- continuous front plate
8 ports 10/100BASE-TX
2 FE/GE Combo ports
2 power supplies 100 up to 240 VAC
(redundant PS – stand-by mode)

MACH102-24TP-F 943 969-401

fixed, not modular ---- continuous front plate
24 ports 10/100BASE-TX
2 FE/GE Combo ports
1 power supply 100 up to 240 VAC

MACH102-24TP-FR 943 969-501

fixed, not modular ---- continuous front plate
24 ports 10/100BASE-TX
2 FE/GE Combo ports
2 power supplies 100 up to 240 VAC
(redundant PS – stand-by mode)

MACH102-8TP 943 969-001

8 ports 10/100BASE-TX
2 FE/GE Combo ports, 2 empty slots for expansion modules
1 power supply 100 up to 240 VAC

MACH102-8TP-R 943 969-101

8 ports 10/100BASE-TX
2 FE/GE Combo ports, 2 empty slots for expansion modules
2 power supplies 100 up to 240 VAC
(redundant PS – stand-by-mode)

M1-8TP-RJ45-PoE 942 028-001

Expansion module
8 Ports PoE / PoE Plus
if PoEP is used, only 4 Ports will be supported
(Limitation on Power: 124W)
external Power supply → 48VDC (min. 46V ; max. 57V)
(>50VDC for PoE Plus)

M1-8TP-RJ45 943 970-001

Expansion module
with 8 ports TP 10/100 BASE-TX

M1-8SFP 943 970-301

Expansion module
with 8 empty slots for SFP transceivers 100BASE-FX
Interface SFP slots for 100BASE-FX
Distance see SFP transceivers (M-FAST SFP-xx)

M1-8MM-SC 943 970-101

Expansion module
with 8 ports Fiber Optic multimode 100BASE-FX
Distance MM (50/125µm): 0-5000m, 11 dB link budget
MM (62.5/125µm): 0-4000m, 8 dB link budget

M1-8SM-SC 943 970-201

Expansion module
with 8 ports Fiber Optic singlemode 100BASE-FX
Distance SM (9/125µm): 0-32.5km, 16 dB link budget

Approvals
- cUL 508
- cUL 60950

Temp. range
- 0°C up to +50°C
- fanless

MACH104 fanless 19-inch switch

Layer 2 and Layer3

- Approvals
  - cUL 508
  - cUL 60950
  - CE, FCC

- Temp. range
  - 0°C up to +50°C

Rear View of device variants:
MACH104-20TX-F…
MACH104-20TX-F-4PoE…

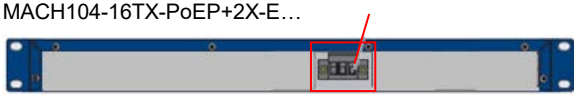
Rear View of device variants:
MACH104-20TX-FR…

Rear View of device variants:
MACH104-16TX-PoEP…
MACH104-16TX-PoEP+2x…

Rear View of device variants:
MACH104-16TX-PoEP-R…
MACH104-16TX-PoEP+2x-R…

Rear view of device variants:
MACH104-16TX-PoEP-E…
MACH104-16TX-PoEP+2X-E…

Plug for power supply 44-57 V DC



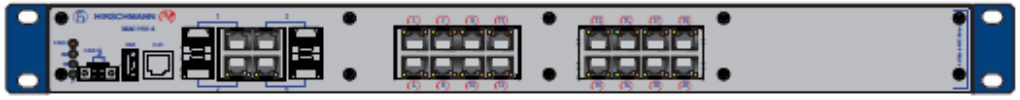
Plug for PoE power supply
For the use of **type 1 powered devices** (PoE):
nom. voltage 48V DC ---------- max. voltage range 45V to 57 V DC
For the use of **type 2 powered devices** (PoE+):
nom. voltage 54V DC ---------- max. voltage range 51V to 57 V DC

Last order: 31.12.2013
Replacement: GRS106

MACH104-20TX-F…
MACH104-20TX-FR

MACH104-20TX-F-4PoE

MACH104-16TX-PoEP+2X…
MACH104-16TX-PoEP+2X-R…
MACH104-16TX-PoEP+2X-E…



MACH104-16TX-PoEP…
MACH104-16TX-PoEP-R…
MACH104-16TX-PoEP-E…

IEEE 802.3af
15 Watt per port

IEEE 802.3at
30 Watt per port

PoE power
(max. number of Powered Devices)
- 8x PD class 4 (30W)
- 16x PD class 0 (15,4W)

It's possible to mix:
The limit is ~248 Watt

Last order: 31. December 2023
Technical support available until 30. June 2029

MACH104

Last order: 30. June 2020
MACH104 with 10GE uplink ports

	MACH104-20TX-F 942 003-001	MACH104-20TX-F-L3P 942 003-002	MACH104-20TX-FR 942 003-101	MACH104-20TX-FR-L3P 942 003-102	MACH104-20TX-F-4PoE 942 003-201	MACH104-20TX-F-4PoE-L3P 942 003-202	MACH104-16TX-PoEP 942 030-001	MACH104-16TX-PoEP-L3P 942 030-002	MACH104-16TX-PoEP-R 942 026-001	MACH104-16TX-PoEP-R-L3P 942 026-002	MACH104-16TX-PoEP+2X 942 031-001	MACH104-16TX-PoEP+2X-L3P 942 031-002	MACH104-16TX-PoEP+2X-R 942 033-001	MACH104-16TX-PoEP+2X-R-L3P 942 033-002	MACH104-16TX-PoEP-E 942 027-001	MACH104-16TX-PoEP-E-L3P 942 027-002	MACH104-16TX-PoEP+2X-E 942 032-001	MACH104-16TX-PoEP+2X-E-L3P 942 032-002
Gigabit ETHERNET COMBO ports	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Gigabit ETHERNET Twisted Pair ports	20	20	20	20	20	20	16	16	16	16	16	16	16	16	16	16	16	16
10 Gigabit ETHERNET ports for XFP	-	-	-	-	-	-	-	-	-	-	2	2	2	2	-	-	2	2
Integrated PoE power supply for 4 PoE ports	-	-	-	-	✓	✓	-	-	-	-	-	-	-	-	-	-	-	-
Integrated PoE+ power supply for 16 ports	-	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Power supply (100-240V AC) (fan inside the power supply)	-	-	-	-	-	-	✓ 1.)	✓ 1.)	✓ 2.)	✓ 2.)	✓ 3.)	✓ 3.)	✓ 2.)	✓ 2.)	-	-	-	-
Redundant Power supply (100-240V AC)			✓	✓														
Redundant power supply (100-240V AC)) (fan inside the power supply	-	-	-	-	-	-	-	-	✓	✓	-	-	✓	✓	- 4.)	- 4.)	- 4.)	- 4.)
Power supply (44-57V DC) fanless	-	-	-	-	-	-	-	-	-	-	-	-	-	-	✓	✓	✓	✓
Software Version	L2P	L3P	L2P	L3P	L2P	L3P	L2P	L3P	L2P	L3P	L2P	L3P	L2P	L3P	L2P	L3P	L2P	L3P

1.) For the supply voltage, the following applies: A power module providing the PoE voltage and the internal supply voltage is integrated in the device

2.) For the supply voltage, the following applies:
- The supply voltage can be connected redundantly;
- Two power modules providing the PoE voltage and the internal supply voltage are integrated in the device. The power modules operate in load-sharing mode.

3.) For the supply voltage, the following applies: A power module providing the PoE voltage and the internal supply voltage is integrated in the device.

4.) For the supply voltage, the following applies: PoE voltage and internal supply voltage are provided by an external power module

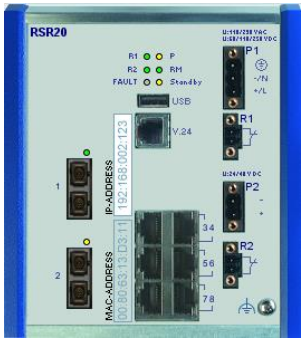
Last order: 31. December 2023
Technical support available until 30. June 2029

RSR Rail Switch Ruggedized

Last order: 31. August 2020

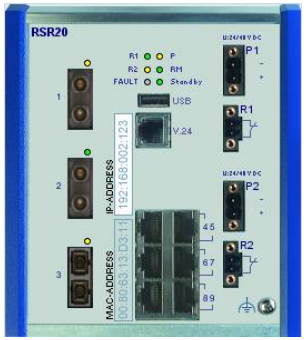
RSR20 08 00 T1 T1 T1
8x 10/100BASE-TX(RJ45)

RSR20 09 00 MM M2 T1
3x 100BASE-FX(SC)
6x 10/100BASE-TX(RJ45)

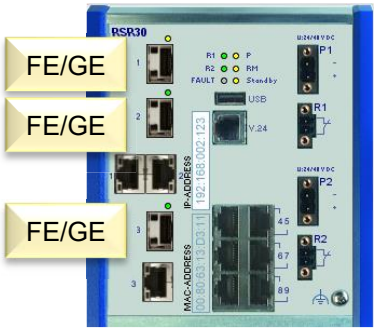


RSR20 08 00 M2 M2 T1
2x 100BASE-FX(SC)
6x 10/100BASE-TX(RJ45)

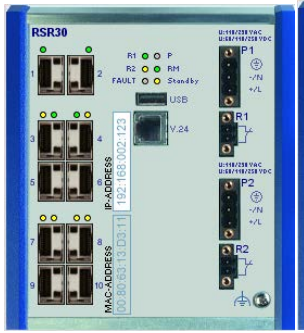
RSR20 09 00 JJ M3 T1
3x 100BASE-FX(MTRJ)
6x 10/100BASE-TX(RJ45)



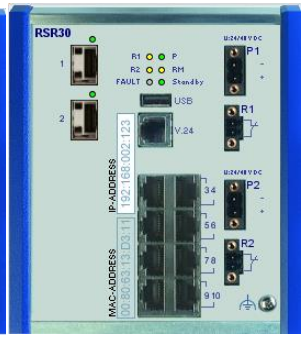
RSR20 09 00 MM M2 T1
3x 100BASE-FX(D-SC)
6x 10/100BASE-TX(RJ45)



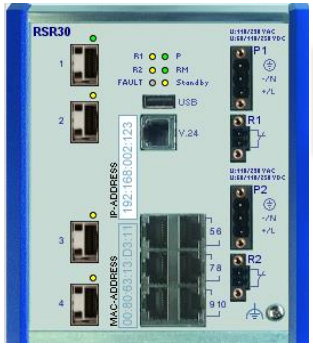
RSR30 06 03 CC 07 T1
3x combo ports SFP slot (FE/GE)/TP-RJ45
6x 10/100BASE-TX(RJ45)



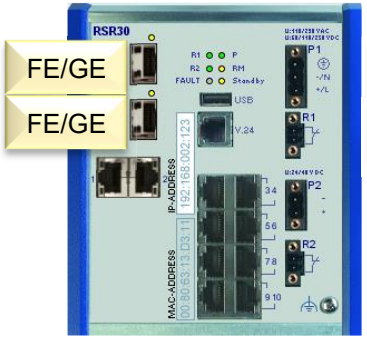
RSR30 07 03 00 06 Z6
3x SFP slot (GE)
7x SFP slot (FE)



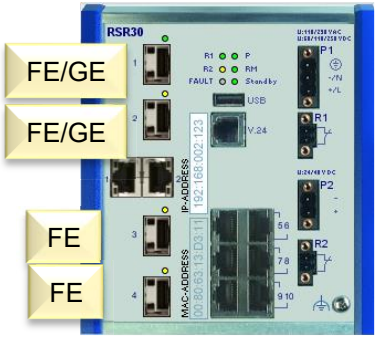
RSR30 08 02 06 06 T1
2x SFP slot (GE)
8x 10/100BASE-TX(RJ45)



RSR30 08 02 00 ZZ T1
2x SFP slot (GE)
2x SFP slot (FE)
6x 10/100BASE-TX(RJ45)



RSR30 08 02 07 07 T1
2x combo port (FE/GE)/ SFP slot TP-RJ45
8x 10/100BASE-TX(RJ45)



RSR30 08 02 CC ZZ T1
2x combo port (FE/GE) SFP slot/TP-RJ45
2x SFP slot (FE)
6x 10/100BASE-TX(RJ45)

Note: All combo ports support GE and FE

The core of your order:

RSR Rail Switch Ruggedized

Last order: 31. August 2020

RSR		-								H	P	H	H	xx.x
1. Product	2. Data rate		3. 10/100 Mbit/s ports	4. 10/100/1000 Mbit/s ports	5. Uplink port 1 configuration	6. Uplink port 2 configuration	7. Temperature range	8. Voltage range 1	9. Voltage range 2	10. Approvals	11. Software version	12. Confi-guration	13. OEM type	14. SW release

1. Product

RSR — Rail Switch ruggedized

2. Data rate

- 20 — 10/100 Mbit/s ports
- 30 — 10/100/1000 Mbit/s ports

3. Ports Fast-ETHERNET

- 06 – 6x 100 Mbit/s (RSR30)
- 07 – 7x 100 Mbit/s (RSR30)
- 08 – 8x 100 Mbit/s (RSR20,RSR30)
- 09 - 9x 100 Mbit/s (RSR20)

4. Ports Gigabit-ETHERNET

- 00 – 0x 1000 Mbit/s (RSR20)
- 02 – 2x 1000 Mbit/s (RSR30)
- 03 – 3x 1000 Mbit/s (RSR30)

5. Ports Type - 1. Uplink

- CC – 2x Combo Port Gigabit
- 00 – 2x SFP Slot Gigabit
- TT – 2x Twisted Pair (RJ45)
- MM – 2x Multimode (D-SC)
- JJ – 2x Multimode (MTRJ)
- NN – 2x Multimode (BFOC/ST)
- VV – 2x Singlemode (D-SC)
- UU – 2x Singlemode (BFOC/ST)
- LL – 2x Singlemode Long Haul (D-SC)
- GG – 2x Singlemode Long Haul+ (D-SC)
- ZZ – 2x SFP Slot (100 Mbit/s)
- 07 – Combo port (1000 Mbit/s)
- 06 – SFP slot (1000 Mbit/s)
- T1 – Twisted Pair (RJ45)
- M2 – Multimode (D-SC)
- M3 – Multimode (MTRJ)
- M4 – Multimode (BFOC/ST)
- S2 – Singlemode (D-SC)
- S4 – Singlemode (BFOC/ST)
- L2 – Singlemode Long Haul (D-SC)
- G2 – Singlemode Long Haul+ (D-SC)
- Z6 – SFP slot (100 Mbit)

Not all options are possible in all RSR types

6. Ports Type - 2. Uplink

ZZ I 07 I 06 I T1 I M2 I M3 I M4 I S2 I S4 I L2 I G2 I Z6

7. Temperature range

- S — Standard 0°C ... +60°C
- U — Extended -40°C ... +85°C
- F — Extended -40°C ... +85°C incl. Corformal Coating

8. Operating voltage 1

- C — 24/36/48 V DC (18-60VDC)
- K — 60/120/250 V DC 110/230 V AC

9. Operating voltage 2

- 9 — not available
- C — 24/36/48 V DC (18-60VDC)
- K — 60/120/250 V DC 110/230 V AC

10. Approvals

- H — UL508;GL, IEC 61850-3, IEEE1613, EN50121-4

11. SW version

- P — **Professional:**

12. Configuration

- H — Hirschmann

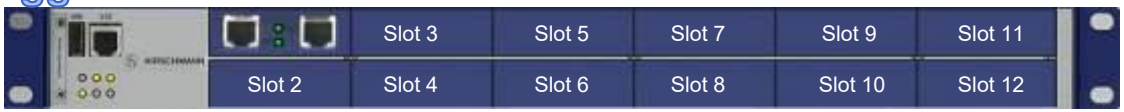
13. OEM type

- H — Hirschmann

14. SW release

- xx.x — Newest software

MACH1000 FAMILY 19-inch ruggedized switch



MAR1020-99 TT …
Max. 24 ports 10/100 Mbit/s

MAR1030-CC TT …
Max. 24 ports 10/100 Mbit/s
+ 2 ports FE/GE (Combo SFP/RJ45)

MAR1030-4O TT …
Max. 24 ports 10/100 Mbit/s
+ 4 ports GE (SFP); 1000 Mbit/s

MAR1030-OT TT …
Max. 24 ports 10/100 Mbit/s
+ 2 ports GE (SFP) + 2 ports 10/100/1000 Mbit/s (RJ45)

MAR1030-4T TT …
Max. 24 ports 10/100 Mbit/s
+ 4 ports 10/100/1000 Mbit/s (RJ45)

MAR1022-99 TT …
Max. 24 ports 10/100 Mbit/s
incl. 4 ports PoE (RJ45)
Take care: with PoE variants the second power supply only feeds the PoE ports

MAR1032-CC TT …
Max. 24 ports 10/100 Mbit/s
incl. 4 ports PoE + 2 ports FE/GE (Combo SFP/RJ45)
Take care: with PoE variants the second power supply only feeds the PoE ports

MAR1120-99 TT …
Rear: Max. 20 ports 10/100 Mbit/s
Front: 1 „service“ port (10/100Base-TX; RJ45)

MAR1130-4T TT …
Rear: Max. 20 ports 10/100 Mbit/s
+ 2/4 ports GE (div. variation)
Front: 1 „service“ port in the front (10/100Base-TX; RJ45)

MACH1000 FAMILY

19-inch ruggedized switch

MAR1xxx																			P	H	H	xx.x
1. Product	2. Data rate	3. – 14. media ports													15. Temp. range	16. Voltage range 1	17. Voltage range 2	18. Approvals	19. SW version	20. Configuration	13. OEM type	14. SW release

1. Chassis type

MAR1020	Fast Ethernet
MAR1030	Gigabit Ethernet
MAR1022	Fast Ethernet with PoE
MAR1032	Gigabit Ethernet with PoE
MAR1120	Fast Ethernet - Ports rear
MAR1130	Gigabit Ethernet - Ports rear
MAR1122	Fast Ethernet with PoE - Ports front
MAR1132	Gigabit Ethernet with PoE - Ports front

2. Gigabit ports

* in chassis MACH103x

CC	2x FE/GE SFP/RJ45 Combo ports
4O	4x GE SFP; 1000 Mbit/s
4T	4x 10/100/1000 Mbit/s; RJ45
OT	2x GE SFP and 2x 10/100/1000 Mbit/s; RJ45
99	no Gigabit/empty (only possible in MAR102x)

CC/4O/4T/OT is only possible in MAR103x/MAR113x

3. – 14. media ports

- 12 slots

(your choice, which media you need)
Empty ports have to be located at the end of the port order

TT	2x Twisted Pair	10/100 Mbit/s; RJ45	
MM	2x Multimode	100 Mbit/s; SC	
JJ	2x Multimode	100 Mbit/s; MTRJ	
NN	2x Multimode	100 Mbit/s; BFOC/ ST	
~~BB~~	~~2x Multimode~~	~~100 Mbit/s; LC~~	Last order: 31.05.2024
VV	2x Singlemode	100 Mbit/s; SC	
UU	2x Singlemode	100 Mbit/s; BFOC/ST	
LL	2x Singlemode LH	100 Mbit/s; SC	
GG	2x Singlemode LH+	100 Mbit/s; SC	only temp.range: „S“
ZZ	2x SFP slot	100 Mbit/s; SFP	
RR	2x Twisted Pair	100 Mbit/s; M12	
99	empty		

15. Temperature range

S	Standard	0°C ... +60°C
C	Standard	0°C ... +60°C incl. Conformal Coating
U	Extended	-40°C ... +85°C
F	Extended	-40°C ... +85°C incl. Conformal Coating

16. Operating voltage 1

C	24/36/48 V DC
G	110/250 V DC --- 110/230 V AC
L	24/36/48 V DC --- power plug
M	110/250 V DC -- 110/230 V AC --- power plug

17. Operating voltage 2

M	110/250 V DC -- 110/230 V AC --- power plug
9	empty
C	24/36/48 V DC
G	110/250 V DC -- 110/230 V AC

18. Approvals

H	UL508; UL1604 Class 1 Div2; GL, IEC 61850-3, IEEE1613, EN50121-4; NEMA TS
T	EN50155

19. SW version

P	**Professional**

20. Configuration

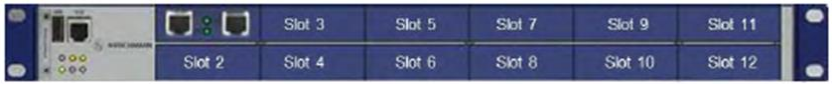
H	Hirschmann

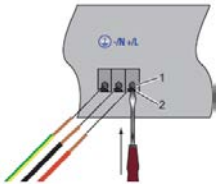
21. OEM type

H	Hirschmann

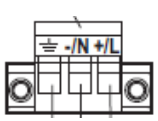
22. SW release

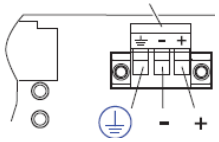
xx.x	Newest software

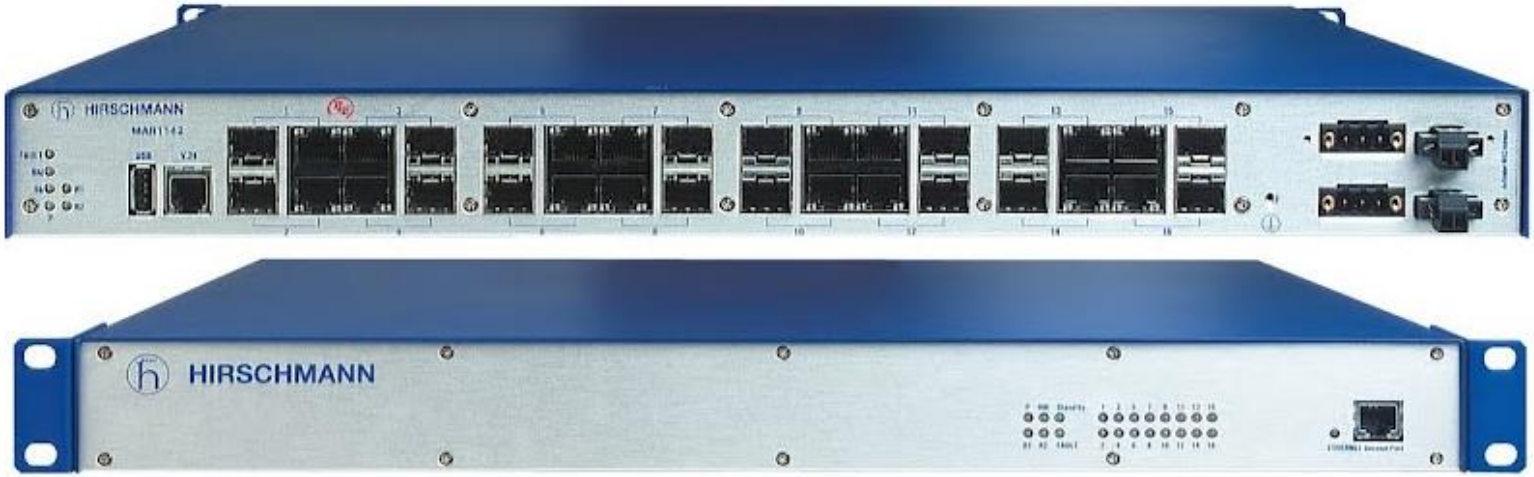




Example of **C** and **G**
Spring clip (left) and pluggable terminal plug **L** and **M** (right)





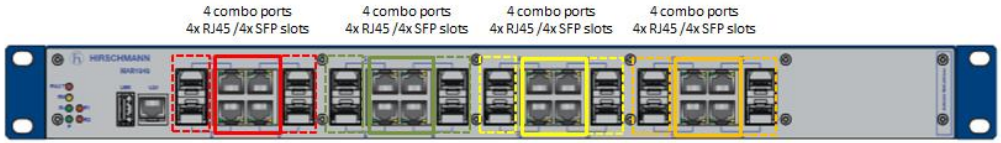

HIRSCHMANN
MAR1142
HIRSCHMANN

MACH1040 FAMILY

19-inch ruggedized switch

Full- Gigabit

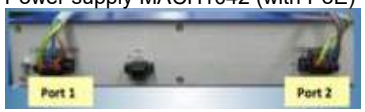
MAR1xxx	4C	4C	4C	4C	99	99				H		H	H	xx.x
1. Product	2. ports						3. Temp. range	4. power supply 1	5. power supply 2	6. Approvals	7. SW version	8. Confi-guration	9. OEM type	10. SW release



1. Chassis type	MAR1040	Full GE switch I 16 ports
	MAR1042	Full GE switch incl. 4 ports PoE
	MAR1140	Full GE switch I 16 ports rear and one port in front
	MAR1142	Full GE switch I and one port in front 16 ports rear incl. 4 ports PoE
2. Gigabit ports	4C4C4C4C9999	16x 10/100/1000 Mbit/s ports Combo Ports ☞ SFP slots – dual speed
3. Temperature range	S	Standard 0°C ... +60°C
	C	Standard 0°C ... +60°C including Corformal Coating
	T	Extended -40°C ... +85°C
	E	Extended -40°C ... +85°C including Corformal Coating
4. Voltage range power supply 1	L	18...60V DC--- power plug
	M	90... 265V AC--- power plug 77... 300V DC--- power plug
5. Voltage range power supply 2	L	18...60V DC--- power plug
	M	90... 265V AC--- power plug 77... 300V DC--- power plug
	9	empty

at PoE versions

Power supply MACH1042 (with PoE)



Port 1 (230 V AC supports chassis operating voltage)

Port 2 (230 V AC supports exclusive 4 ports PoE)
- No operating voltage redundancy -

6. Approvals	H	UL508; UL1604 Class 1 Div2; GL, IEC 61850-3, IEEE1613, EN50121-4; NEMA TS
7. Software version	P	Layer 2 - Professional
	R	Layer 3
8. Configuration	H	Hirschmann
9. OEM type	H	Hirschmann
10. SW release	xx.x	Newest software


MAR1040


MAR1042


MAR1140


MAR1142

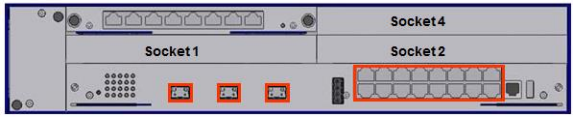
MAR1140, MAR1142

MACH4000 FAMILY 19-inch backbone switch

10 Gigabit-ETHERNET

Maximum ports: 48 GE + 3x 10 GE

MACH 4002 – 48G+3X-L2P	943 878-101
MACH 4002 – 48G+3X-L3E	943 878-201
MACH 4002 – 48G+3X-L3P	943 878-301



3 XFP sockets + 16 TP-ports

Maximum ports: 24 GE + 3x 10 GE

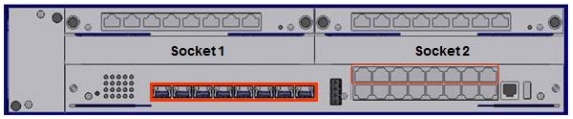
MACH 4002 – 24G+3X-L2P	943 915-101
MACH 4002 – 24G+3X-L3E	943 915-201
MACH 4002 – 24G+3X-L3P	943 915-301

3 XFP sockets + 8 TP-ports

Gigabit-ETHERNET

Maximum ports: 48 GE

MACH 4002 – 48G-L2P	943 911-101
MACH 4002 – 48G-L3E	943 911-201
MACH 4002 – 48G-L3P	943 911-301



8 combo- + 8 TP-ports

Maximum ports: 24 GE

MACH 4002 – 24G-L2P	943 916-101
MACH 4002 – 24G-L3E	943 916-201
MACH 4002 – 24G-L3P	943 916-301

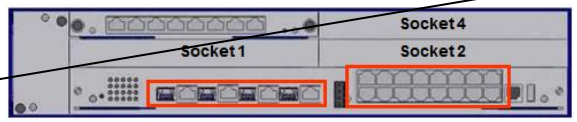
8 combo ports

Fast-ETHERNET

Maximum ports: 48 FE + 4 combi ports GE

MACH 4002 – 48+4G-L2P	943 859-101
MACH 4002 – 48+4G-L3E	943 859-201
MACH 4002 – 48+4G-L3P	943 859-301

End of life



4 combo- + 16x 10/100 ports

M4-FAST 8-SFP 943 864-001

- 8 SFP sockets for use with SFP transceiver
- Speed 100Mbit/s
- SFP transceiver M-FAST SFP xx

M4-GIGA 8-SFP 943 879-001

- 8 SFP sockets for use with SFP transceiver
- Speed 100/1000Mbit/s is defined by the SFP transceiver used, M-FAST SFP xx or M-SFP xx
- PLEASE NOTICE: Not for use in the MACH 4002-48+4G

M4-8TP-RJ45 943 863-001

- 8 ports TP 10/100/1000MBit/s with RJ45 sockets
- AutoNeg, AutoCrossing, Cable Diagnostic
- 10/100MBit/s with MACH 4002 - 48+4G

M4-FAST 8TP-RJ45-PoE 943 873-001

- 8 ports TP 10/100MBit/s with RJ45 sockets
- Power over Ethernet is provided over pairs 1-2, 3-6

End of life – 30.01.2021

Max. PoE power according to chassis	
4002-48+4G	137 Watt
4002-24G	163 Watt
4002-48G	110 Watt
4002-24G+3X	157 Watt
4002-48G+3X	106 Watt

Last order: 31. March 2023
Last Delivery date: 30 June 2023
Last service date: 30. June 2028

MACH4000 FAMILY

PLUG-IN POWER SUPPLY FOR MACH4002-CHASSIS

M4-Rackmount (10 pcs.)
943 951-101
60mm x 88mm x 19mm

M4-Rackmount (10 pcs.)
943 951-001
110mm x 88mm x 19mm

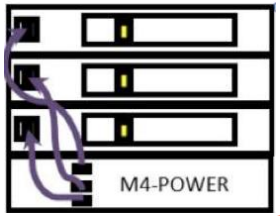
M4-S-AC/DC 300W (943 870-001)
operating voltage: 100-240V AC
120-350V DC

~~**M4-S-24VDC 300W** (943 871-001)~~
~~operating voltage: 19-32V DC~~
~~current: max.15A~~

~~**M4-S-48VDC 300W** (943 872-001)~~
~~operating voltage: 38-72V DC~~
~~current: max.8A~~

Front View

Rear View



EXTERNAL MODULARE POWER SUPPLY CHASSIS

M4-POWER
943 874-001

M4-P-AC/DC 300W (943 875-001)
Operating voltage: 100-240V AC,
129-350V DC

~~**M4-P-24VDC 300W** (943 876-001)~~
~~Operating voltage: 24V DC~~
~~(19V – 32V)~~

~~**M4-P-48VDC 300W** (943 877-001)~~
~~Operating voltage: 48V DC~~
~~(38V – 72V)~~

Last order: 31. March 2023

M4-Powercable 90° of M4-P-xx
is included in the delivery packet.
(943 922-001)

M4-Powercable 180° of M4-P-xx
Accessoire (separate order)
(943 922-101)

Product name	Order number	Alternative - Option Product name	Order number
MACH4002-24G-L2P	943 916-101	GRS105 family	942 287-999
MACH4002-24G-L3E	943 916-201	GRS105 family	942 287-999
MACH4002-24G-L3P	943 916-301	GRS105 family	942 287-999
MACH4002-24G+3X-L2P	943 915-101	GRS106 family	942 287-999
MACH4002-24G+3X-L3E	943 915-201	GRS106 family	942 287-999
MACH4002-24G+3X-L3P	943 915-301	GRS106 family	942 287-999
MACH4002-48G-L2P	943 911-101	DRAGON MACH4000-52G-L2A	942 318-001
MACH4002-48G-L3E	943 911-201	DRAGON MACH4000-52G-L3A-UR	942 318-002
MACH4002-48G-L3P	943 911-301	DRAGON MACH4000-52G-L3A-MR	942 318-003
MACH4002-48G+3X-L2P	943 878-101	DRAGON MACH4000-48G+4X-L2A	942 154-001
MACH4002-48G+3X-L3E	943 878-201	DRAGON MACH4000-48G+4X-L3A-UR	942 154-002
MACH4002-48G+3X-L3P	943 878-301	DRAGON MACH4000-48G+4X-L3A-MR	942 154-003
M4-8TP-RJ45	943 863-001	D4-12TP-RJ45, Linecard	942 155-001
M4-FAST 8TP-RJ45-PoE	943 873-001	D4K-10TP-PoE, Linecard	942 294-001
M4-FAST 8-SFP	943 864-001	D4K-12SFP, Linecard	942 155-501
M4-GIGA 8-SFP	943 879-001	D4K-12SFP, Linecard	942 155-001
M4-S-AC/DC 300W	943 870-001	D4-PSU-300W-HV, Power Supply	942 156-001
M4-P-AC/DC 300W	943 875-001	No replacement	
M4-POWER	943 874-001	No replacement	
M4-AIR	943 869-001	D4K-AIR, Fan Unit	942 157-001

OCTOPUS IP67 switch

Last order: 31. December 2023
Technical support available until 30. June 2029

OCTOPUS 16M (943 912-001)
managed ruggedized IP67-Switch 16 TX,
Approvals: E1, DIN 5510-2, NF F 16-101, NF F 16-102, GL

OCTOPUS 16M Train (943 984-001)
managed ruggedized IP67-Switch 16 TX,
Approvals: EN 50155, EN 50121-4, DIN 5510-2, NF F 16-101, NF F 16-102

OCTOPUS 16M 8PoE (943 960-001)
managed ruggedized IP67-Switch 16 TX, including 8 ports PoE
Approvals: EN50155

OCTOPUS 24M (943 923-001)
managed ruggedized IP67-Switch 24 TX,
Approvals: E1, DIN 5510-2, NF F 16-101, NF F 16-102, GL

OCTOPUS 24M Train (943 985-001)
managed ruggedized IP67-Switch 24 TX,
Approvals: EN 50155, EN 50121-4, DIN 5510-2, NF F 16-101, NF F 16-102

OCTOPUS 24M Train-BP (943 093-001)
managed ruggedized IP67-Switch 24 TX, including 2 Bypass Relais
EN 50155, EN 50121-4, DIN 5510-2, NF F 16-101, NF F 16-102

OCTOPUS 24M-8PoE (943 063-001)
managed ruggedized IP67-Switch 24 TX, including 8 ports PoE
Approvals: E1, EN 50155, EN 50121-4, DIN 5510-2, NF F 16-101, NF F 16-102

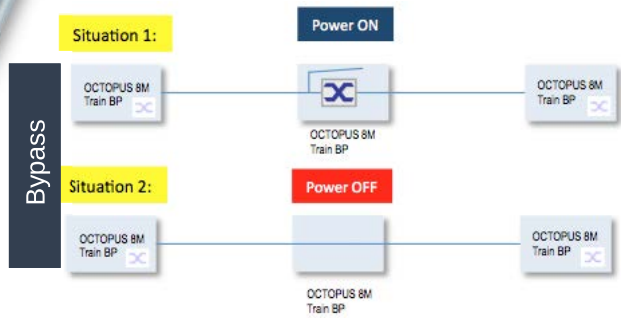
OCTOPUS 8M (943 931-001)
managed ruggedized IP67-Switch 8 TX,
Approvals: E1, DIN 5510-2, NF F 16-101, NF F 16-102, GL

OCTOPUS 8M Train (943 983-001)
managed ruggedized IP67-Switch 8 TX,
Approvals: EN 50155, EN 50121-4, DIN 5510-2, NF F 16-101, NF F 16-102

OCTOPUS 8M –Train-BP (943 091-001)
managed ruggedized IP67-Switch 8 TX, including 2 Bypass Relais
Approvals: EN 50155, EN 50121-4, DIN 5510-2, NF F 16-101, NF F 16-102

OCTOPUS 8M - 6PoE (943 967-101)
managed ruggedized IP67-Switch 8 TX, including 6 ports PoE
Approvals: EN50155

OCTOPUS 8M -8PoE (943 967-001)
managed ruggedized IP67-Switch 8 TX, including 8 ports PoE
Approvals: EN50155



OCTOPUS IP67 switch

Variant 1 and 4 IEC 61076-3-106 connectors are not sold by Belden and need to be sourced via third party , such as Metz Connect.
See parts and link below.

Var 1 plug/shell (EtherNet/IP)	1401015000ME
Var 4 plug/shell (Profinet)	14010850F0ME
Duplex LC insert (multimode)	1402800820-I
Duplex LC insert (singlemode)	1402900820-I

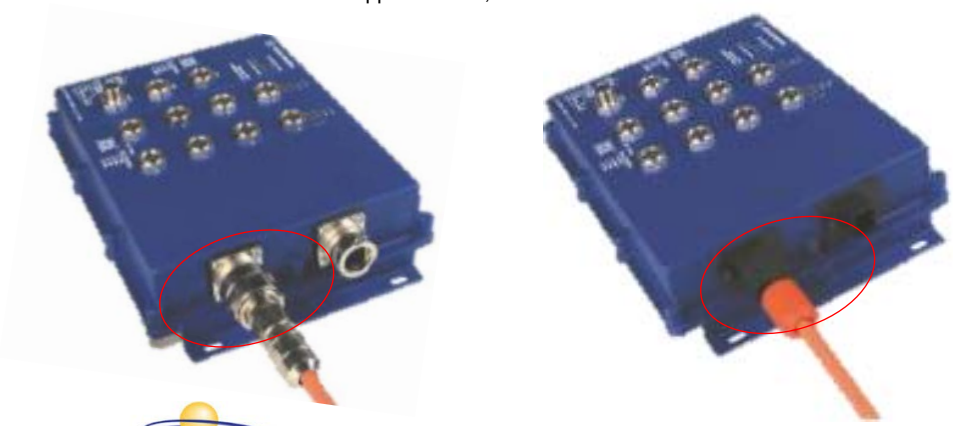
http://www.metz-connect.com/us/productsearch/E-DAT%20Industry%20IP67%20V1

OCTOPUS OS20-0010001M1MTREP (943 988-001)
managed ruggedized IP67-Switch 8 TX, 2 FX-MM,
Approvals: E1, EN50155

OCTOPUS OS20-0010001S1STREP (943 988-002)
managed ruggedized IP67-Switch 8 TX, 2 FX-SM,
Approvals: E1, EN50155

OCTOPUS OS20-0010004M4MTREP (943 988-003)
managed ruggedized IP67-Switch 8 TX, 2 FX-SM,
Approvals: E1, EN50155

OCTOPUS OS20-0010004S4STREP (943 988-004)
managed ruggedized IP67-Switch 8 TX, 2 FX-SM,
Approvals: E1, EN50155



Optical ports variant 4

IEC 61076-3-106 Variant 4	Multimode fibre	Singlemode fibre
Fast ETHERNET	FO link up to 4 km 943 968-**003**	FO link up to 22 km 943 968-**004**
Gigabit ETHERNET	FO link up to 550m 943 968-**007**	FO link up tp 17 km 943 968-**008**

Optical ports variant 1

IEC 61076-3-106 Variant 1	Multimode fibre	Singlemode fibre
Fast ETHERNET	FO link up to 4 km 943 968-**001**	FO link up to 22 km 943 968-**002**
Gigabit ETHERNET	FO link up to 550m 943 968-**005**	FO link up tp 17 km 943 968-**006**

Last order: 31. December 2023
Technical support available until 30. June 2029

OCTOPUS

IP67 switch

Last order: 31. December 2023
Technical support available until 30. June 2029

Product	orL2P.bin	omL2P.bin
OS20-xxxx	✔	
OS30-xxxx	✔	
OCTOPUS 8M (-8PoE)		✔
OCTOPUS 16M (-8PoE)		✔
OCTOPUS 24M (-8PoE)		✔
OS32-xxxx		✔

OCTOPUS OS30-0008021A1ATREP (943 988-005)
managed ruggedized IP67-Switch 8 TX, 2FX-MM (Gigabit)
Approvals: E1, EN50155

OCTOPUS OS30-0008021B1BTREP (943 988-006)
managed ruggedized IP67-Switch 8 TX, 2FX-SM (Gigabit)
Approvals: E1, EN50155

OCTOPUS OS30-0008024A4ATREP (943 988-007)
managed ruggedized IP67-Switch 8 TX, 2FX-MM (Gigabit)
Approvals: E1, EN50155

OCTOPUS OS30-0008024B4BTREP (943 988-008)
managed ruggedized IP67-Switch 8 TX, 2FX-SM (Gigabit)
Approvals: E1, EN50155

End of life

OCTOPUS OS32-080802T6T6TPEP (942 069-002)
managed ruggedized IP65, IP67-Switch 10 TX, including 8 ports PoE (10/100 Mbit/s), M12 „D“ coding, 2x 1000 Mbit/s M12 „X“-coding
Approvals: CE, C-Tick, GOST-R, EN 50155

OCTOPUS OS32-081602T6T6TPEP (942 069-001)
managed ruggedized IP65, IP67-Switch 18 TX, including 8 ports PoE (10/100 Mbit/s), M12 „D“ coding 8 ports 10/100 Mbit/s, M12 „D“ coding 2x 1000 Mbit/s, M12 „X“-coding
Approvals: CE, C-Tick, GOST-R, EN 50155

OCTOPUS OS32-0808020606TPEP (942 069-004)
managed ruggedized IP65, IP67-Switch 10 Ports including 8 ports PoE, M12 „D“ coding, 2 ports 1000BASE-SFP sockets
Approvals: CE, C-Tick, GOST-R, EN 50155

OCTOPUS OS32-0816020606TPEP (942 069-003)
managed ruggedized IP54-Switch 18 Ports including 8 ports PoE, M12 „D“ coding, 8 ports 10/100 Mbit/s, M12 „D“ coding 2 ports 1000BASE-SFP sockets
Approvals: CE, C-Tick, GOST-R, EN 50155

Order No.	Field attachable connector M12	description
942 040-001	0986 EMC 105	M12 male, 4-pole, D-coded Spring type
934 828-002	RSCIS 4D/9	M12 male, 4-pole, D-coded IDC
942 159-001	BRSCIS 4D/9	M12 male, 4-pole, D-coded Rail approved version IDC
942 083-001	EM12G OCTOPUS	M12 male, 8-pole ; X-coded IDC

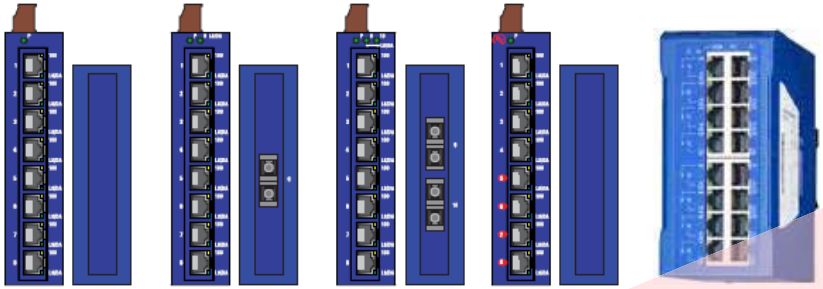
OCTOPUS IP67 switch

Last order: 31. December 2023
Technical support available until 30. June 2029

Product Code	Product Name		Power supply	Ports	FE	GE	PoE	Approval Vehicles
943892001	OCTOPUS 5TX EEC	Unmanaged	9,6V - 32V	5-port	5 Cu	n/a	n/a	E1
943931001	OCTOPUS 8M	Managed	9,6V - 60V	8-port	8 Cu	n/a	n/a	E1, DIN 5510-2, NF F 16-101, NF F 16-102
943983001	OCTOPUS 8M Train	Managed	9,6V - 60V	8-port	8 Cu	n/a	n/a	EN 50155, EN 50121-4, DIN 5510-2, NF F 16-101, NF F 16-102
943967101	OCTOPUS 8M-6PoE	Managed	48V	8-port	8 Cu	n/a	6-port PoE	EN 50155
943967001	OCTOPUS 8M-8PoE	Managed	48V	8-port	8 Cu	n/a	8-port PoE	EN 50155
942091001	OCTOPUS 8M-Train-BP	Managed	9,6V - 60V	8-port	8 Cu	n/a	n/a	EN 50155, EN 50121-4, DIN 5510-2, NF F 16-101, NF F 16-102
943912001	OCTOPUS 16M	Managed	9,6V - 60V	16-port	16 Cu	n/a	n/a	E1, DIN 5510-2, NF F 16-101, NF F 16-102
943984001	OCTOPUS 16M Train	Managed	9,6V - 60V	16-port	16 Cu	n/a	n/a	EN 50155, EN 50121-4, DIN 5510-2, NF F 16-101, NF F 16-102
943960001	OCTOPUS 16M-8PoE	Managed	48V	16-port	16 Cu	n/a	8-port PoE	EN 50155
942092001	OCTOPUS 16M-Train-BP	Managed	9,6V - 60V	16-port	16 Cu	n/a	n/a	EN 50155, EN 50121-4, DIN 5510-2, NF F 16-101, NF F 16-102
943923001	OCTOPUS 24M	Managed	9,6V - 60V	24-port	24 Cu	n/a	n/a	E1, DIN 5510-2, NF F 16-101, NF F 16-102
943985001	OCTOPUS 24M Train	Managed	9,6V - 60V	24-port	24 Cu	n/a	n/a	EN 50155, EN 50121-4, DIN 5510-2, NF F 16-101, NF F 16-102
942063001	OCTOPUS 24M-8PoE	Managed	48V	24-port	24 Cu	n/a	8-port PoE	E1, EN 50155, EN 50121-4, DIN 5510-2, NF F 16-101, NF F 16-102
942093001	OCTOPUS 24M-Train-BP	Managed	9,6V - 60V	24-port	24 Cu	n/a	n/a	EN 50155, EN 50121-4, DIN 5510-2, NF F 16-101, NF F 16-102
942025005	OCTOPUS OS20-000900T5T5TAFBHH	Managed	24V/48V	9-port	9 Cu	n/a	n/a	E1, EN 50155, EN 50121-4, DIN 5510-2, NF F 16-101, NF F 16-102
942025006	OCTOPUS OS20-000900T5T5TNEBHH	Managed	110V	9-port	9 Cu	n/a	n/a	EN 50155, EN 50121-4, DIN 5510-2, NF F 16-101, NF F 16-102
943988001	OCTOPUS OS20-0010001M1MTREPHH	Managed	16,8V - 45V	10-port	8 Cu / 2 Fo	n/a	n/a	E1, EN 50155
943988002	OCTOPUS OS20-0010001S1STREPHH	Managed	16,8V - 45V	10-port	8 Cu / 2 Fo	n/a	n/a	E1, EN 50155
943988003	OCTOPUS OS20-0010004M4MTREPHH	Managed	16,8V - 45V	10-port	8 Cu / 2 Fo	n/a	n/a	E1, EN 50155
943988004	OCTOPUS OS20-0010004S4STREPHH	Managed	16,8V - 45V	10-port	8 Cu / 2 Fo	n/a	n/a	E1, EN 50155
942025001	OCTOPUS OS20-001000T5T5TAFUHB	Unmanaged	24V/48V	10-port	10 Cu	n/a	n/a	E1, EN 50155, EN 50121-4, DIN 5510-2, NF F 16-101, NF F 16-102
942025002	OCTOPUS OS20-001000T5T5TNEUHB	Unmanaged	110V	10-port	10 Cu	n/a	n/a	EN 50155, EN 50121-4, DIN 5510-2, NF F 16-101, NF F 16-102
942025007	OCTOPUS OS24-080900T5T5TFFBHH	Managed	24V/48V	9-port	9 Cu	n/a	8-port PoE	E1, EN 50155, EN 50121-4, DIN 5510-2, NF F 16-101, NF F 16-102
942025008	OCTOPUS OS24-080900T5T5TNEBHH	Managed	110V	9-port	9 Cu	n/a	8-port PoE	EN 50155, EN 50121-4, DIN 5510-2, NF F 16-101, NF F 16-102
942025003	OCTOPUS OS24-081000T5T5TFFUHB	Unmanaged	24V/48V	10-port	10 Cu	n/a	8-port PoE	E1, EN 50155, EN 50121-4, DIN 5510-2, NF F 16-101, NF F 16-102
942025004	OCTOPUS OS24-081000T5T5TNEUHB	Unmanaged	110V	10-port	10 Cu	n/a	8-port PoE	EN 50155, EN 50121-4, DIN 5510-2, NF F 16-101, NF F 16-102
943988005	OCTOPUS OS30-0008021A1ATREPHH	Managed	16,8V - 45V	10-port	8 Cu	2 Fo	n/a	E1, EN 50155
943988006	OCTOPUS OS30-0008021B1BTREPHH	Managed	16,8V - 45V	10-port	8 Cu	2 Fo	n/a	E1, EN 50155
943988007	OCTOPUS OS30-0008024A4ATREPHH	Managed	16,8V - 45V	10-port	8 Cu	2 Fo	n/a	E1, EN 50155
943988008	OCTOPUS OS30-0008024B4BTREPHH	Managed	16,8V - 45V	10-port	8 Cu	2 Fo	n/a	E1, EN 50155
~~942069004~~	~~OCTOPUS OS32-080802O6O6TPEPHH~~	~~Managed~~	~~48V~~	~~10-port~~	~~8 Cu~~	~~2 SFP~~	~~8-port PoE~~	~~E1, EN 50155, EN 50121-4, DIN 5510-2, NF F 16-101, NF F 16-102~~
~~942069002~~	~~OCTOPUS OS32-080802T6T6TPEPHH~~	~~Managed~~	~~48V~~	~~10-port~~	~~8 Cu~~	~~2 Cu~~	~~8-port PoE~~	~~E1, EN 50155, EN 50121-4, DIN 5510-2, NF F 16-101, NF F 16-102~~
~~942069003~~	~~OCTOPUS OS32-081602O6O6TPEPHH~~	~~Managed~~	~~48V~~	~~18-port~~	~~16 Cu~~	~~2 SFP~~	~~8-port PoE~~	~~E1, EN 50155, EN 50121-4, DIN 5510-2, NF F 16-101, NF F 16-102~~
~~942069001~~	~~OCTOPUS OS32-081602T6T6TPEPHH~~	~~Managed~~	~~48V~~	~~18-port~~	~~16 Cu~~	~~2 Cu~~	~~8-port PoE~~	~~E1, EN 50155, EN 50121-4, DIN 5510-2, NF F 16-101, NF F 16-102~~

SPIDER unmanaged switches

EEC: -40° C to +70° C



SPIDER II 8TX
SPIDER II 8TX EEC

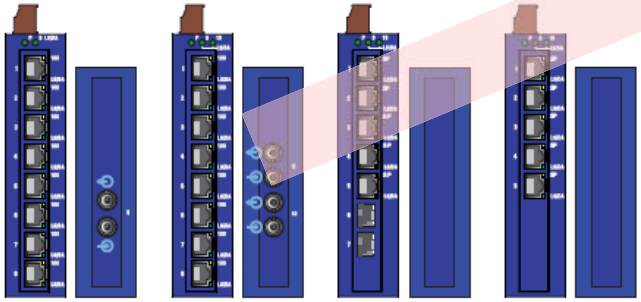
SPIDER II 8TX/1FX EEC
SPIDER II 8TX/1FX-SM EEC

SPIDER II 8TX/2FX EEC
SPIDER II 8TX/2FX-SM EEC

SPIDER II 8TX PoE

SPIDER II 16TX EEC

End of life



SPIDER II 8TX/1FX-ST EEC

SPIDER II 8TX/2FX-ST EEC

SPIDER II Giga 5T/2S EEC

SPIDER II Giga 5T EEC

2 x Fiber Uplink Ports
(100/1000MBit/s SFP slot)

SPIDER II 16TX/2DS-S EEC
(Bottom view)

Back-up fuse	≤4 A Slow Blow
Rated voltage	12 V DC ... 24 V DC
Voltage range incl. maximum tolerances	9,6 V DC ... 32 V DC
Buffer time	min. 10 ms at 20,4 VDC

		10/100/1000 BASE-TX RJ45	10/100 BASE-TX, RJ45	10/100 BASE-TX PoE ports inclu	Fiber - Multimode 100 BASE-FX, D-SC	Fiber – Multimode 100 BASE-FX, ST/BFOC	Fiber – Singlemode 100 BASE-FX, D-SC	Fiber – SFP slots 1000 BASE-FX	Jumbo frame support with up to 9014 Byte user data	QoS support IEEE 802.1D
SPIDER 1TX/1FX	943 890-001		1		1					
SPIDER 1TX/1FX EEC	943 927-001		1		1					
SPIDER 1TX/1FX-SM	943 891-001		1				1			
SPIDER 1TX/1FX-SM EEC	943 928-001		1				1			
SPIDER 3TX-TAP	943 899-001		3							
SPIDER 4TX/1FX	943 221-001		4		1					
SPIDER 4TX/1FX EEC	943 221-101		4		1					
SPIDER 4TX/1FX–ST EEC	943 914-001		4			1				
SPIDER 4TX/1FX-SM EEC	943 880-001		4				1			
SPIDER 5TX	943 824-002		5							
SPIDER 5TX EEC	943 824-102		5							
SPIDER 8TX	943 376-001		8							
SPIDER 8TX EEC	943 376-201		8							
SPIDER II 8TX	943 957-001		8							
SPIDER II 8TX EEC	943 958-001		8							
SPIDER II 8TX PoE	942 008-001		4	4						
SPIDER II 8TX/1FX EEC	943 958-111		8		1					
SPIDER II 8TX/1FX-SM EEC	943 958-131		8				1			
SPIDER II 8TX/2FX EEC	943 958-211		8		2					
SPIDER II 8TX/2FX-SM EEC	943 958-231		8				2			
SPIDER II 8TX/1FX-ST EEC	943 958-121		8			1				
SPIDER II 8TX/2FX-ST EEC	943 958-221		8			2				
SPIDER II 16TX EEC	942 120-001		16							
SPIDER II 16TX/2DS-S EEC	942 121-001		16					2(DS)		
SPIDER II Giga 5T EEC	943 962-002	5								
SPIDER II Giga 5T/2S EEC	943 963-002	5						2		
SPIDER II Giga 5T EEC Jumbo	943 962-202	5							✓	
SPIDER II Giga 5T/2S EEC Jumbo	943 963-202	5						2	✓	
SPIDER II Giga 5T EEC PRO	943 962-102	5								✓
SPIDER II Giga 5T/2S EEC PRO	943 963-102	5						2		✓
SPIDER-SL-40-08T1999999SZ9	942 132-004	8								

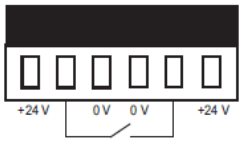
Last order: 31. October 2023
SPIDER II 8TX PoE (942 008-001)

COMPARISON – UNMANAGED SWITCHES

Feature	RS20/30 unmanaged	RS2	Premium Line
FE / GbE ports	Up to 24 ports	Up to 8 ports	Up to 24 ports
PoE(+) ports	✓	✗	tbd
Power Supply	12/24/48 VDC, 24 VAC	24 VDC	12/24/48 VDC, 24 VAC
Extended temperature range (-40°C to +70°C)	✓	✓ (some variants)	✓
IP30 plastic enclosure W x H x D – w/o terminal block	74/110 x 131 x 111 mm	47 x 135 x 111 mm 40 x 145 x 80 mm	✗
IP40 metal enclosure W x H x D – w/o terminal block	✗	✗	39/49/56 x 135 x 117 mm
Redundant power input	✓	✓	✓
Indicator contact (power, port break)	✓	✓	✓
USB interface for configuration	✗	✗	✓*
Conformal coating	✓ (optional)	✗	✓ (optional)
Jumbo frames (up to 9014 Bytes)	✗	✗	✓
Quality of Service	✗	✗	✓
Energy Efficient Ethernet (IEEE 802.1az)	✗	✗	✓
EC, cUL61010, FCC, C-Tick, EAC	✓	✓	✓
Vehicle e1	✗	✓ (some variants)	✓
Haz-Loc ISA12.12.01 C1D2, ATEX Zone 2	✓	✓ (some variants)	✓
Navy GL, DNV	✓	✓ (some variants)	✓
Railway EN50121-4	✓	✗	✓

Feature	SPIDER I/II	Standard Line
FE / GbE ports	Up to 10 ports	Up to 8 ports
PoE+ ports	tbd	tbd
Power Supply	12/24 VDC	12/24 VDC
Extended temperature range (-40°C to +70°C)	✓ (some variants)	✓*
IP30 plastic enclosure W x H x D – w/o terminal block	25/40 x 100 x 79 mm 35 x 138 x 121 mm	26/38 x 102 x 79 mm 45 x 110 x 88 mm
IP40 metal enclosure W x H x D – w/o terminal block	✗	✗
Redundant power input	✗	✗
Indicator contact (power, port break)	✗	✗
USB interface for configuration	✗	✗
Conformal coating	✗	✗
Jumbo frames (up to 9014 Bytes)	✓ (SPIDER II Giga … Jumbo)	✗
Quality of Service	✓ (SPIDER II Giga … Pro)	✗
Energy Efficient Ethernet (IEEE 802.1az)	✗	✗
EC, cUL61010, FCC, C-Tick, EAC	✓	✓
Vehicle e1	✓	✗
Haz-Loc ISA12.12.01 C1D2, ATEX Zone 2	✗	✗
Navy GL, DNV	✗	✗
Railway EN50121-4	✗	✗

SPIDER III PL



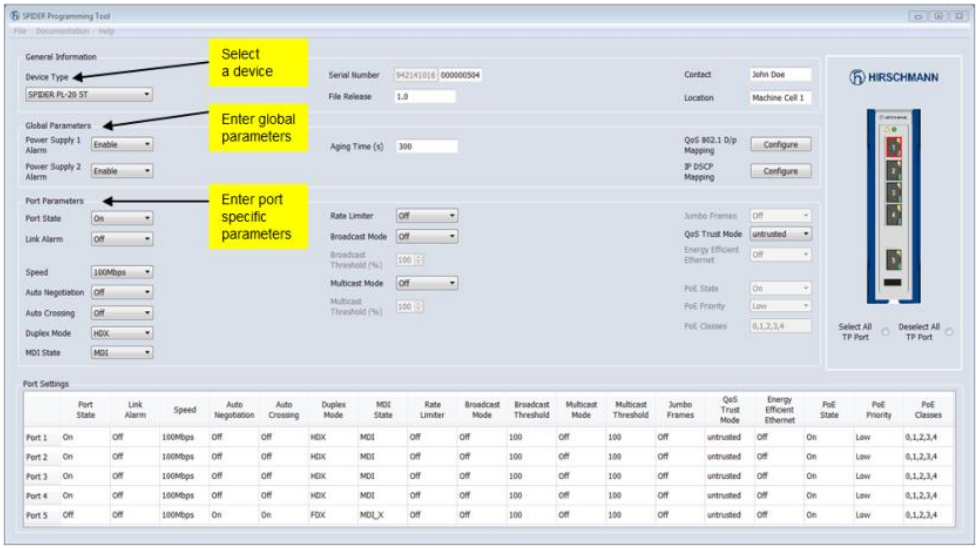
Pin	Function
1	+ 24 V DC
2	FAULT
3	0 V
4	0 V
5	FAULT
6	+ 24 V DC

Feature	Standard Line	Premium Line	PoE Line
FE / GbE ports	Up to 8 ports	Up to 24 ports	Up to 10 ports
PoE+ ports	tbd	✗	tbd
Power Supply	12/24 VDC	12/24/48 VDC, 24 VAC	24/48 VDC
Extended temperature range (-40°C to +70°C)	✗	✓	✓
IP30 plastic enclosure W x H x D – w/o power supply connector	25/42 x 102 x 76 mm 45 x 110 x 82 mm	✗	✗
IP40 metal enclosure W x H x D – w/o power supply connector	✗	39/56 x 135 x 113mm	66 x 135 x 113mm
Redundant power input	✗	✓	✓
Indicator contact (power, port break)	✗	✓	✓
USB interface for configuration	✗	✓	✓
Conformal coating	✗	✓(optional)	✓(optional)
Jumbo frames (up to 9014 Bytes)	✗	✓	✓
Quality of Service	✗	✓	✓
Energy Efficient Ethernet (IEEE 802.1az)	✗	✓	✓
EC, cUL61010, FCC, C-Tick, EAC	✓	✓	✓
Vehicle e1	✗	✓	✓
Haz-Loc ISA12.12.01 C1D2, ATEX Zone 2	✗	✓	✗
Navy GL	✗	✓	✓
Railway EN50121-4	✗	✓	✗

Replacement Variants

Old Number	Old Name	New Number	New Name
942141017	SPIDER-PL-20-08T1999999TY9HHHH	942335017	SPR20-8TX-EEC
942141030	SPIDER-PL-20-07T1M2M299TY9HHHH	942335030	SPR20-7TX/2FM-EEC
942141028	SPIDER-PL-20-08T1M29999TY9HHHH	942335028	SPR20-8TX/1FM-EEC
942141031	SPIDER-PL-20-07T1S2S299TY9HHHH	942335031	SPR20-7TX/2FS-EEC
942132004	SPIDER-SL-40-08T1999999SY9HHHH	942335004	SSR40-8TX
942132003	SPIDER-SL-40-05T1999999SY9HHHH	942335003	SSR40-5TX
942132015	SPIDER-SL-40-06T1O6O699SY9HHHH	942335015	SSR40-6TX/2SFP
942141020	SPIDER-PL-40-08T1999999TY9HHHH	942335020	SPR40-8TX-EEC
942141033	SPIDER-PL-40-01T1O69999TY9HHHH	942335033	SPR40-1TX/1SFP-EEC

Premium Line – Programming Tool



SPIDER III

SPIDER	–		0		T1						HH	HH
1. Product family	-line	2. Data rate		4. Copper ports quantity	5. Copper ports type	6. Fiber port #1	7. Fiber port #2	8. Fiber port #3	9. Temp. range	10. Approvals	11. Customer specific type	12. Customer specific configuration

1. Product family

SPIDER-SL	SPIDER III Standard
SPIDER-PL	SPIDER III Premium

2. Data rate

2	Fast Ethernet
4	Gigabit Ethernet
3	Fast + 2x Gigabit Ethernet

3. Technology

0	no PoE
4	PoE

4. Copper ports quantity

01	1x Twisted Pair /RJ45
04	4x Twisted Pair /RJ45
05	5x Twisted Pair /RJ45
06	6x Twisted Pair /RJ45
07	7x Twisted Pair /RJ45
08	8x Twisted Pair /RJ45
16	16x Twisted Pair /RJ45
24	24x Twisted Pair /RJ45

5. Copper ports type

T1	1x Twisted Pair /RJ45

SPIDER-SL-40-06T1 06 06 99 S Z9 HH HH

SPIDER-PL-40-01T1O69999TWWHHHH

SPIDER-PL-30-24T1O6O699TZ9HHHV
SPIDER-PL-20-24T1Z6Z699TZ9HHHV

SPIDER-PL-20-16T1999999TZ9HHHV

6. Fiber port 1

S2	Singlemode; D-SC (100 Mbit/s)	SL 20	PL 20	
M2	Multimode; D-SC (100 Mbit/s)	SL 20	PL 20	
M4	Multimode; ST (BFOC) (100 Mbit/s)	SL 20	PL 20	
Z6	SFP slot (100 Mbit/s)		PL 20	
06	SFP slot (100/1000 Mbit/s)			PL 40
99	empty	SL 20	PL 20	PL 40

7. Fiber port 2

99	empty	SL 20	SL 40	PL 20	PL 40
M2	Multimode; D-SC (100 Mbit/s)			PL 20	
S2	Singlemode; D-SC (100 Mbit/s)			PL 20	
Z6	SFP slot (100 Mbit/s)			PL 20	
06	SFP slot (100/1000 Mbit/s)		SL 40		

8. Fiber port 3

99	empty	SL 20	SL 40	PL 20	PL 40
Z6	SFP slot (100 Mbit/s)			PL 20	
06	SFP slot (100/1000 Mbit/s)		SL 40		

9. Temperature range

S	Standard 0°C ... +60°C (incl. SPF +50°C)	SL 20	SL 40		
T	Extended -40°C ... +70°C	SL 20		PL 20	PL 40
E	Extended -40°C ... +70°C incl. Conf. Coating			PL 20	PL 40

10. Approvals & Declarations

Z9	CE, FCC; EN 61131, C-Tick ((RCM)	TY	Y9 + EN50121-4
Y9	Z9 + cUL61010	R9	Z9 + e1
X9	Y9 + ISA12.12 Class 1 Div.2	WV	Y9 + ISA12.12 Class 1 Div.2 + ATEX Zone 2 DNVGL + EN50121-4 + e1
W9	Z9 + ATEX Zone 2	WW	Y9 + ISA12.12 Class 1 Div.2 +ATEX Zone 2 IEC 61850-3, IEEE1613 + DNVGL + EN50121-4
UY	Y9 + DNVGL		

11. Customer specific type

HH	Hirschmann Standard
HK	Terminal Block with Spring Clamp

HK

HH

12. Customer specific configuration

HH	Hirschmann Standard (9,6V – 32V DC)	SL	PL
HV	Hirschmann Voltage (9,6V – 60V DC 18V – 30V AC)		PL

Extended range

SPIDER III POE VARIANTS

Product Code	Description
SPIDER-SL-44-05T1O69999TY9HHHH 942 274-001	Full Giga unmanaged switch with dual inputs DC 12-57V. 4 x 10/100/1000 PoE+ 1 x 10/100/1000 TX 1 x 100/1000 SFP
SPIDER-SL-44-05T1999999TY9HHHH 942 274-002	Full Giga unmanaged switch with dual inputs DC 12-57V. 4 x 10/100/1000 PoE+ 1 x 10/100/1000 TX
SPIDER-SL-44-08T1999999TY9HHHH 942 274-003	Full Giga unmanaged switch with dual inputs DC 12-57V. 8 x 10/100/1000 PoE+
SPIDER-SL-44-08T1O6O699TY9HHHH 942 274-004	Full Giga unmanaged switch with dual inputs DC 12-57V. 8 x 10/100/1000 PoE+ 2 x 100/1000 SFP
SPIDER-SL-24-05T1999999TY9HHHH 942 274-005	Fast Ethernet unmanaged switch with dual inputs DC 12-57V. 4 x 10/100 PoE+ 1 x 10/100 TX
SPIDER-SL-24-04T1M29999TY9HHHH 942 274-005	Fast Ethernet unmanaged switch with dual inputs DC 12-57V. 4 x 10/100 PoE+ 1 x 100 MM-SC
SPIDER-SL-24-04T1M49999TY9HHHH 942 274-006	Fast Ethernet unmanaged switch with dual inputs DC 12-57V. 4 x 10/100 PoE+ 1 x 100 MM-ST
SPIDER-SL-24-04T1S29999TY9HHHH 942 274-00Y	Fast Ethernet unmanaged switch with dual inputs DC 12-57V. 4 x 10/100 PoE+ 1 x 100 SM-SC
SPIDER-SL-24-04T1S49999TY9HHHH 942 274-008	Fast Ethernet unmanaged switch with dual inputs DC 12-57V. 4 x 10/100 PoE+ 1 x 100 SM-ST

Approvals

Basis Standard	CE, FCC, EN61131
Safety of industrial control equipment	cUL 61010-1/61010-2-201
Railway norm	EN50121-4

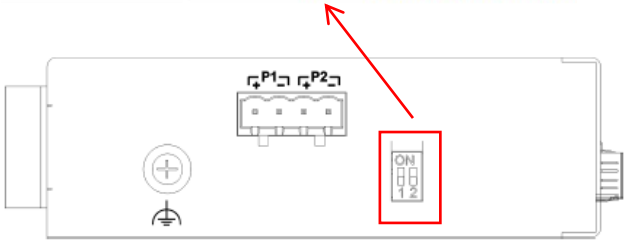
Switch variants: 5 to 10 ports
Up to 10 Gig ports
Up to 5 FE
Up to 8 PoE+ ports

Fiber ports: 2 Gig/FE SFP based, 1 FE-SC/ST types
Copper ports: 4 to 5 FE or 5 to 8 Gig ports
Power supply: 12 - 57VDC (12 - 18VDC)
PoE type: PoE+ (30 W/port); total budget: 120W
PoE power output: 12-18.9V → **60W** 1.
19-57V → **120W** 1.

1. The device stops working, when the total PoE output power exceeds max. PoE power output

Temperature range: -40° to +70° C
More interfaces: DIP switch
Features: Jumbo frame support

Device	DIP Switch	Setting	Description
SPIDER-SL-44-05T1O6...	100/1GSFP	ON	Supports 1000M SFP module
		OFF	Supports 100M SFP module
	Jumbo	ON	Enable Jumbo frame function
		OFF	Disable Jumbo frame function
SPIDER-SL-44-05T199...	N.C.	--	Serves no function
	Jumbo	ON	Enable Jumbo frame function
		OFF	Disable Jumbo frame function
SPIDER-SL-44-08T19999...	N.C.	--	Serves no function
	Jumbo	ON	Enable Jumbo frame function
		OFF	Disable Jumbo frame function
SPIDER-SL-44-08T1O6O6...	100/1GSFP	ON	Supports 1000M SFP module
		OFF	Supports 100M SFP module
	Jumbo	ON	Enable Jumbo frame function
		OFF	Disable Jumbo frame function
SPIDER-SL-24-...	N.C.	--	Serves no function
	Jumbo	ON	Enable Jumbo frame function
		OFF	Disable Jumbo frame function



SPIDER unmanaged switches inclusive PoE/PoE+

Power Source Equipment - PSE

SPIDER Giga 2TX PoE EEC (PoE+ Injector) 942 059-001
Power over Ethernet Injector
Operating Voltage: 24/48 V DC redundant
Power Consumption: max. 33,8 Watt

End of life

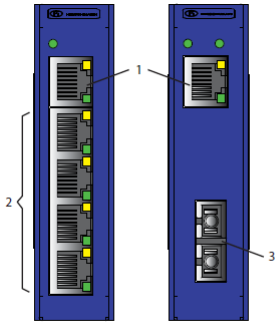
Figure	Pin assignment on the device	Specification of the operating voltage
	1 Power supply connection 2, 0 V, minus terminal	Rated voltage range DC 24 V ... 48 V
	2 Power supply connection 2, 24/48 V, plus terminal	Voltage range DC incl. maximum tolerances 21 V ... 53 V
	3 –	
	4 –	
	5 Power supply connection 1, 0 V, minus terminal	
	6 Power supply connection 1, 24/48 V, plus terminal	

Power Device- PD

Product name	Order number
SPIDER 5TX PD EEC PoE powered switch. 1x 10/100 BASE-TX RJ45 PoE input, 4x 10/100 BASE-TX, RJ45 (non-PoE) ports	942 051-001
SPIDER 1TX/1FX-MM PD EEC PoE powered media converter. 1x 10/100 RJ45 PoE input, 1x 100BASE-FX, D-SC - Multimode	942 051-002
SPIDER 1TX/1FX-SM PD EEC PoE powered media converter. 1x 10/100 BASE-TX, RJ45 PoE input, 1x 100 BASE-FX, D-SC - Singlemode	942 051-003

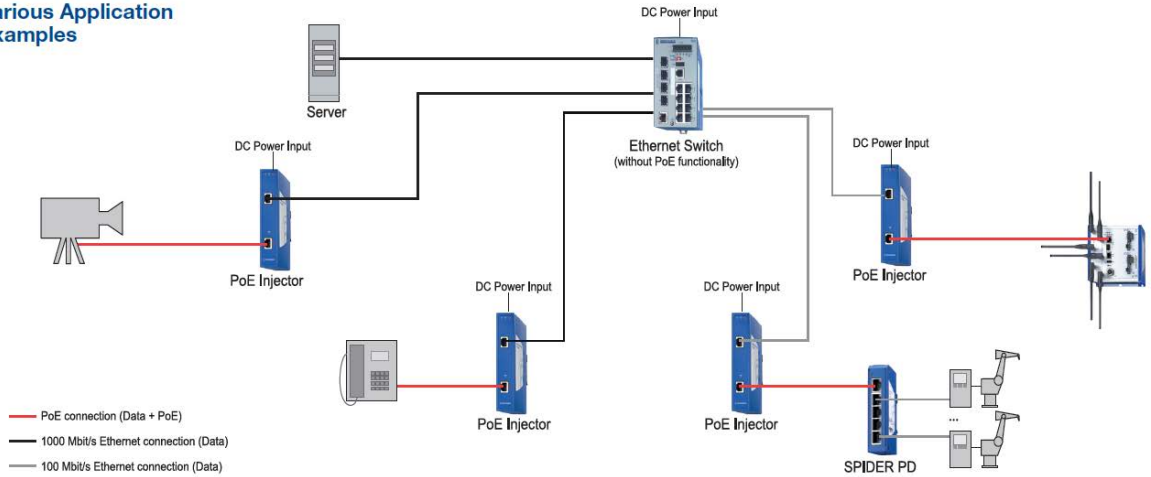
End of life

1: Port 1 10/100 Mbit/s PoE PD port



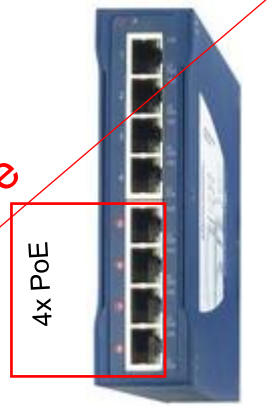
SPIDER 5TX PD EEC
SPIDER 1TX/1FX-MM PD EEC
SPIDER 1TX/1FX-SM PD EEC

Various Application Examples



Product name	Order number
SPIDER II 8TX PoE 8x 10/100 Mbit/s, RJ45, incl. 4x PoE according IEEE802.3af Operating voltage: 18V DC – 32 V DC	942 008-001

End of life



Industrial Security & Firewalls

INDUSTRIAL SECURITY & FIREWALLS

EAGLE One

Extensive **Layer 2 and Layer 3 redundancy features**, combined with other highlights such as NAT and firewall, not only **guarantee maximum data security** but also make it easy to integrate your production facilities into the network.

EAGLE20/30

Multi-port Firewalls offer absolute flexibility for physical deployment combined with **state-of-the-art security** functionality tailored to the unique requirements of industrial Ethernet networks.

Tofino Xenon

The Tofino Xenon industrial security appliance provides comprehensive network protection. It is a **versatile**, **extremely ruggedized** device that ensures **maximum data protection for production systems**.

EAGLE40

Ruggedized EAGLE40 defies industrial firewall expectations – featuring Stateful and Deep Packet Inspection combined with **next-generation multiport configurability** for maximum cybersecurity performance..

Data Diode

The **Data Diode insulates a secure network from a vulnerable network** by providing a one way communication! The benefit is that e.g. maintenance data can be recorded on the vulnerable side whilst no kind of virus, or malware can influence the secure side.

FIREWALL PORTFOLIO

	Layer 2/3 firewall	Layer 2 DPI firewall	Layer 3 firewall	Layer 3 firewall	Layer 2/3 firewall
	EagleOne 	Tofino Xenon 	Eagle 20/30 	Eagle 40-03 	Eagle 40-07 
Application	Network boundary/ internal network/ field level	Internal network/ field level	Network boundary/ internal network/ field level	Network boundary/ internal network/ field level	Network boundary/ internal network/ field level
Product Features (excerpt)					
Year introduced	2013 (2009)	2014 (2010)	2012	2020	2020
Deep Packet Inspection	-	Modbus, OPC, Ethernet/IP, DNP3, IEC 60870-5-104, GOOSE	Modbus, OPC, DNP3	Modbus TCP, EtherNet/IP, OPC, DNP3, IEC104, CAMP	Modbus TCP, EtherNet/IP, OPC, DNP3, IEC104, CAMP
Ports	2 FE	2 FE	4 FE, 2 GE	3 GE	7 GE

HISECOS – SOFTWARE FEATURE OVERVIEW

Industrial Intrusion Detection
SCADA Protocol anomaly detection
OT Asset discovery

State-full Inspection Firewall
Network Address Translation
Layer 2/3 Firewall

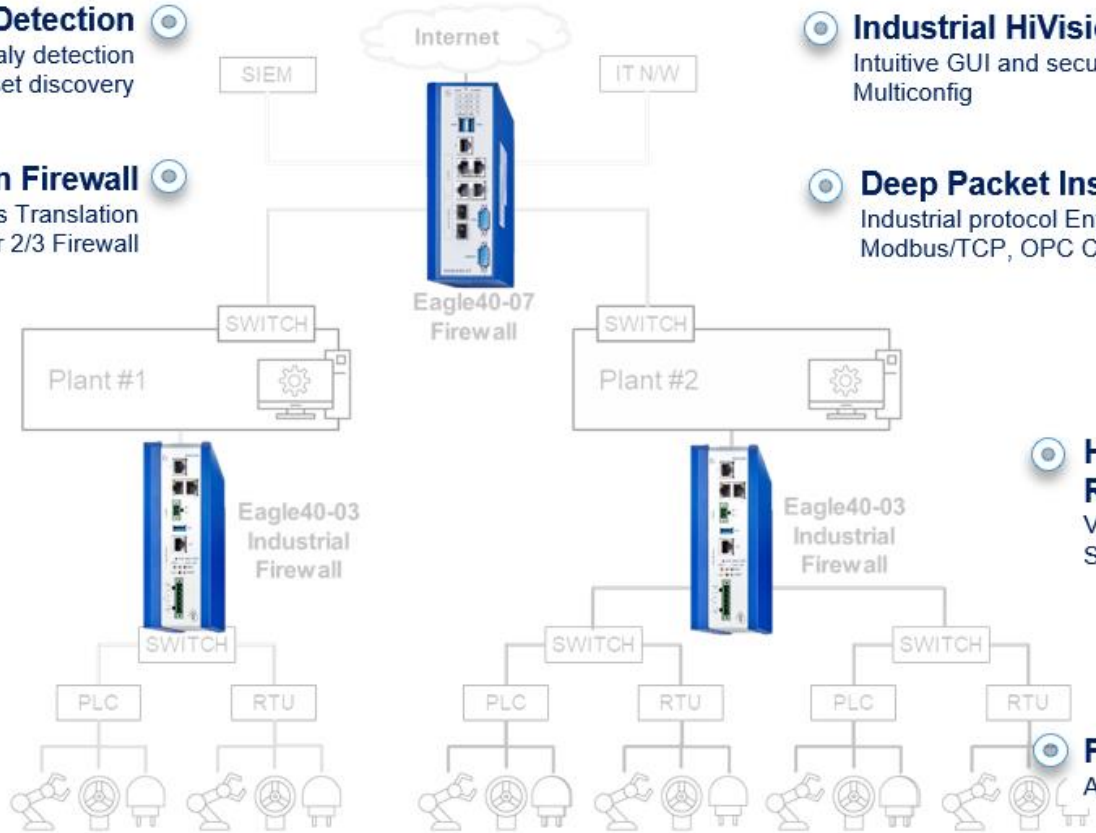
Industrial HiVision Network Management
Intuitive GUI and security dashboard
Multiconfig

Deep Packet Inspection
Industrial protocol Enforcers
Modbus/TCP, OPC Classic, DNP3

High Availability and Dynamic Routing
VRRP and OSPF
Static Routing, IP Services

Virtual Private Networks
IPSec based site-to-site VPN
Remote access VPN

Firewall Learning Mode
Automatic rule suggestion



EAGLE 40-4F Security Router

- **Seamless integration** with intrusion detection system(IDS), such as SCADAfence and Claroty, through traffic mirroring
- **Enhanced security** through ist ability to learn network traffic patterns automatically, set policies and flag deviations
- **Multiple certifications** support use in varied industries and environements, including hazardous conditions

Key Applications

- Learning mode for detection of traffic patterns and discrepancies.
- Real-time traffic monitoring and robust policy management support industrial organizations' cybersecurity requirements.
- Certifications — including CE, DNV, UL, FCC, ATEX, EN 61131, ISA12.1 — for use in varied industrial environments.
- Simplified deployment and maintenance promote ease of use.
- Integration with Belden network access control (NAC) and leading third-party IDS systems.
- Essential cybersecurity features and costoptimized design suit the needs of manyindustrial applications.

Product Description

- Industrial Firewall with DIN rail mounting
- 4 x GbE RJ45 ports
- 1 x USB 2.0 port
- V.24 console interface
- Storage: 8GB eMMC storage
- Operating voltage: 10 to 30V DC
- Operating Temperature: -40°C to +70°C
- MTBF: according to MIL-HDBK-217 FN2 279,542 hours GB at 25°C

EAGLE 40 Security Router

Eagle 40	03			CC		9	HS	R	A	
1. Product	2. GE ports	3. Type	4. Temp. range	5. Voltage range	6. Approvals 1	7. Approvals 2	8. Type	9. SW conf	10. IDS	11. Security

1. Product

EAGLE 40	Security router and firewall

2. GE ports

03	3x 10/100/1.000 Mbit/s ports
07	7x 10/100/1.000 Mbit/s ports

3. Type uplink ports

206	2x SFP slot, x TP, RJ45
3T1	3x Twisted Pair; RJ45
106	1x SFP slot, 2x TP, RJ45

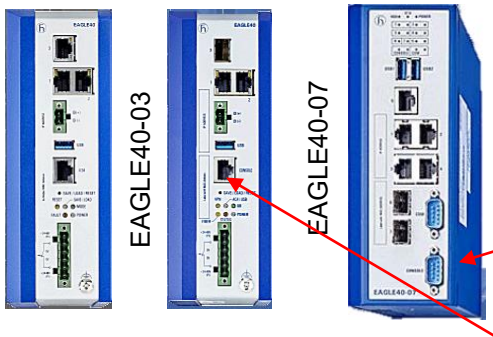
4. Temperature range

S	Standard	0°C ... +60°C
T	Extended	-40°C ... +70°C

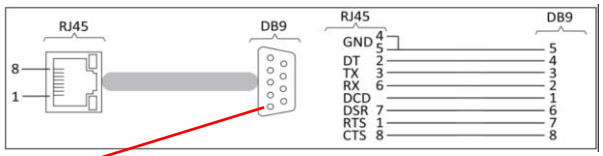
5. Voltage range

CC	2x 24-48 VDC

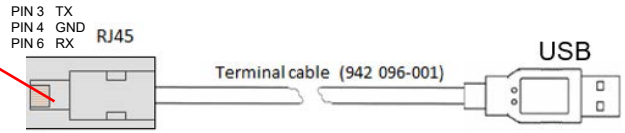
VT 100 terminal settings	
Speed	115200 Baud
Data	8 bit
Stopbit	1 bit
Handshake	off
Parity	none



Terminal cable for EAGLE40-07



Terminal cable for EAGLE40-03



6. Approvals part 1

Z	CE, FCC, C-Tick, EN61131, EN60950
Y	„Z“ + UL61010
T	„Z“ + EN50121-4
A	CE, FCC, (EN62358)
B	„A“ + UL62368
C	„A“ + IEC61850-3, IEEE1613

7. Approvals part 2

9	No additional approval

8. Type

HS	Hirschmann standard

9. SW configuration

R	Router mode

10. IDS Intrusion detection

A	Sensor

11. Security modules

NF	No additional modules firewall only
IN	Industrial Automation Protection Suite Modbus + OPC Enforcer
SU	Substation Protection Suite DNP3 + Modbus Enforcer
UN	Unified Protection Suite All Enforcers

Accessoires on pages 108ff

SPF 124ff

EAGLE.ONE Security Router

EagleOn	02	00				DD		0000	HH	E	xx.x
1. Product	2. FE ports	3. GE ports	4. Port 1 type	5. Port 2 type	6. Temp. range	7. Voltage range	8. Approvals	9. SW Pack	10. OEM	11. SW Conf.	12. SW version

1. Product	EagleOne	2 port Security Router
2. FE ports	02	2x 10/100 Mbit/s ports
3. GE ports	00	not available
4. Port 1 type 100 Mbit/s	T1	1x Twisted Pair; RJ45
	M2	1x Multimode; D-SC
5. Port 2 type 100 Mbit/s	T1	1x Twisted Pair; RJ45
	M2	1x Multimode; D-SC
	S2	1x Singlemode; D-SC
6. Temperature range	S	Standard 0°C ... +60°C
	T	Extended -40°C ... +70°C
	E	Extended -40°C ... +70°C including Corformal Coating

7. Voltage range	DD	12 ... 48 VDC; 24 VAC red. input
8. Approvals	Z9	CE, FCC, C-Tick, EN61131, EN60950
	Y9	„Z9“ + cUL508
	X9	„Z9“ + cUL508, ISA12.12
	W9	„Z9“ + ATEX
	WX	„X9“ + ATEX
	U9	„Z9“ + GL
	UY	„U9“ + cUL508
	UT	„U9“ + cUL508, ISA12.12
	T9	„Z9“ + EN50121-4
	TY	„V9“ + cUL508
	V9	„Z9“ + IEC61850, IEEE1613
	VY	„V9“ + cUL508
	VU	„V9“ + cUL508, GL
	VT	„V9“ + cUL508 + EN50121
9. SW - Package	0000	reserved
10. OEM Type	HH	Hirschmann
11. SW - Configuration	E	Entry (Hirschmann)
12. SW- version	XX.X	newest SW-version

Accessoires on pages 108ff

EAGLE 20/30 Security Router

EAGLE		0	04		206	TT	9	99				HS	E	3F	xx.x
1. Product	2. Data rate	3. HW type	4. 10/100 Mbit/s ports	5. 10/100/1000 ports	6. Uplink port 2 configuration	7. Port conf.	8. Cell ports	9. WAN ports	10. Temp. range	11. Voltage range	12. Approvals	13. Type	14. Confi-guration	15. SW Level	16. SW version

1. Product	EAGLE	Security Router
2. Data rate	2	– 10/100 Mbit/s ports
	3	– 10/100 Mbit/s ports and 10/100/1000 Mbit/s ports
3. Hardware type	0	Standard
4. 10/100 Mbit/s ports	04	4x 10/100 Mbit/s
5. 10/100/1000 Mbit/s ports	00	none
	02	2x 10/100/1000 Mbit/s
6. Uplink port	206	only SFP slots
	999	not available (EAGLE 20)
7. Port configuration	TT	only Twisted Pair (RJ45)
8. Cellular ports	9	not assembled
9. WAN ports	99	not assembled
	H2	2x SHDSL
10. Temperature range	S	Standard 0°C ... +60°C
	T	Extended -40°C ... +70°C
	E	Extended -40°C ... +70°C including Corformal Coating

11. Voltage range 1	CC	2x 18 – 60 VDC
	K9	1x 48 – 320 VDC or 1x 88 – 265 VAC
	KK	2x 48-320 VDC, 89-265 VAC
8. Approvals	Z9 - CE, FCC, EN61131, EN60950	
	Y9 - Z9 + cUL508	
	X9 - Z9 + cUL508, ISA 1212	
	V9 - Z9 + IEC 61850, IEEE1613	
	P9 - Z9 + cUL508	
	VP - V9 + cUL508	
	VY - Z9 + cUL508	
	VU - Z9 + cUL508, GL	
	VT - Z9 + cUL508, EN50121	
	U9 - Z9 + GL	
	UY - U9 + cUL508	
	UX - U9 + cUL508, ISA 1212	
	UT - U9 + cUL508, EN50121	
	T9 - Z9 + EN50121-4	
	TY - Z9 + cUL508, GL	
13. Type	HS	Hirschmann Standard
14. SW - configuration	E	extended encryption
15. SW - Level	3F	Layer 3 Firewall SW
	OP	„3F“ + OPC Classic Enforcer
	MB	„3F“ + Modbus Enforcer
	01	„3F“ + OPC Classic Enforcer + Modbus Enforcer
		Deep Packet Inspection
16. SW- version	XX.X	newest SW-version

Accessoires on pages 108ff

SPF 100ff

TOFINO XENON

Security Switch

TofinoXe	02	00				DD		0003	TA	T	xx.x
1. Product	2. FE ports	3. GE ports	4. Port 1 type	5. Port 2 type	6. Temp. range	7. Voltage range	8. Approvals	9. SW Pack	10. OEM	11. SW Conf.	12. SW version

1. Product	TofinoXE	2 port Security Switch
2. FE ports	02	2x 10/100 Mbit/s ports
3. GE ports	00	not available
4. Port 1 type	T1	1x Twisted Pair; RJ45
	M2	1x Multimode; D-SC
	S2	1x Singlemode; D-SC
5. Port 2 type	T1	1x Twisted Pair; RJ45
	M2	1x Multimode; D-SC
	S2	1x Singlemode; D-SC
6. Temperature range	S	Standard 0°C ... +60°C
	T	Extended -40°C ... +70°C
	E	Extended -40°C ... +70°C including Corformal Coating
7. Voltage range	DD	12 ... 48 VDC; 24 VAC red. input

8. Approvals

Z9 - CE, FCC, C-Tick, EN61131, EN60950
Y9 - "Z9" + cUL508
X9 - "Z9" + cUL508, ISA12.12
W9 - "Z9" + ATEX
WX - "X9" + ATEX
U9 - "Z9" + GL
UY - "U9" + cUL508
UX - "U9"+cUL508, ISA12.12
UT - "U9"+cUL508 + EN50121-4
T9 - "Z9" + EN50121-4
TY - "T9" + cUL508
V9 - Z9 + IEC 61850, IEEE1613
VY - V9 + cUL508
VU - V9+cUL508, GL
VT - V9+cUL508, EN50121

9. SW - Package

Loadable Security Modules

0003	Firewall+NetConnect –FW+NC
0007	„0003“ + Modbus Enforcer – FW+NC+MB
0013	„0003“ + IEC104 Enforcer
0023	„0003“ + DNP3 Enforcer
0043	„0003“ + GOOSE Enforcer
0053	„0003“ + IEC104+GOOSE Enforcer
0063	„0003“ + DNP3+GOOSE Enforcer
000B	„0003“ + OPC Enforcer – FW+NC+OPC
000F	„0007“ + OPC Enforcer – FW+NC+MB+OPC
000K	„0003“ + EtherNet/IP Enforcer – FW+NC+EIP
000Q	„0007“ + EtherNet/IP Enforcer – FW+NC+MB+EIP
000V	„000B“ + EtherNet/IP Enforcer – FW+NC+OPC+EIP
000Z	„000Q“ + OPC Enforcer – FW+NC+MB+OPC+EIP

10. OEM Type	TA	Tofino Security Standard
11. SW - Configuration	T	Tofino Standard Configuration
12. SW- version	XX.X	Latest SW-version

TOFINO VERSUS EAGLE40-03

	Tofino	EAGLE40-03
DPI Supported Protocols	DNP3,Modbus,OPC,EthernetIP,IEC104,Goose	CAMP, DNP3, Modbus, OPC, Ethernet/IP, IEC104
DPI L2 and DPI L3	Yes	Yes
L3 Features	No	NAT, VRRP
Stateful inspection	L2 Networks	L2 and L3 Networks
Performance		
TCP Performance	20Mbps	360Mbps
UDP Performance	60Mbps	400Mbps
IP throughput	N/A	1.2Gbps

PRODUCT POSITIONING TOFINO – EAGLE FAMILY

	Tofino Xenon	Hirschmann EagleONE	Hirschmann Eagle 20/30
Filtering Options Bridge/Transparent Mode Routing	 X -	 X X	 X X
ACL	MAC/IP/TCP/UDP	MAC/IP/TCP/UDP	MAC/IP/TCP/UDP
Deep Packet Inspection DPI	X Modbus TCP, OPC, EtherNet-IP, GOOSE IEC104, DNP3		X Modbus TCP, OPC
Network Address Translation NAT		x	x
VPN		x	x
Router Redundancy		x	x
WAN Interfaces			SHDSL
Ports	2 FE	2 FE	4 FE, 2 GE

Application	EAGLE	Tofino XENON
Primary mode of operation	Layer 3	Layer 2
Zones use different subnets	✓	
Zones within the same subnet		✓
Redundancy support	✓	
„Retrofitting“ security into existing plant		✓
High-security applications		✓
„step and repeat“ zones (NAT)	✓	
Securing critical Modbus controllers		✓
Securing OPC servers		✓
Remote access via VPN	✓	
Plant boundary security	✓	

EAGLE SOLUTIONS

Application	EAGLE One	EAGLE20/30	Tofino Xenon
Mode of operation	Layer 2/3	Layer 2/3	Layer 2
Zones use different subnets	✓	✓	
Zones within the same subnet	✓	✓ ACLs	✓
Redundancy support	✓	✓ L3 only	
'Retrofitting' security into existing plant	✓	✓	✓
High-security applications	✓	✓	✓
'step and repeat' zones (NAT)	✓	✓	
Securing Modbus TCP devices		✓ L3 only	✓
Securing OPC devices		✓ L3 only	✓
Securing Ethernet/IP devices			✓
Securing IEC104 devices			✓
Securing DNP3 devices,			✓
GOOSE			✓
Remote access via VPN	✓ L3 only	✓ L3 only	
Plant boundary security	✓	✓	

PLANT-WIDE SECURITY SOLUTIONS

Feature	EAGLE One	EAGLE 20-0400	EAGLE 30-0402
Application	Edge, Existing LAN	Edge, Existing LAN	Edge, Existing LAN
LAN	2x 10/100	4x 10/100	4x 10/100, 2x SFP (GbE)
Routing	Static	Static, OSPF	Static, OSPF
Redundancy	Ring Coupling, RSTP, L3 redundancy (VRRP based)	VRRP	VRRP
VLANs	1	Up to 64	Up to 64
Power Supply	9 - 60VDC / 24VAC	18 - 60VDC or 48 - 320VDC / 88 - 265VAC	18 - 60VDC or 48 - 320VDC / 88 - 265VAC
VPN	IPSec	IPSec	IPSec
WAN	-	-	SHDSL
DI	1	1	1
Extended Temp, Additional Approvals	Yes	Yes	Yes

OP EDGE-8D - HORIZON OVERVIEW

- 2x USB 3.0
- GbE Management Port
- 4x GbE LAN ports with 1 – pair hardware bypass
- 2x GbE SFP WAN
- 2x Serial DB9 RS232
- IEC61850-3, IEEE1613, -40° to 70°C

Quad-core CPU
- High Performance
- Virtualization

Memory
- 8GB RAM
- 64GB Storage

Scalable Design
- 7x GbE Ports
- Dual power sources

EDGE OS | REMOTE ACCESS | SECURITY | CONTAINERS | VIRTUAL MACHINES

- **Secure Remote Access** SRA
  - Allows access to remote equipment easily through creation of secure tunnels
  - Keeps machine and process downtime to a minimum and reduces support costs
- **Persistent Data Network** PDN
  - Provides a simple, secure, and managed remote infrastructure communication network designed to connect geographically dispersed assets
  - Results in always connected tunnels to all nodes in the network
- **Edge Orchestration – *NEW***
  - Supports the deployment and management of edge applications (containers) across one or more devices
  - Onboards, monitors, and updates edge hardware
- **Future Applications…**
  - Several future applications in the pipeline

INDUSTRIAL WIRELESS LAN

OpenBAT

The OpenBAT hardware is the latest generation of WLAN devices, representing a new evolutionary stage in WLAN technology.

BAT450

BAT450-F Industrial Wireless LAN Access Points robust connection options include WLAN, Wireless Wide Area Network (WWAN), like LTE and Ethernet interfaces.

BAT867

The BAT867 offers only the essential interfaces - one radio, one Ethernet port and one power supply – for applications in need of a compactly designed, cost-effective wireless access point.

BAT-C2

The compact BAT-C2 is a lightweight WLAN Client and Access Point.

BAT Controller

BAT CONTROLLER VIRTUAL

The BAT-Controller can be used for centralized management of large WLAN networks and can be used as VPN concentrator.

OWL

The OWL Industrial Cellular Routers offer increased routing functionalities and advanced security capabilities in a single, reliable product.

Antenna

The huge diversity of omnidirectional anntenna, directional antenna, vehicle omni antenna and leaky cable offers the ideal solution for your application.

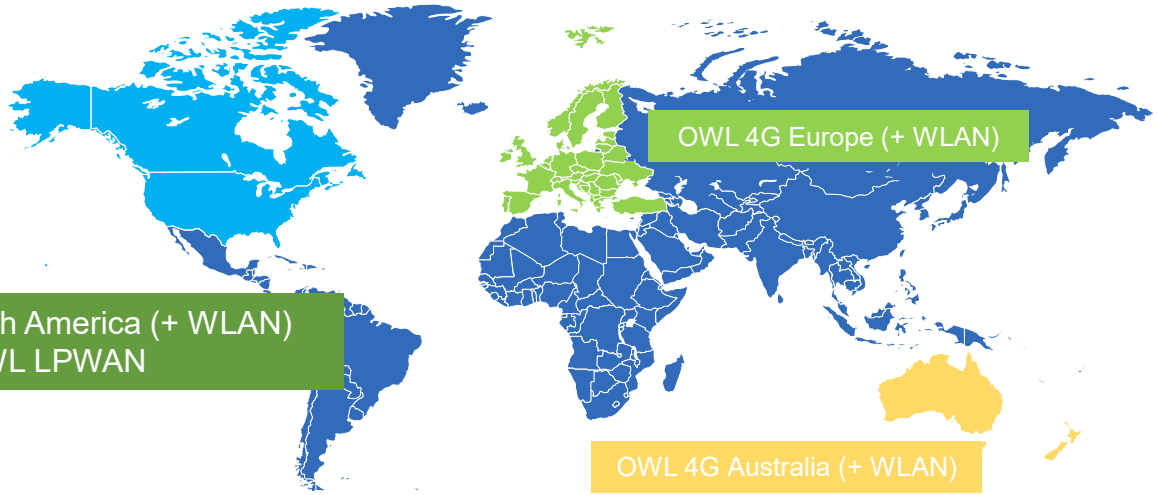
OWL Industrial Cellular Router

Last order of OWL 4G and LPWAN:
01. June 2024

Please note that OWL has SMA sockets. SMA connector has a pin, SMA socket has a hole to match the pin.
Please also note that GPRS/UMTS uses different frequencies and thus antennas than WLAN.
Antenna cables should not be longer than 10 meters.
Antennas are not inside the delivery packet of OWL.
You have to order them separately.

OWL Variants	LTE M12	4G	4G + WLAN	LPWAN
LTE Cat	LTE Cat 4	LTE Cat 4	LTE Cat 4	LTE Cat M1
GPS	Yes	-	Yes	-
WLAN	-	-	802.11ac AP & Client	-
Region	EU	EU, US, ANZ	EU, US, ANZ	US
Carrier Approvals	-	AT&T, Verizon*	AT&T, Verizon*	AT&T, Verizon
Approvals	Rolling Stock EN50155	Vehicles E8 (E-Mark)	Vehicles E8 (E-Mark)	-

Last order: 31. October 2022
OWL LTE M12 (942 147-002):



Product name:
Antenna Cable (3m) (UMTS)
order number: 942 042-102

Product name:
Joymax Stub Antenna (UMTS)
order number: 942 042-103

Product name:
Sencity Omni Antenna (UMTS-Europe)
order number: 942 042-101
Operating temp.: -40°C … +85°C

Product name:
WWAN-A-I-41-S-O
order number: 942 042-105
LTE (4G), UMTS (3G)

Product name:
GNSS-A-O-90-S-P
order number: 942 042-108
GPS

OWL Industrial Cellular Router

Product Description

2x LTE
- 2x2 MIMO: optimal connection
- Category 4: 150Mbit/s Download, 50Mbit/s Upload

2x Fast Ethernet
- Bridged mode acts lika a switch
- Routed mode isolates networks
- Tunneled mode connects transparently

LEDs to easily see:
- Good(Green), Fair(Yellow) or Poor(Red) signal strength
- LTE(4G), 3G or 2G connection
- SIM card OK

Dual SIM (2x 2FF)
- Separate providers
- Auto-failover
- Data Limit
- Ready fo eSIM

Serial (connector included)
- RS485
- RS232
- Binary In
- Binary Out

- 512MB User data storage
- 830MB User module storage

- 9..36 V DC Power (connector included)
- Reset button

Protection Class: IP30, metal, 520g
Operating Temperature: -40 .. +65°C

Wall Mount Wings (included)
- can be reversed to save space

DIN-Rail Mount (included)

Prod.code	Prod.name
942285001	OWL 4G Australia
942285101	OWL 4G Australia + WLAN
942283001	OWL 4G Europe
942283101	OWL 4G Europe + WLAN
942284001	OWL 4G North America
942284101	OWL 4G North America + WLAN
942286001	OWL LPWAN
942147002	OWL LTE M12-S20T5A12221GTDBHHXX.X.XX

OWL 4G

Optional Variant: OWL 4G + WLAN

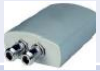
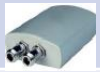
GPS
- supports active antenna

2x2 Full MIMO WLAN
- 802.11ac Wave 2
- Access Point
- Client
- AP anc Client at the same time on the same channel

Optional Variant: OWL LPWAN

Low Power WAN

- LTE Category M.1
- Longer range
- Better building penetration

Order-Nr.	Antenna	Product image	Description	BAT867-R	BAT450-F	OpenBAT BAT-R	OpenBAT BAT-F
943 981-022	BAT-ANT-N-6G-IP65		Omnidirectional antenna for 2.4 GHz band	+	+	+	+
943 981-003	BAT-ANT-N-5A-IP65		Omnidirectional antenna for 5 GHz	+	+	+	+
942 110-001	BAT_ANT-N-3AGN-IP67		Omnidirectional antenna for 2,4 GHz band and 5 GHz band	+	+	+	+
942 047-001	BAT-ANT-N-3AGN-F		Omnidirectional antenna for 2,4 GHz band and 5 GHz band	-	+	-	+
942 046-001	BAT-ANT-RSMA-2AGN-R		Omnidirectional antenna for 2,4 GHz band and 5 GHz band	+	-	+	-
943 981-004	BAT-ANT-N-6ABG-IP65		Hemispherical antenna for 2,4 GHz band and 5 GHz band	+	+	+	+
943 981-005	BAT-ANT-N-14G-IP23		Directional antenna for 2,4 GHz band with 14 dBi gain	-	+	+	+
942 981-006	BAT-ANT-N-18A-V-IP65		Directional antenna for 5 GHz band with 18 dBi gain	-	+	+	+
943 981-007	BAT-ANT-N-23A-V-IP65		Directional antenna for 5 GHz band with a high gain of 23 dBi	-	+	+	+
943 981-008	BAT-ANT-N-23A-VH-IP65		Directional antenna for 5 GHz band with a high gain of 23 dBi	-	+++	+++	+++
943 981-014	BAT-ANT-N-MiMo-18N-IP65		Directional antenna for 5 GHz band with 18 dBi gain	-	+++	+++	+++
943 981-009	BAT-ANT-N-8G-DS-IP65		Polarization-diversity antenna for 2,4 GHz band, linear	-	++	++	++
943 981-010	BAT-ANT-N-9A-DS-IP65		Polarization-diversity antenna for 5 GHz band, linear	-	++	++	++
943 981-012	BAT-ANT-N-MiMoDB-5N-IP65		Omni-directional dualband antenna for MiMo for the 2,4 GHz and 5 GHz bands	+	+++	+++	+++
943 981-013	BAT-ANT-N-MiMo5-9N-IP65		Sectoral MiMo antenna for 5 GHz band	-	+++	+++	+++
943 981-015	BAT-ANT-RPSMA-2xOmni-2&5GHz-3dBi-IP66		Screwable Low Profile Antenna				

+++ very good; ++ good; + possible; - cannot be used

BAT450 Wireless

1. Product	2. Country approvals	3. Slot 1	4. slot 2	5. Slot 3	6. AP/AC	7. Voltage range 1	8. Voltage range 2	9. App 1	10. App 2	11. Mount.	12. Int 1	13. Int 2	14. Temp. range	15. SW Option 1	16. SW Option 2	17. SW Option 3	18. Conf	19. Impl	20. SW
BAT450-F							9			A	T6				9			H	

1. Product

BAT450-F	WLAN Access Point (field variant) IP65/67 housing

2. Country approvals

EU	Europe	MX	Mexico
SG	Singapore	US	USA/Canada for antennas til 9dB
AU	Australia	JP	Japan
CN	China	OM	Oman
IN	India	TW	Taiwan

3. Slot 1

W	WLAN Module 802.11n	5	WLAN Module 802.11ac

4. Slot 2

9	not mounted
W	WLAN Module

5. Slot 3

L	LTE Europe
9	not mounted

6. Client / Access point

A	Access Point / Access Client (configurable)
C	Access Client (only)

7. Voltage range 1

W	16-32 V DC, PoE (PD)
N	77-138 V DC

8. Voltage range 2

9	not assembled

9. Approvals 1

9	no additional approval
K	K-Train (EN50155)

10. Approvals 2

9	no additional approvals
M	Vehicles, E1

11. Mounting

A	Standard

12. Interface 1

T6	10/100/1000 Mbit/s; M12

13. Interface 2

T6	10/100/1000 Mbit/s; M12
T7	10/100/1000 Mbit/s; M12 + V.24 + ACA
V4	V.24
99	not assembled

14. Temp.- range

T	Extended	-40°C ... +70°C	E	„**T**“ incl. Conf Coat.
M	Extended	-30°C ... +70°C		including Conformal Coating
A	Extended	-25°C ... +70°C	N	„**A**“ incl. Conf Coat.

15. SW Option 1

9	none	B	VPN-50
A	VPN-5	C	VPN-100

16. SW Option 2

9	none

17. SW Option 3

D	Public Spot	P	PRP
9	none	A	Auto WDS

18. Configuration

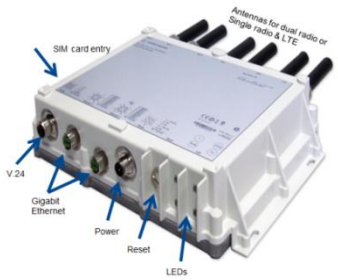
Z	Starter Kit (Antenna, Connector incl.)
9	no accessories

19. Implementation

H	Hirschmann Standard

20. SW version

XX.X	Newest software version



Scope of delivery („Z“: Starter Kit)
1 × premounted protection cap (M12, plastic) for supply voltage connection;
3 × per WLAN Module premounted protection cap (7/8"", plastic) for N socket depending on device configuration;
3 × per WLAN module Antennas (BAT-ANT-N-3AGN-IP67);
2 × per WLAN module 50 Ω terminators for closing free antenna connections;
1 × or 2 × Included X-coded M12 plug for Ethernet port 1 and/or Ethernet port 2;
1 × Included M12 power supply plug ELKA 5012 PG7 (933-170-100);
0 × or 1 × Included Terminal cable: M12 plug, 4-pin, A-coded applies to device variants with V.24 interface

OPEN BAT Wireless

BAT-?																				
															9			H		
1. Product	2. Country approvals	3. Slot 1	4. slot 2	5. Slot 3	6. AP/AC	7. Voltage range 1	8. Voltage range 2	9. App 1	10. App 2	11. Inst.	12. Ports Eth 1	13. Ports Eth 2	14. Temp. range	15. SW Option 1	16. SW Option 2	17. SW Option 3	18. Conf	19. Impl	20. SW

1. Product

BAT-R	WLAN Access Point (DIN rail mountable)
BAT-F	IP65/67 housing

2. Country approvals

AU – Australia	KO – Corea	EU – Europe/CE
BR – Brazil	MX – Mexico	SG – Singapore
CN – China	MY-Malaysia	TH – Thailand
DZ – Algeria	OM- Oman	US – USA/Canada (FCC/IC) for antennas til 9 dB
ID – Indonesia	SA-Saudia Arabia	VN- Vietnam
IN – India		
JP – Japan		

3. Slot 1

W	WLAN Module

4. Slot 2

9	not mounted
W	WLAN Module

5. Slot 3

9	not mounted

6. Client / Access point

A	Access Point/Access Client (configurable)
C	Access Client (only)

7. Voltage range 1

C	24 – 48 VDC
K	60 -250 VDC; 110 – 230 VAC
P	PoE, 802.3af (single radio)
W	19,2 - 32 VDC, PoE

8. Voltage range 2

C	24 – 48 VDC
K	60 -250 VDC; 110 – 230 VAC
W	19,2 - 32 VDC, PoE
9	not assembled

9. Approvals 1

I	Substation (EN61850	G	ATEX Zone 2
M	Vehicles, E1	9	no additional approvals
F	ANSI/ISA61010-1 + Class 1 Div 2	K	Train (EN50155)

10. Approvals 2

9	no additional approvals
M	Vehicles, E1
V	SRD (UNII-3 Channels for Europe)

11. Installation

A	OPERATOR ACCESS AREA Indoor Area for which one of the following conditions applies when operated as intended: - accessible without TOOLS - access options for the OPERATOR provided deliberately - the OPERATOR is informed of access, regardless of which he need
B	SERVICE ACCESS AREA Indoor Voltage range 1/2: only „K“ Area outside the OPERATOR AREA which must be accessible to the SERVICER even when switched off.

12. Ports Ethernet 1

M12 X-coded Ethernet connector
Order code: 942 083-001

O7	Combo Gigabit Ethernet (Gigabit SFP-slot; RJ45) **BAT-R**
O5	Combo Gigabit Ethernet (Gigabit SFP-slot; M12; x-code) **BAT-F**

13. Ports Ethernet 2

T1/T6	TP 10/100/1000 Mbit/s;	**BAT-R**: RJ45 **BAT-F**: M12: x-code
99	not assembled	

14. Temperature range

K	-40°C ... +55°C Incl. Conf. Coating	S	Standard	0°C ... +60°C
		T	Extended	-40°C ... +70°C
		E	Extended including Conformal Coating	-40°C ... +70°C

15. SW Option 1

9	none	B	VPN-50
A	VPN-5	C	VPN-100

16. SW Option 2

9	none

17. SW Option 3

D	Public Spot	P	PRP
9	none	A	Auto WDS

18. Configuration

Z	Starter Kit (Antenna, Connector incl.)
9	no accessories

19. Implementation

H	Hirschmann Standard

20. SW version

XX.X	Newest software version

BAT867-R Wireless

BAT867-R				9						A	T6				9		H	
1. Product	2. Country approvals	3. Slot 1	4. slot 2	5. Slot 3	6. AP/AC	7. Voltage range 1	8. Voltage range 2	9. App 1	10. App 2	11. Mount.	12. Int 1	13. Int 2	14. Temp. range	15. SW Option 1	16. SW Option 2	17. SW Option 3	18. Conf	19. Impl	20. SW

1. Product	BAT867-R	WLAN Access Point IP40 housing
2. Country approvals	EU	Europe (CE)
	US	USA/Canada (FCC/IC) for antennas till 9dB
	AU	Australia
	CN	China
3. Slot 1	W	WLAN Module
4. Slot 2	9	not mounted
5. Slot 3	9	not mounted
6. Client / Access point	A	Access Point / Access Client (configurable)
	C	Access Client (only)
7. Voltage range 1	U	24 VDC
8. Voltage range 2	9	not assembled
9. Approvals 1	9	no additional approval
10. Approvals 2	9	no additional approvals
11. Mounting	A	Standard

12. Interface 1	T1	10/100/1.000 Mbit/s; RJ45
13. Interface 2	99	not assembled
14. Temp.- range	L	Extended -10°C ... +60°C
15. SW Option 1	9	none
16. SW Option 2	9	none
17. SW Option 3	9	none
18. Configuration	Z	Starter Kit (Antenna, Connector incl.)
	9	no accessories
19. Implementation	H	Hirschmann Standard
20. SW version	XX.X	Newest software version

Still on the roadmap

BAT867-F
- 2x2 11ac MIMO
- PoE and 24V
- Rapid Roaming

Key Features

- WLAN module : 1 x 802.11ac
  (backward compatible with 802.11a/b/g/n)
- Data rates: IEEE 802.11 n -> up to 300 Mbps
  IEEE 802.11 ac -> up to 867 Mbps
- MIMO : 2x2
- Antenna connectors : 2 X RSMA
- Frequency : 2.4 / 5 GHZ
- Reset button, 3xLED (Power, WLAN, LAN)
- Ethernet : 1 X RJ 45 (10/100/1000BASE-TX data rates)

OPEN BAT - ACCESSOIRES

Configurator >>> Point 18. What‘s included **with (Z)** & **without (9)** the Starter Kit

OpenBAT-F

No accessories option includes the following…

1× Installation manual and 1 × CD/DVD with PDF docs and software
1× or 2x Field installable power plug, for 6 to 8 mm OD cable
(connector type dependent on the configured power input.
A power plug with a larger thread, e.g. for 8 to 10 mm cable OD,
can be found in the Other Accessories below .
1× or 2x (depending on device model) Dust cap for power socket(s)
1× V1 sealing cap for optical connection
1× Sealing caps for power supply
3× per WLAN module Sealing caps N for antenna
4× or 5× (depending on device model) M12 cap

OpenBAT-R

No accessories option includes the following…

1× Installation manual and 1 × CD/DVD with PDF docs and software
1× per C or W power input configuration,
a 2-pin pluggable terminal block for power
1× per K power input configuration,
a 3-pin pluggable terminal block for power
1× per C, K or W power input configuration,
a 2-pin pluggable terminal block for signal/fault output

9

Starter Kit includes all of the above and…

1× Terminal cable: M12 connector, 8-pin on DB9 socket
1× or 2× (depending on device model) M12 plug ; x-coded (934 637-032)
3× per WLAN module 50-Ω terminators
for equipping free antenna connections
3× per WLAN module 3-dBi dipole dual-band antennas
for initial operation

Z

Starter Kit includes all of the above and…

1× Terminal cable: M12 connector, 8-pin on DB9 socket
3× 50-Ω terminators for equipping free antenna connections
(only for device variants with 2 wireless modules)
3× per WLAN module 3-dBi dipole dual-band antennas
for initial operation

OPEN BAT - ACCESSOIRES

• ACA 21-M12 (EEC) - Auto Configuration Adapter w/ M12 for OpenBAT-F	943 913-001
• ACA 21-USB (EEC) - Auto Configuration Adapter w/ USB for OpenBAT-R	943 271-003
• Terminal/serial configuration cable w/ 8-pin M12 to DB9 socket	942 087-001
• Field-attachable 8-pin M12 Ethernet X-Code plug for Gigabit	934 637-032 (Hirschmann) Lumberg part no. 0986 EMC 600
• Single-ended M12, male, X-coded, Gigabit Ethernet	Lumberg part no. RSTS 8X-478/…M
• Single-ended M12, male, X-coded, Gigabit Ethernet, rail industry approval	Lumberg part no. BRSTS 8X-552/…M
• 7/8″ plug for K power input option, cable OD 6-8 mm	942 086-003
• 7/8″ plug for K power input option, cable OD 8-10mm	Lumberg part no. RKC 30/11
• 7/8″ plug for W and C power input option, cable OD 8-10mm	942 086-004
• 7/8″ plug for W and C power input option, cable OD 6 to 8 mm	Lumberg part no. RKC 40/11
• 4-pin female M12 A-Code field-attachable for relay output, cable OD 3-6.5 mm	Lumberg part no. RKC 4/7
• 4-pin female M12 A-Code field-attachable for relay output, cable OD 4-8 mm	Lumberg part no. RKC 4/9
• Locking screw for M12 socket, metal, IP67 (25 pieces)	942 057-001
• Locking screw for M12 plug, metal, IP67 (10 pieces)	942 115-001
• Locking screw for 7/8“ plug, metal, IP67 (10 pieces)	942 111-001
• BAT-ANT-N-3AGN-IP67 (10 pcs.)	942 110-001
• 50-Ω terminators for unused antenna connections, N (10 pieces)	942 118-001
• 50-Ω terminators for unused antenna connections, SMA (10 pieces)	942 117-001
• Pole mounting kit for OpenBAT-F	942 116-001
• SFP mounting/extraction tool for IP67 socket	942 079-001
• Adapter for pole mounting (BAT450-F)	943 966-001

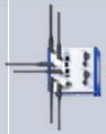
DIFFERENCE BAT450-F AND OPENBAT (BAT-F) AND BAT867-R

		BAT867-R	OpenBAT (BAT-R)
Configurations		Access Point / Client	Access Point / Client
Radio/WLAN	No. of WLAN modules Standards Frequency Bands MIMO Data rates Clear space	1 IEEE 802.11a/b/g/n/ac 2.4 and 5 GHz 2 x 2 up to 867 Mbit/s X	Up to 2 IEEE 802.11a/b/g/n 2.4 and 5 GHz 3 x 3 up to 450 Mbit/s ✓
Ports	Ethernet (10/100/1000 Mbit/s)	1	1 or 2
	SFP (GE)	X	1
	Serial / USB	X	V.24/ACA21
Power Supply	U → 24 V DC	✓	X
	W → 24 V DC, PoE	X	✓
	C → 18-60 V DC	X	✓
	K → 48-320 V DC / 90-265 V AC	X	✓
	P → PoE, 802.3 af	X	✓
Temperature Range	Standard	-10°C to 60°C	0°C to 60°C
	Extended	X	-40°C to 70°C
Dimensions	(W x H x D)	50 x 147.5 x 122.5 mm	150 x 136 x 115 mm
Approval	K - Train (EN50155) M - Vehicles (E1)	X	✓
	I - Substation (EN61850) G - ATEX Zone 2 F - ANSI/ISA 61010-1; Class 1 Div 2	X	✓

		BAT450-F	OpenBAT (BAT –F)
Ports	Ethernet (10/100/1000 Mbit/s)	2	2
	SFP (GE)	X	✓
	Serial	(V.24/ACA11)	(V.24/ACA21)
Power Supply	W → 24 VDC, PoE	✓	✓
	C → 18-60 VDC	X	✓
	K → 48-320 VDC / 90-265 VAC	X	✓
	P → PoE, 802.3 af	X	✓
Temperature Range	Standard	X	0°C to 60°C
	Extended	-40°C to 70°C	-40°C to 70°C
Dimension	**(WxHxD)** in mm	261 x 189 x 55	311 x 219 x 75
Approval	K - Train (EN50155) M - Vehicles (E1)	✓	✓
	I - Substation (EN61850) G - ATEX Zone 2 F - ANSI/ISA 61010-1; Class 1 Div 2	X	✓
Extension Interface	LTE, IIoT (WHART, ISA 100.11a, BlueTooth)	✓ *	X

* Planned for Q2/2017)

Device	Supported standards	Maximum gross data rate
BAT-C	IEEE 802.11a/b/g/h/n	65 MBit/s
BAT867-R	IEEE 802.11a/b/g/n/ac	867 MBit/s (2x MIMO)
BAT300 family	IEEE 802.11a/b/g/h/n	300 MBit/s (2x MIMO)
BAT450-F	IEEE 802.11a/b/g/h/n	450 MBit/s (3x MIMO)
OpenBAT family	IEEE 802.11a/b/g/h/n	450 MBit/s (3x MIMO)

Features	Entry level	Mid Range	High End
IP30 / DIN Rail	 BAT867-R		 OpenBAT-R
IP65/67 / Wall – Mast		 BAT450-F	 OpenBAT-F
Hardware Optionen	Limited	Medium	High
Client / Access point	C/AP	C/AP	C/AP
Software	HiLCOS	HiLCOS	HiLCOS

Special Approvals

		BAT-R	BAT-F	BAT-C
Safety of industrial control equipment	UL60950-1	●	●	
	EN60950-1	●	●	●
	EN60950-22		●	
	UL508			●
Substation	IEEE1613	●	●	
	EN61850-3	●	●	
Vehicle	E1/e1	●	●	●
Railway norm	EN 50121-4	●	●	
	EN50155	●	●	
	EN45545	●	●	
Hazardous Location	Atex Zone II	●	●	
	Class 1 Div 2	●	●	
Protection Class	Nema 4X		●	

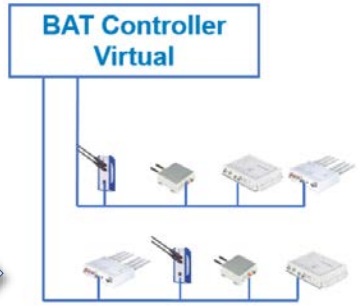
BAT - FAMILY

BAT-Controller WLC xx

WLC25	manages < 25 APs	942 034-001
WLC50	manages < 50 APs	942 034-002
WLC100	manages < 100 APs	942 034-003
WLC200	manages < 200 APs	942 034-004
WLC500	manages < 500 APs	942 034-005
WLC1000	manages < 1000 APs	942 034-006

Last order: 15. December 2020

Replacement



Name	Number	Description
BAT Controller Virtual (for ESXi)	free download	free software with limited functionality without a license
BAT Controller License 100	942 313-001	License for the software: Up to 100 APs or VPN, 64 ARF, 500 MBit/s throughput limit
BAT Controller License 200	942 313-002	License for the software: Up to 200 APs or VPN, 128 ARF, 500 MBit/s limit
BAT Controller License 1000	942 313-010	License for the software: Up to 1000 APs or VPN, 256 ARF, unlimited throughput

BAT-C2

Last order: 01. June 2024

BAT-C2 Europe (942 249-001)
BAT-C2 North America (942 249-002)
BAT-C2 China (942 249-003)

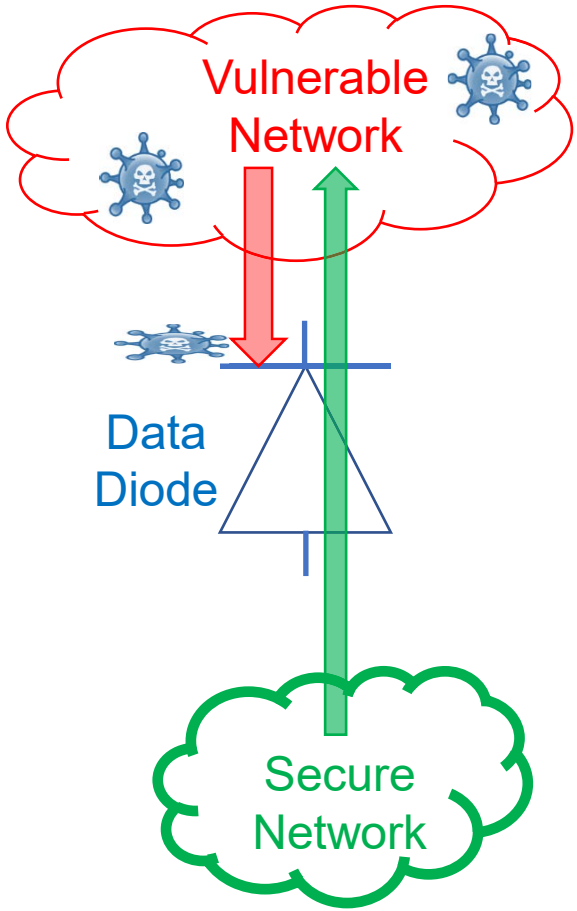
Radio protocol: IEEE802.11a/b/g/n/ac
Port type: 1x port 10/100 BASE-TX

BAT-867-F

BAT-867-F Europe (942 276-201)
BAT-867-F North America (942 276-301)

- WLAN 802.11ac with 2x2 MIMO
- 2.4 or 5GHz operation
- Client or AccessPoint
- Industrial grade operating system HiLCOS
- 24V DC or PoE
- Extended temperature range
- Trackside certification: EN50121-4

RAIL DATA DIODE



Use case

➢ Get Ethernet data from a secure part of a network to a potentially infected network for monitoring reasons.

Requirements

1. Make 100% sure that no data can get from the vulneable part of the network to the secure part,
2. Chose an evident and comprehensive insulation methode.

Solution

✓ Physically interrupt one data path at an interface where both directions use separate paths: Block one direction by cutting wires,

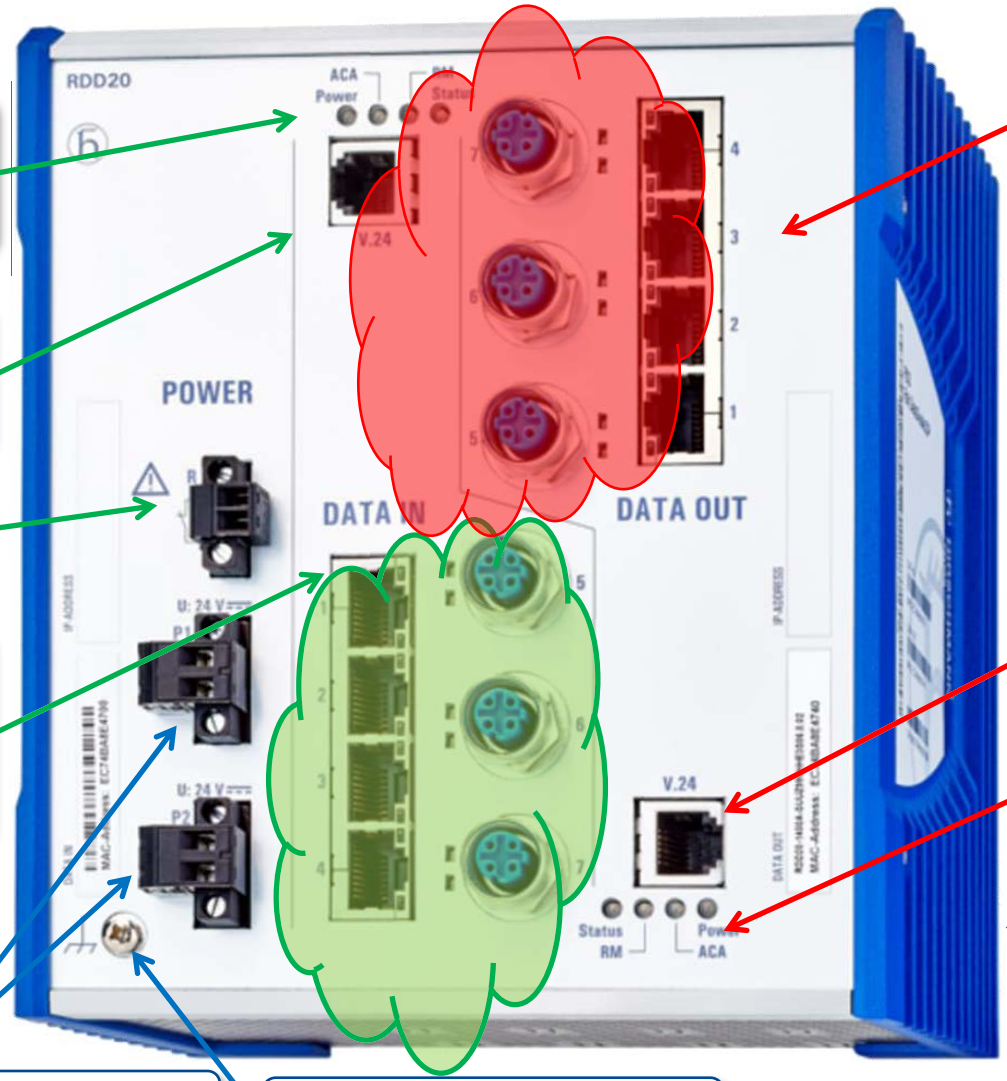
✓ Use routers on both sides of the diode element to get the communication going.

Product name and reference number

• Rail Data Diode LV	942 197 -001
• Rail Data Diode HV	942 197 -002
• Rail Data Diode LV Train	942 197 -003
• Rail Data Diode HV Train	942 197 -004

Last order date: 31.10.2024

RAIL DATA DIODE



Status LEDs
DATA IN Router

Configuration
DATA IN Router

Fault Relay

Secure Network

7 FE Ports of
DATA IN Router

Vulnerable Net

7 FE Ports of the
DATA OUT Router

Configuration
DATA OUT Router

Status LEDs
DATA OUT Router

Metal housing

Redundant power supplies

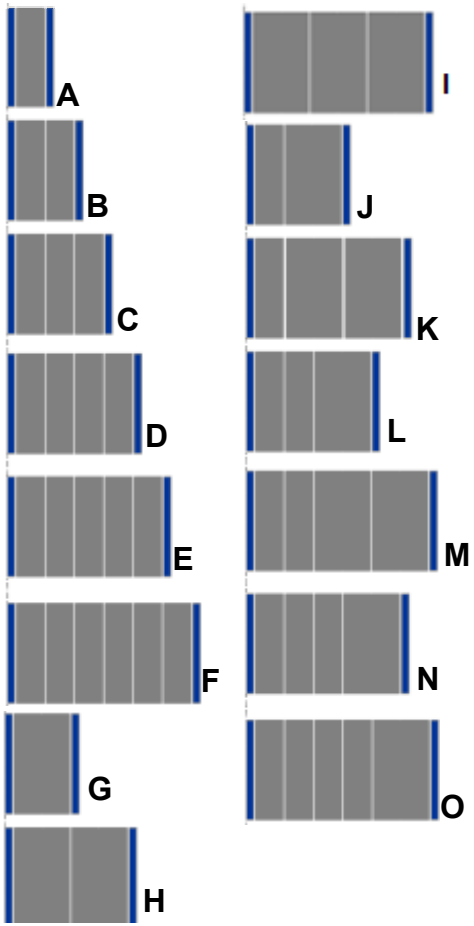
Ground connection

ORDER CODE MIPP --- CHASSIS

MIPP	/	chassis	/	Module 1	/	Module 2	/	Module 3	/	Module 4	/	Module 5	/	Module 6	/	XX
		XX		XXXX		XXXX		XXXX		XXXX		XXXX		XXXX		

X	no chassis
W	wall mounting plate
D	**Standard DIN Rail**

X	no Module
A	1x Single Module
B	2x Single Modules
C	3x Single Modules
D	4x Single Modules
E	5x Single Modules
F	6x Single Modules
G	1x Double Module
H	2x Double Modules
I	3x Double Modules
J	1x Single Module + 1x Double Module
K	1x Single Module + 2x Double Modules
L	2x Single Modules + 1x Double Module
M	2x Single Modules + 2x Double Modules
N	3x Single Modules + 1x Double Module
O	4x Single Modules + 1x Double Module



Chassis **tuned to space requirements of the used modules**

ORDER CODE MIPP --- MODULES

MIPP / XX / XXXX / XXXX / XXXX / XXXX / XXXX / XXXX / XXXX / XX

chassis | Module 1 | Module 2 | Module 3 | Module 4 | Module 5 | Module 6 | reserved

Copper modules

Keystone

Coupler

REVConnect

Module type – construction (copper)

c Single Module

Keystones / couplers (copper)

At the fiber adapters are color-integrated according to cable type

- c unshielded coupling
- d shielded coupling
- u unshielded keystone
- s shielded keystone
- r unshielded REVConnect couplers
- j unshielded REVConnect jacks
- v shielded REVConnect jacks

Cable type (copper)

- d Cat 5e
- e Cat 6
- a Cat 6A

Number of Connections (copper)

- 2 2 keystones / 2 couplers
- 4 4 keystones / 4 couplers

1	N	N	N

Two options

Blind Module

- 1 Single Blind Module
- 2 Double Blind Module

Mode	Fiber	connector	coupler	Color of cable
SM	OS1/OS2 ; 9/125µm	blue	blue	yellow
SM	OS1/OS2 ; 9/125µm	green	green	yellow
MM	OM1 62.5/125 µm	beige	beige	orange
MM	OM2 50/125 µm	beige	beige	orange
MM	OM3 50/125 µm	beige	turquoise	turquoise
MM	OM4 50/125 µm	beige	violett	violet
MM	OM5 50/125 µm	beige	green	green

Fiber modules

Module type – construction (fiber)

1 Single Module

2 Double Module

P Pre-Terminated MPO Cassette

Adapter (fiber)

At the fiber adapters are color-integrated according to cable type

- T BFOC (ST) Duplex adapter
- B BFOC (ST) Duplex **metal** adapter
- L LC Duplex adapter
- S SC Duplex adapter
- M SC Duplex **metal** adapter
- E E2000 adapter
- N Leermodul
- 4 LC Duplex MM/OM4 (only in module type „P“)
- 9 LC Duplex SM/OS2 (only in module type „P“)

Cable type (fiber)

- 1 MM/OM1
- 2 MM/OM2
- 3 MM/OM3
- 4 MM/OM4
- 9 SM/OS2 UPC
- A SM/OS2 APC (color: green)
- 5 6 x SM/OS2 / 6 x OM1
- 6 6 x SM/OS2 / 6 x OM2
- 7 6 x SM/OS2 / 6 x OM3
- 8 6 x SM/OS2 / 6 x OM4
- M MPO-12 (male) (only in module type „P“)

Accessories (fiber) (matched to the type of cable)

- P Pigtails
- B Brilliance field installable connectors
- N no accessoire
- A Polarität Typ-A (only in module type „P“)

Keystone Color Chart Fiber

Light ivory
Fibertype: Multimode
OM1 62,5/125
OM2 50/125

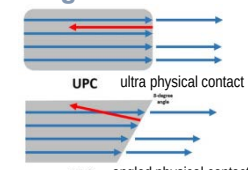
aqua
Fibertyp: Multimode
OM3 50/125

aqua
Fibertyp: Multimode
OM4 50/125

azure
Fibertyp: Singlemode
9/125
OS2/UPC

green
Fibertyp: Singlemode
9/125
OS2/APC

Singlemode SM

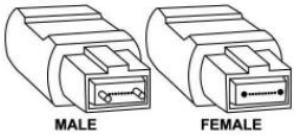


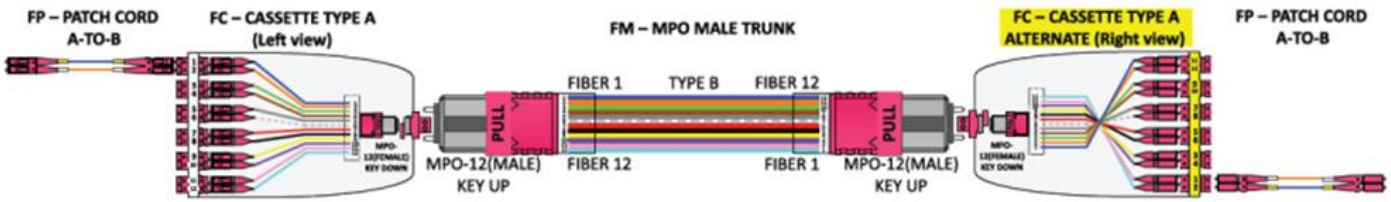
MIPP --- MPO CASSETTE

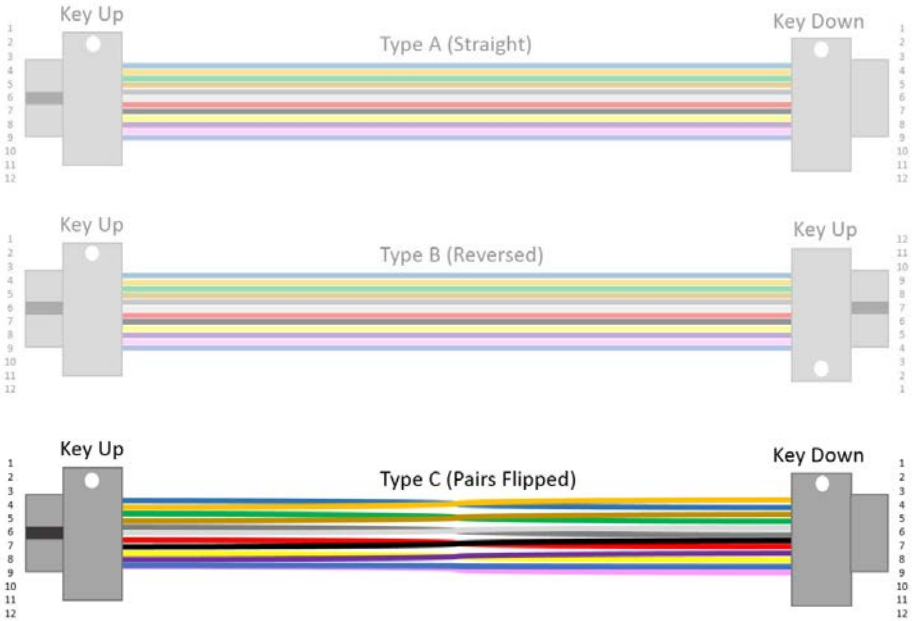
Multi-Fiber **P**ush-**O**n Connector

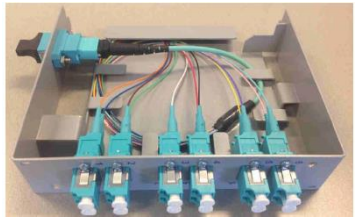
MIPP™ Pre-Terminated MPO Cassette is designed for plug & play network designs

- Pre-Terminated module with one MPO (12 fibers) on bottom or top side (Trunk side).
  The MPO in internally connected by means of a fan out, to six LC duplex adapters (12 fibers) on the front (Patch side)









Type of Adapters

Patch Side
- LC Duplex
- LC/APC Duplex
- LC Duplex w/ Shutters
- LC/APC Duplex w/ Shutters
- SC Duplex
- SC/APC Duplex
- SC Duplex w/ Shutters
- SC/APC Duplex w/ Shutters
- ST Duplex

Trunk Side
- 1-Port MPO-12 (m)
- 1-Port MPO-12 (f)

Fiber Applications
- Multimode: OM1, OM2, OM3 and OM4
- Singlemode: OS2 and OS2/APC

Polarity
- Type - A
- Type - A ALT
- Type - B
- Type - C

INDUSTRIAL HIVISION NETWORK MANAGEMENT SOFTWARE

Improve productivity, security and network uptime using Hirschmann's Industrial HiVision to configure and monitor industrial Ethernet networks

Industrial HiVision is a proven solution that saves you time, reduces errors and provides a snapshot of network health which increases availability and enhances security.

•**Actionable** – Obtain instant visibility of key performance indicators with the Network Dashboard, allowing timely remediation that improves uptime and security.

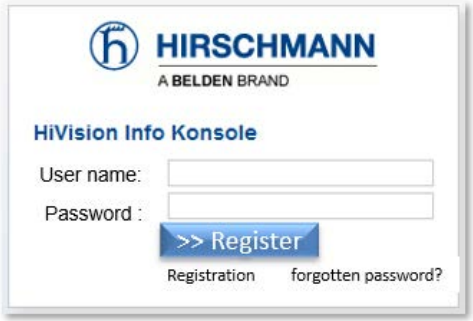
•**Time Saving** – Configure hundreds of SNMP-enabled devices from any manufacturer simultaneously with the MultiConfig feature. You can use this both when commissioning devices and during live operation.

•**Informative** – Identify and map all network infrastructure and terminal equipment that supports SNMP including any device-specific properties.

Annual Maintenance Plan (AMP)

- The Annual Maintenance Plan (AMP) offers cost-effective updates for Industrial HiVision. For a single payment, the latest version will be available automatically for a period of twelve months.

You can check your license database
→ http://information.ihivision.de



INDUSTRIAL HIVISION - LICENSE/AMP

License keys for Industrial HiVision depend on the number of devices (nodes) to be monitored. The following classifications are available. You can also add the licenses.

The 16 Node Free License is supported by version 06.0.04 and higher.
In Ind. HiVision it is displayed as Promotion license.
The Promotion License is free of charge.
It is bound to a Hardware Key.
Only one Promotion License can be used at one time.
It can not be added to nodes of other licenses.
Node leasing is not supported.

Order number	Nodes
costfree	16
943 156-032	32
943 156-064	64
943 156-128	128
943 156-256	256
943 156-512	512
943 156-124	1024
943 156-248	2048
943 156-496	4096

Click on: www.hivision.de/license to generate your license

License Industrial HiVision

Dear Mr. Customer

You can receive your license key for Industrial HiVision here

Click the corresponding link to request your license key.

Industrial HiVision 4.0 and higher

Full version / Free 16 node license / Hardware-Change

Request license key

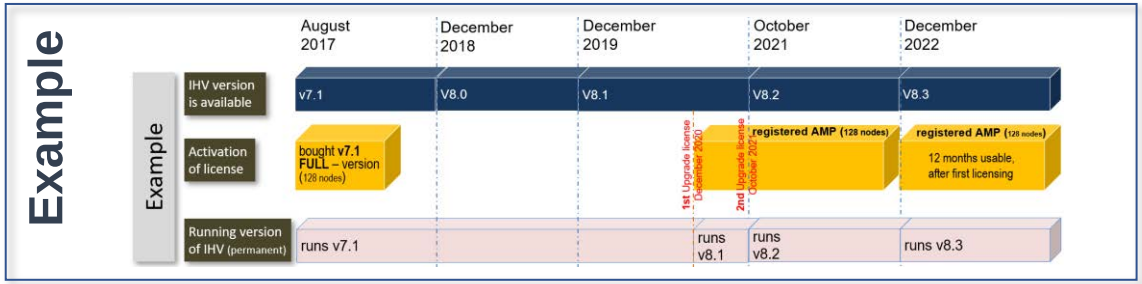
Option: Upgrade from lower to higher version of Industrial HiVision via **A**nnual **M**aintenance **P**lan

You already have a **full version** of Industrial HiVision version >= 4.0
The number of upgrade nodes should be the same as of the full nodes.

With an AMP you can get upgrades to newer versions of Ind. HiVision within 12 months.
You can get an upgrade for the current version within 12 months after the first use of an AMP.
With an AMP you get a license of the type **Upgrade**

After the 12 months you want to be free to decide wether you want to order a new AMP or not.

NOTE: Your AMP registration code is valid for all upgrades of Industrial HiVision within 12 months, starting from the first licensing.
IMPORTANT: You have to edit FULL-LICENSE **and** UPGRADE-LICENSE in the license menu



Ind.HiVision, Annual Maintenance Plan, 32 Nodes	942 021-032
Ind.HiVision, Annual Maintenance Plan, 64 Nodes	942 021-064
Ind.HiVision, Annual Maintenance Plan, 128 Nodes	942 021-128
Ind.HiVision, Annual Maintenance Plan, 256 Nodes	942 021-256
Ind.HiVision, Annual Maintenance Plan, 512 Nodes	942 021-512
Ind.HiVision, Annual Maintenance Plan, 1024 Nodes	942 021-124
Ind.HiVision, Annual Maintenance Plan, 2048 Nodes	942 021-248
Ind.HiVision, Annual Maintenance Plan, 4096 Nodes	942 021-496

INDUSTRIAL HIVISION - LICENSE/AMP

www.hivision.de/license

Industrial HiVision needs licenses to work properly. Since Industrial HiVision 3.0 these licenses can be obtained online.
A Hardware Key (located in the license menue of Industrial HiVision) is needed.

Each package contains a product certificate (a blue sheet of paper) with a registration code.
This registration code has to be entered into the registration wizard: https://www.hivision.de/license.
The registration wizard then provides the license code which has to be entered in Industrial HiVision.

Upgrade – AMP: To upgrade from a version A to C you do not need an upgrade to version B. **Full version A** and **upgrade C** is enough.

Calculation of Nodes

Example	Nodes with 7.1.04 full license	Nodes with 8.2 upgrade license	Additional nodes	Result: valid nodes in version 8.2
1	128			0
2		128		0
3	128	128		128
4	512	128		128
5	128	512		128
6	128	128	128 (8.2 full license)	256
7	224 (128 + 32 + 64)	256		224
8	128		512 (8.2 full license)	512
9	128	128	512 (8.2 full license)	640

Example 6

Licenses

Key	Version	Expires	Type	Devices	Hardware Key	License holder	Registration Code
A14E467E..	07.1.04	never	Full	128	048906008AB70092...	Harry Hirsch	19692574-943....
A14E467E..	08.2.00	never	Full	128	048906008AB70092...	Harry Hirsch	1975725-943...
A14E467E..	08.2.00	never	Upgrade	128	048906008AB70092...	Harry Hirsch	1954391-942...

Remaining Licenses: 100 / 256
Hardware Key: 048906008AB70092387

Example 5

Licenses

Key	Version	Expires	Type	Devices	Hardware Key	License holder	Registration Code
A14E467E..	07.1.04	never	Full	128	048906008AB70092...	Harry Hirsch	19692574-943....
A14E467E..	08.2.00	never	Upgrade	512	048906008AB70092...	Harry Hirsch	1954391-942...

Remaining Licenses: 100 / 128
Hardware Key: 048906008AB70092387

The 08.2.00 upgrade license is yellow, because not all of the nodes can be used

PROVIZE

Simplifies Network Planning, Configuration & Commissioning

- **Seamless integration:** PROVIZE Planner and PROVIZE Explorer seamlessly integrate with Belden PROVIZE Suite supporting streamlined network planning, configuration and commissioning via a single interface.
- **Easy to use:** Quickly plan your network and commission your devices with our intuitive software with no learning curve.
- **Free base version:** Get unlimited installations of entry-level solutions for PROVIZE Explorer and PROVIZE Planner and upgrade to paid PROVIZE licenses to access advanced features.

PROVIZE Planner

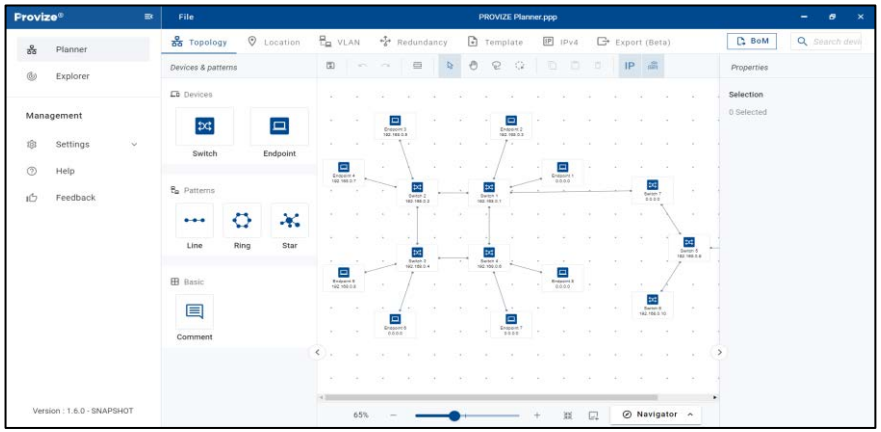
- **Intent-based network planning and configuration:** Automatically translate user intents into configurations.
- **Automatic bill of materials (BOM) generation:** Identify relevant equipment based on user-defined network topologies.

PROVIZE Explorer

- **Fast commissioning:** Easy commissioning of your devices.
- **Simple device access:** Access Hirschmann device interfaces without installing Java libraries on users' PCs.

Belden's PROVIZE Suite provides comprehensive network planning, configuration and commissioning via a single, user-friendly user interface. Choose between free or advanced (paid) **PROVIZE Planner** and **PROVIZE Explorer** versions based on your network requirements and complexity.

Type	PROVIZE Planner	PROVIZE Planner Professional	PROVIZE Explorer	PROVIZE Explorer Professional
Order No.	942340002	942338002	942340001	942338003
Product Description	Free Version	Paid Version	Free Version	Paid Version
Features	• Topology Planning • Location Settings • BOM Creation	• All Features of Free PROVIZE Planner Version • Redundancy (MRP) • Automatic VLAN Configuration • IPv4 Configuration • CLI Template and Template Stacks Configuration • CLI Configuration Export	• Basic Commissioning of Belden Devices	• All Features of Free PROVIZE Explorer Version • MultiConfig Commissioning • MultiConfig Password Change



PROVIZE

Simplifies Network Planning, Configuration & Commissioning

Features	Free	Professional
Topology Planning	x	x
Location Settings	x	x
BOM Creation	x	x
Redundancy (MRP)		x
Automatic VLAN Configuration		x
IPv4 Configuration		x
CLI Template and Template Stacks Configuration		x
CLI Configuration Export		x

SYSTEM ACCESSORIES

SFP Transceiver

Hirschmann offers a **flexible line of fiber optic and copper SFP transceivers**.

MIPP

Hirschmann offers a **Industrial Termination and Patching Solution - Modular Industrial Patch Panel**

Power supply

Hirschmann offers a wide range of **AC and DC power supplies**.

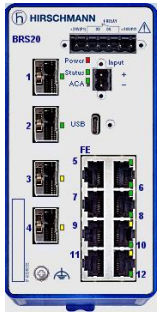
Adapter cable

Auto-configuration adapter - **Programming and Configuration Backup**.

PoE Injector

Industrial PoE/PoE+ Injector with Optional Power Supply Capabilities - providing a high port count and up to 240 W of power.

WHICH TYPE OF SFP IN WHICH SWITCH SLOT ?



BRS20-1200ZZZZ
4x SFP-slot: FE

BRS30-0804OOOO
4x SFP slot: FE/GE

BRS40-0012OOOO
4x SFP-slot FE/GE

BRS50-00122Q2Q
4x SFP-slot: FE/GE/2.5GE

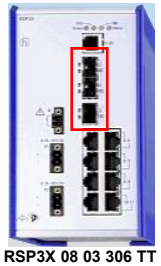
Tri-speed

SPIDER-SL-40-06 T1 06 06 99
2 SFP slots: FE/GE

SPIDER-PL-20-06 T1 Z6Z6Z6
3 SFP slots: FE

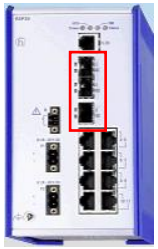
SPIDER-PL-40-01T1O69999
1 SFP slot FE/GE

SPIDER-PL-20-16T1999999
2 SFP slots FE

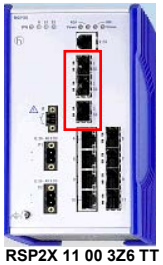


RSP3X 08 03 306 TT
3 SFP-slots (GE/FE)

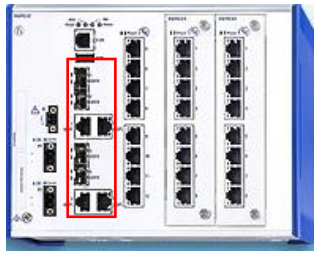
RSP3X 08 03 306 ZT
3 SFP-slots (GE/FE)
4x FE SFP-slots



RSP2X 11 00 3Z6 TT
3 SFP-slots (FE)



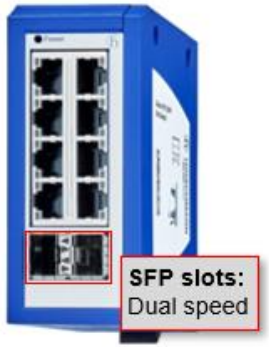
RSP2X 11 00 3Z6 TT
3 SFP-slots (FE)
4x FE SFP-slots



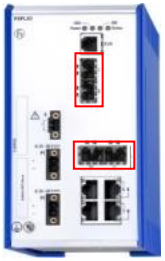
RSPE3X
3 SFP slots (GE/FE)

SPIDER-SL44-05T1
1x SFP-slot FE/GE

SPIDER-SL44-08T10606
2x SFP-slot: FE/GE

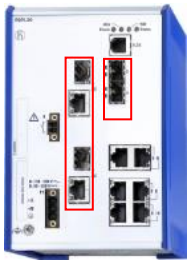


GECKO 8TX/2SFP
2 SFP slots (FE)

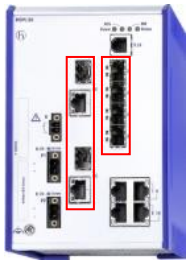


RSPL20-0800 2Z6YT
4 SFP slots (FE)

RSPL20-0800 2Z6YT
4 SFP slots (FE)



RSPL30-0802 207YT
2x Combo/SFP-slot: (GE/FE)
2x SFP slots (FE)



RSPL30-0802 207ZT
2x Combo/SFP-slot: (GE/FE)
4x SFP slots (FE)

RED25
2 SFP slots (FE)

WHICH TYPE OF SFP IN WHICH SWITCH SLOT ?

MSP40

Slot 1 on MSP40

- MSM50 – 1GE or 2.5 GE SFP module (4 ports)
- MSM60 – 1GE or 10 GE SFP module (2 ports)

MSP30

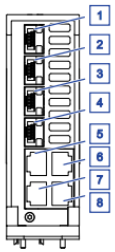
Slot 1 on MSP30

- MSM40 – 4x 10/100/1.000 Mbit/s; RJ45
  4x 100/1.000 Mbit/s; SFP slots

Slot 2 – 7 on MSP40

- MSM40 –
  4x 10/100/1.000 Mbit/s; RJ45 (T1);
  100 Mbit/s; SFP slots; Combo ports (C1)

MSM40-C1C1C1C1…



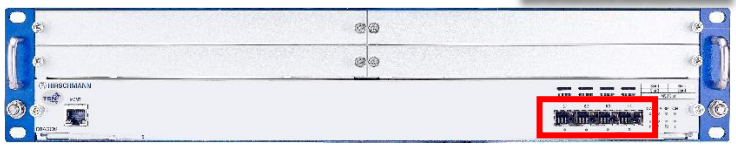
1	Port 1	(F/O)
2	Port 2	(F/O)
3	Port 3	(F/O)
4	Port 4	(F/O)
5	Port 1	(Twisted Pair)
6	Port 2	(Twisted Pair)
7	Port 3	(Twisted Pair)
8	Port 4	(Twisted Pair)

Slot 2 – 7 on MSP30

- MSM40 –
  4x 10/100 Mbit/s; RJ45 (T1);
  100 Mbit/s; SFP slots; Combo ports (C1)

WHICH TYPE OF SFP IN WHICH SWITCH SLOT ?

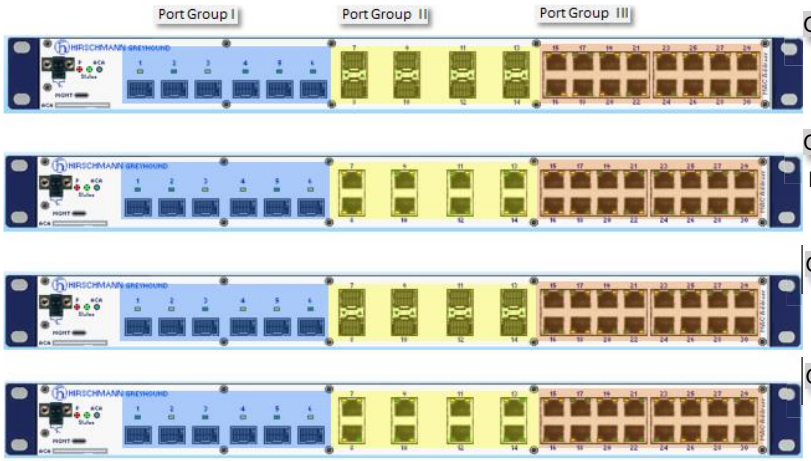
DRAGON MACH4000



4 SFP slots: 10GE, 2.5GE, 1GE

DRAGON MACH4500

8 SFP slots: 10GE, 2.5GE, 1GE



GRS105-6F8F16T

PG I : 6x 1/2.5GE (SFP slots)
PG II : 8x 1GE (SFP slots)

GRS105-6F8T16T

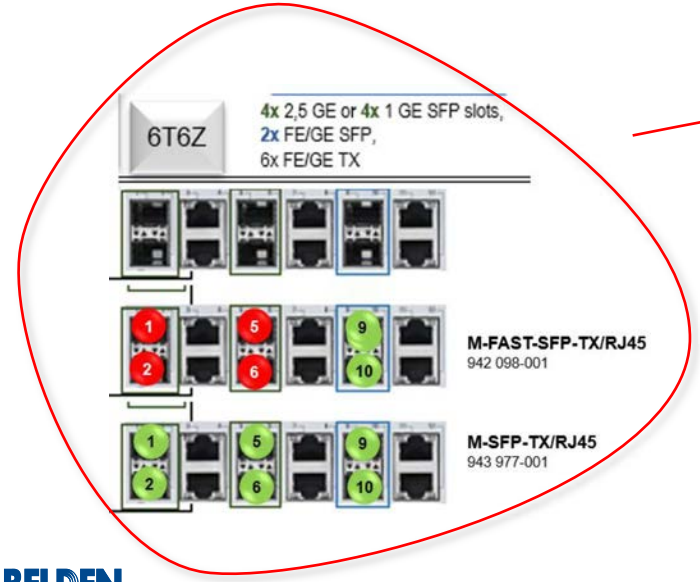
PG I : 6x 1/2.5GE (SFP slots)

GRS106-6F8F16T

PG I : 6x 1/2.5/10GE (SFP slots)
PG II : 8x 1/2.5GE (SFP slots)

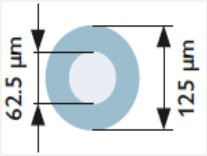
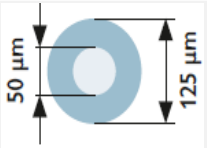
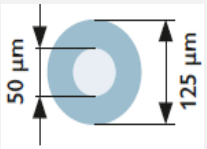
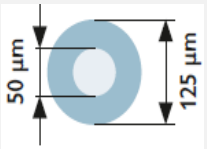
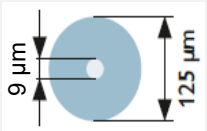
GRS106-6F8T16T

PG I : 6x 1/2.5/10GE (SFP slots)



GRS1042

FIBRE CLASSES

Multimode	Fiber design	Sheath color	Fiber category	Typical range	Typical wavelength
		Orange	OM1	1000Base-SX: max. 275m 1000Base-LX: max. 550m	850 nm 1.300 nm
		Orange	OM2	1000Base-SX: max. 550m 1000Base-LX: max.1.000m	850 nm 1.300 nm
		Aqua	OM3	1000Base-SX: max. 1.000m 1000Base-LX: max. 550m 10GBase-SX : max. 300m	850 nm 1.300 nm
		Heather violet	OM4	1000Base-SX; max 1.000m 1000Base-LX: max. 600m 10GBase-SX : max. 550m	850 nm 1.300 nm
Single mode					
		Yellow	OS2	10GBase-LR: max. 10km 10GBase-ER: max. 40km	1.310nm 1.550nm

D-LC connector

D-SC connector

ST/BFOC connector

XFP 10 Gbit/s

XFP Transceiver		Cable type	Wavelength in nm	Connector	System Attenuation	Transmit Power min	Receiver Sensitivity	Example for F/O expansion	Fiber data
M-XFP SR/LC **M-XFP SR/LC EEC**	943 917-001 942 054-001	62,5/125µm Multimode	850	LC	0 – 8,1 dB	-1,0 dBm	-11,1 dBm	2m – 26m	3,2 dB/km 160 MHz x km
								2m – 33m	3,2 dB/km 200 MHz x km
		50/125µm Multimode						2m -66m	3,0 dB/km 400 MHz x km
								2m – 82m	3,0 dB/km 500 MHz x km
		50/125µm Multimode						2m – 300m	3,0 dB/km 2000 MHz x km
		50/125µm Multimode			0 –8,4dB	-1,0 dBm	-14,4 dBm	2m – 10km	0,4 dB/km 3,5 ps/(nm x km)
M-XFP LR/LC **M-XFP LR/LC EEC**	943 919-001 942 055-001	9/125µm Singlemode	1300		3 – 15 dB	+ 2,0 dBm	-16,0 dBm	10km – 40km	0,25 dB/km 19 ps/(nm x km)
M-XFP ER/LC **M-XFP ER/LC EEC**	943 920-001 942 056-001	9/125µm Singlemode	1550						
M-XFP ZR/LC	943 921-001	9/125µm Singlemode	1550		11 – 24 dB	+4,0 dBm	-24 dBm	40km – 80km	0,25 dB/km 19 ps/(nm x km)

Last order: 31. May 2021
M-XFP-ZR/LC (943 921-001)
M-XFP-SR/LC EEC (942-054-001)

Last order: 31. March 2023
M-XFP-ER/LC (943 920-001)
M-XFP-ER/LC EEC(942 056-001)
M-XFP-LR/LC (943 919-001)
M-XFP LR/LC EEC (942 055-001)
M-XFP-SR/LC (943 917-001)

EEC: -40°C - +85°C

SFP+

10 Gbit/s

SFP+ slots included in DRAGON MACH, GRS106 and MSP40 – MSM60 media module

Product Code	Order number		Wave-length	Fiber	System attenuation	Distance	Fiber data	Temperature range	MTBF
M-SFP-10-SR/LC EEC	942 210-001	MM	850nm	50/125 µm	0-8.1 dB	max. 66 m	3,0 dB/km, 400 MHz*km	-40 - +85°C	Telcordia SR-332, Issue 2, 40°C 610 years
						max. 82 m	3,0 dB/km, 500 MHz*km (OM2)		
						max. 300 m	3,0 dB/km, 2.000 MHz*km (OM3)		
						max. 400 m	3,0 dB/km, 4.700 MHz*km (OM4)		
				62,5/125 µm		max. 26 m	3,2 dB/km, 160 MHz*km		
						max. 33 m	3,2 dB/km, 200 MHz*km (OM1)		
M-SFP-10-LR/LC EEC	942 211-001	SM	1310 nm	9/125 µm	0-7.4 dB	typ. 10 km	0,4 dB/km, 3,5 ps/(nm*km)		Telcordia SR-332, Issue 3, 40°C 2466 years
M-SFP-10-ER/LC EEC	942 212-001	SM	1550 nm		3-15 dB	10-40 km	0,25 dB/km, 19 ps/(nm*km)		Telcordia SR-332, Issue 3, 40°C 1059 years
SFP-10-SR/LC EEC	**942 326-001**	MM	850nm	50/125 µm	0-8.1 dB	max. 66m	3,0 dB/km, 400 MHz*km		Telecordia SR-332 Issue 3 @ 25°C: 610 years
						max. 82 m	3,0 dB/km, 500 MHz*km (OM2)		
						max. 300 m	3,0 dB/km, 2.000 MHz*km (OM3)		
				62,5/125 µm		max. 26m	3,2 dB/km, 160 MHz*km		
						max. 33 m	3,2 dB/km, 200 MHz*km (OM1)		
SFP-10-LR/LC EEC	942 326-002	SM	1310nm	9/125 µm	0-7.4 dB	typ. 10km	0,4 dB/km, 3,5 ps/(nm*km)		Telecordia SR-332 Issue 3 @ 25°C: 2466 years

SR … Short Reach: 850 nm → 300m
LR … Long Reach: 1310 nm → 10km
ER … Extended Reach: 1550 nm → 40km

Approvals: EN60950, cUL 60950-1

EEC: -40°C - +85°C

Certificates:
https://www.doc.hirschmann.com/certificates.html

SFP+ 10 Gbit/s Twisted Pair

Usable in Dragon MACH, MSP/MSM60 and GRS106

Direct Attached Cable

Product Code	Order number	Product Description
SFP-10-DAC-05m	942 280-001	Copper SFP + Cable 0,5m
SFP-10-DAC-1m	942 280-002	Copper SFP + Cable 1m
SFP-10-DAC-2m	942 280-003	Copper SFP + Cable 2m
SFP-10-DAC-4m	942 280-004	Copper SFP + Cable 4m

2.5 Gbit/s FIBER

Currently, exclusive to DRAGON MACH,GRS1042/1142, MSP40 (MSM50Q6Q6…) and BRS50

Product Code	Order number		Wave-length	Fiber	System attenuation	Distance	Fiber data	Temperature range	MTBF
M-SFP-2.5-MM/LC EEC	942 162-001	MM	850 nm	62,5/125 µm 50/125 µm	0 – 4 dB	0-170m (OM1) 0-400m (OM2) 0-550m (OM3)	3,5 dB/km (200 MHz x km) 3,5 dB/km (500 MHz x km) 3,5 dB/km (2000 MHz x km)		
M-SFP-2.5-SM-/LC EEC	942 163-001	SM	1310nm	9/125µm	0 – 8,5 dB	0-5km			
M-SFP-2.5-SM/LC EEC	942 164-001				0 – 13 dB	0-20km	0,4 dB/km, 3,5 ps/(nm x km)		
M-SFP-2.5-SM+/LC EEC	942 165-001		1550 nm		5 – 21 dB	21-45km	0,25 dB/km, 19 ps(nm x km)		
M-SFP-2.5-LH/LC	942 220-001				14-28 dB	Typ. 80 km	0,25 dB/km, 19 ps/(nm x km)	0 - +60°C	Telcordia SR-332, Issue 1, 40°C 236 Jahre
M-SFP-2.5-LH+/LC	942 221-001				16-31 dB	Typ. 100 km	non-amplified links 0,25 dB/km, 19 ps/(nm x km)		Telcordia SR-332, Issue 2, 40°C 259 Jahre

EEC: -40°C - +85°C

SFP

1 Gbit/s

EEC: -40°C - +85°C

Safety of information technology equipment	cUL 60950-1
Shipbuilding	Germanischer Lloyd, ABS, BV, DNV, LR, KR, RINA

*with f/o adapter inline with IEE 802.3-2000 clause 38
(single-mode fiber offset-launch mode conditioning patch cord

Hint:
Autoneg not supported → OFF: 100 MB, 2,5 GB
Autoneg 1 GB: on both locations ON
(both locations OFF)

Product Code	Order number		Wave-length	Fiber	System attenuation	Distance	Transmit Power max.	Transmit Power min	Receiver sensitivity	Max. Optical Input Power
M-SFP-SX/LC	943 014-001	MM	850nm	G 62,5/125 BLP:200 MHz*km G50/125 BLP:400 MHZ*km	0-7,5dB	0-275m 0-550m	-4,0dBm	-9,5dBm	-20dBm	0dBm
M-SFP-SX/LC EEC	943 896-001									
M-SFP-LX/LC	943 015-001	MM SM	1310nm	G62,5/125 G50/125 S9/125	0-10,5dB	0-550m* 0-550m* 0-20km	-3dBm	-9,5dBm	-20dBm	-3dBm
M-SFP-LX/LC EEC	943 897-001									
M-SFP-MX/LC EEC	942 108-001	MM		G62,5/125 G50/125 (800MHz/km)	0-12dB	0-500m 0-1,5km	-3dBm	-9dBm	-17dBm	-3dBm
M-SFP-LX+/LC	942 023-001	SM		S9/125	5-20dB	14-42km	+2dBm	-3dBm	-23dBm	-3dBm
M-SFP-LX+/LC EEC	942 024-001									
M-SFP-LH/LC	943 042-001		1550nm		5-22dB	23-80km (0,25dB/km)	+5dBm	0dBm	-22dBm	0dBm
M-SFP-LH/LC EEC	943 898-001									
M-SFP-LH+/LC	943 049-001				15-30dB	60-108km (0,25dB/km) 71-128km (0,21dB/km)	+5dBm	0dBm	-30dBm	-10dBm
M-SFP-LH+/LC EEC	942 119-001				13-32dB	52-116km (0,25dB/km) 62-138km (0,21dB/km	+5dBm	0dBm	-32dBm	-8dBm
M-SFP-BIDI Bundle LX/LC EEC	943 974-101		A:1310nm B:1550nm		0-11dB	0-20km (0,25dB/km)	-3dBm		-20dBm	
M-SFP-BIDI Bundle LH/LC EEC	943 975-101		A:1490nm B:1590nm		5-24dB	23-80km (0,25dB/km)				

SFP

100 Mbit/s

Shipbuilding Germanischer Lloyd

EEC: -40°C - +85°C

Product Code	Order number		Wave-length	Fiber	System attenuation	Distance	Transmit Power max	Transmit Power min	Receiver sensitivity
M-FAST SFP-MM/LC	943 865-001	MM	1310nm	G62,5/125 G50/125	0-11dB 0-8dB	0-4km (1,0dB/km, 500 MHz*km) 0-5km (1,0dB/km, 800MHz*km)	-14dBm (62,5/125)	-20dBm (62,5/125) -23,5dBm (50/125)	-31dBm
M-FAST SFP-MM/LC EEC	943 945-001								
M-FAST SFP-SM/LC	943 866-001	SM		S9/125	0-13dB	0-25km (0,4dB/km)	-8dBm	-15dBm	-28dBm
M-FAST SFP-SM/LC EEC	943946-001								
M-FAST SFP-SM+/LC	943 867-001				10-29dB	25-65km	0dBm	-5dBm	-34dBm
M-FAST SFP-SM+/LC EEC	943 947-001								
M-FAST SFP-LH/LC	943 868-001		1550nm		10-29dB	47-104km (0,25dB/km) 55-140km (0,18dB/km)	0dBm	-5dBm	-34dBm
M-FAST SFP-LH/LC EEC	943 948-001								

SFP

Entry-Level SPF

	100 Mbit/s		1.000 Mbit/s
	SFP-FAST-MM/LC 942 194-001 SFP-FAST-MM/LC EEC 942 194-002 (Multimode)	SFP-FAST-SM/LC 942 195-001 SFP-FAST-SM/LC EEC 942 195-002 (Singlemode)	SFP-GIG-LX/LC 942 196-001 SFP-GIG-LX/LC EEC 942 196-002 (Singlemode)
Transmit Power max.	-14dBm	-8dBm	-2dBm
Transmit Power min.	-20dBm	-15dBm	-8dBm
Center wavelength	1310 nm	1310 nm	1310 nm
Receiver sensitivity	-32dBm	-34dBm	-23dBm
Maximum Optical Input Power	dBm	dBm	dBm
Optical budget	0-8dB	0-13dB	0 – 10,5dB
Maximum Link Span	0 – 2km GI 50/125	0 – 30km SM 9/125	0 – 20km SM 9/125

Approvals

Safety of information technology equipment	cUL 60950-1

SFP Dust-Cover (25 pcs.)
943 942-001

Fiber cable types and limitations

Name	Diameter	Bandwith	100 Mbit/s	1.000 Mbit/s
OM1	62,5/125 µm	200 MHz x km	4km	275m
OM2	50/125 µm	500 MHz x km	5km	550m
OM3	50/125 µm	2.000 MHz x km	5km	550m
OM4	50/125 µm	4.700 MHz x km	5km	1km
OS1/OS2	9/125 µm		150km	120km

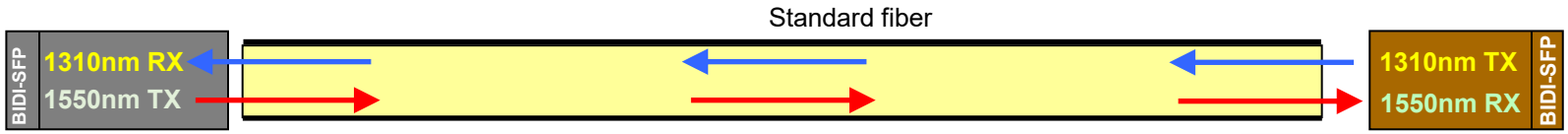
Twisted Pair (RJ45) SFP

M- SFP-TX/RJ45 (943 977-001) M-SFP-TX/RJ45 EEC (942 161-001)	Gigabit RJ45 SFP
M- FAST SFP-TX/RJ45 (942 098-001) M-FAST SFP-TX/RJ45 EEC (942 098-002)	FastEthernet RJ45 SFP

SFP

Entry-Level BIDI-SPF

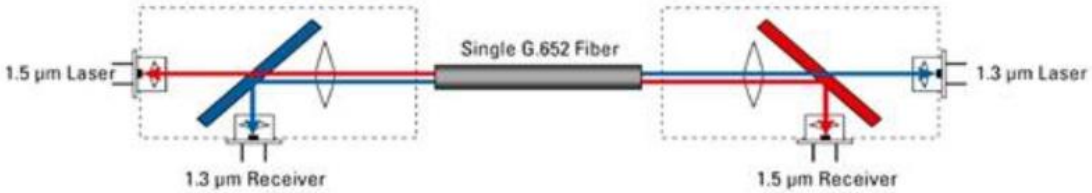
100 Mbit/s



Only one fiber to send **and** receive

EEC: -40°C - +85°C

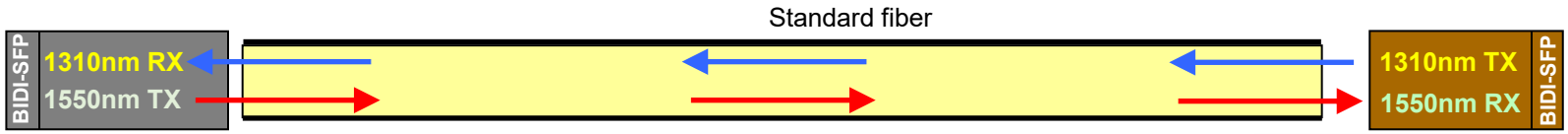
Product Code	Order number		Wave-length	Fiber	System attenuation	distance	Fiber data	Temperature range	Approvals
SFP-FAST-BA MM/LC EEC	942 204-001	MM	TX 1310 nm; RX 1550 nm	50/125 µm	0-16 dB	0-2 km	1,0 dB/km, 800 MHz*km	-40 - +85°C	EN60950, cUL 60950-1
SFP-FAST-BA MM/LC EEC	942 204-001	MM	TX 1310 nm; RX 1550 nm	62,5/125 µm	0-16 dB	0-2 km	1,0 dB/km, 500 MHz*km	-40 - +85°C	EN60950, cUL 60950-1
SFP-FAST-BB MM/LC EEC	942 204-002	MM	TX 1550 nm; RX 1310 nm	50/125 µm	0-16 dB	0-2 km	1,0 dB/km, 800 MHz*km	-40 - +85°C	EN60950, cUL 60950-1
SFP-FAST-BB MM/LC EEC	942 204-002	MM	TX 1550 nm; RX 1310 nm	62,5/125 µm	0-16 dB	0-2 km	1,0 dB/km, 500 MHz*km	-40 - +85°C	EN60950, cUL 60950-1
SFP-FAST-BA SM/LC EEC	942 205-001	SM	TX 1310 nm; RX 1550 nm	9/125 µm	0-18 dB	0-20 km	0,4 dB/km, 3,5 ps/(nm*km)	-40 - +85°C	EN60950, cUL 60950-1
SFP-FAST-BB SM/LC EEC	942 205-002	SM	TX 1550 nm; RX 1310 nm	9/125 µm	0-18 dB	0-20 km	0,25 dB/km, 19 ps/(nm*km)	-40 - +85°C	EN60950, cUL 60950-1
SFP-FAST-BA SM+/LC EEC	942 206-001	SM	TX 1310 nm; RX 1550 nm	9/125 µm	0-29 dB	0-60 km	0,4 dB/km, 3,5 ps/(nm*km)	-40 - +85°C	EN60950, cUL 60950-1
SFP-FAST-BB SM+/LC EEC	942 206-002	SM	TX 1550 nm; RX 1310 nm	9/125 µm	0-29 dB	0-60 km	0,25 dB/km, 19 ps/(nm*km)	-40 - +85°C	EN60950, cUL 60950-1



SFP

Entry-Level BIDI-SPF

1.000 Mbit/s



Only one fiber to send **and** receive

EEC: -40°C - +85°C

Product Code	Order number		wave-length	fiber	System attenuation	Distance	Fiber data	Temperature range	Approvals
SFP-GIG-BA LX/LC EEC	942 207-001	SM	TX 1310 nm; RX 1550 nm	9/125 µm	0–15 dB	0 - 20 km	0,4 dB/km, 3,5 ps/(nm*km)	-40 - +85°C	EN60950, cUL 60950-1
SFP-GIG-BB LX/LC EEC	942 207-002	SM	TX 1550 nm; RX 1310 nm	9/125 µm	0–15 dB	0 - 20 km	0,25 dB/km, 19 ps/(nm*km)	-40 - +85°C	EN60950, cUL 60950-1
SFP-GIG-BA LX+/LC EEC	942 208-001	SM	TX 1310 nm; RX 1550 nm	9/125 µm	3-20 dB	12 - 40 km	0,4 dB/km, 3,5 ps/(nm*km)	-40 - +85°C	EN60950, cUL 60950-1
SFP-GIG-BB LX+/LC EEC	942 208-002	SM	TX 1550 nm; RX 1310 nm	9/125 µm	3-20 dB	12 - 40 km	0,25 dB/km, 19 ps/(nm*km)	-40 - +85°C	EN60950, cUL 60950-1
SFP-GIG-BA LH/LC EEC	942 209-001	SM	TX 1490 nm; RX 1550 nm	9/125 µm	4-24 dB	19 - 80 km	0,25 dB/km, 19 ps/(nm*km)	-40 - +85°C	EN60950, cUL 60950-1
SFP-GIG-BB LH/LC EEC	942 209-002	SM	TX 1550 nm; RX 1490 nm	9/125 µm	4-24 dB	19 - 80 km	0,25 dB/km, 19 ps/(nm*km)	-40 - +85°C	EN60950, cUL 60950-1
M-SFP-BIDI Type A LX/LC EEC	943 974-001	SM	TX 1310 nm; RX 1550 nm	9-125 µm	0-11 dB	0 – 20 km	0,4 dB/km; D = 3,5ps(nm*km)	-40 - +85°C	
M-SFP-BIDI Type B LX/LC EEC	943 974-002	SM	TX 1550 nm; RX 1310 nm	9-125 µm	0-11 dB	0 – 20 km	0,4 dB/km; D = 3,5ps(nm*km)	-40 - +85°C	
M-SFP-BIDI Type A LH/LC EEC	943 975-001	SM	TX 1490 nm; RX 1590 nm	9-125 µm	5 -24 dB	23-80 km	0,25dB/km; D = 19ps (nm*km)	-40 - +85°C	
M-SFP-BIDI Type B LH/LC EEC	943 975-002	SM	TX 1590 nm; RX 1490 nm	9-125 µm	5-24 dB	23-80 km	0,25dB/km; D = 19ps (nm*km)	-40 - +85°C	

RAIL POWER SUPPLIES

RPS15 943 662-015

Input data	AC 100-240V; 50-60Hz AC Input Current 0,28A DC 110-300V
Output data	DC 24-28V 0,63A (24V); 0,54A (28V)
AC Input Current	0,17A at 230V AC

RPS30 943 662-003

Input data	100-240V AC; 47 to 63Hz or 85 to 375 DC Max. 0,35A at 296V AC Activation current: <36A at 240V AC
Output data	24V DC (-0,5%, +0,5%) 1,3A at 100 – 240V AC
Current consumption	Max. 0,35 A at 296 V AC

RPS80 EEC 943 662-080

Input data	100-240V AC(+/-15%); 50-60Hz or 110 to 300V DC (-20/+25%) Activation current: <13A at 230V AC
Output data	24-28V DC (typ. 24,1 V) external adjustable 3,4 -3,0 A continous Min 5,0 – 4,5A for typ. 4 sec
Current consumption	Max. 1,0 – 1,8 A at 100-240 V AC Max. 0,85 – 0,3 A at 110-200 V DC

RPS120EEC (CC) 943 662-121

Input data	100-240V AC; (-15/+10%) 50 to 60Hz or 110 to 300V DC (+/- 20%) Max. 1,4 - 0,65 A at 100-240V AC Max. 1,2 – 0,45 A at 120 – 300V DC Activation current: < 15A at 100 and 230V AC
Output data	24-28V DC (typ. 24,1 V); externally adjustable Min. 5 – 4,5 A continous 7,5 – 6,7A for 4 sec
Current consumption	Max. 1,4-0,65 A at 100-240 V AC Max. 1,2 -0,45 A at 120-300V DC

Last order: 31.10.2020

RPS60/48V EEC 943 952-001

60 Watt

Input data	**100-240V AC**; 50-60Hz or 85 to 264V DC; 47-63Hz (DC 100 to 375V) Max. 0,7A at 230V AC; max. 1,3A at 100V AC Activation current: <40A at 264V AC
Output data	47-52V DC (typ. 48V); externally adjustable 1,25A static at 48V nominal 1,88A (150% of nominal load) for max. 2,5 sec)
Current consumption	Max. 0,7A at 230V; max. 1,3A at 100V

RPS260/PoE EEC 942 200-001

260 Watt

Input data	**100-240V AC**; 50-60Hz or 110-150V DC
Output data	48-56V DC
Current consumption	Input inrush current: 6/9A (120/230V AC)
Temp. range	-25° to +70°C

RPS480/PoE EEC 942 201-001

480 Watt

Input data	**100-240V AC**; 50-60Hz or 110-150V DC
Output data	48-56V DC
Current consumption	-25° to +70°C

PC150/72V/48V-IP67

Input data	Rated voltage: **72V DC / 96V DC / 110V DC** Voltage range: **72 - 110V DC** Input current: **1,5 – 2,4A DC** Fuse: **6,3 A (T)**
Output data	Output voltage: **48V DC (0 to +2% accuracy)** Output current (max.): **3,2A**

Last order: 31.10.2020

RPS90/48V LV 943 980-001

Input data	**24V DC** (4,2A) 48V DC (2,1A)
Output data	48-54V DC (typ. 48V); externally adjustable 1,25A static at 48V nominal 1,88A (150% of nominal load) for max. 2,5 sec
Current consumption	24 V DC (4,2 A); 48 V DC (2,1 A)

Last order: 31.10.2020

RPS90/48 HV 943979-001

Input data	**100-240V AC**; 50-60Hz or 85 to 264V DC; 47-63 Hz (DC 100 to 375V)
Output data	48-54V DC (typ. 48V); esternally adjustable 1,9A static at 48V nominal 1,88A (150% of nominal load) for max. 2,5 sec
Current consumption	60V DC (1,7A); 250V DC (0,4A) 110V AC (1,0A); 230V AC (0,5A)

90 Watt

PC150/36V/48V-IP67

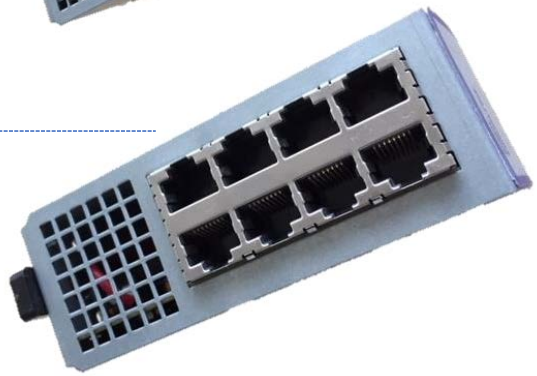
Input data	Rated voltage range: 24V DC to 48V DC Rated input current: 8.0A DC to 3.8A DC Fuse (exchangable): **16A** (T)
Output data	Output voltage: **48V DC** (0 to +2% accuracy) Output current (max.): **3,2A**

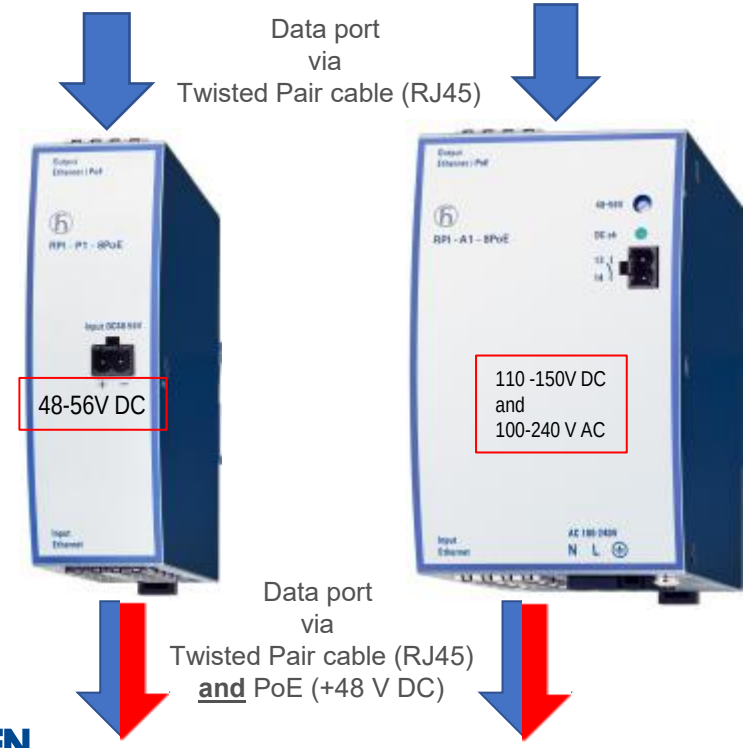
PC150/72V/48V-IP67

Input data	Rated voltage range: 72V DC to 110V DC Rated input current: 2.4A DC to 1.5A DC Fuse (exchangable): **6.3A** (T)
Output data	Output voltage: **48V DC** (0 to +2% accuracy) Output current (max.): **3,2A**

POE INJECTORS

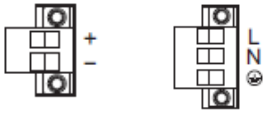
Product	Order number	Port type	Power consumption	Operating Voltage	Operating Temperature
RPI-P1-4PoE	942 227-001	4x FE/GE ports à 30W	125 W	48-56 V DC	-40°C to +85°C
RPI-A1-4PoE	942 226-001	4x FE/GE ports à 30W	160 W	110 -150V DC and 100-240 V AC	-25°C to +70°C
RPI-P1-8PoE	942 225-001	8x FE/GE ports à 30W	245 W	48-56 V DC	-40°C to +85°C
RPI-A1-8PoE	942 224-001	8x FE/GE ports à 30W	290 W	110 -150V DC and 100-240 V AC	-25°C to +70°C





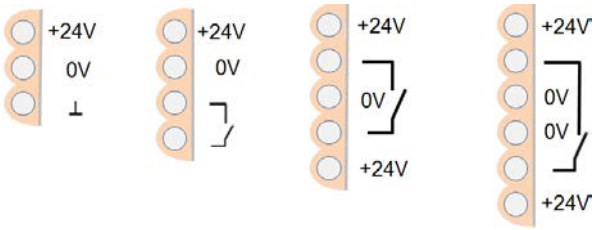
POWER BLOCKS

Order code

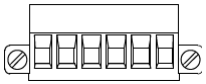


GRS Greyhound
RSR20/30 („C“)
RSP2x/3x („CC“)
LV power supply

GRS Greyhound
RSR20/30 („K“)
RSP2x/3x (KK“,“K9“)
HV power supply



Screw tork



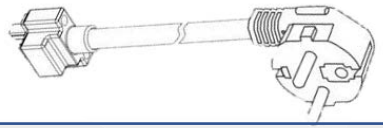
name	order number	type	product
Terminal block 5 pin + interlock (50 pcs)	943 845-001	5 pin interlock (screw)	Rail RS2-xx/xx, MSP
Terminal block 6 pin + interlock (50 pcs)	943 845-002	6 pin interlock (screw)	MICE MS2108/MS3124, SPIDER PL, EAGLE One, RED25, BRS
Terminal block 5 pin green (50 pcs)	943 845-003	5 pin snap (green)	Rail RS unmanaged
Terminal block 4 pin black (50 pcs)	943 845-004	4 pin snap	Power MICE MS4128, MS20/30 (Option „E“)
Terminal block 3 pin (50 pcs)	943 845-005	3 pin snap	SPIDER I + II, SPIDER III-SL, GECKO
Terminal block 6 pin (50 pcs)	943 845-006	6 pin snap	Rail RS20/30/40, RSB
Terminal block 4 pin (50 pcs)	943 845-007	4 pin snap with coding	MICE MS20/MS30
Terminal block 3 pin (50 pcs)	943 845-008	3 pin power (screw)	RSR/MACH1000/RSP/GRS (HV power supply); MSM46 (PoE media modul), EAGLE20/30 („K9“,“KK“)
Terminal block 2 pin (50 pcs)	943 845-009	2 pin power (screw)	RSR/PoE-PS/RSP/GRS (LV power supply), BAT867, OpenBAT, RPS90/48V LV, EAGLE20/30 („CC“), GRS1040 (Option „HL“), RSP, RSPE
Terminal block 2 pin (50pcs)	943 845-010	2 pin relay (screw)	RSR/MACH100/1000-signal contact, RSP/RSPL/RSPS-Signal contact, EAGLE20/30-Signal contact, GRS1040-signal contact,
Terminal block 3 pin (50 pcs), screw	943 845-011	3 pin power (screw)	MACH1000 (LV power supply)
Terminal block 4 pin (50 pcs)	943 845-012	4 pin power	BAT-54, BAT300
Terminal block 6 pin (50 pcs), screw	943 845-013	5 pin power (screw)	EagleOne, SPIDER III-PL, RED25
Terminal block 4 pin (10 pcs), + interlock	942 272-103	4 pin power (screw)	MSP30/40
Power cord	942 000-001	3 pin power moulded (screw)	RSR/MACH1000/Greyhound/RSP (HV power supply)
Power cord	942 067-001 (1,5m) 942 067-101 (2,5m)	3 pin power (screw) + Schuko	RSR/MACH1000/Greyhound/RSP (HV power supply)

ACCESSORIES

Rail Power Supplies Accessorie

Power cord (942 000-001) for pluggable connection
for the power supply of GRS1042/MACH1000 family and RSP/RSR20/30; cable length 2meters

Power cord that has a CEE 7/4 plug (Schuko) at one end
(942 067-001; 1,5m 942 067-101; 2,5m) for pluggable connection
for the power supply of MACH1000-, Greyhound -, RSR20/30 -, RSP-family.

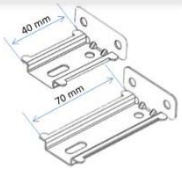


19“ DIN Rail Adapter

943 766-002

SPIDER III, DIN rail wall mounting (40mm) 942 177-001

SPIDER III, DIN rail wall mounting (70mm) 942 177-002



SFP tool, to unplug SFP from a slot (OCTOPUS/BAT) 942 079-001

Dust Cover

RJ45 Dust-Cover (50 pcs.)
943 936-001

SFP Dust-Cover (25 pcs.)
943 942-001

OCTOPUS Dust cap (25 pcs.)
942 057-001

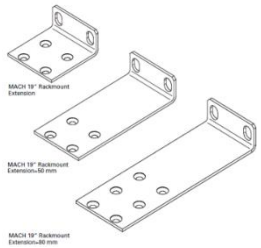
MACH4000, M4-Rackmount (10pcs.)
943 951-101
60mm x 88mm x 19mm

MACH4000, M4-Rackmount (10pcs.)
943 951-001
110mm x 88mm x 19mm

MACH100/1000, Greyhound fixing brackets (2pcs.)
943 943-001
47mm x 44mm x 19mm

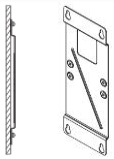
MACH100/1000, Greyhound fixing brackets (2pcs.)
943 943-101
97mm x 44mm x 19mm

MACH100/1000, Greyhound fixing brackets (2pcs.)
943 943-201
127mm x 44mm x 19mm



OZD HA Rail-Adapter, Last order date: 31.10.2024
Mechanical adapter for the plug-on modules
933 920-001

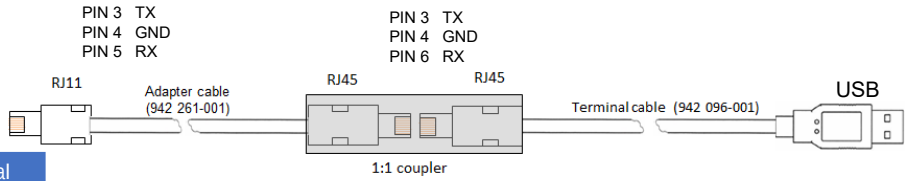
Wall Mounting Plate for Screw Mounting
The wall mounting plate is suitable for the following devices: RSP/RSPL/RSPS; EAGLE20/30

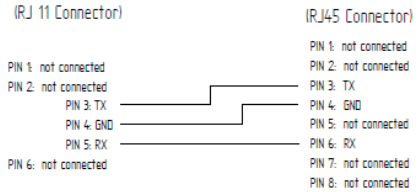


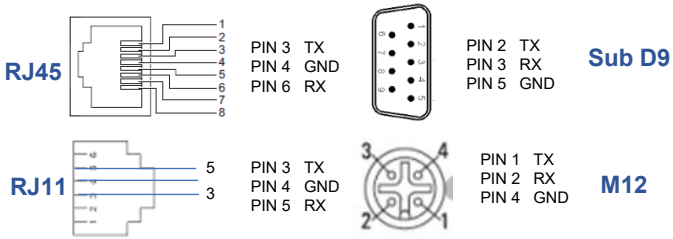
SUPPORTED TERMINAL CABLE

Especially PIN assignement
„CISCO Terminal cable“

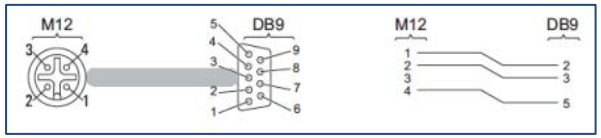
Product Family	Terminal Cable RJ11 to DB9 943 301-001	Terminal Cable RJ45 to USB 942 096-001	Terminal Cable RJ45 to DB9 942 097-001	Adapter Cable M12 to USB 942 199-001	Terminal Cable M12-4pin to DB9 943 902-001	Terminal Cable M12-8pin to DB9 942 087-001	Terminal Cable 942 097-001
RSB	X			Adapter cable to connect an Autoconfiguration Adapter (ACA21 M12 or ACA22 M12) to an USB- interface of your computer			
RS20/30/40	X						
RSR	X						
MS20/30	X						
MSP30/40		X	X				
RED	X						
RSP/RSPL/RSPS/RSPE	X						
MACH100	X						
MACH1000	X						
MACH4000	X						
Dragon MACH4000/4500		X					
GRS1020/1030/1040		X	X				
OCTOPUS (Platform 4)					X		
OCTOPUS II/III (HiOS)					X		
EagleOne	X						
EAGLE20/30	X						
EAGLE40-03		X					
EAGLE40-07							X
OpenBAT-R/-F						X	
BAT450-F					X		





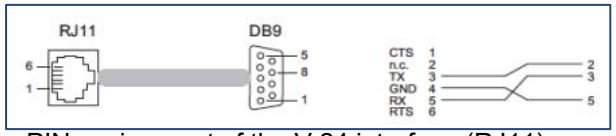


Terminal cable: M12 on Sub-D9 943 902-001



PIN assignment of the V.24 interface(M12) and wiring to the DB9 connector

Terminal cable: RJ11 on Sub-D9 943 301-001



PIN assignment of the V.24 interface (RJ11) and wiring to the DB9 connector

942 902-001
M12 D-coded male

BXS, Adapter cable
942 309-001
M12 5-pin/A-coded Male to USB

942 199-001
M12 D-coded female

VT 100 terminal settings

Speed	9,600 Baud
Data	8 Bit
Stopbit	1 Bit
Handshake	OFF
Parity	none

BELDEN

2024-03

SUPPORTED AUTO-CONFIGURATION ADAPTERS

Product Family	ACA11-RJ11 EEC	ACA11-M12 EEC	ACA21-M12 EEC	ACA21-USB EEC	ACA22A-	ACA22-M12 EEC	ACA22-M12-C	ACA22-USB EEC	ACA22-USB-C EEC	ACA31
SPIDER III PL				X	X			X		
OCTOPUS 8TX			X			X				
RS20/30/40	X*			X	X			X		
RSR				X	X			X		
MS20/30	X*			X	X			X		
MSP30					X			X		X
MSP40					X			X		X
Bobcat BRS									X	
BXS						x				
RED25				X	X			X		
RSP/RSPL/RSPS										X
RSPE				X	X			X		X
MACH100				X	X			X		
MACH1000				X	X			X		
MACH4000				X	X			X		
DRAGON MACH					X			X		X
GRS103									X	
GRS105/106									X	X
GRS1020/1030				X	X			X		
GRS1042					X			X		X
OCTOPUS			X			X				
OCTOPUS II			X			X				
EagleOne				X						
EAGLE20/30								X		X
OpenBAT-R				X				X		
OpenBAT-F			X			X				
BAT450-F		X								

ACA22-M12-C (EEC) 942 306-001
512MB USB 2.0

ACA 22-M12 (EEC) 942 125-001
512MB USB 2.0

ACA 21-M12 (EEC) 943 913-003
64MB USB 1.1

ACA 22A Mini 942 152-001
512MB USB 2.0

ACA 22-USB EEC 942 124-001
512MB USB 2.0

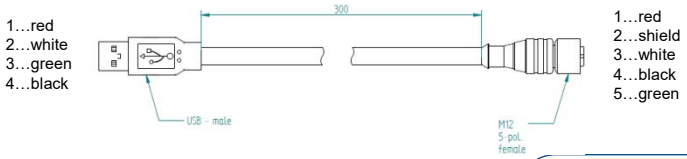
USB-A

ACA 21-USB (EEC) **USB-C**
64MB USB1.1

ACA 22-USB-C EEC 942 239-001

ACA 31 942 074-001

Adapter cable M12 – USB cable 942 199-001
Adapter cable to connect an ACA2x M12 to an USB-interface of a computer



* limited write support

POWER CONSUMPTION – POWER OUTPUT

Device name	Max. power consumption	Power output
SPIDER II 8TX	4,1 W	14,0 Btu (IT)/h
SPIDER II 8TX EEC	5,8 W	19,8 Btu (IT)/h
SPIDER II 8TX/1FX EEC	6,3 W	21,5 Btu (IT)/h
SPIDER II 8TX/2FX EEC	8,4 W	28,7 Btu (IT)/h
SPIDER II 8TX/1FX-SM EEC	7,0 W	23,9 Btu (IT)/h
SPIDER II 8TX 1FX-ST EEC	7,0 W	23,9 Btu (IT)/h
SPIDER II 8TX/2FX-SM EEC	8,4 W	28,7 Btu (IT)/h
SPIDER II 8TX/2FX-ST EEC	8,4 W	28,7 Btu (IT)/h
SPIDER II GIGA 5T EEC	3,6 W	12,1 Btu (IT)/h
SPIDER II GIGA 5T/2S EEC	6,6 W	21,6 Btu (IT)/h
SPIDER II GIGA 5T EEC PRO	3,6 W	12,1 Btu (IT)/h
SPIDER II GIGA 5T/2S EEC PRO	6,6 W	21,6 Btu (IT)/h
SPIDER II GIGA 5T EEC JUMBO	3,6 W	12,1 Btu (IT)/h
SPIDER II GIGA 5T/2S EEC JUMBO	6,6 W	21,6 Btu (IT)/h
SPIDER II 8TX PoE non PD (powered device)	4,6 W	15,7 Btu (IT)/h
SPIDER II 8TX PoE 4x Class 0-PD (powered device)	74,9 W	255,5 Btu (IT)/h
GECKO	2,35 W	8,0 BTU (IT)/h
SPIDER Giga 2TX PoE EEC	33,8 W	115,4 BTU (IT)/h

Device name	Max. power consumption	Power output in Btu (IT)/h
SPIDER III PL-20-01...HH	3,8 W	13,1
SPIDER III PL-20-01...HV	4,4 W	15,1
SPIDER III PL-20-04...HH	4,3 W	14,7
SPIDER III PL-20-04..HV	4,9 W	16,7
SPIDER III PL-20-05...HH	2,4 W	8,0
SPIDER III PL-20-05...HV	3,0 W	10,4
SPIDER III PL-20-06....HH	9,0 W	30,7
SPIDER III PL-20-06....HV	8,6 W	29,5
SPIDER III PL-20-07....HH	6,9 W	23,7
SPIDER III PL-20-07...HV	6,9 W	23,5
SPIDER III PL-20-08...2....HH	5,0 W	16,9
SPIDER III PL-20-08...2...HV	5,2 W	17,7
SPIDER III PL-20-08..99...HH	2,6 W	8,8
SPIDER III PL-20-08..99...HV	3,1 W	10,6
SPIDER III PL-40-01...HH	4,0 W	13,8
SPIDER III PL-40-01..HV	4,7 W	16,0
SPIDER III PL-40-04...HH	5,9 W	20,0
SPIDER III PL-40-04...HV	6,1 W	21,0

Device name	Max. power consumption	Power output in Btu (IT)/h
SPIDER III SL-20-01T1...	2,0	7,0
SPIDER III SL-20-04T1..	2,4	8,3
SPIDER III SL-20-05T1...	1,3	4,6
SPIDER III SL-20-06T1.....9	2,8	9,5
SPIDER III SL-20-06T1.....2	3,8	12,8
SPIDER III SL-20-08T1...	1,5	5,3
SPIDER III SL-40-05T1...	4,0	13,7
SPIDER III SL-40-06T1....99..	8,7	29,6
SPIDER III SL-40-06T1....O6..	13,3	45,4
SPIDER III SL-40-08T1...	5,0	17,1
SPIDER III SL-20-01T1...	2,0	7,0
SPIDER III SL-20-04T1..	2,4	8,3
SPIDER III SL-20-05T1...	1,3	4,6
SPIDER III SL-20-06T1.....9	2,8	9,5
SPIDER III SL-20-06T1.....2	3,8	12,8
SPIDER III SL-20-08T1...	1,5	5,3
SPIDER III SL-40-05T1...	4,0	13,7
SPIDER III SL-40-06T1....99..	8,7	29,6

POWER CONSUMPTION – POWER OUTPUT

Device name		Device model	Maximum power consumption	Power output
2 uplink ports:				
RS20-0400...		2xTX port	5.3 W	18.1 Btu (IT)/h
RS20-0400...		1xFX port, 1xTX port	6.5 W	22.2 Btu (IT)/h
RS20-0400...		2xFX port	7.7 W	26.3 Btu (IT)/h
RS20-0800...	RS22-0800...	2xTX port	5.3 W	18.1 Btu (IT)/h
RS20-0800...	RS22-0800...	1xFX port, 1xTX port	6.5 W	22.2 Btu (IT)/h
RS20-0800...	RS22-0800...	2xFX port	7.7 W	26.3 Btu (IT)/h
RS20-1600...	RS22-1600...	2xTX port	9.4 W	32.1 Btu (IT)/h
RS20-1600...	RS22-1600...	1xFX port, 1xTX port	10.6 W	36.2 Btu (IT)/h
RS20-1600...	RS22-1600...	2xFX port	11.8 W	40.3 Btu (IT)/h
RS20-2400-...	RS22-2400-...	2xTX port	12.1 W	41.3 Btu (IT)/h
RS20-2400-...	RS22-2400-...	1xFX port, 1xTX port	13.3 W	45.4 Btu (IT)/h
RS20-2400-...	RS22-2400-...	2xFX port	14.5 W	52.9 Btu (IT)/h
RS30-0802-...	RS32-0802-...	2xTX port	8.9 W	30.4 Btu (IT)/h
RS30-0802-...	RS32-0802-...	1xFX port, 1xTX port	8.6 W	29.4 Btu (IT)/h
RS30-0802-...	RS32-0802-...	2xFX port	8.3 W	28.4 Btu (IT)/h
RS30-1602-...	RS32-1602-...	2xTX port	13.0 W	44.4 Btu (IT)/h
RS30-1602-...	RS32-1602-...	1xFX port, 1xTX port	12.7 W	43.4 Btu (IT)/h
RS30-1602-...	RS32-1602-...	2xFX port	12.4 W	42.4 Btu (IT)/h
RS30-2402-...	RS32-2402-...	2xTX port	15.7 W	53.6 Btu (IT)/h
RS30-2402-...	RS32-2402-...	1xFX port, 1xTX port	15.4 W	52.6 Btu (IT)/h
RS30-2402-...	RS32-2402-...	2xFX port	15.1 W	51.6 Btu (IT)/h
3 uplink ports:				
RS20-0900-...	RS22-0900-...	3xFX port	9.6 W	32.8 Btu (IT)/h
RS20-1700-...	RS22-1700-...	3xFX port	13.7 W	46.7 Btu (IT)/h
RS20-2500-...	RS22-2500-...	3xFX port	16.4 W	56.0 Btu (IT)/h
4 uplink ports:				
RS30-0802-...	RS32-0802-...	4xFX port	12.7 W	43.3 Btu (IT)/h
RS30-1602-...	RS32-1602-...	4xFX port	16.8 W	57.3 Btu (IT)/h
RS30-2402-...	RS32-2402-...	4xFX port	19.5 W	66.5 Btu (IT)/h
RS40-...		4xFX port	20.0 W	68.2 Btu (IT)/h

Power consumption/power output RS20/RS30/RS40 and RS22/RS32 without PDs

Device name	Device model	Maximum power consumption	Power output
2 uplink ports:			
RS22-0800...	2xTX port	70.9 W	31.8 Btu (IT)/h
RS22-0800...	1xFX port, 1xTX port	72.1 W	35.9 Btu (IT)/h
RS22-0800...	2xFX port	73.3 W	40.0 Btu (IT)/h
RS22-1600...	2xTX port	75.0 W	45.8 Btu (IT)/h
RS22-1600...	1xFX port, 1xTX port	76.2 W	49.9 Btu (IT)/h
RS22-1600...	2xFX port	77.4 W	54.0 Btu (IT)/h
RS22-2400-...	2xTX port	77.7 W	55.0 Btu (IT)/h
RS22-2400-...	1xFX port, 1xTX port	78.9 W	59.1 Btu (IT)/h
RS22-2400-...	2xFX port	80.1 W	66.6 Btu (IT)/h
RS32-0802-...	2xTX port	74.5 W	44.1 Btu (IT)/h
RS32-0802-...	1xFX port, 1xTX port	74.2 W	43.1 Btu (IT)/h
RS32-0802-...	2xFX port	73.9 W	42.1 Btu (IT)/h
RS32-1602-...	2xTX port	78.6 W	58.1 Btu (IT)/h
RS32-1602-...	1xFX port, 1xTX port	78.3 W	57.1 Btu (IT)/h
RS32-1602-...	2xFX port	78.0 W	56.1 Btu (IT)/h
RS32-2402-...	2xTX port	81.3 W	67.3 Btu (IT)/h
RS32-2402-...	1xFX port, 1xTX port	81.0 W	66.3 Btu (IT)/h
RS32-2402-...	2xFX port	80.7 W	65.3 Btu (IT)/h
3 uplink ports:			
RS22-0900-...	3xFX port	75.2 W	46.5 Btu (IT)/h
RS22-1700-...	3xFX port	79.3 W	60.4 Btu (IT)/h
RS22-2500-...	3xFX port	82.0 W	69.7 Btu (IT)/h
4 uplink ports:			
RS32-0802-...	4xFX port	78.3 W	57.0 Btu (IT)/h
RS32-1602-...	4xFX port	82.4 W	71.0 Btu (IT)/h
RS32-2402-...	4xFX port	85.1 W	80.2 Btu (IT)/h

Power consumption/power output RS22/RS32 with 4x Class 0 PD

POWER CONSUMPTION – POWER OUTPUT

Device name MS family	Power consumption	Power output
MS20-0800..A	5,0 W	17,1 Btu (IT)/h
MS20-0800…C.. MS20-0800…E..	7,4 W	25,4 Btu (IT)/h
MS30-0802…A..	5,6 W	19,2 Btu (IT)/h
MS30-0802…C..	8,6 W	29,6 Btu (IT)/h
MS20-1600…A..	12 W	40,0 Btu (IT)/h
MS20-1600…C..	15,6 W	52,2 Btu (IT)/h
MS30-1602…A..	12,6 W	41,1 Btu (IT)/h
MS30-1602…C..	16,8 W	56,7 Btu (IT)/h
MS20-2400…A..	12,0 W	40,0 Btu (IT)/h
MS20-2400…C..	16,8 W	56,7 Btu (IT)/h
MS30-2402…A..	12,6 W	42,1 Btu (IT)/h
MS30-2402…C..	18,0 W	60,9 Btu (IT)/h

Device name media modules	Power consumption	Power output
MM23-S2S2T1T1	5,5 W	18,8 Btu (IT)/h
MM23-F4F4T1T1	5,5 W	18,8 Btu (IT)/h
MM30-07070707	9,0 W	30,8 Btu (IT)/h
MM30-07079999	5,8 W	19,8 Btu (IT)/h
MM33-07079999	7,5 W	25,6 Btu (IT)/h

	Power consumption	Power output
MICE 2000 media modules:		
MM2-4TX1	0.8 W	2.8 Btu (IT)/h
MM2-4TX1-EEC	0.8 W	2.8 Btu (IT)/h
MM2-4FXM3	6.8 W	23.2 Btu (IT)/h
MM2-2FXM3 / 2TX1	3.8 W	13.0 Btu (IT)/h
MM2-2FXM2	3.8 W	13.0 Btu (IT)/h
MM2-2FXS2	3.8 W	13.0 Btu (IT)/h
MICE 3000 media modules:		
MM3-2AUI	3.4 W	11.6 Btu (IT)/h
MM3-4FLM4	5.0 W	17.1 Btu (IT)/h
MM3-2FLM4 / 2TX1-RT	5.0 W	17.1 Btu (IT)/h
MM3-4TX5	0.8 W	2.8 Btu (IT)/h
MM3-4TX1-RT	0.8 W	2.8 Btu (IT)/h
MM3-1FXM2 / 3TX1	2.3 W	7.9 Btu (IT)/h
MM3-2FXM2 / 2TX1	3.8 W	13.0 Btu (IT)/h
MM3-2FXM2 / 2TX1-EEC	3.8 W	13.0 Btu (IT)/h
MM3-2FXM2 / 2TX1-RT	3.8 W	13.0 Btu (IT)/h
MM3-2FXM4 / 2TX1	3.8 W	13.0 Btu (IT)/h
MM3-4FXM2	6.8 W	23.2 Btu (IT)/h
MM3-4FXM4	6.8 W	23.2 Btu (IT)/h
MM3-1FXS2 / 3TX1	2.3 W	7.9 Btu (IT)/h
MM3-1FXS2 / 3TX1 EEC	2.3 W	7.9 Btu (IT)/h
MM3-2FXS2 / 2TX1	3.8 W	13.0 Btu (IT)/h
MM3-2FXS2 / 2TX1-EEC	3.8 W	13.0 Btu (IT)/h
MM3-4FXS2	6.8 W	23.2 Btu (IT)/h
MM3-1FXL2 / 3TX1	3.4 W	11.6 Btu (IT)/h

	Power consumption	Power output
MICE 4000 media modules:		
MM4-4TX / SFP	9.0 W	30.8 Btu (IT)/h
MM4-2TX / SFP	5.8 W	19.8 Btu (IT)/h
MM20-... 4 TX-/0 FX-Ports	0.8 W	2.8 Btu (IT)/h
MM20-... 3 TX-/1 FX-Ports	2.3 W	7.9 Btu (IT)/h
MM20-... 2 TX-/2 FX-Ports	3.8 W	13.0 Btu (IT)/h
MM20-... 0 TX-/2 FX-Ports	3.8 W	13.0 Btu (IT)/h
MM20-... 1 TX-/3 FX-Ports	5.3 W	18.1 Btu (IT)/h
MM20-... 0 TX-/4 FX-Ports	6.8 W	23.2 Btu (IT)/h
MM20-A8A89999	3.4 W	11.6 Btu (IT)/h
MM20-F4F4F4F4	5.0 W	17.1 Btu (IT)/h
MM20-Z6Z6Z6Z6	8.0 W	27.3 Btu (IT)/h
MM20-P9P9P9P9P9SAHH	8.0 W	27.3 Btu (IT)/h
MM20-P9P9T1T1SAHH	5.2 W	17.8 Btu (IT)/h
MM30-O7O7O7O7	9.0 W	30.8 Btu (IT)/h
MM30-O7O79999	5.8 W	19.8 Btu (IT)/h
MM21-T1T1T1T1	0.8 W	2.8 Btu (IT)/h
MM21-F4F4T1T1	5.0 W	17.1 Btu (IT)/h
MM21-M2M2T1T1	3.8 W	13.0 Btu (IT)/h
MM21-S2S2T1T1	3.8 W	13.0 Btu (IT)/h
MM22-T1T1T1T1	0.8 W	2.8 Btu (IT)/h
MM23-T1T1T1T1...SAHH	4.5 W	15.4 Btu (IT)/h
MM23-M2M2T1T1...SAHH	6.0 W	20.5 Btu (IT)/h
MM23-S2S2T1T1...SAHH	5.5 W	18.8 Btu (IT)/h
MM23-F4F4T1T1...SAHH	5.5 W	18.8 Btu (IT)/h
MM24-IOIOIOIO...	7,5 W	26,6 Btu (IT)/h
MM33-O7O79999...SAHH	7.5 W	25.6 Btu (IT)/h

POWER CONSUMPTION – POWER OUTPUT

Device name MSP family	Power consumption	Power output
MSP30-0804	16 W	55 Btu (IT)/h
MSP30-1604	17 W	58 Btu (IT)/h
MSP30-2404	18 W	61 Btu (IT)/h
MSP32-0804	17 W	58 Btu (IT)/h
MSP32-1604	18 W	61 Btu (IT)/h
MSP32-2404	19 W	65 Btu (IT)/h
MSP40-0012	17 W	58 Btu (IT)/h
MSP40-0020	19 W	65 Btu (IT)/h
MSP40-0028	21,5 W	73 Btu (IT)/h
MSP42-0012	18 W	61 Btu (IT)/h
MSP42-0020	19,5 W	67 Btu (IT)/h
MSP42-0028	22,5 W	77 Btu (IT)/h

MSM20 media modules		
MSM20-xxT1T1T1 (GE)	5 W	17 Btu (IT)/h
MSM20-xxT1T1T1 (FE)	4 W	14 Btu (IT)/h
MSM20-xxxxT1T1 (GE)	4 W	14 Btu (IT)/h
MSM20-xxxxT1T1 (FE)	4 W	14 Btu (IT)/h
MSM20-xxxxxxxx (GE/FE)	5 W	17 Btu (IT)/h
MSM20-T5T5T5T5 (FE)	2 W	7 Btu (IT)/h
MSM20-T5T5T5T5 (FE)	3 W	10 Btu (IT)/h
MSM22-T5T5T5T5 (FE)	3 W	10 Btu (IT)/h
MSM24-IOIOIOIO	7 W	24 Btu (IT)/h

MSM40 media modules		
MSM40-C1C1C1C1 (GE)	5 W	17 Btu (IT)/h
MSM40-C1C1C1C1 (FE)	5 W	17 Btu (IT)/h
MSM40-T1T1T1T1 (GE)	3 W	10 Btu (IT)/h
MSM40-T1T1T1T1 (FE)	2 W	7 Btu (IT)/h
MSM42/46 media modules		
MSM42-T1T1T1T1 (GE)	4 W	14 Btu (IT)/h
MSM42-T1T1T1T1 (FE)	3 W	10 Btu (IT)/h
MSM46-T1T1T1T1 (GE)	4 W	14 Btu (IT)/h
MSM46-T1T1T1T1 (FE)	3 W	10 Btu (IT)/h
MSM50 media modules		
MSM50-Q6Q6Q6Q6 (1GE)	3 W	10 Btu (IT)/h
MSM50-Q6Q6Q6Q6 (2,5GE)	4 W	14 Btu (IT)/h
MSM60-Q6Q69999 (10GE)	7W	24 Btu (IT)/h

POWER CONSUMPTION – POWER OUTPUT

Device name	Max. power consumption	Power output
RSP20-11003Z6TT..	15W	51 BTU (IT)/h
RSP20-11003Z6ZT…	18W	61 BTU (IT)/h
RSP25-11003Z6TT…	19W	65 BTU (IT)/h
RSP25-11003Z6ZT…	22W	75 BTU (IT)/h
RSP30-0803306TT…	15W	51 BTU (IT)/h
RSP30-0803306ZT…	18W	61 BTU (IT)/h
RSP35-0803306TT…	19W	65 BTU (IT)/h
RSP35-0803306ZT…	22W	75 BTU (IT)/h
RSPL20-08002Z6TT…	8W	27 BTU (IT)/h
RSPL20-08002Z6YT…	10W	34 BTU (IT)/h
RSPL30-0802207YT…	14W	47 BTU (IT)/h
RSPL30-0802207ZT…	16W	55 BTU (IT)/h
RSPS20-…2Z6YT…	10W	34 BTU (IT)/h
RSPS20-…2Z6TT…	8W	27 BTU (IT)/h
RSPS20-…2T11TT…	7W	24 BTU (IT)/h
RSPS25-…2Z6YT…	12W	41 BTU (IT)/h
RSPS25-…2Z6TT…	10W	34 BTU (IT)/h
RSPS25-…2T1TT…	9W	31 BTU (IT)/h

Device name	Max. power consumption	Power output
RSPE30	16 W	55 BTU (IT)/h
RSPE32 incl. 124W PoE output power	151W	92 BTU (IT)/h
RSPE35	18 W	61 BTU (IT)/h
RSPE37 Incl. 124W output power	153W	98 BTU (IT)/h
RSPM20-4Z64Z6	9W	31 BTU (IT)/h
RSPM20-4T14T1	2W	7 BTU (IT)/h
RSPM20-4T14Z6	5W	17 BTU (IT)/h
RSPM22-4T14T1 incl. PoE output power	2W	7 BTU (IT)/h
RSPM22-4T14Z6 incl. PoE output power	5W	17 BTU (IT)/h

POWER CONSUMPTION – POWER OUTPUT

Device name RSR family	Power consumption incl. SFP modules	Power output
3x Combo port and 6x TX port (100 Mbit/s	15 W	51 Btu (IT)/h
2x combo port, 2x SFP slot (100 Mbit/s) and 6x TX port (10/100 Mbit/s)	16 W	55 Btu (IT)/h
2x Combo port and 8x TX port (10/100 Mbit/s)	14 W	48 Btu (IT)/h
2x SFP slot (1000 Mbit/s), 2x SFP slot (100 Mbit/s) and 6x TX ports (10/100 Mbit/s)	14 W	48 Btu (IT)/h
2x SFP slot (1000Mbit/s) and 8x TX ports	12 W	41 Btu (IT)/h
3x SFP slot (1000Mbit/s) and 7x TX ports	21 W	72 Btu (IT)/h
3x FX port (100Mbit/s) and 6x TX ports	14 W	48 Btu (IT)/h
2x FX port (100Mbit/s) and 6x TX ports	12 W	41 Btu (IT)/h
8x FX port (100Mbit/s) and 6x TX ports	10 W	34 Btu (IT)/h

BAT-R --- BAT-F

Conditions	Max. power consumption	Power output
When equipped with 1 WLAN module	12,95 W	44,19 BTU (IT)/h
When equipped with 2 WLAN modules	17,5W	59,71 BTU (IT)/h

Name	Max. power consumption (W)	Max. power output (Btu; IT/h)
MAR1020-... basic device (without Fast Ethernet modules)	7,5 W	25.6 Btu (IT)/h
MAR1030-... basic device (incl. 2 Gigabit Ethernet module combo ports, without Fast Ethernet modules)	10.5 W	35.9 Btu (IT)/h
MAR 1x3y-4O... basic device (x = 0 or 1, y = 0 or 2)	11.5 W	39.2 Btu (IT)/h
MAR 1x3y-4T... basic device (x = 0 or 1, y = 0 or 2)	14.5 W	49.5 Btu (IT)/h
MAR 1x3y-OT... basic device (x = 0 or 1, y = 0 or 2)	13,0 W	44,4 Btu (IT)/h
Fast Ethernet modules		
additionally for each Fast Ethernet FX module	2,0 W	6.9 Btu (IT)/h
additionally for each Fast Ethernet TX module	0,4 W	1.4 Btu (IT)/h
additionally for each PoE module	38.0 W	130.0 Btu (IT)/h
Examples		
MAR1020-99TTTTTTTTTTTTTTTTTTTTTTTTUG9HPHH	12,3 W	42.0 Btu (IT)/h
MAR1020-99TTTTTTTTTTTTMMMMMMMMMMMMUG9HPHH	21.9 W	74.8 Btu (IT)/h
MAR1020-99MMMMMMMMMMMMMMMMMMMMMMMMUG9HPHH	31.5 W	107.5 Btu (IT)/h

Device name	Max. power consumption	Power output
EAGLE20-0400…	12W	41 BTU (IT)/h
EAGLE30-0402…	14W	48 BTU (IT)/h
EagleONE-0200T1T1…	5W	17 BTU (IT)/h
EagleONE-0200T1M2…	6W	20 BTU (IT)/h
EagleONE-0200M2T1…	6W	20 BTU (IT)/h
EagleONE-0200M2M2…	7W	24 BTU (IT)/h

POWER CONSUMPTION – POWER OUTPUT

Device name	Max. power consumption	Power output
GRS1020-16T9…	7,5 W	26 BTU (IT)/h
GRS1120-16T9…	7,5 W	26 BTU (IT)/h
GRS1030-16T9…	10,5 W	36 BTU (IT)/h
GRS1130-16T9…	10,5 W	36 BTU (IT)/h
GRS1020-8T8Z…	12 W	41BTU (IT)/h
GRS1130-8T8Z…	12 W	41 BTU (IT)/h
GRS1030-8T8Z…	16 W	55 BTU (IT)/h
GRS1130-8T8Z…	16 W	55 BTU (IT)/h
GRS1020-16T9…	9 W	31 BTU (IT)/h
GRS1120-16T9…	9 W	31 BTU (IT)/h
GRS1030-16T9…	12 W	41 BTU (IT)/h
GRS1130-16T9…	12 W	41 BTU (IT)/h
GRS1020-8T8Z…	15,5 W	53 BTU (IT)/h
GRS1120-8T8Z	15,5 W	53 BTU (IT)/h
GRS1030-8T8Z	18 W	61 BTU (IT)/h
GRS1130-8T8Z	18 W	61 BTU (IT)/h
Media modules		
GRM20-TTTTTTTT…	2 W	7 BTU (IT)/h
GRM20-XXXXTTTT…	7,5 W	26 BTU (IT)/h
GRM20-XXXXXXXX	9 W	31 BTU (IT)/h

M

C

Name	Max. power consumption (W)	Max. power output (Btu; IT/h)
GRS1042 AT2Z...	32	110
GRS1142 AT2Z...	32	110
GRS1042 6T6Z...	32	110
GRS1142 6T6Z...	32	110
GPS1-K	2,5	9
GPS1-C	3,5	12
GPS3-P	5,5	19
GMM20-XXXXXXXX	10	34
GMM30-XXXXTTTT	6,5	22
GMM32-XXXXTTTT	8,5	29
GMM40-OOOOTTTT	5,5	19
GMM42-OOOOTTTT	7,5	26
GMM40-OOOOOOOO	7,5	26
GMM40-TTTTTTTT	3,5	12
GMM42-TTTTTTTT	5,5	19

POWER CONSUMPTION – POWER OUTPUT

Device name	Max. power consumption	Power output
MACH104-16TX-PoEP… MACH104-16TX-PoEP+2X…	Max. 330 W	Max. 300 BTU (IT)/h
MACH104-16TX-PoEP-R… MACH104-16TX-PoEP+2X-R…	Max. 340 W	Max. 340 BTU (IT)/h
MACH104-16TX-PoEP-E… MACH104-16TX-PoEP+2X-E…	Max. 300 W	Max. 200 BTU (IT)/h
MACH104-20TX-F…	35 W	119 BTU (IT)/h
MACH104-20TX-FR…	35 W	119 BTU (IT)/h
MACH104-20TX-F-4PoE when 4x Class 0 PD connected	110 W	170 BTU (IT)/h

Device name		Maximum power consumption	Power output
OS20-000800...		22 W	75 BTU (IT)/h
OS20-001200...		26 W	87 BTU (IT)/h
OS20-002000...		27 W	94 BTU (IT)/h
OS20-002800...		29 W	100 BTU (IT)/h
OS24-xx1200...	including 60 W PoE output power	103 W	140 BTU (IT)/h
OS24-xx2000...	including 60 W PoE output power	106 W	149 BTU (IT)/h
OS24-xx2800...	including 60 W PoE output power	108 W	157 BTU (IT)/h
OS30-0008xx...		26 W	87 BTU (IT)/h
OS30-0016xx..		27 W	94 BTU (IT)/h
OS30-0024xx..		29 W	100 BTU (IT)/h
OS34-xx08xx..	including 60 W PoE output power	103 W	140 BTU (IT)/h
OS34-xx16xx..	including 60 W PoE output power	106 W	149 BTU (IT)/h
OS34-xx24xx..	including 60 W PoE output power	108 W	157 BTU (IT)/h

Note: The values for the maximum power output and the power consumption each apply to the fully expanded devices. See the type plate of the device for the exact specifications.

Device name	Max. power consumption	Power output
MACH102-8TP	12W	41 Btu (IT)/h
MACH102-8TP-R	13W	44 Btu (IT)/h
MACH102-8TP-F	12W	41 Btu (IT)/h
MACH102-8TP-FR	13W	44 Btu (IT)/h
MACH102-24TP-F	16W	55 Btu (IT)/h
MACH102-24TP-FR	17W	58 Btu (IT)/h
M1-8TP-RJ45	2 W	7 Btu (IT)/h
M1-8TP-RJ45 PoE - Internal operating voltage - External PoE voltage - no PD - 8x Class0 PD	2,2W 1,2W 2W + PDs	7,6 Btu (IT)/h 4,1 Btu (IT)/h 6,9 Btu (IT)/h
M1-8MM-SC	10W	34 Btu (IT)/h
M1-8SM-SC	10W	34 Btu (IT)/h
M1-8SFP (incl. SFP modules)	11W	37 Btu (IT)/h

Device name	Max. power consumption	Power output
MACH4002-48+4G	66.0 W	225.3 Btu (IT)/h
MACH4002-24G	66.0 W	225.3 Btu (IT)/h
MACH4002-24G+3X	74.0 W	252.6 Btu (IT)/h
MACH4002-48G	118.0 W	402.7 Btu (IT)/h
MACH4002-48G+3X	125.0 W	426.6 Btu (IT)/h
M4-POWER	0	0
M4-S-AC/DC 300W (230 V)	350.0 W	170.7 Btu (IT)/h
M4-S-AC/DC 300W (110 V)	370.0 W	238.9 Btu (IT)/h
M4-S-24VDC 300W	380.0 W	273.0 Btu (IT)/h
M4-S-48VDC 300W	380.0 W	273.0 Btu (IT)/h
M4-P-AC/DC 300W (230 V)	350.0 W	170.7 Btu (IT)/h
M4-P-AC/DC 300W (110 V)	370.0 W	238.9 Btu (IT)/h
M4-P-24VDC 300W	380.0 W	273.0 Btu (IT)/h
M4-P-48VDC 300W	380.0 W	273.0 Btu (IT)/h

Name	Maximum power consumption	Maximum power output
Basic device incl. SFP transceivers + 1 PSU + Fan module		
MACH4000	80 W	273 Btu (IT)/h
MACH4500	120 W	410 Btu (IT)/h
Power supply unit (PSU)		
D4K-PSU-300W-HV	6 W	21 Btu (IT)/h
Fan module		
D4K-AIR	20 W	68 Btu (IT)/h
Media modules		
D4K-12TP-RJ45	15 W	51 Btu (IT)/h
D4K-12SFP incl. SFP transceiver	25 W	85 Btu (IT)/h

MTBF

these are calculated values

According to Telecordia SR-332 Issue 1, May 2001

Standard Line	MTBF in h for environmental condition	
	G_B 25°C	G_B 60°C
SPIDER SL-20 5T	2 848 397	984 750
SPIDER SL-20 5T EEC	2 845 546	981 389
SPIDER SL-20 1T/1M-SC	2 705 181	740 364
SPIDER SL-20 1T/1S-SC	2 140 568	562 307
SPIDER SL-20 4T/1M-SC	2 286 711	631 384
SPIDER SL-20 4T/1M-SC EEC	2 282 902	629 724
SPIDER SL-20 4T/1M-ST	2 286 711	631 384
SPIDER SL-20 4T/1M-ST EEC	2 282 902	629 724
SPIDER SL-20 4T/1S-SC	1 869 809	497 136
SPIDER SL-40 5T	1 453 349	591 049
SPIDER SL-20 8T	2 218 157	832 761
SPIDER SL-20 8T EEC	2 218 157	832 761
SPIDER SL-40 8T	1 207 249	531 875
SPIDER SL-20 6T/1M-SC	1 830 046	526 160
SPIDER SL-20 6T/1S-SC	1 554 703	430 277
SPIDER SL-20 6T/2M-SC	1 499 396	389 370
SPIDER SL-20 6T/2S-SC	1 162 135	292 800

Standard Line	MTBF in h for environmental condition	
SPIDER SL-40 6T/1SFP	1 158 737	448 785
SPIDER SL-40 6T/2SFP	1 088 487	425 025
SPIDER PoE SL-24	1 447 374	na
SPIDER PoE SL-44-05	979 190	na
SPIDER PoE SL-44-08	472 065	na

Premium Line		MTBF in h for environmental condition	
		G_B 25°C	G_B 60°C
SPIDER PL-20 5T	24V	1 363 990	546 843
	48V	1 391 965	593 548
SPIDER PL-20 1T/1M-SC	24V	1 349 776	465 245
	48V	1 363 807	489 704
SPIDER PL-20 1T/1S-SC	24V	1 226 563	403 067
	48V	1 204 795	405 585
SPIDER PL-20 4T/1M-SC	24V	1 149 795	388 071
	48V	1 159 961	404 941
SPIDER PL-20 4T/1M-ST	24V	1 149 795	388 071
	48V	1 159 961	404 941
SPIDER PL-20 4T/1S-SC	24V	1 059 586	343 911
	48V	1 042 891	345 660
SPIDER PL-20 6T/3SFP	24V	1 025 704	376 198
	48V	1 041 443	397 728
SPIDER PL-20 8T/1M-SC	24V	954 743	321 009
	48V	968 365	336 555
SPIDER PL-20 8T/1S-SC	24V	873 990	282 590
	48V	885 392	294 568

Premium Line		MTBF in h for environmental condition	
SPIDER PL-20 7T/2M-SC	24V	852 056	261 414
	48V	862 889	271 631
SPIDER PL-20 7T/2S-SC	24V	731 432	214 023
	48V	739 400	220 823
SPIDER PL-40 5T	24V	1 117 606	457 011
	48V	1 127 208	480 589
SPIDER PL-40 1T/1SFP	24V	1 530 211	633 903
	48V	1 565 508	697 528
SPIDER PL-40 4T/1SFP	24V	1 112 112	441 174
	48V	1 130 639	471 079
SPIDER PL-20 8T	24V	1 206 410	496 940
	48V	1 228 242	535 211
SPIDER PL-40 8T	24V	908 230	382 076
	48V	920 549	404 304

GECKO	MTBF in h for environmental condition	
	G_B 25°C	G_B 60°C
GECKO 8TX	7 308 431	2 965 762
GECKO 8TX/2SFP	7 146 019	2 834 949

MTBF

these are calculated values

According to Telcordia SR-332 Issue 1, May 2001

Rail Basic Switch	MTBF in h for environmental condition			
	G_B25°C	G_B60°C	G_F25°C	G_F60°C
RSB20-0800T1T1SAABHH RSB20-0800T1T1TAABHH	770 754	242 503	385 377	121 252
RSB20-0800M2M2SAABHH RSB20-0800M2M2TAABHH	559 490	154 077	279 745	77 038
RSB20-0800S2S2SAABHH RSB20-0800S2S2TAABHH	565 695	165 236	282 847	82 618
RSB20-0900ZZZ6SAABHH RSB20-0900ZZZ6TAABHH	624 766	189 506	312 383	94 753
RSB20-0900M2TTSAABHH RSB20-0900M2TTTAABHH	579 932	167 181	289 966	83 590
RSB20-0900S2TTSAABHH RSB20-0900S2TTTAABHH	583 247	173 539	291 624	86 770
RSB20-0900MMM2SAABHH RSB20-0900MMM2TAABHH	514 927	137 830	257 463	68 915
RSB20-0900VVM2SAABHH RSB20-0900VVM2TAABHH	520 178	146 693	260 089	73 347

Rail Switch Rugged	MTBF in h für Umgebungsbedingung				
	G_B25°C	G_B60°C	G_F25°C	G_F60°C	Interne Temperaturerhöhung
RSR30-0603CCO7T1___P	430 740	98 013	215 370	49 006	15°C
RSR30-0703OOO6Z6___P	454 980	90 240	227 490	45 120	15°C
RSR30-0802CCZZT1___P	440 687	97 523	220 343	48 761	15°C
RSR30-0802O7O7T1___P	453 682	101 798	226 841	50 899	15°C
RSR30-0802OOZZT1___P	490 969	101 719	245 485	50 860	15°C
RSR30-0802O6O6T1___P	507 412	106 399	253 706	53 200	15°C
RSR20-0900JJM3T1___P	399 746	72 770	199 873	36 385	15°C
RSR20-0900MMM2T1___P	439 056	90 344	219 528	45 172	15°C
RSR20-0800M2M2T1___P	472 820	97 551	236 410	48 776	15°C
RSR20-0800T1T1T1___P	541 481	113 319	270 741	56 660	15°C

OpenRail	MTBF in h for environmental condition			
RS20-0800T1T1_D_E	547 337	140 488	273 669	70 244
RS20-0800T1T1_D_P	489 137	107 239	244 569	53 620
RS20-1600T1T1_D_E	392 548	111 438	196 274	55 719
RS20-1600T1T1_D_P	361 684	89 441	180 842	44 721
RS20-2400T1T1_D_E	323 986	95 657	161 993	47 829
RS20-2400T1T1_D_P	302 668	78 983	151 334	39 492
TP-Modul	21 691 974	5 600 191	10 845 987	2 800 096
MM-Modul	6 335 457	1 228 602	3 167 729	614 301
SM-Modul	6 754 935	1 681 336	3 377 468	840 668
Modul SM+	4 360 303	1 061 170	2 180 152	530 585
LH-Modul	3 045 711	426 552	1 522 856	213 276
RS20+				
RS20-0900MMM2_D_E	419 309	85 457	209 654	42 729
RS20-0900MMM2_D_P	384 280	71 897	192 140	35 949
RS20-1700MMM2_D_E	322 029	73 761	161 015	36 881
RS20-1700MMM2_D_P	300 960	63 435	150 480	31 717
RS20-2500MMM2_D_E	274 393	66 499	137 197	33 250
RS20-2500MMM2_D_P	258 947	57 989	129 473	28 994
RS20-2500VVS2_D_E	279 454	79 713	139 727	39 856
RS20-2500VVS2_D_P	263 449	67 788	131 725	33 894
RS20-2500LLL2_D_E	202 535	58 239	101 268	29 119
RS20-2500LLL2_D_P	193 994	51 606	96 997	25 803

RS30				
RS30-0802T1T1_D_E	454 581	124 677	227 291	62 339
RS30-0802O6T1_D_E	410 201	98 604	205 101	49 302
RS30-0802O6O6_D_E	373 716	81 549	186 858	40 775
RS30-1602T1T1_D_E	342 436	101 253	171 218	50 627
RS30-1602O6T1_D_E	316 630	83 353	158 315	41 677
RS30-1602O6O6_D_E	294 442	70 831	147 221	35 416
RS30-2402T1T1_D_E	289 071	88 054	144 536	44 027
RS30-2402O6T1_D_E	270 464	74 197	135 232	37 099
RS30-2402O6O6_D_E	254 107	64 109	127 054	32 055
RS30+				
RS30-0802OOZZ_D_E	285 056	62 150	142 528	31 075
RS30-0802OOZZ_D_P	268 423	54 654	134 211	27 327
RS30-1602OOZZ_D_E	236 490	55 724	118 245	27 862
RS30-1602OOZZ_D_P	224 927	49 622	112 463	24 811
RS30-2402OOZZ_D_E	209 749	51 477	104 874	25 739
RS30-2402OOZZ_D_P	200 602	46 226	100 301	23 113
RS40-0009				
RS40-0009CCCC???E	237 340	56 551	118 670	28 276
RS40-0009CCCC???P	225 696	50 277	112 848	25 139

MTBF

these are calculated values

According to Telcordia SR-332 Issue 1, May 2001

	G_B25°C	G_B60°C	G_F25°C	G_F60°C
MS20-0800_A_E	472 193	116 306	236 097	58 153
MS20-1600_A_E	315 592	93 445	157 796	46 723
MS30-0802_A_E	397 985	105 191	198 993	52 596
MS30-1602_A_E	280 621	86 133	140 311	43 067
MS20-0800_C_E	422 494	105 268	211 297	52 634
MS20-1600_C_E	292 589	86 184	146 295	43 092
MS30-0802_C_E	362 086	96 079	181 043	48 040
MS30-1602_C_E	262 285	79 926	131 143	39 963
Medien-Module				
MM4-2TX/SFP	1 724 797	301 941	862 399	150 971
MM20-M5M5M5M5__HH	969 606	185 124	484 803	92 562
MM20-P9P9T1T1__HH	880 067	163 208	440 034	81 604
MM20-P9P9P9P9__HH	658 511	111 913	329 256	55 957
MM20-Z6Z6Z6Z6__HH (ohne SFPs)	695 335	134 176	347 668	67 088
PoE-Modul; MM22-T1T1T1T1__HH **(interne Temperaturerhöhung = 20°C)**	2 450 677	423 125	1 225 339	211 563
MM23-T1T1T1T1__HH	1 065 394	270 915	532 697	135 457
MM23-M2M2T1T1__HH	840 263	199 521	420 131	99 761
MM23-S2S2T1T1__HH	854 336	218 643	427 168	109 322
MM23-F4F4T1T1SAHH	681 346	166 647	340 673	83 324
MM33-O7O79999SAHH	646 124	136 473	323 062	68 237

MSM Media Modules		
MSM40-T1T1T1T1	11 371 362	2 161 185
MSM42-T1T1T1T1	3 401 409	742 500
MSM40-C1C1C1C1	8 176 469	2 282 662
MSM45-C1C1C1C1		
MSM24-IOIOIOIO	1 538 951	490 118
MSM20-M2T1T1T1	4 588 064	969 848
MSM20-S2T1T1T1	4 804 113	1 231 646
MSM20-M4T1T1T1	4 588 064	969 848
MSM20-S4T1T1T1	2 574 363	390 390
MSM20-L2T1T1T1	2 574 363	390 390
MSM20-G2T1T1T1	3 004 303	588 740
MSM20-M2M2T1T1	3 050 653	599 102
MSM20-S2S2T1T1	3 244 700	812 460
MSM20-M4M4T1T1	3 050 653	599 102
MSM20-S4S4T1T1	1 495 269	211 414
MSM20-L2L2T1T1	1 495 269	211 414
MSM20-G2G2T1T1	1 793 411	332 881
MSM20-M2M2M2M2	1 742 597	334 002
MSM20-S2S2S2S2	1 870 387	472 294
MSM20-M4M4M4M4	1 742 597	334 002
MSM20-S4S4S4S4	796 298	109 700
MSM20-L2L2L2L2	796 298	109 700
MSM20-G2G2G2G2	967 631	176 560

MSP PowerMICE	MTBF in h for environmental condition	
	G_B 25°C	G_B 60°C
MSP30-08040_C...	372 029	134 746
MSP30-16040_C...	312 816	117 404
MSP30-24040_C...	270 065	104 093
MSP32-08040_P...	340 385	121 132
MSP32-16040_P...	290 136	106 933
MSP32-24040_P...	252 991	95 777

	GB 25°C	GB 60°C
BXS30-000804-(_)BB	1 450 382	488 164
BXS30-000804-(_)M9/N9	699 913	259 090
BXS32-000804-(_)QQ	895 418	333 113
BXS32-000804-(_)M9/N9	437 460	160 568
BXS40-000012-(_)BB	1 444 112	486 620
BXS40-000012-(_)M9/N9	698 449	258 655
BXS42-000012-(_)QQ	893 024	332 394
BXS42-000012-(_)M9/N9	436 888	160 400

MTBF

these are calculated values

According to Telcordia SR-332 Issue 3, January 2011

BRS Low Port PoE	MTBF in h for environmental condition	
	Gb 25°C	Gb 60°C
BRS22-0800 54VDC	3 496 292	1 144 422
BRS22-0800 24VDC	579 655	205 891
BRS32-08042T2T 54VDC	2 578 069	908 939
BRS32-08042T2T 24VDC	544 678	198 568
BRS32-0804OOOO 54VDC	3 409 257	1 104 328
BRS32-0804OOOO 24VDC	574 257	206 551
BRS42-0008 54DC	2 673 467	957 690
BRS42-0008 24VDC	548 815	200 801
BRS42-00129999 54VDC	2 101 211	787 055
BRS42-00129999 24VDC	519 757	192 070
BRS42-0012OOOO 54VDC BRS52-00122Q2Q 54VDC	2 622 278	929 451
BRS42-0012OOOO 24VDC BRS52-00122Q2Q 24VDC	546 625	199 530

BRS High Port	MTBF in h for environmental condition	
	Gb 25°C	Gb 60°C
BRS40-024OOOO-()F	1 612 116	659 280
BRS50-00202Q2Q-()T	1 940 000	762 266
BRS50-00202Q2Q	1 907 949	752 561
BRS50-00242Q2Q-()T	1 634 939	659 280
BRS50-00242Q2Q-()F	1 612 116	652 007

BRS Low Port	MTBF in h for environmental condition	
	Gb 25°C	Gb 60°C
BRS20-0400 12VDC	5 880 430	1 703 256
BRS20-0400 24VAC	5 710 934	1 674 365
BRS20-0500 12VDC	3 577 779	858 123
BRS20-0500 24VAC	3 514 319	850 727
BRS20-0600 12VDC	2 638 177	596 279
BRS20-0600 24VAC	2 603 511	592 698
BRS20-0600Z6Z6 12VDC	5 720 732	1 651 507
BRS20-0600Z6Z6 24VAC	5 560 191	1 624 331
BRS20-0800 12VDC	4 467 842	1 399 895
BRS20-0800 24VAC	4 369 315	1 380 319
BRS40-0008 12VDC	3 191 748	1 128 026
BRS40-0008 24VAC	3 141 147	1 115 281
BRS20-0900 12VDC	2 957 173	752 890
BRS20-0900 24VAC	2 913 685	747 191
BRS20-1000 12VDC	2 284 631	543 493
BRS20-1000 24VAC	2 258 588	540 517
BRS20-1100 12VDC	1 861 317	425 227
BRS20-1100 24VAC	1 843 994	423 403
BRS20-12009999 12VDC BRS30-08042T2T 12VDC	3 070 388	1 063 016
BRS20-12009999 24VAC BRS30-08042T2T 24VAC	3 023 534	1 051 691
BRS20-1200ZZZZ 12VDC BRS30-0804OOOO 12VDC	4 326 692	1 340 367
BRS40-00129999 12VDC	2 408 606	898 566
BRS40-00129999 24VAC	2 379 677	890 460
BRS40-0012OOOO 12VDC BRS50-00122Q2Q 12VDC	3 119 057	1 089 053
BRS40-0012OOOO 24VAC BRS50-00122Q2Q 24VAC	3 070 717	1 077 169

BRS High Port	MTBF in h for environmental condition	
	Gb 25°C	Gb 60°C
BRS20-16009999-()T	3 054 970	1 077 415
BRS20-16009999-()F	2 976 237	1 058 128
BRS20-20009999-()T	2 320 199	860 520
BRS20-20009999-()F	2 274 501	848 172
BRS20-2000ZZZZ-()T	2 972 379	1 033 659
BRS20-2000ZZZZ-()F	2 897 794	1 015 894
BRS20-24009999-()T	1 896 895	731 520
BRS20-24009999-()F	1 866 240	722 577
BRS20-2400ZZZZ-()T	2 311 547	852 976
BRS20-2400ZZZZ-()F	2 266 187	840 842
BRS30-16042T2T-()T	2 320 199	860 520
BRS30-16042T2T-()F	2 274 501	848 172
BRS30-1604OOOO-()T	2 972 379	1 033 659
BRS30-1604OOOO-()F	2 897 794	1 015 894
BRS30-20042T2T-()T	1 896 895	731 520
BRS30-20042T2T-()F	1 866 240	722 577
BRS30-2004OOOO-()T	2 311 547	852 976
BRS30-2004OOOO-()F	2 266 187	840 842
BRS40-00169999-()T	1 974 846	785 800
BRS40-00169999-()F	1 941 643	775 491
BRS40-00209999-()T	1 639 262	663 778
BRS40-00209999-()F	1 616 319	656 406
BRS40-0020OOOO-()T	1 940 000	762 266
BRS40-0020OOOO-()F	1 907 949	752 561
BRS40-00249999-()T	1 416 009	584 297
BRS40-00249999-()F	1 398 856	578 578
BRS40-0024OOOO-()T	1 634 939	659 280

MTBF

these are calculated values

According to Telcordia SR-332 Issue 1, May 2001

RSP	MTBF for environmental condition			
	G_B 25°C	G_B 60°C	G_F 25°C	G_F 60°C
RSP20-11003Z6TT-xCC RSP30-08033O6TT-xCC	563 927 h 64,4 y	180 168 h 20,6 y	281 964 h 32,2 y	90 084 h 10,3 y
RSP20-11003Z6TT-xK9 RSP30-08033O6TT-xK9	534 852 h 61,1 y	175 416 h 20,0 y	267 426 h 30,5 y	87 708 h 10,0 y
RSP20-11003Z6TT-xKK RSP30-08033O6TT-xKK	437 873 h 50,0 y	146 128 h 16,7 y	218 936 h 25,0 y	73 064 h 8,3 y
RSP25-11003Z6TT-xCC RSP35-08033O6TT-xCC	541 412 h 61,8 y	174 006 h 19,9 y	270 706 h 30,9 y	87 003 h 9,9 y
RSP25-11003Z6TT-xK9 RSP35-08033O6TT-xK9	514 557 h 58,7 y	169 570 h 19,4 y	257 279 h 29,4 y	84 785 h 9,7 y
RSP25-11003Z6TT-xKK RSP35-08033O6TT-xKK	424 176 h 48,4 y	142 048 h 16,2 y	212 088 h 24,2 y	71 024 h 8,1 y
RSP20-11003Z6ZT-xCC RSP30-08033O6ZT-xCC	579 684 h 66,2 y	178 652 h 20,4 y	289 842 h 33,1 y	89 326 h 10,2 y
RSP20-11003Z6ZT-xK9 RSP30-08033O6ZT-xK9	549 006 h 62,7 y	173 978 h 19,9 y	274 503 h 31,3 y	86 989 h 9,9 y
RSP20-11003Z6ZT-xKK RSP30-08033O6ZT-xKK	447 313 h 51,1 y	145 129 h 16,6 y	223 657 h 25,5 y	72 564 h 8,3 y
RSP25-11003Z6ZT-xCC RSP35-08033O6ZT-xCC	556 036 h 63,5 y	172 613 h 19,7 y	278 018 h 31,7 y	86 306 h 909 y
RSP25-11003Z6ZT-xK9 RSP35-08033O6ZT-xK9	527 749 h 60,2 y	168 246 h 19,2 y	263 875 h 30,1 y	84 123 h 9,6 y
RSP25-11003Z6ZT-xKK RSP35-08033O6ZT-xKK	433 100 h 49,4 y	141 118 h 16,1 y	216 550 h 24,7 y	70 559 h 8,1 y

RSPE	MTBF for environmental condition			
	G_B 25°C	G_B 60°C	G_F 25°C	G_F 60°C
RSPE Base Unit:				
RSPE30-24044O7T99-_CC	423 905 h	147 964 h	211 953 h	73 982 h
RSPE30-24044O7T99-_K9	406 777 h	144 084 h	203 388 h	72 042 h
RSPE30-24044O7T99-_KK	348 135 h	123 716 h	174 068 h	61 858 h
RSPE32-24044O7T99-_PP	336 090 h	114 774 h	168 045 h	57 387 h
RSPE35-24044O7T99-_CC	415 895 h	145 994 h	207 948 h	72 997 h
RSPE35-24044O7T99-_K9	399 396 h	142 214 h	199 698 h	71 107 h
RSPE35-24044O7T99-_KK	342 715 h	122 336 h	171 357 h	61 168 h
RSPE37-24044O7T99-_PP	331 035 h	113 585 h	165 518 h	56 792 h
RSPE Media Modules:				
RSPM20-4T14Z6_	3 328 178 h	1 074 332 h	1 664 089 h	537 166 h
RSPM22-4T14Z6_	1 952 815 h	559 641 h	976 407 h	279 821 h
RSPM20-4T14T1_	2 928 504 h	971 611 h	1 464 252 h	485 806 h
RSPM22-4T14T1_	1 442 827 h	424 280 h	721 413 h	212 140 h
RSPM20-4Z64Z6_	4 600 414 h	1 293 096 h	2 300 207 h	646 548 h

RSPS	MTBF for environmental condition			
	G_B 25°C	G_B 60°C	G_F 25°C	G_F 60°C
RSPS20-06002T1TT-_CC	683 494 h 78,0 a	232 464 h 26,5 a	341 747 h 39,0 a	116 232 h 13,3 a
RSPS20-06002T1TT-_K9	641 245 h 73,2 a	224 612 h 25,6 a	320 623 h 36,6 a	112 306 h 12,8 a
RSPS20-06002T1TT-_M9	677 087 h 77,3 a	236 724 h 27,0 a	338 543 h 38,6 a	118 362 h 13,5 a
RSPS20-06002Z6TT-_CC	718 364 h 82,0 a	238 127 h 27,2 a	359 182 h 41,0 a	119 064 h 13,6 a
RSPS20-06002Z6TT-_K9	671 841 h 76,7 a	229 895 h 26,2 a	335 920 h 38,3 a	114 948 h 13,1 a
RSPS20-06002Z6TT-_M9	711 290 h 81,2 a	242 599 h 27,7 a	355 645 h 40,6 a	121 300 h 13,8 a
RSPS20-06002Z6YT-_CC	724 054 h 82,7 a	241 076 h 27,5 a	362 027 h 41,3 a	120 538 h 13,8 a
RSPS20-06002Z6YT-_K9	676 815 h 77,3 a	232 642 h 26,6 a	338 407 h 38,6 a	116 321 h 13,3 a
RSPS20-06002Z6YT-_M9	716 867 h 81,8 a	245 660 h 28,0 a	358 434 h 40,9 a	122 830 h 14,0 a
RSPS25-06002T1TT-_CC	650 821 h 74,3 a	221 778 h 25,3 a	325 411 h 37,1 a	110 889 h 12,7 a
RSPS25-06002T1TT-_K9	612 401 h 69,9 a	214 620 h 24,5 a	306 201 h 35,0 a	107 310 h 12,3 a
RSPS25-06002T1TT-_M9	645 009 h 73,6 a	225 651 h 25,8 a	322 505 h 36,8 a	112 826 h 12,9 a
RSPS25-06002Z6TT-_CC	682 360 h 77,9 a	226 927 h 25,9 a	341 180 h 38,9 a	113 463 h 13,0 a
RSPS25-06002Z6TT-_K9	640 247 h 73,1 a	219 439 h 25,1 a	320 123 h 36,5 a	109 719 h 12,5 a
RSPS25-06002Z6TT-_M9	675 974 h 77,2 a	230 984 h 26,4 a	337 987 h 38,6 a	115 492 h 13,2 a
RSPS25-06002Z6YT-_CC	687 491 h 78,5 a	229 603 h 26,2 a	343 746 h 39,2 a	114 801 h 13,1 a
RSPS25-06002Z6YT-_K9	644 762 h 73,6 a	221 940 h 25,3 a	322 381 h 36,8 a	110 970 h 12,7 a
RSPS25-06002Z6YT-_M9	681 009 h 77,7 a	233 757 h 26,7 a	340 505 h 38,9 a	116 879 h 13,3 a

RSPL	MTBF for environmental condition			
	G_B 25°C	G_B 60°C	G_F2 5°C	G_F 60°C
RSPL20-08002Z6TT-_CC	684 453 h 78,1 a	237 944 h 27,2 a	342 226 h 39,1 a	118 972 h 13,6 a
RSPL20-08002Z6TT-_M9	678 027 h 77,4 a	242 409 h 27,7 a	339 014 h 38,7 a	121 204 h 13,8 a
RSPL20-08002Z6YT-_CC	710 870 h 81,1 a	240 792 h 27,5 a	355 435 h 40,6 a	120 396 h 13,7 a
RSPL20-08002Z6YT-_M9	703 941 h 80,4 a	245 365 h 28,0 a	351 971 h 40,2 a	122 682 h 14,0 a
RSPL30-08022O7YT-_CC	554 040 h 63,2 a	195 585 h 22,3 a	277 020 h 31,6 a	97 793 h 11,2 a
RSPL30-08022O7YT-_M9	549 822 h 62,8 a	198 592 h 22,7 a	274 911 h 31,4 a	99 296 h 11,3 a
RSPL30-08022O7ZT-_CC	571 223 h 65,2 a	197 505 h 22,5 a	285 611 h 32,6 a	98 753 h 11,3 a
RSPL30-08022O7ZT-_M9	566 740 h 64,7 a	200 572 h 22,9 a	283 370 h 32,3 a	100 286 h 11,4 a

AutoConfiguration Adapter	MTBF in h für Umgebungsbedingung			
	G_B25°C	G_B60°C	G_F25°C	G_F60°C
ACA11	6 807 352	1 111 900	3 403 676	555 950
ACA21-USB	4 851 177	571 555	2 425 589	285 778
ACA22	2 000 000	/	/	/
ACA31	2 000 000	/	/	/

MTBF

these are calculated values

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MACH100	MTBF in h für Umgebungsbedingung			
	G_B25°C	G_B50°C	G_F25°C	G_F50°C
MACH102-8TP MACH102-8TP-F	189 007	96 929	94 503	48 465
MACH102-8TP-R MACH102-8TP-FR	231 733	110 401	115 867	55 201
MACH102-24TP-F	166 916	85 037	83 458	42 519
MACH102-24TP-FR	199 380	95 232	99 690	47 616
M1-8TP-RJ45	2 856 204	1 386 195	1 428 102	693 098
M1-8MM-SC	741 899	220 167	370 950	110 084
M1-8SM-SC	839 442	306 586	419 721	153 293
M1-8SFP	4 116 891	1 517 748	2 058 446	758 874
M1-8TP-RJ45 PoE	1 085 552	486 119	542 776	243 060

MACH104 Family Full Gigabit	MTBF in h for environmental condition			
	G_B25°C	G_B50°C	G_F25°C	G_F50°C
MACH104-20TX-F MACH104-20TX-FR MACH104-20TX-F-4PoE	210 192	86 687	105 096	43 344

MACH104 Family Full Gigabit	MTBF in h für Umgebungsbedingung			
	G_B25°C	G_B50°C	G_F25°C	G_F50°C
MACH104-20TX-F	130 139	65 306	65 069	32 653
MACH104-20TX-FR	149 063	71 156	74 531	35 578
MACH104-20TX-F-4PoE	119 950	61 406	59 975	30 703

MACH104-16TX-PoE+	MTBF in h für Umgebungsbedingung				
	G_B25°C	G_B50°C	G_F25°C	G_F50°C	Interne Temperaturerhöhung
MACH104-16TX-PoEP	131 722	52 578	65 861	26 289	15°C
MACH104-16TX-PoEP-R	148 227	59 671	74 113	29 835	15°C
MACH104-16TX-PoEP-E	187 299	77 311	93 649	38 655	15°C
MACH104-16TX-PoEP+2X	128 310	51 693	64 155	25 846	15°C
MACH104-16TX-PoEP+2X-R	143 921	58 533	71 960	29 266	15°C
MACH104-16TX-PoEP+2X-E	180 476	75 412	90 238	37 706	15°C

MACH1040 Family Full Gigabit	MTBF in h für Umgebungsbedingung			
	G_B25°C	G_B60°C	G_F25°C	G_F60°C
MAR1040-4C4C4C4C9999S_9HPHH MAR1040-4C4C4C4C9999S__HPHH	243 521	62 863	121 760	31 431
MAR1140-4C4C4C4C9999S_9HPHH	237 643	60 373	118 822	30 186
MAR1140-4C4C4C4C9999S__HPHH	237 574	60 350	118 787	30 175
MAR1042-4C4C4C4C9999S_MHPHH	243 521	62 863	121 760	31 431
MAR1142-4C4C4C4C9999S_MHPHH	237 574	60 350	118 787	30 175

Substation-Switch	MTBF in h for environmental condition				
	G_B25°C	G_B60°C	G_F25°C	G_F60°C	Interne Temperaturerhöhung
MAR1020-99 & 12 FE-2-Port-Module TT (ohne Netzteile)	340 555	79 039	170 278	39 519	15°C
MAR1020-99 & 12 FE-2-Port-Module MM (ohne Netzteile)	188 623	35 818	94 311	17 909	15°C
MAR1030-CC (ohne Netzteile, ohne FE-Module, ohne SFPs)	417 186	87 918	208 593	43 959	15°C
MAR1030-CC & 12 FE-2-Port-Module TT (ohne Netzteile, ohne SFPs)	299 762	72 387	149 881	36 193	15°C
MAR1030-CC & 12 FE-2-Port-Module MM (ohne Netzteile, ohne SFPs)	175 402	34 386	87 701	17 193	15°C

MTBF

these are calculated values

According to Telcordia SR-332 Issue 3, January 2011

GRS Basic Unit 16TP	MTBF in h for environmental condition	
	G_B 25°C	G_B 60°C
GRS1020-16T9_C9 GRS1120-16T9_C9	969 614	346 738
GRS1030-16T9_C9 GRS1130-16T9_C9	878 699	321 139
GRS1020-16T9_CC GRS1120-16T9_CC	1 265 183	450 612
GRS1030-16T9_CC GRS1130-16T9_CC	1 114 694	408 313
GRS1020-16T9_M9 GRS1120-16T9_M9	980 088	350 517
GRS1030-16T9_M9 GRS1130-16T9_M9	887 292	324 377
GRS1020-16T9_MC GRS1120-16T9_MC	1 270 997	452 646
GRS1030-16T9_MC GRS1130-16T9_MC	1 119 204	409 983
GRS1020-16T9_MM GRS1120-16T9_MM	1 277 211	454 961
GRS1030-16T9_MM GRS1130-16T9_MM	1 124 020	411 880

GRS Basic Unit 8TP/8SFP	MTBF in h for environmental condition	
	G_B 25°C	G_B 60°C
GRS1020-8T8Z_C9 GRS1120-8T8Z_C9	1 053 320	367 764
GRS1030-8T8Z_C9 GRS1130-8T8Z_C9	946 892	339 094
GRS1020-8T8Z_CC GRS1120-8T8Z_CC	1 411 554	486 779
GRS1030-8T8Z_CC GRS1130-8T8Z_CC	1 226 772	437 786
GRS1020-8T8Z_M9 GRS1120-8T8Z_M9	1 065 693	372 017
GRS1030-8T8Z_M9 GRS1130-8T8Z_M9	956 879	342 707
GRS1020-8T8Z_MC GRS1120-8T8Z_MC	1 418 793	489 154
GRS1030-8T8Z_MC GRS1130-8T8Z_MC	1 232 237	439 706
GRS1020-8T8Z_MM GRS1120-8T8Z_MM	1 426 541	491 858
GRS1030-8T8Z_MM GRS1130-8T8Z_MM	1 238 077	441 890

GRS Media Module	MTBF in h for environmental condition	
	G_B 25°C	G_B 60°C
GRM20-TTTTTTTT	9 781 396	4 372 979
GRM20-ZZZZZZZZ	33 626 288	8 555 903
GRM20-ZZZZTTTT	15 248 004	5 471 925
GRM20-[_][_]TTTT	2 101 581	444 307
GRM20-[_][_][_][_]	1 179 558	235 470

GRS103	MTBF in h for environmental condition	
	G_B 25°C	G_B 60°C
GRS103-6TX/4C GRS103-10_G9...	313 574	222 319
GRS103-6TX/4C-R GRS103-10_GG...	451 767	308 725
GRS103-22TX/4C GRS103-26_G9...	295 583	203 585
GRS103-22TX/4C-R GRS103-26_GG...	415 346	273 745
M1-8TP-RJ45	10 303 652	4 832 040
M1-8MM-SC	1 224 826	240 599
M1-8SM-SC	1 224 916	240 606
M1-8SFP (without SFPs)	38 097 066	10 075 890
M1-8TP-RJ45 PoE	3 286 905	1 205 773

GRS106	MTBF in h for environmental condition	
	G_B 25°C	G_B 60°C
GRS106-6F8F16TSG9(__)HHS GRS106-6F8F16TSM9(__)HHS GRS105-6F8F16TSG9(__)HHS GRS105-6F8F16TSM9(__)HHS	817 310	301 242
GRS106-6F8F16TSGG(__)HHS GRS106-6F8F16TSGM(__)HHS GRS105-6F8F16TSGG(__)HHS GRS105-6F8F16TSGM(__)HHS	1 013 941	375 221
GRS106-6F8F16TSGL(__)HHS GRS106-6F8F16TSML(__)HHS GRS105-6F8F16TSGL(__)HHS GRS105-6F8F16TSML(__)HHS	1 010 325	373 860
GRS106-6F8F16TSL9(__)HHS GRS105-6F8F16TSL9(__)HHS	810 209	298 584
GRS106-6F8F16TSLL(__)HHS GRS105-6F8F16TSLL(__)HHS	1 006 663	372 481

GRS1042 Basic Unit	MTBF in h for environmental condition	
	Gb 25°C	Gb 60°C
GRS1042-AT2Z_HL|LL	1 968 468	648 414
GRS1042-AT2Z_HH	1 924 455	639 731
GRS1142-AT2Z_HL|LL	1 941 044	619 187
GRS1142-AT2Z_HH	1 898 235	611 264
GRS1042-6T6Z_HL|LL	2 423 370	737 546
GRS1042-6T6Z_HH	2 357 006	726 332
GRS1142-6T6Z_HL|LL	2 381 939	699 965
GRS1142-6T6Z_HH	2 317 795	689 857

GRS1042 Media Module	MTBF in h for environmental condition	
	Gb 25°C	Gb 60°C
GMM40-TT TT	5 151 671	2 397 260
GMM42-TT TT TT TT	4 067 165	1 774 230
GMM40-OO OO OO OO	33 626 288	8 555 903
GMM40-OO OO TT TT	8 628 357	3 506 957
GMM42-OO OO TT TT	6 716 387	2 609 343
GMM30-()()TT TT	1 900 610	424 973
GMM20-() () () ()	1 179 558	235 470

Comment: () = MM or NN or VV or UU

GRS1042 Power supply	MTBF in h for environmental condition	
	Gb 25°C	Gb 60°C
GPS-P	4 101 007	1 544 106
GPS1-C	1 383 473	501 393
GPS1-K	757 498	274 529

MTBF

these are calculated values

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MACH4000-Familie	MTBF in h for environmental condition							
	G_B25°C	G_B50°C	G_B55°C	G_B60°C	G_F25°C	G_F50°C	G_F55°C	G_F60°C
Grundgeräte (ohne SFPs/XFPs)								
MACH4002-48+4G	165 602	72 064	/	48 609	82 801	36 032	/	24 305
MACH4002-24G	150 897	/	/	44 376	75 449	/	/	22 188
MACH4002-48G	102 712	/	/	34 895	51 356	/	/	17 448
MACH4002-24G+3X	140 157	/	/	42 460	70 079	/	/	21 230
MACH4002-48G+3X	97 620	/	/	33 699	48 810	/	/	16 850
Lüftereinschub								
M4-AIR	10 000 000	/	/	/	/	/	/	/
M4-AIR-T	4 819 187	/	/	/	/	/	/	/
Netzteileinschübe; Switch-Chassis								
M4-S-AC/DC 300W	/	/	/	/	/	/	/	/
M4-S-24VDC 300W M4-S-48VDC 300W	649 676	/	/	/	324 838	/	/	/
Einschub-Module								
M4-8TP-RJ45	6 094 897	/	/	1 352 104	3 047 449	/	/	676 052
M4-FAST 8-SFP (ohne SFPs)	1 155 420	/	/	293 869	577 710	/	/	146 935
M4-FAST 8TP-RJ45-PoE	571 149	/	/	197 741	285 575	/	/	98 871
M4-GIGA 8-SFP (ohne SFPs)	2 378 994	/	/	594 716	1 189 497	/	/	297 358
Netzteileinschübe; Netzteil-Chassis								
M4-P-AC/DC 300W	/	/	/	/	/	/	/	/
M4-P-24VDC 300W M4-P-48VDC 300W	649 676	/	/	/	324 838	/	/	/

DRAGON MACH4x00	MTBF in h for environmental condition	
	G_B 25°C	G_B 60°C
Basic Unit:		
DRAGON MACH4000-48G+4X (inclusive Fan-module but without PSU)	1 281 583	372 785
DRAGON MACH4500-48G+8X (inclusive Fan-module but without PSU)	679 052	145 406
PSU:		
D4K-PSU-300W-HV	840 336	132 767
Fan-module:		
D4K-AIR	6 995 673	1 837 332
Media-module:		
D4K-12TP-RJ45	2 921 848	540 314
D4K-12SFP	8 472 775	2 348 804

MTBF

these are calculated values

According to Telcordia SR-332 Issue 3, January 2011

	MTBF in h for environmental condition	
	G_B 25°C	G_B 60°C
OCTOPUS		
OCTOPUS 8TX-EEC	6 779 960	2 716 143
OCTOPUS 8TX-EEC PoE	4 755 238	1 857 306

	MTBF in h for environmental condition	
	G_B 25°C	G_B 60°C
OS2-		
OS20-000800T5T5T5-TBBZ999HHSE2A	1 671 961	520 671
OS20-000800T5T5T5-TN9Z999HHSE2A	735 186	264 964
OS20-001200T5T5T5-TBBZ999HHSE2A	1 547 509	492 975
OS20-001200T5T5T5-THHS999HHNE3S	1 661 958	592 347
OS20-001200T5T5T5-TN9Z999HHSE2A	710 076	257 599
OS20-002000R5R5T5-TBBS999HHSE2A	1 229 710	401 107
OS20-002000T5T5T5-TBBS999HHSE2A	1 347 709	442 400
OS20-002800T5T5T5-TBBY999HHSE3S	1 195 600	406 818
OS30-001604R6R6T5-TN9S999HHTE3S	625 078	226 280
OS24-152800T5T5T5-TQQS999HHSE2S	767 401	279 626
OS34-100804R6T6T5-TN9S999HHSE2S	438 904	158 195
OS34-100804R6T6T5-TPPS999HHSE3S	1 511 944	557 476
OS34-100804R6T6T5-TQQS999HHSE3S	901 551	323 060
OS34-110804T6T6T5-TN9S999HHSE3S	441 326	158 816
OS34-121604R6R6T5-TN9S999HHSE2A	418 708	151 976
OS34-122404R6R6T5-TN9S999HHSE2S	402 560	146 802
OS34-1416041AT6T5-TN9S999HHSE3S	362 096	143 740
OS34-141604R6T6T5-TN9S999HHTE3S	416 146	150 417
OS34-141604R6T6T5-TPPS999HHSE3S	1 293 494	483 022
OS34-141604R6T6T5-TQQS999HHSE3S	819 068	296 569
OS34-142404R6T6T5-TPPS999HHSE2A	1 143 511	433 839
OS34-151604T6T6T5-TN9S999HHSE2A	420 575	152 138
OS34-152404T6T6T5-TN9S999HHSE2A	404 285	146 953
OS34-152404T6T6T5-TPPS999HHSE2A	1 167 542	439 097

	MTBF in h for environmental condition	
OS3-	G_B 25°C	G_B 60°C
OS3-34-080800160800R6R6-TPPS9URHHSE3A	895 740	356 461
OS3-34-080800160800R6R6-TQQS9URHHSE3A	639 288	243 492
OS3-40-000000000800T6T6-TBBS9URHHSE3A	1 451 293	456 022
OS3-40-000000000800T6T6-TN9S9MRHHSE3A	700 136	249 777
OS3-40-000000001600T6T6-TN9S9MRHHSE3A	606 850	223 289
OS3-44-080008000800T6T6-TPPS9MRHHSE3A	1 533 788	551 396
OS3-44-080008000800T6T6-TQQS999HHSE2A	909 236	321 014
OS3-44-240024002400T6T6-TN9S9URHHSE3A	358 929	132 619

MTBF

these are calculated values

According to Telcordia SR-332 Issue 3, January 2011

BAT450	MTBF in h for environmental condition	
	G_B 25°C	G_B 60°C
BAT450-F M12:		
BAT450-F__W99[_]W9[_][_]AT699[_][_]9[_][_]HXX.XX.XXXX	1 329 564	577 241
BAT450-F__W99[_]W9[_][_]AT6T6[_][_]9[_][_]HXX.XX.XXXX	1 289 590	561 757
BAT450-F__WW9[_]W9[_][_]AT699[_][_]9[_][_]HXX.XX.XXXX	1 246 444	444 228
BAT450-F__WW9[_]W9[_][_]AT6T6[_][_]9[_][_]HXX.XX.XXXX	1 211 246	435 001
BAT450-F M12 LTE:		
BAT450-FEUW9LAW9K9AT6[_]E9999HXX.XX.XXXX	898 486	303 394
BAT450-FUSW9AAW9K9AT6T7E9999HXX.XX.XXXX* BAT450-FUSW9VAW9K9AT6T7E9999HXX.XX.XXXX* *US-variant not obtainable	1 044 404	437 246
BAT450-F M12 110V:		
BAT450-F[_]W99[_]N9[_]AT699[_]HXX.XX.XXXX	4 402 313	837 493
BAT450-F[_]W99[_]N9[_]AT6T6[_]HXX.XX.XXXX	3 992 607	805 289
BAT450-F[_]WW9[_]N9[_]AT699[_]HXX.XX.XXXX	3 606 135	583 853
BAT450-F[_]WW9[_]N9[_]AT6T6[_]HXX.XX.XXXX	3 326 471	568 017
BAT450-F M12 LTE 110V:		
BAT450-F[_]W9L[_]N[_]HXX.XX.XXXX	1 700 650	362 621
BAT450-F M12 11ac:		
BAT450-F__599[_]W9[_][_]AT699[_][_]9[_][_]HXX.XX.XXXX	1 107 435	525 857
BAT450-F__599[_]W9[_][_]AT6T6[_][_]9[_][_]HXX.XX.XXXX	1 079 562	512 976
BAT450-F M12 11ac 110V:		
BAT450-F[_]599[_]N9[_]AT699[_]HXX.XX.XXXX	2 645 402	733 506
BAT450-F[_]599[_]N9[_]AT6T6[_]HXX.XX.XXXX	2 491 727	708 684

BAT867	MTBF in h for environmental condition	
	G_B 25°C	G_B 60°C
BAT867-R	2 512 737	783 960
BAT867-F	not yet developed	not yet developed

BAT-C2	MTBF in h for environmental condition	
	G_B 25°C	G_B 60°C
	1 207 342	541 434

MTBF

these are calculated values

According to Telcordia SR-332 Issue 1, May 2001

EAGLE_One TX-TX	652 424 h
	74,5 a
EAGLE_One TX-MM	604 004 h
	69,0 a
EAGLE_One MM-MM	562 275 h
	64,2 a
EAGLE20-0400999TT999_CC	587 930 h
	67,1 a
EAGLE20-0400999TT999_K9	556 397 h
	63,5 a
EAGLE20-0400999TT999_KK	452 208 h
	51,6 a
EAGLE30-04022O6TT999_CC	583 357 h
	66,6 a
EAGLE30-04022O6TT999_K9	552 300 h
	63,0 a
EAGLE30-04022O6TT999_KK	449 498 h
	51,3 a

RPS 15	7 165 000
RPS 30	
RPS 80 EEC	2 436 000
RPS 120	2 436 000
RPS 120 EEC	1 338 000

MTBF in h for environmental condition (Telcordia Issue 4)		
	Gb 25°C	Gb 55°C
EAGLE40-03	816 773	321 519
EAGLE40-07	387 288	

M-FAST SFP-MM/LC	4 504 505
M-FAST SFP-SM/LC	5 714 000
M-FAST SFP-SM+/LC	5 602 000
M-FAST SFP-LH/LC	3 215 434
M-FAST SFP-MM/LC EEC	4 716 000
M-FAST SFP-SM/LC EEC	5 714 000
M-FAST SFP-SM+/LC EEC	5 602 000
M-FAST SFP-LH/LC EEC	4 346 000
M-SFP-SX/LC	17 211 704
M-SFP-MX/LC	
M-SFP-LX/LC	13 888 889
M-SFP-LX+/LC	4 269 126
M-SFP-LH/LC	15 936 019
M-SFP-LH+/LC	
M-SFP-SX/LC EEC	5 211 000
M-SFP-LX/LC EEC	7 407 000
M-SFP-LX+/LC EEC	4 269 126
M-SFP-LH/LC EEC	4 220 000
M-SFP-LH+/LC EEC	4 158 350
M-SFP-2,5-MM/LC EEC	4 700 000
M-SFP-2,5-SM/LC EEC	6 983 000
M-SFP-2,5-SM/LC EEC	5 163 000
M-SFP-2,5-SM+/LC EEC	2 411 000

MTBF

these are calculated values

According to Telcordia SR-332

	MTBF in h
M-FAST SFP-MM/LC	4 504 505
M-FAST SFP-SM/LC	5 714 000
M-FAST SFP-SM+/LC	5 602 000
M-FAST SFP-LH/LC	3 215 434
M-FAST SFP-MM/LC EEC	4 716 000
M-FAST SFP-SM/LC EEC	5 714 000
M-FAST SFP-SM+/LC EEC	5 602 000
M-FAST SFP-LH/LC EEC	4 346 000

	MTBF in h
M-SFP-SX/LC	17 211 704
M-SFP-MX/LC EEC	5 192 338
M-SFP-LX/LC	13 888 889
M-SFP-LX+/LC	4 269 126
M-SFP-LH/LC	15 936 019
M-SFP-LH+/LC	15 936 019
M-SFP-SX/LC EEC	5 211 000
M-SFP-LX/LC EEC	7 407 000
M-SFP-LX+/LC EEC	4 269 126
M-SFP-LH/LC EEC	4 220 000
M-SFP-LH+/LC EEC	4 158 350

	MTBF in h
M-SFP-RJ45	5 652 000
M-SFP-TX/RJ45 EEC	8 620 000

	MTBF in h
M-SFP-2.5-MM/LC EEC	4 700 000
M-SFP-2.5-SM-/LC EEC	6 983 000
M-SFP-2.5-SM/LC EEC	5 163 000
M-SFP-2.5-SM+/LC EEC	2 411 000

	MTBF in h
M-XFP SR/LC	1 974 000
M-XFP LR/LC	1 650 000
M-XFP ER/LC	1 217 000
M-XFP ZR/LC	1 193 000

TECHNICAL DATAS

BRS L2S

Switching

Size of the MAC address table (incl. static filters)	16384
Max. number of statically configured MAC address filters	100
Max. number of MAC address filters learnable through IGMP Snooping	1024
Max. number of MAC address entries (MMRP)	64
Number of priority queues	8 Queues
Port priorities that can be set	0..7
MTU (Max. allowed length of packets a port can receive or transmit)	9720 Bytes

VLAN

VLAN ID range	1..4042
Number of VLANs	max. 128 simultaneously per device max. 128 simultaneously per port

Access Control Lists (ACL)

Max. number of ACLs	50
Max. number of rules per ACL	256
Max. number of rules per port	256
Number of total configurable rules	2048 (8 × 256)
Max. number of VLAN assignments	12
Max. number of rules which log an event	128
Max. number of Ingress rules	514

BRS L2A

Switching

Size of the MAC address table (incl. static filters)	16384
Max. number of statically configured MAC address filters	100
Max. number of MAC address filters learnable through IGMP Snooping	1024
Max. number of MAC address entries (MMRP)	64
Number of priority queues	8 Queues
Port priorities that can be set	0..7
MTU (Max. allowed length of packets a port can receive or transmit)	9720 Bytes

VLAN

VLAN ID range	1..4042
Number of VLANs	max. 128 simultaneously per device max. 128 simultaneously per port

Access Control Lists (ACL)

Max. number of ACLs	50
Max. number of rules per ACL	256
Max. number of rules per port	256
Number of total configurable rules	2048 (8 × 256)
Max. number of VLAN assignments	12
Max. number of rules which log an event	128
Max. number of Ingress rules	514

TECHNICAL DATAS

MSP L2A | MSP-L3A

Switching

Size of the MAC address table (incl. static filters)	32768
Max. number of statically configured MAC address filters	100
Max. number of MAC address filters learnable through IGMP Snooping	1024
Max. number of MAC address entries (MMRP)	512
Number of priority queues	8 Queues
Port priorities that can be set	0..7
MTU (Max. allowed length of packets a port can receive or transmit)	12288 Bytes

VLAN

VLAN ID range	1..4042
Number of VLANs	max. 512 simultaneously per device max. 512 simultaneously per port

Access Control Lists (ACL)

Max. number of ACLs	100
Max. number of rules per ACL	1023
Max. number of rules per port	1023
Number of total configurable rules	8184 (8 × 1023)
Max. number of VLAN assignments	24
Max. number of rules which log an event	128
Max. number of Ingress rules	1792
Max. number of Egress rules	512

Routing

MTU (Max. allowed length of over-long packets a router interface can receive or transmit)	12266
Number of loopback interfaces	8
Max. number of Secondary IP addresses (Multinetting)	31
Max. number of VLAN router interfaces	128
Max. number of static routing entries	1280
Max. number of total IPv4 Unicast routing entries	12288 (Routing profiles `ipv4RoutingDefault`, `ipv4RoutingUnicast` and `ipv4RoutingMulticast`) 8160 (Routing profile `ipv4DataCenter`)
Max. number of IPv4 Multicast routing entries	1024 (Routing profiles `ipv4RoutingDefault` and `ipv4DataCenter`) 0 (Routing profile `ipv4RoutingUnicast`) 2047 (Routing profile `ipv4RoutingMulticast`)
Max. number of ARP entries	6144 (Routing profiles `ipv4RoutingDefault` and `ipv4DataCenter`) 8189 (Routing profile `ipv4RoutingUnicast`) 4096 (Routing profile `ipv4RoutingMulticast`)
Max. number of ECMP Next Hop entries	4 (Routing profiles `ipv4RoutingDefault`, `ipv4RoutingUnicast` and `ipv4RoutingMulticast`) 16 (Routing profile `ipv4DataCenter`)

TECHNICAL DATAS

RSP L2S

Switching

Size of the MAC address table (incl. static filters)	16384
Max. number of statically configured MAC address filters	100
Max. number of MAC address filters learnable through IGMP Snooping	1024
Max. number of MAC address entries (MMRP)	64
Number of priority queues	8 Queues
Port priorities that can be set	0..7
MTU (Max. allowed length of packets a port can receive or transmit)	12288 Bytes

VLAN

VLAN ID range	1..4042
Number of VLANs	max. 256 simultaneously per device max. 256 simultaneously per port

Access Control Lists (ACL)

Max. number of ACLs	50
Max. number of rules per ACL	255
Max. number of rules per port	255
Number of total configurable rules	2040 (8 × 255)
Max. number of VLAN assignments	12
Max. number of rules which log an event	128
Max. number of Ingress rules	768

RSP L2A

Switching

Size of the MAC address table (incl. static filters)	16384
Max. number of statically configured MAC address filters	100
Max. number of MAC address filters learnable through IGMP Snooping	1024
Max. number of MAC address entries (MMRP)	512
Number of priority queues	8 Queues
Port priorities that can be set	0..7
MTU (Max. allowed length of packets a port can receive or transmit)	12288 Bytes

VLAN

VLAN ID range	1..4042
Number of VLANs	max. 256 simultaneously per device max. 256 simultaneously per port

Access Control Lists (ACL)

Max. number of ACLs	50
Max. number of rules per ACL	511
Max. number of rules per port	511
Number of total configurable rules	4088 (8 × 511)
Max. number of VLAN assignments	24
Max. number of rules which log an event	128
Max. number of Ingress rules	768

TECHNICAL DATAS

RSP L3S

Switching

Size of the MAC address table (incl. static filters)	16384
Max. number of statically configured MAC address filters	100
Max. number of MAC address filters learnable through IGMP Snooping	1024
Max. number of MAC address entries (MMRP)	512
Number of priority queues	8 Queues
Port priorities that can be set	0..7
MTU (Max. allowed length of packets a port can receive or transmit)	12288 Bytes

VLAN

VLAN ID range	1..4042
Number of VLANs	max. 256 simultaneously per device max. 256 simultaneously per port

Access Control Lists (ACL)

Max. number of ACLs	50
Max. number of rules per ACL	511
Max. number of rules per port	511
Number of total configurable rules	4088 (8 × 511)
Max. number of VLAN assignments	24
Max. number of rules which log an event	128
Max. number of Ingress rules	768

RSPE L2S

Switching

Size of the MAC address table (incl. static filters)	16384
Max. number of statically configured MAC address filters	100
Max. number of MAC address filters learnable through IGMP Snooping	1024
Max. number of MAC address entries (MMRP)	64
Number of priority queues	8 Queues
Port priorities that can be set	0..7
MTU (Max. allowed length of packets a port can receive or transmit)	12288 Bytes

VLAN

VLAN ID range	1..4042
Number of VLANs	max. 256 simultaneously per device max. 256 simultaneously per port

Access Control Lists (ACL)

Max. number of ACLs	50
Max. number of rules per ACL	255
Max. number of rules per port	255
Number of total configurable rules	2040 (8 × 255)
Max. number of VLAN assignments	12
Max. number of rules which log an event	128
Max. number of Ingress rules	768

TECHNICAL DATAS

RSPE L2A

Switching

Size of the MAC address table (incl. static filters)	16384
Max. number of statically configured MAC address filters	100
Max. number of MAC address filters learnable through IGMP Snooping	1024
Max. number of MAC address entries (MMRP)	512
Number of priority queues	8 Queues
Port priorities that can be set	0..7
MTU (Max. allowed length of packets a port can receive or transmit)	12288 Bytes

VLAN

VLAN ID range	1..4042
Number of VLANs	max. 256 simultaneously per device max. 256 simultaneously per port

Access Control Lists (ACL)

Max. number of ACLs	50
Max. number of rules per ACL	511
Max. number of rules per port	511
Number of total configurable rules	4088 (8 × 511)
Max. number of VLAN assignments	24
Max. number of rules which log an event	128
Max. number of Ingress rules	768

RSPE L3S

Switching

Size of the MAC address table (incl. static filters)	16384
Max. number of statically configured MAC address filters	100
Max. number of MAC address filters learnable through IGMP Snooping	1024
Max. number of MAC address entries (MMRP)	512
Number of priority queues	8 Queues
Port priorities that can be set	0..7
MTU (Max. allowed length of packets a port can receive or transmit)	12288 Bytes

Routing

MTU (Max. allowed length of over-long packets a router interface can receive or transmit)	12266
Number of loopback interfaces	2
Max. number of VLAN router interfaces	24
Max. number of static routing entries	40
Max. number of total IPv4 Unicast routing entries	64
Max. number of IPv4 Multicast routing entries	32 (Routing profile `ipv4RoutingDefault`) 0 (Routing profile `ipv4RoutingUnicast`)
Max. number of ARP entries	448 (Routing profile `ipv4RoutingDefault`) 512 (Routing profile `ipv4RoutingUnicast`)
Max. number of ECMP Next Hop entries	1

VLAN

VLAN ID range	1..4042
Number of VLANs	max. 256 simultaneously per device max. 256 simultaneously per port

Access Control Lists (ACL)

Max. number of ACLs	50
Max. number of rules per ACL	511
Max. number of rules per port	511
Number of total configurable rules	4088 (8 × 511)
Max. number of VLAN assignments	24
Max. number of rules which log an event	128
Max. number of Ingress rules	768

TECHNICAL DATAS

GRS106 L2S

Switching

Size of the MAC address table (incl. static filters)	16384
Max. number of statically configured MAC address filters	100
Max. number of MAC address filters learnable through IGMP Snooping	1024
Max. number of MAC address entries (MMRP)	64
Number of priority queues	8 Queues
Port priorities that can be set	0..7
MTU (Max. allowed length of packets a port can receive or transmit)	12288 Bytes

VLAN

VLAN ID range	1..4042
Number of VLANs	max. 512 simultaneously per device max. 512 simultaneously per port

Access Control Lists (ACL)

Max. number of ACLs	100
Max. number of rules per ACL	1023
Max. number of rules per port	1023
Number of total configurable rules	8184 (8 × 1023)
Max. number of VLAN assignments	24
Max. number of rules which log an event	128
Max. number of Ingress rules	1792

GRS106 L2A

Switching

Size of the MAC address table (incl. static filters)	16384
Max. number of statically configured MAC address filters	100
Max. number of MAC address filters learnable through IGMP Snooping	1024
Max. number of MAC address entries (MMRP)	512
Number of priority queues	8 Queues
Port priorities that can be set	0..7
MTU (Max. allowed length of packets a port can receive or transmit)	12288 Bytes

VLAN

VLAN ID range	1..4042
Number of VLANs	max. 512 simultaneously per device max. 512 simultaneously per port

Access Control Lists (ACL)

Max. number of ACLs	100
Max. number of rules per ACL	1023
Max. number of rules per port	1023
Number of total configurable rules	8184 (8 × 1023)
Max. number of VLAN assignments	24
Max. number of rules which log an event	128
Max. number of Ingress rules	1792
Max. number of Egress rules	512

GRS1x20/30 L2S

Switching	
Size of the MAC address table (incl. static filters)	16384
Max. number of statically configured MAC address filters	100
Max. number of MAC address filters learnable through IGMP Snooping	512
Maximum number of MAC address entries (MMRP)	64
Number of priority queues	8 Queues
Port priorities that can be set	0..7

VLAN	
VLAN-ID	1..4042
Number of VLANs	max. 128 simultaneously per device max. 128 simultaneously per port

TECHNICAL DATAS

GRS1042 L2A

Switching

Size of the MAC address table (incl. static filters)	32768
Max. number of statically configured MAC address filters	100
Max. number of MAC address filters learnable through IGMP Snooping	1024
Max. number of MAC address entries (MMRP)	512
Number of priority queues	8 Queues
Port priorities that can be set	0..7
MTU (Max. allowed length of packets a port can receive or transmit)	12288 Bytes

VLAN

VLAN ID range	1..4042
Number of VLANs	max. 512 simultaneously per device max. 512 simultaneously per port

Access Control Lists (ACL)

Max. number of ACLs	100
Max. number of rules per ACL	1023
Max. number of rules per port	1023
Number of total configurable rules	8184 (8 × 1023)
Max. number of VLAN assignments	24
Max. number of rules which log an event	128
Max. number of Ingress rules	1792
Max. number of Egress rules	512

GRS1042 L3A

Switching

Size of the MAC address table (incl. static filters)	32768
Max. number of statically configured MAC address filters	100
Max. number of MAC address filters learnable through IGMP Snooping	1024
Max. number of MAC address entries (MMRP)	512
Number of priority queues	8 Queues
Port priorities that can be set	0..7
MTU (Max. allowed length of packets a port can receive or transmit)	12288 Bytes

VLAN

VLAN ID range	1..4042
Number of VLANs	max. 512 simultaneously per device max. 512 simultaneously per port

Access Control Lists (ACL)

Max. number of ACLs	100
Max. number of rules per ACL	1023
Max. number of rules per port	1023
Number of total configurable rules	8184 (8 × 1023)
Max. number of VLAN assignments	24
Max. number of rules which log an event	128
Max. number of Ingress rules	1792
Max. number of Egress rules	512

Routing

MR | UR

MTU (Max. allowed length of over-long packets a router interface can receive or transmit)	12266
Number of loopback interfaces	8
Max. number of Secondary IP addresses (Multinetting)	31
Max. number of VLAN router interfaces	128
Max. number of static routing entries	1280
Max. number of total IPv4 Unicast routing entries	12288 (Routing profiles `ipv4RoutingDefault`, `ipv4RoutingUnicast` and `ipv4RoutingMulticast`) 8160 (Routing profile `ipv4DataCenter`)
Max. number of IPv4 Multicast routing entries	1024 (Routing profiles `ipv4RoutingDefault` and `ipv4DataCenter`) 0 (Routing profile `ipv4RoutingUnicast`) 2047 (Routing profile `ipv4RoutingMulticast`)
Max. number of ARP entries	6144 (Routing profiles `ipv4RoutingDefault` and `ipv4DataCenter`) 8189 (Routing profile `ipv4RoutingUnicast`) 4096 (Routing profile `ipv4RoutingMulticast`)
Max. number of ECMP Next Hop entries	4 (Routing profiles `ipv4RoutingDefault`, `ipv4RoutingUnicast` and `ipv4RoutingMulticast`) 16 (Routing profile `ipv4DataCenter`)

TECHNICAL DATAS

DRAGON MACH

Switching

Size of the MAC address table (incl. static filters)	32768
Max. number of statically configured MAC address filters	100
Max. number of MAC address filters learnable through IGMP Snooping	1024
Max. number of MAC address entries (MMRP)	512
Number of priority queues	8 Queues
Port priorities that can be set	0..7
MTU (Max. allowed length of packets a port can receive or transmit)	12288 Bytes

VLAN

VLAN ID range	1..4042
Number of VLANs	max. 512 simultaneously per device max. 512 simultaneously per port

Access Control Lists (ACL)

Max. number of ACLs	100
Max. number of rules per ACL	1023
Max. number of rules per port	1023
Number of total configurable rules	16368 (16 × 1023)
Max. number of VLAN assignments	48
Max. number of rules which log an event	128
Max. number of Ingress rules	3584 (7168)
Max. number of Egress rules	1024 (2048)

Routing/Switching

MTU (Max. allowed length of over-long packets a router interface can receive or transmit)	12266
Number of loopback interfaces	8
Max. number of Secondary IP addresses (Multinetting)	31
Max. number of VLAN router interfaces	128
Max. number of static routing entries	1280
Max. number of total IPv4 Unicast routing entries	12288 (Routing profiles `ipv4RoutingDefault`, `ipv4RoutingUnicast` and `ipv4RoutingMulticast`) 8160 (Routing profile `ipv4DataCenter`)
Max. number of IPv4 Multicast routing entries	2048 (Routing profiles `ipv4RoutingDefault` and `ipv4DataCenter`) 0 (Routing profile `ipv4RoutingUnicast`) 4095 (Routing profile `ipv4RoutingMulticast`)
Max. number of ARP entries	12288 (Routing profiles `ipv4RoutingDefault` and `ipv4DataCenter`) 16384 (Routing profile `ipv4RoutingUnicast`) 8192 (Routing profile `ipv4RoutingMulticast`)
Max. number of ECMP Next Hop entries	4 (Routing profiles `ipv4RoutingDefault`, `ipv4RoutingUnicast` and `ipv4RoutingMulticast`) 16 (Routing profile `ipv4DataCenter`)

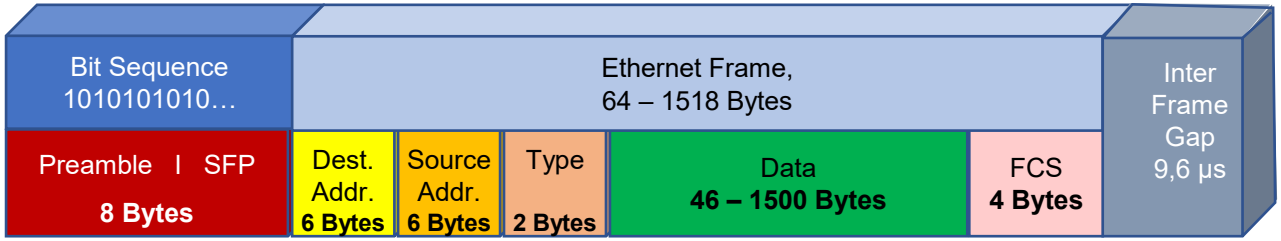
ROUTING LIMITS

Device	Multicast Routes	Unicast Routes	Unicast Routes	ARP Entries	ARP Entries	VRRP	VRRP	ACLS (direction IN)	ACLS (direction IN)	ACLS (direction IN)	DVMRP	PIM-DM	PIM-SM
		static	total	static	total	VRRP	HiVRRP	Max. rules per ACL	Max rules per Interface	Max. rules per device	Max. table entries in HW	Max. table entries	Max. table entries
PowerMICE L3E	0	256	2048	64	2048	Max. 8 instances per interface	Max. 16 instances per device	10	20	1.000	-	-	-
PowerMICE L3P	512	256	4096	64	2048				100	1.000	512	512	512
MACH4000 L3E	0	256	2048	64	2048				20	1.000	-	-	-
MACH4000 L3P	512	256	4096	64	2048				100	1.000	512	512	512
MACH4000 XG L3E	0	256	1536	64	3584				20	480/1.000	-	-	-
MACH4000 XG L3P	512	256	1860	64	2048				100	480/1.000	512	512	512
MACH104 L3P	512	256	4096	64	3072				100	1.000	512	512	512
MACH1040 L3P	512	256	4096	64	3072				100	1.000	512	512	512

GENERAL LIMITS

	RSP, RSPE, OCTOPUS	RSP20/30	RSPL20/30 EESX20/30 GRS1020/1030	RSPS20/25 EES20/25 RED25	MSP30	GRS1042 MSP40	DRAGON MACH4000 DRAGON MACH4500
MAC Address Table	16k	16k	16k	2k	32k	32k	32k
L2 Multicasts	1k	1k	512	256	1k	1k	1k
MAX DOT1X Clients per port	- (2S) - 16 (2A, 3A)	-	-	-	16	16	16
Port Security – Max. Dynamic Addresses	600						
Port Security – Max. Static Addresses	64						
VLANs	256	256	128	16	512	512	512
MSTP Instances	-				16	16	31 (TBD)
LAGs (03.0.00)	2 (2S) 4 (2A, 3S)	2	2	2	8	8	16 (TBD)
Max. ports per LAG (03.0.00)	4	4	4	2	8	8	8
Traffic-Classes/Queues	8	8	8	4	8	8	8
Max. ACL Lists	50	50	-	-	100	100	100 (TBD)
Max. ACL Rules per List	256 (2S) 512 (2A)	255	-	-	1023	1023	1023 (TBD)
Number of total configurable rules	8x256 (2S) 8x512 (2A)	8x256	-	-	8x1023	8x1023	8x1023
Max. ACL VLAN Assignements	12 (2S) 24 (2A)	12	-	-	24	24	48
Mac. ACL Logging Rules	128	128	-	-	128	128	128
Max. Ingress ACL Rules per device	768	768	-	-	1792	1792	3840 (m4000) 7680 (m4500)
Max. Egress ACL Rules per device	-	-	-	-	512	512	1024 (m4000) 2048 (m4500)

MAXIMUM TRANSMISSION UNIT -- MTU



RS20/30/40:	1522/1632 (default: 1522)
MS20/MS30:	1522/1632 (default: 1522)
RSP:	1518 …. 12288 (default: 1518)
RSPE:	1518 …. 12288 (default: 1518)
MSP:	1518 …. 12288 (default: 1518)
Bobcat BRS:	9720
OCTOPUS-OS_2S:	1518 …. 12288 (default: 1518)
GECKO	1522

MACH102:	1522 and 1632 (default: 1522)
MACH104:	1522/1552/9022 (default: 1522)
MACH1040:	1522 … 9022 (default: 1522)
Greyhound GRS1020/1030:	1996 without VLAN tag
Greyhound GRS105/106:	1518 …12288
RED25, RSPS, RSPL:	2000
Greyhound GRS1042:	1518 … 12288 (default: 1518)
MACH4000:	1522 … 1552 (default:1522)
Dragon MACH:	1522 … 12288

SPIDER-PL:	9720 Bytes
High port SPIDER-PL and OCTOPUS 8TX:	9728 Bytes

SPIDER II Giga 5T EEC Jumbo:
Jumbo packets supported till 9000 byte
SPIDER II Giga 5T/2S EEC Jumbo:
Jumbo packets supported till 9000 byte

SOFTWARE PLATFORMS

Hirschmann offers the following software for use with its world class industrial network equipment

The Classic Switch Software (Release 9)
Software Platform for Hirschmann managed MACH, MICE, Rail and OCTOPUS families

HiOS - Hirschmann Operating System
Software Platform for Hirschmann managed BOBCAT, RSP(RSPS, RSPL, RSPE), RED25, GREYHOUND, MSP, OCTOPUS and Embedded Ethernet Switch families

Classic Firewall Software
Software Platform for Hirschmann 2-port EAGLE20 Security family

HiSecOS - Hirschmann Security Operating System
Software Platform for Hirschmann EAGLE Security Router family

Tofino
Software Platform for the Tofino family

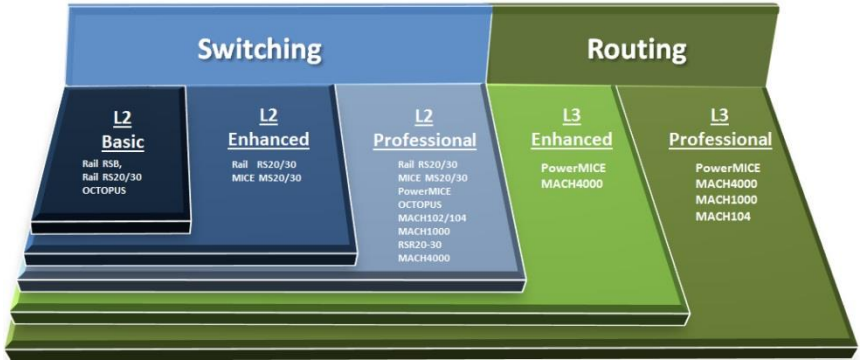
WLAN-Software HiLCOS
Software Platform for Hirschmann BAT-Family

Classic

Platform 4

The Classic Switch Software (Release 8)

Software Platform for Hirschmann™ **managed MACH, MICE, Rail and OCTOPUS** families



Switching	
Layer 2 Basic	Suitable for **RSB20, OCTOPUS**. The cost-effective entrance into managed switch capabilities. Includes statistics, Filters and redundancy technologies. The alternative for unmanaged switches.
Layer 2 Enhanced	Suitable for **RS20/30/40, MS20/30**. Basic level plus a wide range of management, filter and diagnostic functions. Fast redundancy mechanisms, industrial profiles like EtherNet/IP and PROFINET and security features are also supported. Ideally suited for standard industrial
Layer 2 Professional	Suitable for **MACH100, MACH1000, MACH4000, RS20/30/40, MS20/30, RSR** Enhanced software plus extended diagnostic, filter properties, security and redundancy features. A software package for applications where great value is placed on uncompromising plant safety and the highest level of availability
Routing	
Layer 3 Enhanced	Suitable for **PowerMICE, MACH4000** Professional L2 software plus additional security, static routing, dynamic routing protocols (RIP), router- and link redundancy. The Layer 3 software for smaller networks and applications with extended security requirements.
Layer 3 Professsional	Suitable for **PowerMICE, MACH104, MACH1040,MACH4000** Layer 3 Enhanced plus a wide range of dynamic routing protocols (RIP, OSPF), multicast routing protocols, fast router redundancy and enhanced link redundancy

HiOS

Platform 5

HiOS - Hirschmann™ Operating System

Software Platform for Hirschmann™ **managed RSP, MSP and Embedded Ethernet Switch** families

Switching	
Layer 2 Standard	Suitable for **RSP, GRS** series. In addition to numerous management and diagnostic options, HiOS provides precise time synchronization compliant with IEEE 1588v2 plus a variety of redundancy protocols. With zero switchover times, the PRP (Parallel Redundancy Protocoll) and HSR (High-Availabilty Seamless Redundancy) redundancy methods ensure smooth production processes. Comprehensive security mechanisms protect your network against attacks and operatinng errors, so also contributing to high network availability
Layer 2 Advanced	Suitable for **MSP and RSP series.** The Advanced Level includes all features of the Standard Level plus additional redundancy enhancements with MRP over Link Aggregation and Quality of Service functions such as DiffServ, MAC and IP based VLANs, protocol based VLANs and security mechanisms like enhanced Access Control Lists (ACL). Flow based ACL, RADIUS-based poilicy assignment, IP source guard, dynamic ARP inspection and IEEE 802.1x multi client authentication.
Routing	
Layer 3 Standard	Suitable for OCTOPUS, RSP and RSPE series. Layer 3 software includes the functionality of L2 software plus additional functionality such as static routing, 1:1 Network Address Translation, Router Redundancy and multicast forwarding. Ethernet Train Backbone is available for OCTOPUS.
Layer 3 Advanced	Suitable for **MSP** series Layer 3 software includes the functionality of L3 Standard software plus additional functionality plus a wide range of dynamic routing protocols for unicast- and multicast protocols

Function Platform 4 (Classic) + Platform 5 (HiOS)

* Hardware dependent

Switching	Classic Switch Software v9.0					HiEOS v1.0	HiOS Hirschmann Operating System v9.2				
	L2B	L2E	L2P	L3E	L2P		L2E	L2S	L2A	L3S	L3A
Lernen ausschalten (Hub-Funktion)		•	•	•	•						
Fast Aging	•	•	•	•	•		•	•	•	•	•
Statisches Unicast / Multicast-Adresseinträge	•	•	•	•	•	•	•	•	•	•	•
VLAN (802.1Q)		•	•	•	•	•	•	•	•	•	•
Unabhängiges VLAN-Lernen		•	•	•	•	•	•	•	•	•	•
Private VLANs									•*		•*
Double VLAN Tagging (QinQ)			•	•	•				•*	•*	•*
GARP VLAN Registration Protocol (GVRP)			•	•	•			•	•	•	•
Multiple VLAN Registration Protocol (MVRP)							•	•	•	•	•
Protokollbasiertes VLAN					•				•	•	•
Voice-VLAN			•	•	•			•	•	•	•
MAC-basiertes VLAN									•	•	•
IP-Subnetz-basiertes VLAN									•	•	•
VLAN Unaware Mode							•	•	•	•	•
QoS / Port Priorisierung (802.1D/p)	•	•	•	•	•	•	•	•	•	•	•
TOS/DSCP Priorisierung	•	•	•	•	•	•	•	•	•	•	•
Interface-Trust Mode							•	•	•	•	•
IP Ingress DiffServ Classification und Policing									•	•	•
IP Egress DiffServ Classification und Policing									•*		•
CoS Queue Management				•	•	•	•	•	•	•	•
Traffic Shaping				•	•						
Queue-Shaping / Max. Queue-Bandbreite						•		•*	•	•	•
Jumbo Frames			•*		•*	•	•*	•*	•	•	•
GARP Multicast Registration Protocol (GMRP)			•	•	•			•*	•	•	•
IGMP Snooping/Querier (v1/v2/v3)	•	•	•	•	•	•					
IGMP Snooping/Querier per VLAN (v1/v2/v3)							•	•	•	•	•
Unknown Multicast Filtering		•	•	•	•	•	•	•	•	•	•
IGMP Group Filtering per Port						•					
Multiple MAC Registration Protocol (MMRP)							•	•	•	•	•
Multiple Registration Protocol (MRP)							•	•	•	•	•
Egress Broadcast Limiter per Port		•	•	•	•						
Flusskontrolle (802.3X)		•	•	•	•	•	•	•	•	•	•
Loop-Erkennung									•	•	•
Egress Interface Shaping						•	•	•	•	•	•
Ingress Storm Protection						•	•	•	•	•	•
Ethernet Train Backbone										•*	
Time Sensitive Networking								•*	•*	•*	
FPGA-basierte 802.1Qbv								•*	•*	•*	

You can see also a complete overview of features on
→ **https://www.doc.hirschmann.com/hios.html**

Function Platform 4 (Classic) + Platform 5 (HiOS)

* Hardware dependent

Redundanz	Classic Switch Software v9.0					HiEOS v1.0	HiOS Hirschmann Operating System v9.2				
	L2B	L2E	L2P	L3E	L2P		L2E	L2S	L2A	L3S	L3A
HIPER-Ring (Manager)	•	•	•	•	•						
HIPER-Ring (Ring Switch)	•	•	•	•	•				•	•	•
Fast HIPER-Ring			•*	•*	•*						
Link Aggregation mit LACP			•	•	•		•	•	•	•	•
HIPER-Ring über Link-Aggregation			•*	•*	•*				•	•	•
Link Backup							•	•	•	•	•
Media Redundancy Protocol (MRP) (IEC62439-2)	•	•	•	•	•		•	•	•	•	•
MRP Client Only						•					
Fast MRP (IEC62439-2)							•*	•*	•*	•*	
MRP über Link-Aggregation									•	•	•
Advanced Ring Configuration für MRP			•	•	•						
High-availability Seamless Redundancy Protocol (HSR) (IEC62439-3)							•*	•*	•*	•*	
Parallel Redundancy Protocol (PRP) (IEC62439-3)							•*	•*	•*	•*	
Device Level Ring (DLR)								•*	•*	•*	
Redundante Netzkopplung		•	•	•	•				•	•	•
Redundant Coupling Protocol									•	•	•
Sub-Ring-Manager			•*	•*	•*				•	•	•
RSTP 802.1D-2004 (IEC62439-1)	•	•	•	•	•	•	•	•	•	•	•
MSTP (802.1Q)			•	•	•				•*	•	•
RSTP Guards		•	•	•	•		•	•	•	•	•
RSTP über MRP		•	•	•	•						
RSTP über HSR							•*	•*	•*	•*	
RSTP Ring Only Mode									•	•	•
VRRP				•	•					•	•
HiVRRP (VRRP-Erweiterungen)				•	•					•	•
VRRP Tracking				•	•					•	•
ERPS (G.8032)						•					
ERPS v2 (G.8032)						•					

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Function Platform 4 (Classic) + Platform 5 (HiOS)

* Hardware dependent

Konfiguration	Classic Switch Software v9.0					HiEOS v1.0	HiOS Hirschmann Operating System v9.2				
	L2B	L2E	L2P	L3E	L2P		L2E	L2S	L2A	L3S	L3A
Automatische Konfiguration rückgängig machen (roll-back)	•	•	•	•	•		•	•	•	•	•
Text-basierte Konfigurationsdatei (XML)							•	•	•	•	•
Konfigurationsfingerabdruck		•	•	•	•		•	•	•	•	•
DHCP Server: pro Port			•	•	•			•	•	•	•
DHCP Server: Pools pro VLAN			•	•	•			•	•	•	•
DHCP Server: Option 43			•	•	•						
DHCP Relay pro Interface				•	•						
Autokonfigurationsadapter ACA31 (SD Karte)							•*	•*	•	•	•
Autokonfigurationsadapter ACA21/22 (USB)		•	•	•	•			•*	•*	•*	•
HiDiscovery	•	•	•	•	•	•	•	•	•	•	•
DHCP Relay mit Option 82	•	•	•	•	•		•*	•*	•	•	•
Command Line Interface (CLI)	•	•	•	•	•	•	•	•	•	•	•
CLI Scripting			•	•	•		•	•	•	•	•
Umfassende MIB-Unterstützung	•	•	•	•	•	•	•	•	•	•	•
Webbasiertes Management	•	•	•	•	•	•	•	•	•	•	•
Contextsensitive Hilfe	•	•	•	•	•		•	•	•	•	•

Management	Classic Switch Software v9.0					HiEOS v1.0	HiOS Hirschmann Operating System v9.2				
	L2B	L2E	L2P	L3E	L2P		L2E	L2S	L2A	L3S	L3A
IPv6 Management								•*	•*	•*	
LLDP (802.1AB)	•	•	•	•	•	•	•	•	•	•	•
LLDP-MED			•	•	•	•		•	•	•	•
Passwortänderung beim ersten Login	•	•	•	•	•	•	•	•	•	•	•
SSHv1			•	•	•						
SSHv2			•	•	•	•	•	•	•	•	•
V.24	•	•	•	•	•		•	•	•	•	•
HTTP	•	•	•	•	•	•	•	•	•	•	•
HTTPS			•	•	•	•	•	•	•	•	•
Responsive GUI						•		•*	•	•	•
SNMP v1/v2/v3	•	•	•	•	•	•	•	•	•	•	•
Traps	•	•	•	•	•	•	•	•	•	•	•
Telnet		•	•	•	•	•	•	•	•	•	•
TFTP	•	•	•	•	•	•	•	•	•	•	•
SFTP							•	•	•	•	•
SCP							•	•	•	•	•
DNS Client									•	•	•
Unterstützung von Dual-Software-Image			•	•	•	•	•*	•*	•	•	•
Signierte Software-Images								•*	•*	•*	
Out Of Band Management									•*		•*

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Function Platform 4 (Classic) + Platform 5 (HiOS)

* Hardware dependent

Routing	Classic Switch Software v9.0					HiEOS v1.0	HiOS Hirschmann Operating System v9.2				
	L2B	L2E	L2P	L3E	L2P		L2E	L2S	L2A	L3S	L3A
Full Wire-Speed Routing				•	•					•	•
Loopback-Interface										•	•
ICMP-Filter										•	•
Net-directed Broadcasts				•	•					•	•
Statisches Unicast-Routing				•	•					•	•
Statisches Routen-Nachverfolgen					•					•	•
1:1 Netzwerkadressübersetzung										•	
RIP v1/v2				•	•					•	•
OSPFv2					•					•	•
ICMP-Router-Discovery (IRDP)				•	•					•	•
Equal Cost Multiple Path (ECMP)				•	•						•
Proxy ARP				•	•					•	•
IP/UDP Helper										•	•

Multicast Routing	Classic Switch Software v9.0					HiEOS v1.0	HiOS Hirschmann Operating System v9.2				
	L2B	L2E	L2P	L3E	L2P		L2E	L2S	L2A	L3S	L3A
IGMP v1, v2, v3					•					•	•
IGMP-Proxy (Multicast-Routing)										•	•
DVMRP					•						•*
PIM-DM (RFC3973)					•						•*
PIM-SM / SSM (RFC4601)					•						•*

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Function Platform 4 (Classic) + Platform 5 (HiOS)

* Hardware dependent

Sicherheit	Classic Switch Software v9.0					HiEOS v1.0	HiOS Hirschmann Operating System v9.2				
	L2B	L2E	L2P	L3E	L2P		L2E	L2S	L2A	L3S	L3A
IP-basiertes Port-Security		•	•	•	•						
MAC-basiertes Port-Security		•	•	•	•		•	•	•	•	•
MAC-Adressenbegrenzung pro Port		•	•	•	•	•	•	•	•	•	•
Port-basiertes Access-Control mit 802.1X			•	•	•		•	•	•	•	•
RADIUS-VLAN-Zuordnung							•	•	•	•	•
Gast/nicht authentifiziertes VLAN			•	•	•		•	•	•	•	•
RADIUS-Richtlinien-Zuweisung									•	•	•
MAC-Authentifizierungs-Bypass			•	•	•				•	•	•
Multi-Client-Autentifizierung pro Port			•	•	•				•	•	•
Integrierter Autentifizierungs-Server (IAS)			•	•	•		•	•	•	•	•
Remote Autentifizierung via RADIUS			•	•	•		•	•	•	•	•
LDAP									•	•	•
Basis-ACL								•*			
Ingress MAC-basiertes ACL				•	•				•	•	•
Ingress IPv4-basiertes ACL				•	•				•	•	•
Ingress VLAN-basiertes ACL									•	•	•
Egress MAC-basiertes ACL									•*		•
Egress IPv4-basiertes ACL									•*		•
Egress VLAN-basiertes ACL									•*		•
Zeit-basiertes ACL									•	•	•
VLAN-basiertes ACL								•*	•	•	•
ACL-flussbasierte Begrenzung									•	•	•
DHCP-Snooping									•	•	•
IP Source Guard									•*		•
Dynamische ARP-Inspektion									•	•	•
Automatisches Denial-of-Service Prevention							•	•	•	•	•
Anzeige der Gerätesicherheit							•	•	•	•	•
Audit-Trail							•	•	•	•	•
CLI-Logging							•	•	•	•	•
HTTPS-Zertifikats-Management			•	•	•		•	•	•	•	•
Durch VLAN eingeschränkter Management-Zugriff		•	•	•	•		•	•	•	•	•
Eingeschränkter Management-Zugriff			•	•	•	•	•	•	•	•	•
Appropriate Use-Banner			•	•	•	•	•	•	•	•	•
SNMP-Logging		•	•	•	•		•	•	•	•	•
Syslog über TLS									•	•	•
Multiple-Privilege-Levels						•	•	•	•	•	•
Lokales Benutzer-Management	•	•	•	•	•	•	•	•	•	•	•
Konfiurierbare Passwortrichtlinie							•	•	•	•	•
Konfigurierbare Anzahl von Login-Versuchen							•	•	•	•	•
User-Account-Locking							•	•	•	•	•

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Function Platform 4 (Classic) + Platform 5 (HiOS)

* Hardware dependent

Zeitsynchronisation	Classic Switch Software v9.0					HiEOS v1.0	HiOS Hirschmann Operating System v9.2				
	L2B	L2E	L2P	L3E	L2P		L2E	L2S	L2A	L3S	L3A
SNTP-Client	•	•	•	•	•		•	•	•	•	•
SNTP-Server	•	•	•	•	•		•	•	•	•	•
NTP-Client						•					
Gepufferte Echtzeituhr			•	•	•		•*	•	•	•	•
PTPv2 Transparent Clock Two-step*			•	•	•		•*	•*	•	•	•
PTPv2 Boundary Clock*		•	•	•	•		•*	•*	•	•	•
802.1AS								•*	•*	•*	•*

Industrial Profile	Classic Switch Software v9.0					HiEOS v1.0	HiOS Hirschmann Operating System v9.2				
	L2B	L2E	L2P	L3E	L2P		L2E	L2S	L2A	L3S	L3A
PROFINET IO Protokoll		•	•	•	•		•*	•*	•	•	•
VLAN 0 Weiterleitung								•*	•*		
EtherNet/IP Protokoll		•	•	•	•		•*	•*	•	•	•
Separates EtherNet/IP VLAN								•*	•*	•*	
ModbusTCP							•	•	•	•	•
IEC61850 Protocol (MMS-Server, Switch-Modell)			•	•	•		•	•	•	•	•
OPC UA Server									•	•	•

Sonstiges	Classic Switch Software v9.0					HiEOS v1.0	HiOS Hirschmann Operating System v9.2				
	L2B	L2E	L2P	L3E	L2P		L2E	L2S	L2A	L3S	L3A
Digitales-IO-Management	•*	•*	•*	•*	•*				•*		•*
PoE (802.3AF)		•*	•*	•*	•*	•*	•	•*	•*	•*	•*
PoE+ (802.3AT)			•*		•*	•*	•	•*	•*	•*	•*
PoE+ Manuelles Leistungs-Budget-Management			•*		•*			•*	•*	•*	•*
PoE-Schnellstart			•*					•*	•*	•*	•*
Port Leistungsabschaltung						•	•	•	•	•	•
Manuelles Kabelkreuzen	•	•	•	•	•	•	•	•	•	•	•

* Hardware dependent

You can see also a complete overview of HiOS features on
→ **https://www.doc.hirschmann.com/hios.html**

Function Platform 4 (Classic) + Platform 5 (HiOS)

* Hardware dependent

Diagnose	Classic Switch Software v9.0					HiEOS v1.0	HiOS Hirschmann Operating System v9.2				
	L2B	L2E	L2P	L3E	L2P		L2E	L2S	L2A	L3S	L3A
Management-Adresskonflikterkennung			•	•	•	•	•	•	•	•	•
Adress-Relearn-Erkennung		•	•	•	•				•	•	•
LEDs	•	•	•	•	•	•	•	•	•	•	•
MAC-Benachrichtigung			•	•	•			•	•	•	•
Signalkontakt	•	•	•	•	•		•*	•	•	•	•
Gerätestatus-Indikation	•	•	•	•	•	•	•	•	•	•	•
TCPDump			•	•	•		•	•	•	•	•
E-Mail-Benachrichtigung									•	•	•
Syslog		•	•	•	•	•	•	•	•	•	•
Dauerhaftes Logging auf ACA							•*	•	•	•	•
Portbeobachtung mit Auto-Ausschaltung			•	•	•		•	•	•	•	•
Link-Flap-Erkennung			•	•	•		•	•	•	•	•
Überlast-Erkennung		•	•	•	•		•	•	•	•	•
Duplex-Mismatch-Erkennung			•	•	•	•	•	•	•	•	•
RMON (1, 2, 3, 9)	•	•	•	•	•	•	•	•	•	•	•
Port-Mirroring 1:1	•	•	•	•	•	•	•	•	•	•	•
Port-Mirroring 8:1		•	•	•	•		•	•	•	•	•
Port-Mirroring N:1			•*		•*	•	•	•	•	•	•
Port-Mirroring N:2							•*	•*	•	•	•
VLAN-Mirroring									•	•	•
RSPAN									•	•	•
SFLOW									•	•	•
Kupferkabeltest			•	•	•		•*	•*	•	•	•
Systeminformation	•	•	•	•	•	•	•	•	•	•	•
Selbsttests bei Kaltstart	•	•	•	•	•		•	•	•	•	•
SFP-Management	•	•	•	•	•	•	•	•	•	•	•
Konfigurationsprüfungsdialog			•	•	•		•	•	•	•	•
Switch Dump		•	•	•	•		•	•	•	•	•
Schnappschuss-Konfigurationseigenschaft							•	•	•	•	•

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HIOS FEATURE OVERVIEW PER DEVICE

Status of list: HiOS v08.7

		Layer 2 Standard								Layer 2 Advanced								
Group	Feature	BRS	RSP	RSPS	RSPL	RSPE	RED	OS	GRS	BRS	RSP	RSPE	OS	MSP	MSP40	OS3	GRS1042	DRAGON
Management	Command Line Interface (CLI)	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	HTTP	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	HTTPS	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Telnet	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	SSHv2	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	SNMP v1/v2	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	SNMP Traps	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	V.24		◆	◆	◆	◆	◆	◆	◆		◆	◆	◆	◆	◆	◆	◆	◆
	IP v6 Management	◆								◆								
	TFTP	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	SFTP	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	SCP	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	LLDP (802.1AB)	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	LLDP-MED	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	DNS Client									◆	◆	◆	◆	◆	◆	◆	◆	◆
	Dual Software Image	◆	◆			◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆

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HIOS FEATURE OVERVIEW PER DEVICE

Status of list: HiOS v08.7

		Layer 2 Standard								Layer 2 Advanced								
Group	Feature	BRS	RSP	RSPS	RSPL	RSPE	RED	OS	GRS	BRS	RSP	RSPE	OS	MSP	MSP40	OS3	GRS1042	DRAGON
Industrial Protocols	EtherNet/IP Protocol	◆	◆			◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Separate EtherNet/IP VLAN	◆								◆								
	IEC61850 Protocol (MMS Server, Switch Model)	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Modbus TCP	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	PROFINET Protocol	◆	◆	◆		◆	◆	◆		◆	◆	◆	◆	◆	◆	◆	◆	◆
	OPC UA Server									◆	◆	◆	◆	◆	◆	◆	◆	◆
Miscellaneous	Digital Input / (Output)	◆								◆				◆	◆			
	PoE (802.3af)	◆								◆				◆	◆			
	PoE+ (802.3at)	◆				◆		◆		◆		◆	◆	◆	◆	◆	◆	
	PoE+ Manual Power Management	◆				◆		◆		◆		◆	◆	◆	◆	◆	◆	
	PoE Fast Startup	◆				◆		◆		◆		◆	◆	◆	◆	◆	◆	
	Manual Cable Crossing	◆				◆		◆		◆		◆	◆	◆	◆	◆	◆	
	Port Power Down	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
Time Synchronization	PTPv2 Transparent Clock Two-step	◆	◆	◆		◆	◆	◆		◆	◆	◆	◆	◆	◆	◆	◆	◆
	PTPv2 Boundary Clock	◆	◆	◆		◆	◆	◆		◆	◆	◆	◆	◆	◆	◆	◆	◆
	BC with up to 8 Sync /s	◆								◆					◆	◆	◆	
	802.1AS	◆				◆		◆		◆		◆	◆					
	IRIG-B																	
	Buffered Real Time Clock	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	SNTP Client	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	SNTP Server	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆

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HIOS FEATURE OVERVIEW PER DEVICE

Status of list: HiOS v08.7

		Layer 2 Standard								Layer 2 Advanced								
Group	Feature	BRS	RSP	RSPS	RSPL	RSPE	RED	OS	GRS	BRS	RSP	RSPE	OS	MSP	MSP40	OS3	GRS1042	DRAGON
Diagnostics	Signal Contact	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	LEDs	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Device Status Indication	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	System Information	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Configuration Check Dialog	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Snapshot Configuration Feature		◆	◆	◆	◆	◆	◆	◆		◆	◆	◆	◆	◆		◆	
	Difference to Default Configuration										◆	◆	◆	◆	◆	◆	◆	◆
	Self-Tests on Cold Start	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	RMON (1,2,3,9)	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Port Mirroring 1:1	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Port Mirroring 8:1	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Port Mirroring N:1	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Port Mirroring N:2	◆			◆				◆	◆				◆	◆	◆	◆	◆
	RSPAN										◆	◆	◆	◆	◆	◆	◆	◆
	SFLOW										◆	◆	◆	◆	◆	◆	◆	◆
	VLAN MIrroring										◆	◆	◆	◆	◆	◆	◆	◆
	Management Address Conflict Detection	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Management MAC Address Conflict Detection	◆	◆			◆		◆		◆	◆	◆	◆	◆	◆	◆	◆	◆
	MAC Notification	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆

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HIOS FEATURE OVERVIEW PER DEVICE

Status of list: HiOS v08.7

		Layer 2 Standard								Layer 2 Advanced								
Group	Feature	BRS	RSP	RSPS	RSPL	RSPE	RED	OS	GRS	BRS	RSP	RSPE	OS	MSP	MSP40	OS3	GRS1042	DRAGON
Diagnostics	TCPDump	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Switch Dump	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Syslog	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Syslog over TLS									◆	◆	◆	◆	◆	◆	◆	◆	◆
	Persistent Logging on ACA	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Email Notification									◆	◆	◆	◆	◆	◆	◆	◆	◆
	Link Flap Detection	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Overload Detection	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Duplex Mismatch Detection	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Link Speed and Duplex Monitoring	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Copper Cable Test	◆	◆		◆	◆		◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	SFP Management	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆

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HIOS FEATURE OVERVIEW PER DEVICE

Status of list: HiOS v08.7

		Layer 2 Standard								Layer 2 Advanced								
Group	Feature	BRS	RSP	RSPS	RSPL	RSPE	RED	OS	GRS	BRS	RSP	RSPE	OS	MSP	MSP40	OS3	GRS1042	DRAGON
Configuration	HiDiscovery	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	CLI Scripting	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	CLI Script Handling Over ENVM at Boot	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	HTML5-based Management	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Full-featured MIB Support	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	BOOTP/DHCP Client with Auto-Configuration	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	DHCP Server: Pools per VLAN	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	DHCP Relay with Option 82	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	USB-C Management Support	◆								◆								
	AutoConfiguration Adapter ACA 31 (SD card)		◆	◆	◆	◆					◆	◆		◆	◆		◆	◆
	AutoConfiguration Adapter ACA21/22 (USB)	◆				◆	◆	◆	◆	◆		◆	◆	◆	◆	◆	◆	◆
	USB-C Management Support	◆								◆								
	Text-based Configuration File (XML)	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Automatic Configuration Undo (roll-back)	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Configuration Fingerprint	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Backup Config on Remote Server when saving	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Clear Config but keep IP settings	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Context-sensitive Help	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Customized Factory Default	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆

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HIOS FEATURE OVERVIEW PER DEVICE

Status of list: HiOS v08.7

		Layer 2 Standard								Layer 2 Advanced								
Group	Feature	BRS	RSP	RSPS	RSPL	RSPE	RED	OS	GRS	BRS	RSP	RSPE	OS	MSP	MSP40	OS3	GRS1042	DRAGON
Switching	VLAN (802.1Q)	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Protocol-based VLAN										◆	◆	◆	◆	◆	◆	◆	◆
	VLAN Unaware Mode		◆	◆	◆	◆	◆	◆	◆		◆	◆	◆	◆	◆	◆	◆	◆
	GARP VLAN Registration Protocol (GVRP)	◆							◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Voice VLAN	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	MAC-base VLAN										◆	◆	◆	◆	◆	◆	◆	◆
	IP subnet-based VLAN										◆	◆	◆	◆	◆	◆	◆	◆
	Private VLAN														◆	◆	◆	
	Independent VLAN learning	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	GARP Multicast Registration Protocol (GMRP)	◆							◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	IGMP Snooping/Querier per VLAN (v1/v2/v3)	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Unknown Multicast Filtering	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Multiple VLAN Registration Protocol (MVRP)	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Multiple MAC Registration Protocol (MMRP)	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Static Unicast/Multicast Address Entries	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆

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HIOS FEATURE OVERVIEW PER DEVICE

Status of list: HiOS v08.7

		Layer 2 Standard								Layer 2 Advanced								
Group	Feature	BRS	RSP	RSPS	RSPL	RSPE	RED	OS	GRS	BRS	RSP	RSPE	OS	MSP	MSP40	OS3	GRS1042	DRAGON
Switching	Qos / Port Prioritization (802.1D/p)	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Configurable Managemt Priority	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	TOS/DSCP Prioritization	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Interface Trust Mode	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	CoS Queue Management	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	IP Ingress DiffServ Classification and Policing										◆	◆	◆	◆	◆	◆	◆	◆
	IP Egress DiffServ Classification and Policing													◆	◆	◆	◆	◆
	Queue-Shaping / Max. Queue Bandwidth	◆	◆			◆		◆		◆	◆	◆	◆	◆	◆	◆	◆	◆
	Fast Aging	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Loop Protection									◆	◆	◆	◆	◆	◆	◆	◆	◆
	Flow Control (802.3X)	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Egress Interface Shaping	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Ingress Storm Protection	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Jumbo Frames	◆	◆			◆		◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	TSN 802.1Qbv Support on Interfaces 1/1 -1/3					◆		◆				◆	◆					
	TSN 802.1Qbv Support on all Interfaces	◆								◆								

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HIOS FEATURE OVERVIEW PER DEVICE

Status of list: HiOS v08.7

		Layer 2 Standard								Layer 2 Advanced								
Group	Feature	BRS	RSP	RSPS	RSPL	RSPE	RED	OS	GRS	BRS	RSP	RSPE	OS	MSP	MSP40	OS3	GRS1042	DRAGON
Security	Device Security Indication	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	MAC-based Port Security	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Port-based Access Control with 8021.X	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Guest/unauthenticated VLAN	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Integrated Authentication Server (IAS)	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Radius Client	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	RADIUS VLAN Assignment	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	RADIUS Policy Assigment										◆	◆	◆	◆	◆	◆	◆	◆
	Multi-Client Authentication per Port									◆	◆	◆	◆	◆	◆	◆	◆	◆
	MAC Authentication Bypass									◆	◆	◆	◆	◆	◆	◆	◆	◆
	Format Options for MAC Authentication Bypass									◆	◆	◆	◆	◆	◆	◆	◆	◆
	DHCP Snooping										◆	◆	◆	◆	◆	◆	◆	◆
	IP Source Guard													◆	◆	◆	◆	◆
	Dynamic ARP Inspection										◆	◆	◆	◆	◆	◆	◆	◆
	Denial-of-Service Prevention	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	DoS Prevention Drop Counter	◆								◆								
	Basic ACL	◆	◆		◆	◆		◆	◆	◆								
	Ingress MAC-based ACL										◆	◆	◆	◆	◆	◆	◆	◆
	Egress MAC-based ACL													◆	◆	◆	◆	◆
	Ingress IPv4-based ACL										◆	◆	◆	◆	◆	◆	◆	◆
	Egress IPv4-based ACL													◆	◆	◆	◆	◆

→ https://www.doc.hirschmann.com/hios.html

HIOS FEATURE OVERVIEW PER DEVICE

Status of list: HiOS v08.7

		Layer 2 Standard								Layer 2 Advanced								
Group	Feature	BRS	RSP	RSPS	RSPL	RSPE	RED	OS	GRS	BRS	RSP	RSPE	OS	MSP	MSP40	OS3	GRS1042	DRAGON
Security	Time-based ACL										◆	◆	◆	◆	◆	◆	◆	◆
	VLAN-based ACL	◆	◆		◆	◆		◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Ingress VLAN-based ACL	◆	◆		◆	◆		◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Egress VLAN-based ACL													◆	◆	◆	◆	◆
	ACL Flow-based Limiting										◆	◆	◆	◆	◆	◆	◆	◆
	Restricted Management Access	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Access to Management Restricted by VLAN	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Audit Trail	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	CLI Logging	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	SNMP Logging	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	HTTPS Certificate Management	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Appropriate Use Banner	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Configurable Password Policy	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Configurable Number of Login Attempts	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Multiple Privilege Levels	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Local User Management	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Remote Authentication via RADIUS	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	LDAP									◆	◆	◆	◆	◆	◆	◆	◆	◆
	User Account Locking	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Password Change First Login	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆

→ https://www.doc.hirschmann.com/hios.html

HIOS FEATURE OVERVIEW PER DEVICE

Status of list: HiOS v08.7

		Layer 2 Standard								Layer 2 Advanced								
Group	Feature	BRS	RSP	RSPS	RSPL	RSPE	RED	OS	GRS	BRS	RSP	RSPE	OS	MSP	MSP40	OS3	GRS1042	DRAGON
Redundancy	RSTP 802.1D-2004 (IEC62439)	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	RSTP Ring Only Mode										◆	◆	◆	◆	◆	◆	◆	◆
	MSTP (802.1Q)										◆	◆	◆	◆	◆	◆	◆	◆
	RSTP Guards	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Media Redundancy Protocol (MRP) (IEC62439-2)	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Fast MRP (IEC62439-2)		◆	◆		◆	◆	◆			◆	◆	◆					
	MRP over Link Agregation								◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Sub Ring Manager								◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	HIPER-Ring (Ring Switch)	◆								◆	◆	◆	◆	◆	◆	◆	◆	◆
	HIPER-Ring over Link Aggregation																	
	Redundant Network Coupling										◆	◆	◆	◆	◆	◆	◆	◆
	Device Level Ring (DLR)		◆	◆		◆	◆	◆				◆	◆	◆				
	Link Aggregation with LACP	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Link Backup	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	High Availability Seamless Redundancy Protocol (HSR) (IEC62439-3)		◆	◆		◆	◆	◆			◆	◆	◆					
	HSR 1 Gbit/s		◆			◆		◆			◆	◆	◆					
	Parallel Redundancy Protocol (PRP) (IEC62439-3)		◆			◆	◆	◆			◆	◆	◆					
	PRP 1 Gbit/s		◆			◆		◆			◆	◆	◆					

→ https://www.doc.hirschmann.com/hios.html

HIOS FEATURE OVERVIEW PER DEVICE

Status of list: HiOS v08.7

		Layer 3 Standard				Layer 3 Advanced									
Group	Feature	RSP	RDD	RSPE	OS	MSP (UR)	MSP (MR)	MSP40 (UR)	MSP40 (MR)	OS3 (UR)	OS3 (MR)	GRS1042 (UR)	GRS1042 (MR)	DRAGON (UR)	DRAGON (MR)
Management	Command Line Interface (CLI)	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	HTTP	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	HTTPS	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Telnet	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	SSHv2	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	SNMP v1/v2	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	SNMP Traps	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	V.24	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	IP v6 Management														
	TFTP	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	SFTP	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	SCP	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	LLDP (802.1AB)	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	LLDP-MED	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	DNS Client	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Dual Software Image	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
Redundancy	VRRP	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	VRRP Tracking	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	HiVRRP (VRRP enhancements)	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆

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HIOS FEATURE OVERVIEW PER DEVICE

Status of list: HiOS v08.7

		Layer 3 Standard				Layer 3 Advanced									
Group	Feature	RSP	RDD	RSPE	OS	MSP (UR)	MSP (MR)	MSP40 (UR)	MSP40 (MR)	OS3 (UR)	OS3 (MR)	GRS1042 (UR)	GRS1042 (MR)	DRAGON (UR)	DRAGON (MR)
Industrial Protocols	EtherNet/IP Protocol	◆		◆	◆	◆	◆	◆	◆	◆	◆	◆	◆		
	Separate EtherNet/IP VLAN														
	IEC61850 Protocol (MMS Server, Switch Model)	◆		◆	◆	◆	◆	◆	◆	◆	◆	◆	◆		
	Modbus TCP	◆		◆	◆	◆	◆	◆	◆	◆	◆	◆	◆		
	PROFINET Protocol	◆		◆	◆	◆	◆	◆	◆	◆	◆	◆	◆		
	OPC UA Server	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
Miscellaneous	Digital IP Management					◆	◆	◆	◆						
	PoE (802.3af)			◆	◆	◆	◆	◆	◆	◆	◆	◆	◆		
	PoE+ (802.3at)			◆	◆	◆	◆	◆	◆	◆	◆	◆	◆		
	PoE+ Manual Power Management			◆	◆	◆	◆	◆	◆	◆	◆	◆	◆		
	PoE Fast Startup			◆	◆	◆	◆	◆	◆	◆	◆	◆	◆		
	Manual Cable Crossing	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Port Power Down	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
Time Synchronization	PTPv2 Transparent Clock Two-step	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	PTPv2 Boundary Clock	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	BC with up to 8 Sync /s							◆	◆	◆	◆	◆	◆		
	802.1AS			◆	◆										
	IRIG-B														
	Buffered Real Time Clock	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	SNTP Client	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	SNTP Server	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆

→ https://www.doc.hirschmann.com/hios.html

HIOS FEATURE OVERVIEW PER DEVICE

Status of list: HiOS v08.7

		Layer 3 Standard				Layer 3 Advanced									
Group	Feature	RSP	RDD	RSPE	OS	MSP (UR)	MSP (MR)	MSP40 (UR)	MSP40 (MR)	OS3 (UR)	OS3 (MR)	GRS1042 (UR)	GRS1042 (MR)	DRAGON (UR)	DRAGON (MR)
Diagnostics	Signal Contact	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	LEDs	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Device Status Indication	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	System Information	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Configuration Check Dialog	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Snapshot Configuration Feature	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Difference to Default Configuration	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Self-Tests on Cold Start	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	RMON (1,2,3,9)	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Port Mirroring 1:1	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Port Mirroring 8:1	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Port Mirroring N:1	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Port Mirroring N:2	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	RSPAN	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	SFLOW	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	VLAN MIrroring	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Management Address Conflict Detection	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Management MAC Address Conflict Detection	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	MAC Notification	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆

→ https://www.doc.hirschmann.com/hios.html

HIOS FEATURE OVERVIEW PER DEVICE

Status of list: HiOS v08.7

		Layer 3 Standard				Layer 3 Advanced									
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Diagnostics	TCPDump	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Switch Dump	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Syslog	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Syslog over TLS	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Persistent Logging on ACA	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Email Notification	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Link Flap Detection	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Overload Detection	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Duplex Mismatch Detection	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Link Speed and Duplex Monitoring	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Copper Cable Test	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	SFP Management	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆

→ https://www.doc.hirschmann.com/hios.html

HIOS FEATURE OVERVIEW PER DEVICE

Status of list: HiOS v08.7

		Layer 3 Standard				Layer 3 Advanced									
Group	Feature	RSP	RDD	RSPE	OS	MSP (UR)	MSP (MR)	MSP40 (UR)	MSP40 (MR)	OS3 (UR)	OS3 (MR)	GRS1042 (UR)	GRS1042 (MR)	DRAGON (UR)	DRAGON (MR)
Configuration	HiDiscovery	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	CLI Scripting	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	CLI Script Handling Over ENVM at Boot	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	HTML5-based Management	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Full-featured MIB Support	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	BOOTP/DHCP Client with Auto-Configuration	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	DHCP Server: Pools per VLAN	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	DHCP Relay with Option 82	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	USB-C Management Support														
	AutoConfiguration Adapter ACA 31 (SD card)	◆	◆	◆		◆	◆	◆	◆			◆	◆	◆	◆
	AutoConfiguration Adapter ACA21/22 (USB)			◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	USB-C Management Support														
	Text-based Configuration File (XML)	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Automatic Configuration Undo (roll-back)	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Configuration Fingerprint	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Backup Config on Remote Server when saving	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Clear Config but keep IP settings	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Context-sensitive Help	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Customized Factory Default	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆

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HIOS FEATURE OVERVIEW PER DEVICE

Status of list: HiOS v08.7

		Layer 3 Standard				Layer 3 Advanced									
Group	Feature	RSP	RDD	RSPE	OS	MSP (UR)	MSP (MR)	MSP40 (UR)	MSP40 (MR)	OS3 (UR)	OS3 (MR)	GRS1042 (UR)	GRS1042 (MR)	DRAGON (UR)	DRAGON (MR)
Security	Device Security Indication	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	MAC-based Port Security	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Port-based Access Control with 8021.X	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Guest/unauthenticated VLAN	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Integrated Authentication Server (IAS)	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Radius Client	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	RADIUS VLAN Assignment	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	RADIUS Policy Assigment	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Multi-Client Authentication per Port	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	MAC Authentication Bypass	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Format Options for MAC Authentication Bypass	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	DHCP Snooping	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	IP Source Guard					◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Dynamic ARP Inspection	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Denial-of-Service Prevention	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	DoS Prevention Drop Counter														
	Basic ACL														
	Ingress MAC-based ACL	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Egress MAC-based ACL					◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Ingress IPv4-based ACL	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Egress IPv4-based ACL					◆	◆	◆	◆	◆	◆	◆	◆	◆	◆

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Status of list: HiOS v08.7

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Security	Time-based ACL	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	VLAN-based ACL	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Ingress VLAN-based ACL	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Egress VLAN-based ACL					◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	ACL Flow-based Limiting	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Restricted Management Access	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Access to Management Restricted by VLAN	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Audit Trail	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	CLI Logging	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	SNMP Logging	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	HTTPS Certificate Management	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Appropriate Use Banner	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Configurable Password Policy	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Configurable Number of Login Attempts	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Multiple Privilege Levels	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Local User Management	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Remote Authentication via RADIUS	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	LDAP	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	User Account Locking	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Password Change First Login	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆

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HIOS FEATURE OVERVIEW PER DEVICE

Status of list: HiOS v08.7

		Layer 3 Standard				Layer 3 Advanced									
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Routing	Full Wire-Speed Routing	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Static Unicast Routing	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Static Route Tracking	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	RIP v1/v2	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	OSPFv2	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Port-based Router Interface	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	VLAN-based Router Interface	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Proxy ARP	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	ICMP Router Discovery (IRDP)	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	ICMP Filter	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	IP/UDP Helper	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Loopback Interface	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Net-directed Broadcasts	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	1:1 NAT	◆		◆	◆										
	Equal Cost Multiple Path (ECMP)					◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
Multicast Routing	DVMRP						◆		◆		◆		◆		◆
	IGMP v1/v2/v3	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	IGMP Proxy (Multicast Routing)	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	PIM-DM (RFC3973)						◆		◆		◆		◆		◆
	PIM-SM / SSM (RFC4601)						◆		◆		◆		◆		◆

→ https://www.doc.hirschmann.com/hios.html

WHICH SOFTWARE ON WHICH DEVICE ?

→ https://hirschmann-support.belden.com/en
→ Download

PLATFORM IV (Classic)

Latest version: v09.1.10

Device	Software packet
RS20 L2E, RS30 L2E, RS40 L2E	Web_OpenRail
RS20 L2P, RS30 L2P, RS40 L2P	Web_OpenRail
MS20 L2E, MS30 L2E	Web_MICE
MS20 L2P, MS30 L2P	Web_MICE
MACH102 L2P	Web_MACH100
MACH104 L2P	Web_MACH100GE
RSR20 L2P, RSR30 L2P	Web_RSR
MACH1020 L2P, MACH1030 L2P	Web_MAR1000
MACH1040 L2P	Web_MACH1000GE
MACH1040 L3	Web_MACH1000GE
MACH4002-48G/24G+3X-L2P	Web_m4002xgL2P
MACH4002-48G24G+3X-L3E	Web_m4002xgL3E
MACH4002-48G/24G+3X-L3P	Web_m4002xgL3P
MACH4002-48G/24-L2P	Web_m4002L2P
MACH4002-48G/24-L3E	Web_m4002L3E
MACH4002-48G/24-L3P	Web_m4002L3P
OCTOPUS xxM	Web_Octopus

Hardware revision
BRS device variants marked as „**HW: Rev.2**“ only support SW versions as of 08.7.02.
BRS device variants marked as „**HW: Rev.3**“ only support SW versions as of 08.7.04
RSP device variants with the software level characteristic value 2S marked as „**HW: Rev.3**“ only support software version 08.6. and higher.
The device variants provide you with a larger range of functions.
You find the revision marking of your device on the side label of your device

PLATFORM V (HiOS)

* exception v07.1.08

Device	Software packet
BRS20 L2S, BRS30 L2S, BRS40 L2S, BRS50 L2S	Web_BRS_09.4.02
BRS20 L2A, BRS30 L2A, BRS40 L2A, BRS50 L2A	Web_BRS_09.4.02
BXS 2S/2A	Web_BXS_09.4.02
RSP2x L2S, RSP3x L2S	Web_RSP_09.4.02
RSP2x L2A, RSP3x L2A	Web_RSP_09.4.02
RSP2x L3S, RSP3x L3S	Web_RSP_09.4.02
RSPE3x L2S	Web_RSPE_09.4.02
RSPE3x L2A	Web_RSPE_09.4.02
RSPE3x L3S	Web_RSPE_09.4.02
RSPL20 L2S, RSPL30 L2S	Web_RSPL_07.1.08 (*)
RSPS2x L2S	Web_RSPS_07.1.08 (*)
RED25 L2S	Web_RED_07.1.08 (*)
MSP3x L2A	Web_MSP_09.0.07
MSP3x L3A	Web_MSP_09.0.07
MSP4x L2A	Web_MSP_09.4.02
MSP4x L3A	Web_MSP_09.4.02 (3A-MR – 09.0.07)
GRS103 L2S, L2A	Web_GRS_09.4.02
GRS1020 L2S, GRS1030 L2S	Web_GRS_07.1.09
GRS1x42 L2A	Web_GRS_09.4.02
GRS1x42 L3A	Web_GRS_09.4.02 (L3A-MR – 09.0.07)
GRS1x5 L2S	Web_GRS_09.4.02
GRS1x5 L2A	Web_GRS_09.4.02
GRS1x6 L2S	Web_GRS_09.4.02
GRS1x6 L2A	Web_GRS_09.4.02
OCTOPUS II L2S, L2A, L3S	Web_OCTOPUS_09.4.02
OCTOPUS III L2A	Web_OCTOPUS_09.4.02
OCTOPUS III L3A	Web_OCTOPUS_09.4.02 (L3A-MR – 09.0.07

COMPARISON OF REDUNDANCY PROTOCOLS

defined in IEC62439

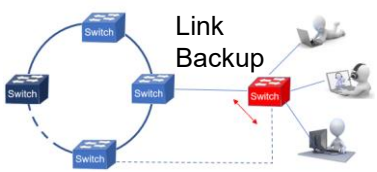
Protocol		Most current standard	Typical reconfig	Remark	Available since
CRP	Cross-Network Redundancy	IEC 62439-4:2010	1s worst case for 512 end nodes	any topology/mesh, diameter limited	2007
BRP	Beacon Redundancy Protocol	IEC 62439-5:2010	4…8ms worst case for 500 end nodes	Two top level switches with star, line or ring topologies	2007
DRP	Distributed Redundancy Protocol	IEC 62439-6:2010	100ms worst case for 50 end nodes	Ring, double ring	2010
STP	Spanning Tree Protocol	IEEE 802.1d	30s	any topology/mesh, diameter limited	1990
RSTP	Rapid Spanning Tree Protocol	IEEE 802.1D-2004	1s	any topology/mesh, diameter limited	2004
Optimized RSTP	Rapid Spanning Tree Protocol	IEEE 802.1D-2004 (configuration requirements described in IEC 62439-1:2010	5…20ms per switch	ring	2010
MRP* (1)	Media Redundancy Protocol	IEC 62439-2:2010	200ms worst case for 50 switches	ring	1998/2007
Fast (2) **MRP**	Media Redundancy Protocol	IEC 62439-2:2010	30ms worst case for 50 switches; 10ms worst case for 15 switches	ring	2010
HSR 100 Mbit/s 1000 Mbit/s in RSP, RSPE OCTOPUS with HW: Rev.2	High-Availability Seamless Redundancy	IEC 62439-3:2012-07	0ms	ring	2010
PRP 100 Mbit/s 1000 Mbit/s in RSPE35	Parallel Redundancy Protocol	IEC 62439-3:2012-07	0ms	Any topology/ duplicated networks	2010

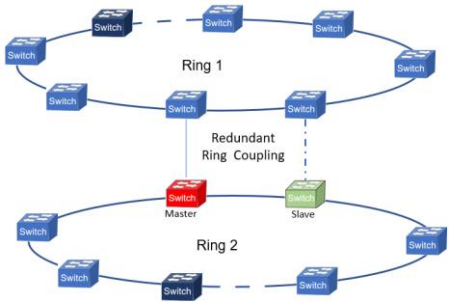
(1) pre-standard Hiper Ring since 1998, MRP since 2007
(2) pre-standard Fast Hiper Ring since 2007

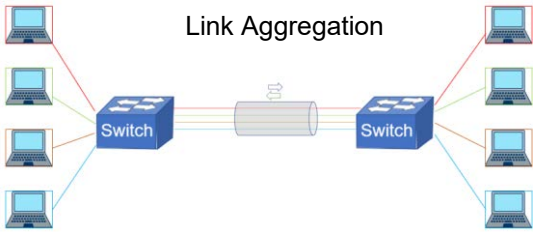
Proprietary - Hirschmann subring <100ms (200 switches)

REDUNDANCY PROTOCOLS

Redundancy procedure	10 Mbit/s typ./max.	100 Mbit/s typ./max	1 Gbit/s typ./max.	10 Gbit/s typ./max.	Comment
Link Aggregation	< 1s	< 1s	< 1s	< 1 s	
RSTP default values	< 1s / ?	< 1s / ?	< 1s / ?	< 1s / ?	
HIPER ring over TP		500 ms / 500 ms	500 ms / 500 ms		Standard behaviour causes additional 300 ms to F/O value
HIPER ring over F/O		120 ms	80 ms	80 ms	Typ. < 300 ms for 100 switches in ring
Fast HIPER ring		5 ms/ < 10ms	5 ms / < 10 ms		5 ms for 10 switches in ring 25 ms for 100 switches in ring 40 ms for 200 switches in ring
MRP		40 ms	40 ms	20 ms	P4-Classic: 80 ms up to < 200ms for 100 switches in ring P5-HiOS: 40 ms, up to < 200 ms for 100 switches in ring
Fast MRP		< 30 ms < 10 ms	< 30 ms < 10 ms		5 ms, up to < 30 ms, 130 switches would be possible, but only if ring configuration ist set to 30 ms
Subring		40 ms / 300 ms	40 ms / 300 ms		Typ. 80 ms, up to < 500 ms or 200 ms (selectable) number of switches has a min. effect on the switch-over time
Redundant Ring Coupling		220 ms / < 500 ms	220 ms / < 500 ms		Recovery time < 1,5 s, if „extended mode redundancy“ is enabled
Link Backup		/ < 1000 ms	/ < 1000 ms		

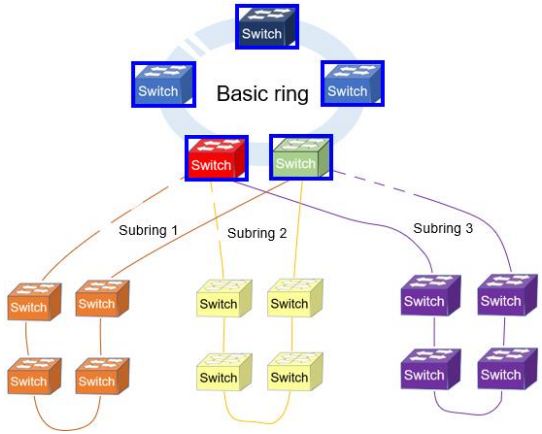


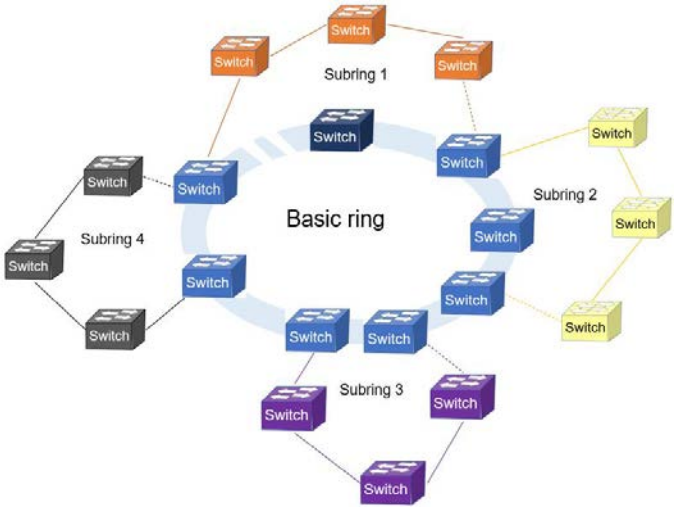




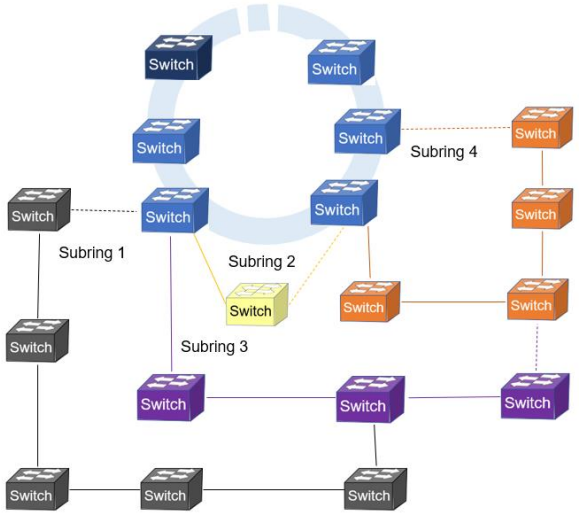
REDUNDANCY PROTOCOLS

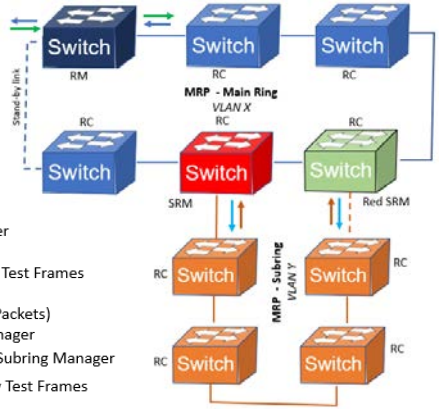
Subrings





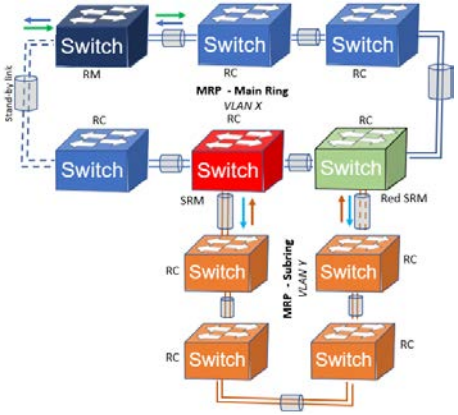
Basic-Ring	Sub-Ring
Fast HIPER ring	MRP
HIPER ring	MRP
DLR	MRP
MRP *in VLAN x* Fast MRP *in VLAN x*	MRP in *VLAN y* Subring settings could be indentical (x ≠ y)

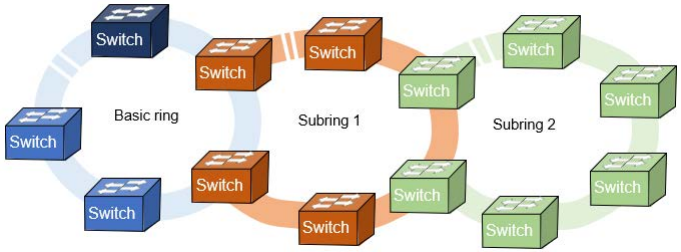




RM Ring Manager
RC Ring Client
Redundancy Test Frames Main ring (Watchdog-Packets)
SRM Subring Manager
Red SRM Redundant Subring Manager
Redundancy Test Frames Subring (Watchdog-Packets)

Link Aggregation over MRP



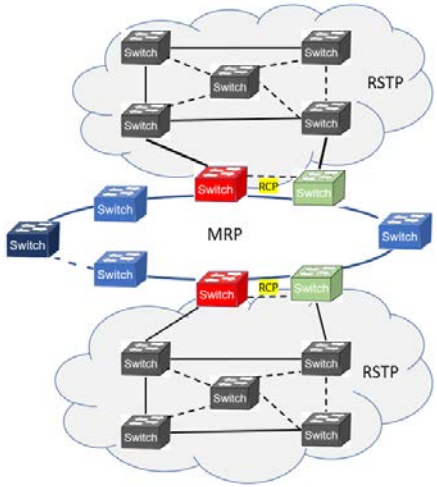


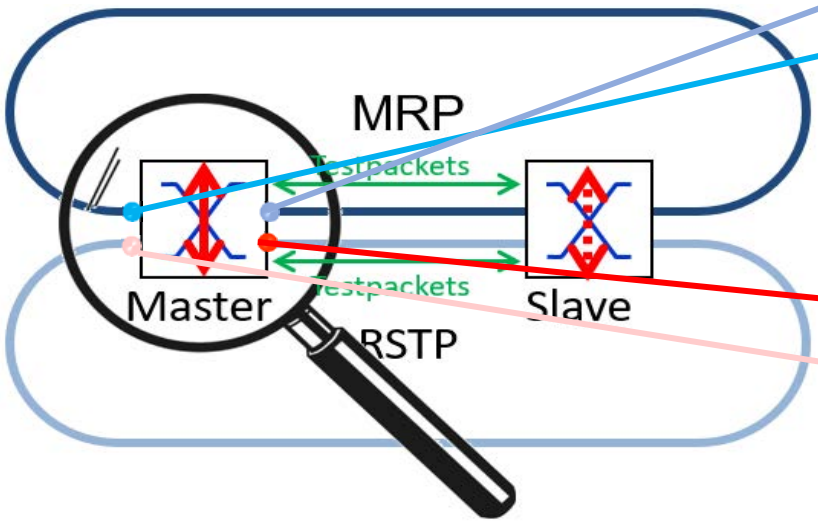
Subring – cascade
→Checked and approved up to 5 subrings

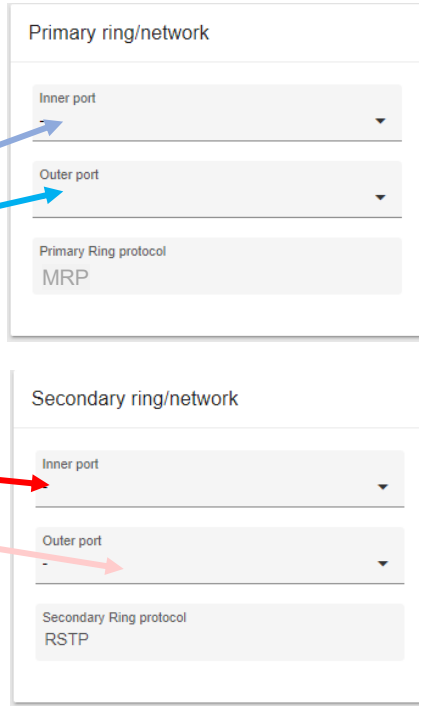
REDUNDANCY PROTOCOLS

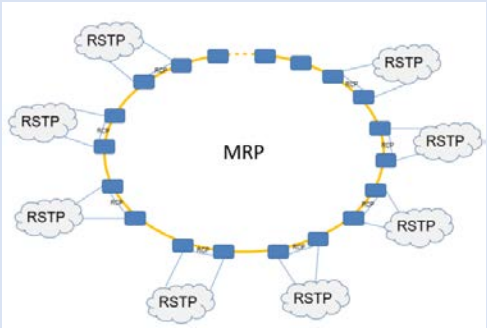
Redundant Coupling Protocol

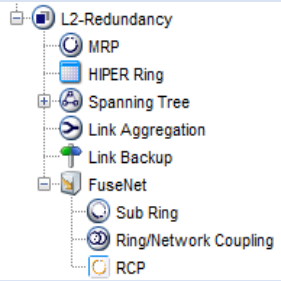
Main Ring	Connected Network				
	MRP	Fast MRP	HIPER ring	DLR	RSTP
MRP	Subring	Ring/Network Coupling	Ring/Network Coupling RCP	Ring/Network Coupling RCP	Ring/Network Coupling RCP
Fast MRP	Subring	Ring/Network Coupling	Ring/Network Coupling RCP	Ring/Network Coupling	Ring/Network Coupling RCP
HIPER ring	Subring	Ring/Network Coupling RCP	Ring/Network Coupling	Ring/Network Coupling RCP	Ring/Network Coupling RCP
DLR	Subring / RCP	-	RCP	-	RCP
RSTP	RCP	RCP	RCP	RCP	-











Redundant Coupling Protocol

- Only 2 devices per coupling, but no devices in-between.
- Coupling of 2 Rings. Redundancy protocol can be HR, Fast-MRP, MRP, RSTP, DLR.
- SW 2A and higher
- Note: RSTP off at non-RSTP ring ports
- 2 Red. protocols have to be configured at the same time.

REDUNDANCY – LAYER 2

FuseNet

	RSTP	MSTP	HIPER Ring	Fast HIPER Ring	MRP	Fast MRP	PRP HSR DLR	Link Backup	**Link Aggre-gation**	Link Aggregation over HIPER ring	Link Aggregation over MRP (HiOS-2A)	Loop-protection/ -prevention	Subring Manager	Redundant Ring-/ Network-coupling	Ring Coupling Protocol RCP
RS2 xx/xx															
RS20-L2B/RSB															
RS20/30/40 OCTOPUS OS20/30 Classic									L2P						
MS20/30									L2P						
MS2108/3124															
MS4128										L2P			4		
MSP30									8				8		
MSP40									8				20		
MACH102/104									7				4 *MACH104		
MACH1000													4		
MACH1040													16		
RSR20/30													4		
Greyhound GRS103												L2A	8 L2A		
Greyhound GRS105/106		L2A	L2A						L2S: 2 L2A:16	L2A	L2A	L2A	20 L2A	L2A	L2A
Greyhound GRS1X20/30													2		
Greyhound GRS 1X42									8	L2A, L3S			20		
MACH4000									8 L2P	L2P			8		
DRAGON MACH													20		
Bobcat BRS		L2A v09.4	L2S L2A						2		max.2 LAGs à 4 links	L2A	8 L2A		L2A v09.6
RSP20/30 OCTOPUS OS20/24/30/34 HiOS									4	L2A, L3S		L2A	8 L2A	L2A	L2A
RSP25/35 RSPE35/37									4	L2A, L3S		L2A	8 L2A	L2A	L2A
RSPE30									4	L2A, L3S		L2A	8 L2A	L2A	L2A
RSPL20/30															
RSPS20/25						*25	*25								
RED25															
GECKO					MRP client										

Since v08.7

OCTOPUS: The hardware configuration must be choosen accordingly, as seamless redundancy requires a piece of hardware at the respective ports 1 and port 2

Since V5.0 --- HIPER-Ring (Ring Switch-only); L2A, L3S, L3A

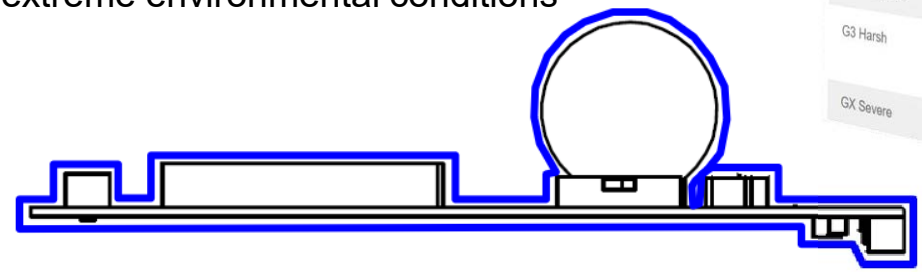
Since V6.1 --- L2A, L3S, L3A

2024-03

Classic switches don't support subring over LACP
HiOS switches devices (2A) support subring over LACP

CONFORMAL COATING

… protection in extreme environmental conditions
dust
humidity
noxius gas

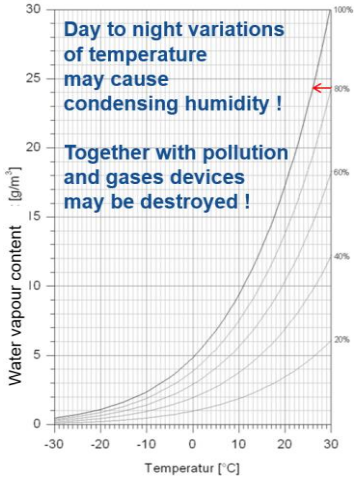


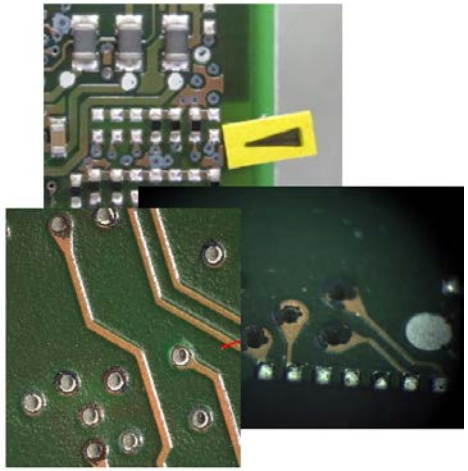
ISA CONFORMAL COATING STANDARD 71.04

Corrosivity Level	Typical Environment
G1 Mild	Corrosion is not a factor in determining equipment reliability.
G2 Moderate	Effects of corrosion are measurable and may be a factor in determining equipment reliability.
G3 Harsh	High probability that corrosive attacks will occur. This harsh level should prompt further evaluation and result in environmental controls or specially designed and packaged equipment.
GX Severe	ONLY specially designed and packaged equipment would be expected to survive.

- conform with G2 moderate ISA-S71.04-1985 (classification G2- moderate) and EN60068-2-60

31 day test with 4 components noxius gas
- hydrogen sulphide (H_2S)
- nitrogen dioxide (NO_2)
- sulphur dioxide (SO_2)
- Chlorine (CL_2)





Temperature range

S	Standard 0°C … +60°C
T	Extended -40°C … +70°C
C	Standard 0°C … +60°C incl. Conformal Coating
E	Extended -40°C … +70°C incl. Conformal Coating
G	Extended -40°C … +70°C incl. Conformal Coating, glued

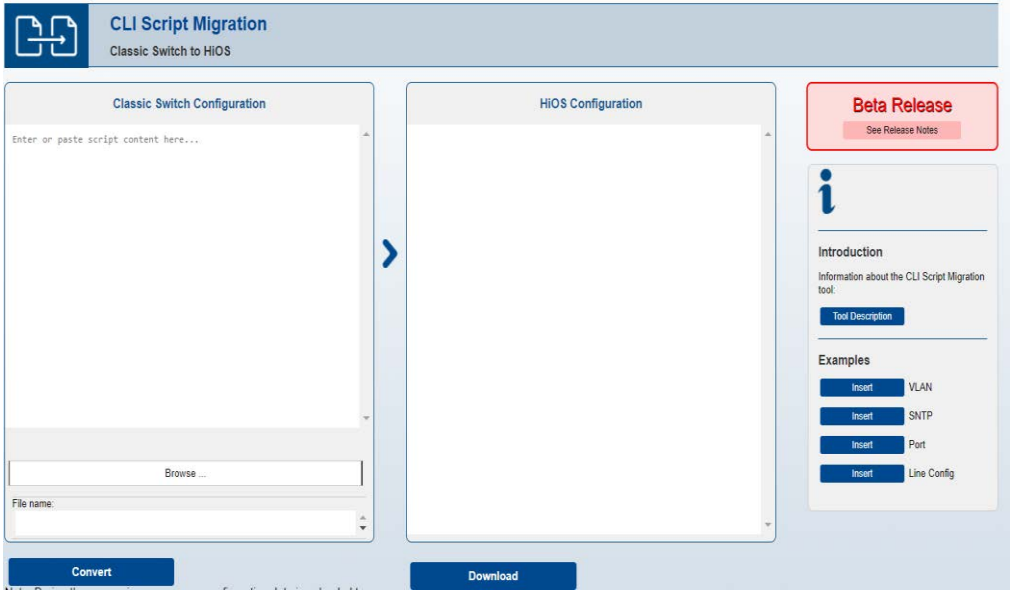
Added version: Conformal Coating, glued
Glued means : Bigger electronic components, like capacitors, are glued to the board (PCB) and thus fixed in place.
That make sense, if you have an application in a location with vibration.

We tested our devices with conformal coating for 31 days with G2 and G3 classification according to ISA71.04.

CONVERTER TOOL --- DIP SWITCHES (PLATFORM 4)

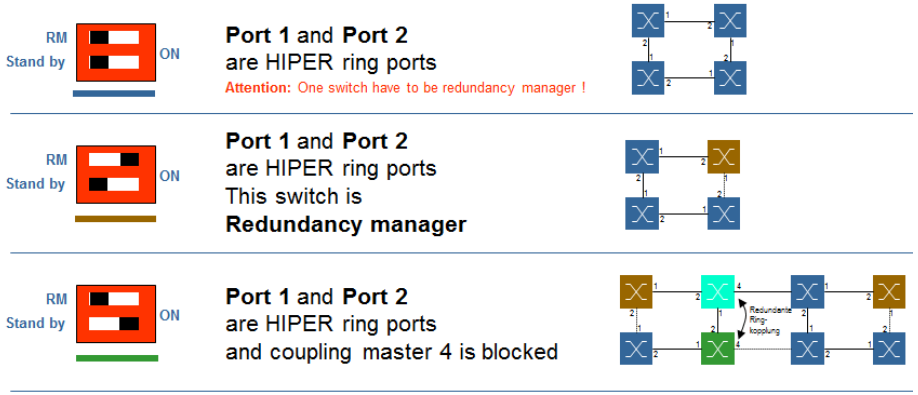
Classic Switch to HiOS

Converter Tool

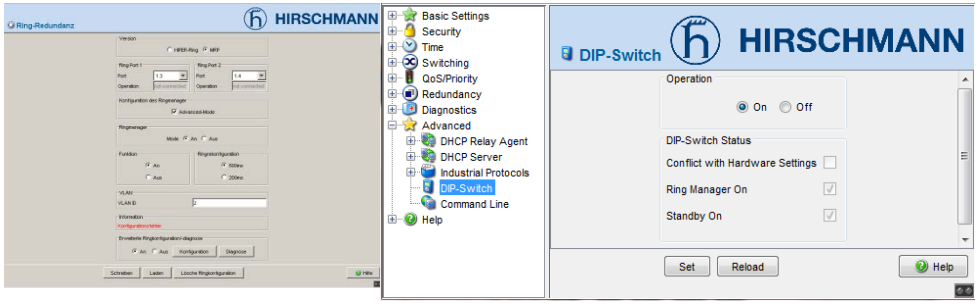


https://convert.hirschmann.com/

Take care:
Not all settings are converted and the ports numbers have to be changed from a classic to the HiOS device as ports can be different (like RS <-> BRS).
Only MICE to MSP can be taken without port translation.

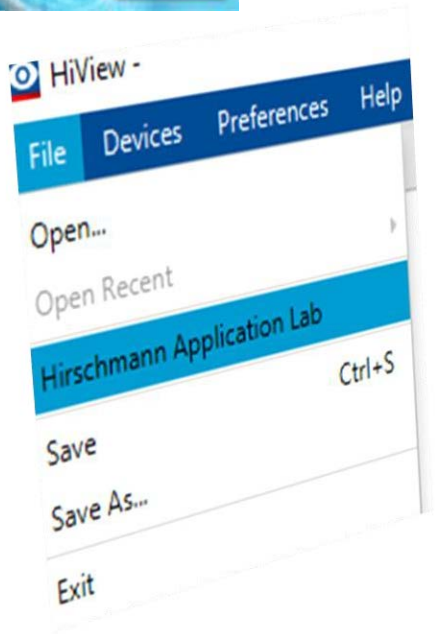


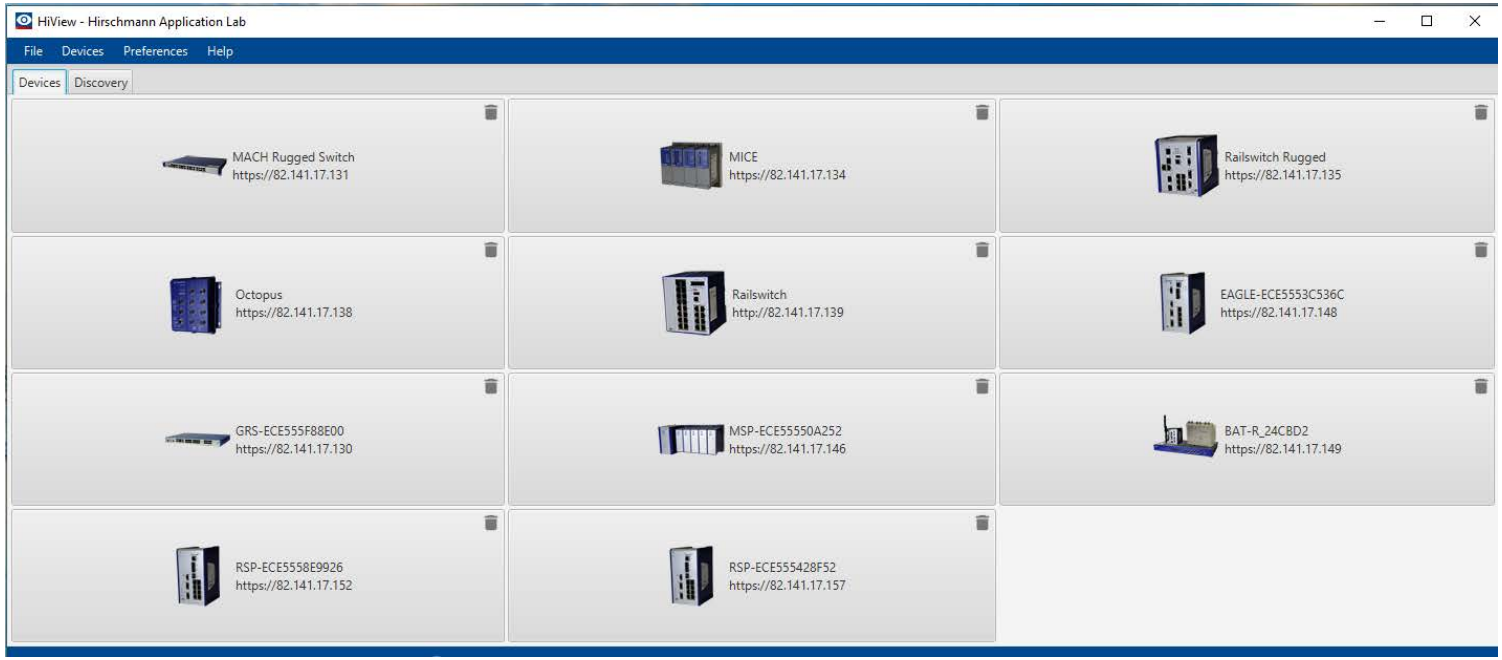
Software-Configuration
is dominant

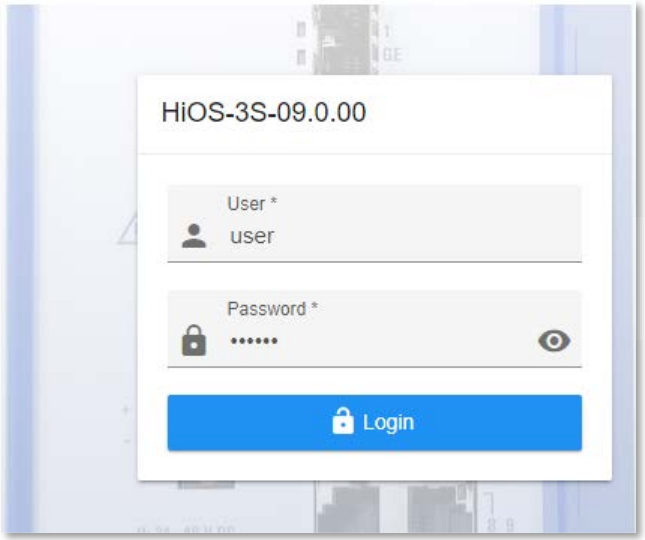


LOOK AND FEEL – GRAPHICAL USER INTERFACE

→ Click on Hirschmann Application Lab inside HiView-Tool







user/public

FIELDBUS - REPEATER

Profibus FO-Repeater

- Ring suitable repeater supporting all kinds of LWL
- Profibus DP and FMS including automatically adjustment all data rates
- Ring redundancy with 0 ms ring configuration time in in the event of a network fault
- Ex-approvals for Zone 2 according to ATEX (RL94/9/EG), FM and NEPSI, Zone 1 Approvals according to ATEX (RL94/9/EG)

Geniusbus and Modbus Plus FO-Repeaters

- Ring suitable repeater for multimode and singlemode fiber
- Ring redundancy with 0 ms reconfiguration time
- Ex-approvals for Zone 2 according to ATEX (RL94/9/EG) and Class 1, Div. 2 according to cUL1604
- Ring suitable repeater, ring redundancy with 0 ms reconfiguration time
- Ex approvals for Class 1, Div 2 according to cUL1604

Universal Fieldbus Repeater

- Ring suitable repeater for multimode and singlemode fiber
- Suitable for RS485-based Bus protocols, e.g. Modbus
- Ex approvals for Zone 2 according to ATEX (RL94/9/EG) and Class 1, Div. 2 according to cUL1604

FIELDBUS - PROFIBUS

1rst Generation		
OZD Profi G4		
2nd Generation		2 copper ports, 1.5 Mbit/s max
OZD Profi P3a	943 418-321	1 POF port
OZD Profi P4a	943 418-421	2 POF ports
OZD Profi G3a	943 419-321	1 MMF port
OZD Profi G4a	943 419-421	2 MMF ports
OZD Profi G3a-1300	943 420-321	1 port SMF/MMF
OZD Profi G4a-1300	943 420-421	2 ports SMF/MMF
3rd Generation		1 copper port, 12 Mbit/s max
OZD Profi 12M P11	943 728-221	1 POF port
OZD Profi 12M P12	943 728-321	2 POF ports
OZD Profi 12M G11	943 727-221	1 MMF port
OZD Profi 12M G12	943 727-321	2 MMF ports
OZD Profi 12M G12 EEC	943 730-321	2 MMF ports; larger temp. range etc.
OZD Profi 12M G11-1300	943 729-221	1 SMF/MMF port
OZD Profi 12M G12-1300	943 729-321	2 SMF/MMF ports
OZD Profi 12M G12-1300 EEC	943 256-321	2 SMF/MMF ports; larger temp. range etc.
4th Generation		1 copper port, 12 Mbit/s max
OZD Profi 12M P11 PRO	943 904-221	1 POF/PCF port
OZD Profi 12M P12 PRO	943 904-321	2 POF/PCF ports
OZD Profi 12M G11 PRO	943 905-221	1 MMF/PCF port
OZD Profi 12M G12 PRO	943 905-321	2 MMF/PCF ports
OZD Profi 12M G12 EEC PRO	943 907-321	2 MMF/PCF ports; larger temp. range etc.
OZD Profi 12M G11-1300 PRO	943 906-221	1 port MMF/SMF
OZD Profi 12M G12-1300 PRO	943 906-321	2 ports MMF/SMF
OZD Profi 12M G12-1300 EEC PRO	943 908-321	2 ports MMF/SMF; larger temp. range etc.
OZD Profi G12DU ATEX 1	943 881-321	ATEX 1 approved; 2 MMF ports; no housing
OZD Profi G12DK ATEX 1	943 882-321	ATEX 1 approved; 2 MMF ports; plastic housing
OZD Profi G12DE ATEX 1	943 883-321	ATEX 1 approved; 2 MMF ports; inox housing
5th Generation		
OZD Profi 12M G11	942 148-001	1 copper port, 1 multimode (MMF)
OZD Profi 12M G12	942 148-002	1 copper port, 2 MMF ports
OZD Profi 12M G22	942 148-003	2 copper ports
OZD Profi 12M G11-1300	942 148-004	1 copper port, 1 singlemode (SMF)
OZD Profi 12M G12-1300	942 148-005	1 copper port, 2 SMF ports
OZD Profi 12M G22-1300	942 148-006	2 copper ports, 2SMF ports
OZD Profi 12M P11	942 148-007	1 copper port, 1 POF port
OZD Profi 12M P12	942 148-008	1 copper port, 2 POF ports
OZD Profi 12M P22	942 148-009	2 copper ports, 2 POF ports
OZD Profi 12M G12 EEC	942 148-102	1 copper port, 2 MMF ports,
OZD Profi 12M G12-1300 EEC	942 148-105	1 copper port, 2 SMF ports
OZD Profi 12M G22 EEC	942 148-103	2 copper ports, 2 MMF ports
OZD Profi 12M G22-1300 EEC	942 148-106	2 copper ports, 2 SMF ports

OZD Profi 1st Generation	OZD Profi 2nd Generation	OZD Profi 3rd Generation	OZD Profi 4th Generation	OZD Profi 5th Generation
				
OZD Profi…	**OZD Profi… a**	**OZD Profi 12M…**	**OZD Profi 12M… PRO**	**OZD Profi 12M**
White metal chassis	White metal chassis	Blue metal chassis	Blue plastic slightly chassis, larger	Blue metal chassis
Up to 1.5 Mbit/s	Up to 1.5 Mbit/s	Up to 12 Mbit/s	Up tp 12 Mbit/s	
2 electrical ports	2 electrical ports	1 electrical ports	1 electrical ports	1 or 2 electrical ports
	Fault contact introduced	Terminal block for CH2 ia canceled		Copper ports insulated Terminal block different One more DIP (2 electr. Port)
	2nd generation is „limitedly compatible“ with - 1st generation	3rd generation is compatible to - 2nd generation via „compatibility mode“	OZD 12M …PRO is compatible with: • 3rd generation • 2nd generation via „compatibility mode“	OZD Profi 12… is compatible with: • 4th generation • 3rd generation • 2nd generation via „compatibility mode“

DOWNLOAD-WEBPAGE: MANUALS/INSTALLATION GUIDES/CERTIFICATION

https://www.doc.hirschmann.com/

All current product manual seen at a glance

On this website you will find the current manuals and operating instructions for Hirschmann products at a glance. Currently, you will find the product manuals of the last five years here.
Manuals for older products will be available shortly.

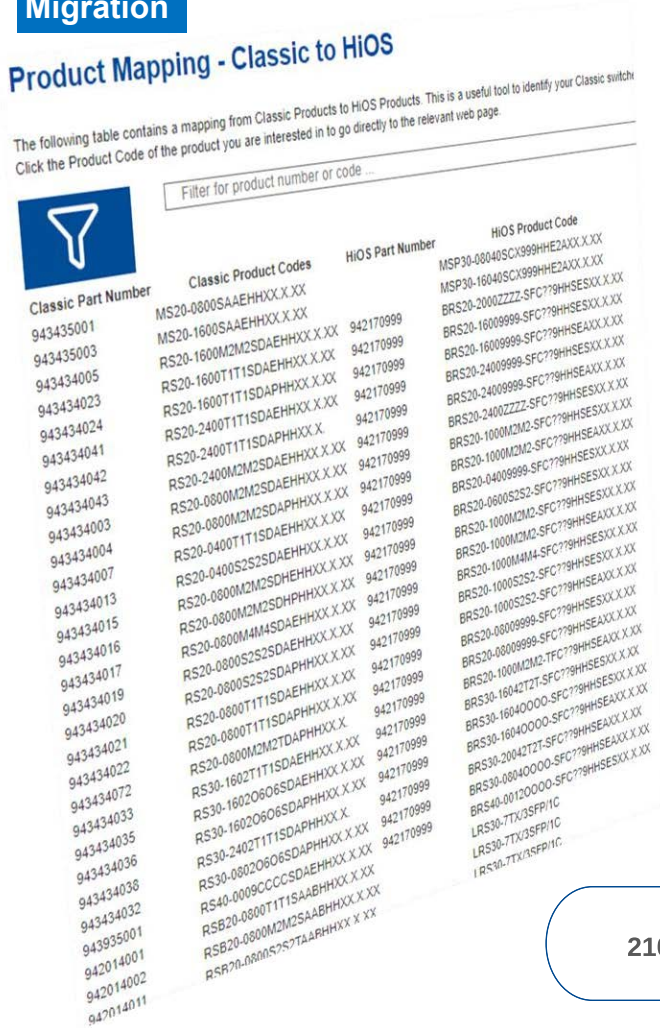
- General Safety instructions
- Hardware Installation Guides
- Software Manual Collections (User and Reference Manuals

MANUALS | CERTIFICATES | HIOS FEATURES | MIGRATION NEW | EPLAN

MANUALS

CERTIFICATES

Migration



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Knowledgebase

Basics (11)

- What are the standards for 2.5 GB and 5 GB Ethernet via fiber?
- Mode-conditioning patch cord
- Managing communication between VLANs
- Fiber ports and Autonegotiation
- HiOS: HTML - How to Configure the Virtual Router Redundancy ...

View all articles in Basics >

Products (299)

- Collect tool cannot download system info and event log
- What are the Java recommended settings for remote access o...
- Rogue Device Detection
- Industrial Hivision - Scheduled Device Configuration Backup
- Calculating Optical Fiber Power Budget

View all articles in Products >

Tools (3)

- How to decrypt a WPA encrypted communication with Wireshark
- How to identify a burst in a capture ?
- How to anonymize capture files

Support Portal (3)

- Privacy Policy
- Terms and conditions of use
- How to use the Support Portal

https://www.belden.com/subscibe/industrial

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EPLAN Data Portal:

http://www.eplandata.de/portal/portal.php?nppnew=500&action=part-list&edpp=1.0&ev=1.9.11&lang=de_DE&clang=de_DE&lastmpg=.&tab=l&ofw=mf2&mf%5B%5D=HIR

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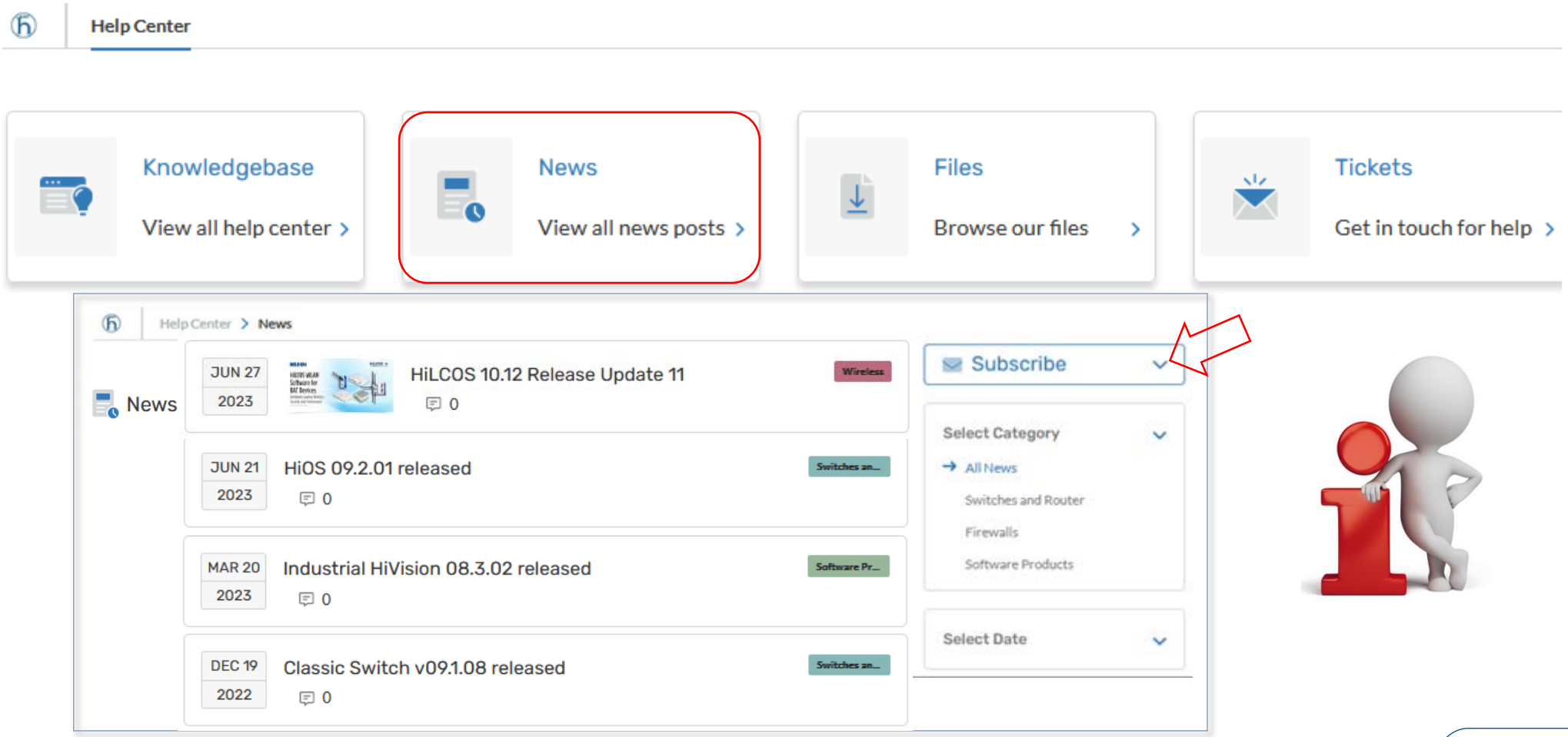
Which software version is the latest version?

→ https://hirschmann-support.belden.com/en



BE INFORMED - PRODUCT DISCONTINUATIONS

https://beldensolutions.com/en/Service/long-term-product-support/index.phtml

English > Service > Long Term Product Support

Long Term Product Support - Product Discontinuations and Product Change Notifications

There are a number of reasons, which cause a product to be discontinued. In many cases, as products mature they are replaced by richer technology. Therefore we know how important it is to set milestones to navigate you through the lifecycle of a product and the impact on its networks or infrastructure.

We would like to explain you the role Belden plays in helping migrate to an alternative platform or technology.
Learn more about Belden's Long Term Product Support Policy

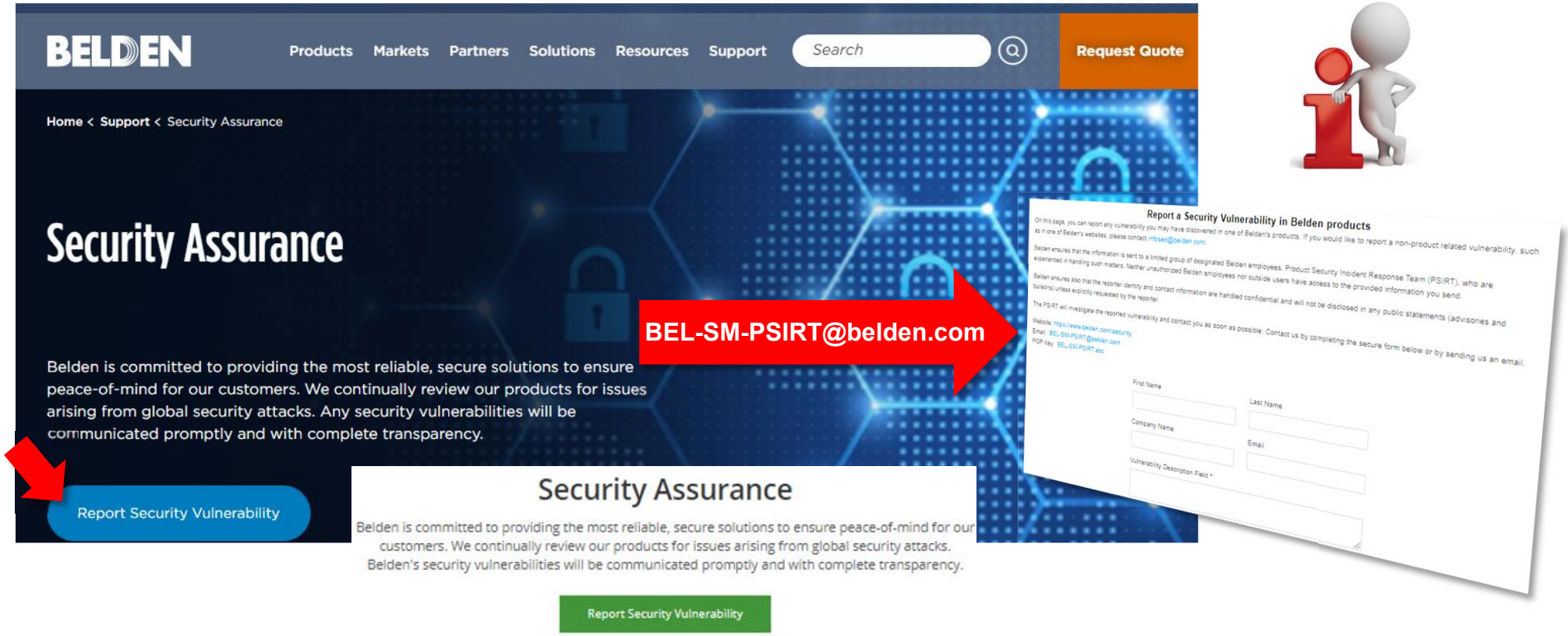
All current product discontinuations at a glance:

- Product Discontinuations
- Product Change Notifications

SECURITY VULNERABILITIES IN BELDEN PRODUCTS

https://www.belden.com/security

As network operating systems and software applications are becoming more complex, it is inevitable that security vulnerabilities will continue to be discovered in our products and those from other manufacturers.
Belden is committed to providing information about security vulnerabilities in a timely and transparent fashion.
This page contains information about vulnerabilities which affect Hirschmann, GarrettCom, Tofino and ProSoft hardware and software products, both historical and present.



HI.... product naming

The starting point for configuring Hirschmann devices
HiDiscovery is a simple, free of charge application to identify Hirschmann devices in your LAN and assign IP addresses.
HiDiscovery is available in versions 1 and 2. The basic difference is that it runs on **v1** via MAC multicasts and can work as IP multicast on **v2** and thus also across router boundaries.

HiView is an intuitive, free of charge application which provides access to our products' graphical user interface
HiView v3.1 includes HiDiscovery v2.

The essential management tool for all stages of your network lifecycle

HiFusion allows you to integrate manufacturer-specific MIB variables for third-party devices into Industrial HiVision

Display state of network by smartphone via Industrial HiVision

Each new version of HiLCOS comes with LANconfig, the powerful Windows management tool for BAT devices

SNMP based windows monitoring tools providing monitoring, diagnostic, statistics, trace and syslog for the BAT devices

INDUSTRIAL ETHERNET

Patch cord

Typ/ type	Kontaktbelegung/ contact assignment			
	Polzahl/ number of poles		Farbkennung/ color code	Paar/ pair
RSTS 8X	8		1 = weiß / white	2
			2 = orange / orange	
			3 = weiß / white	3
			4 = grün / green	
			5 = weiß / white	4
			6 = braun / brown	
			7 = weiß / white	1
			8 = blau / blue	
RJ45	8		1 = weiß / white	2
			2 = orange / orange	
			3 = weiß / white	3
			4 = blau / blue	1
			5 = weiß / white	
			6 = grün / green	3
			7 = weiß / white	4
			8 = braun / brown	

X-coded (Gigabit)

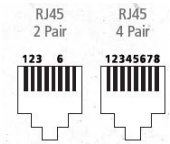
Insulation displacment connection IDC contact style connector
RSCIS 4D/9 (934 828-002)

An example how IDC contacts work

D-coded (10/100 Mbit/s)

Pin	Data	PoE
1	TX+	Positive V_{PSE}
2	RX+	Negative V_{PSE}
3	TX−	Positive V_{PSE}
4	RX−	Negative V_{PSE}

Pin	10/100 Mbit/s	1000 Mbit/s	PoE
1	RX+	BI_DB+	Negative V_{PSE}
2	RX−	BI_DB−	Negative V_{PSE}
3	TX+	BI_DA+	Positive V_{PSE}
4	TX−	BI_DA−	Positive V_{PSE}
5	—	BI_DC+	—
6	—	BI_DC−	—
7	—	BI_DD−	—
8	—	BI_DD+	—



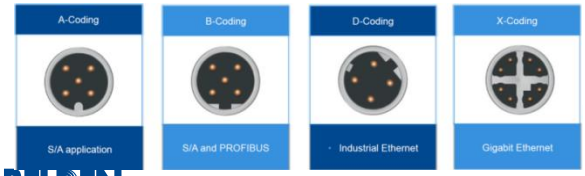
#	TIA-1005 and ISO 11801-3				PROFINET	
	RJ45 4 Pair	RJ45 2 Pair	M12-X	M12-D	RJ45 2 Pair	M12-D
1						
2						
3						
4						
5						
6						
7						
8						

Product name	Order number
RSTS 8X-RSTS 8X-478/2 M	934 809-005
RSTS 8X-RSTS 8X-478/5 M	934 809-006
RSTS 8X-RSTS 8X-478/10 M	934 809-007
RSTS 8X-RSTS 8X-478/15 M	934 809-008

Order No.	Field attachable connector M12	description
942 040-001	0986 EMC 105	M12 male, 4-pole, D-coded Spring type
934 828-002	RSCIS 4D/9	M12 male, 4-pole, D-coded IDC
942 159-001	BRSCIS 4D/9	M12 male, 4-pole, D-coded Rail approved version IDC
942 083-001	EM12G OCTOPUS	M12 male, 8-pole ; X-coded IDC
934 637-032	0986 EMC 600	M12 male, 8-pole ; X-coded

Hirschmann Product Name	Hirschmann Order Number	Hirschmann Description
CAT5e Ethernet patch cord, RJ45/RJ45, 100 Mb, 0.3 m	942112176	Length 0.3 m, Cat 5e, SF/UTP, RJ45/RJ45, 2-pair, 100 Mbit/s, PUR jacket
CAT5e Ethernet patch cord, RJ45/RJ45, 100 Mb, 0.5 m	942112177	Length 0.5 m, Cat 5e, SF/UTP, RJ45/RJ45, 2-pair, 100 Mbit/s, PUR jacket
CAT5e Ethernet patch cord, RJ45/RJ45, 100 Mb, 1 m	942112178	Length 1m, Cat 5e, SF/UTP, RJ45/RJ45, 2-pair, 100 Mbit/s, PUR jacket
CAT5e Ethernet patch cord, RJ45/RJ45, 100 Mb, 2 m	942112179	Length 2 m, Cat 5e, SF/UTP, RJ45/RJ45, 2-pair, 100 Mbit/s, PUR jacket
CAT5e Ethernet patch cord, RJ45/RJ45, 100 Mb, 5 m	942112180	Length 5 m, Cat 5e, SF/UTP, RJ45/RJ45, 2-pair, 100 Mbit/s, PUR jacket
CAT6A Ethernet patch cord, RJ45/RJ45, 1 Gb, 0.3 m	942112181	Length 0.3 m, Cat 6A, S/FTP, RJ45/RJ45, 4-pair, 1000 Mbit/s, PUR jacket
CAT6A Ethernet patch cord, RJ45/RJ45, 1 Gb, 0.5 m	942112182	Length 0.5 m, Cat 6A, S/FTP, RJ45/RJ45, 4-pair, 1000 Mbit/s, PUR jacket
CAT6A Ethernet patch cord, RJ45/RJ45, 1 Gb, 1 m	942112183	Length 1m, Cat 6A, S/FTP, RJ45/RJ45, 4-pair, 1000 Mbit/s, PUR jacket
CAT6A Ethernet patch cord, RJ45/RJ45, 1 Gb, 2 m	942112184	Length 2 m, Cat 6A, S/FTP, RJ45/RJ45, 4-pair, 1000 Mbit/s, PUR jacket
CAT6A Ethernet patch cord, RJ45/RJ45, 1 Gb, 5 m	942112185	Length 5 m, Cat 6A, S/FTP, RJ45/RJ45, 4-pair, 1000 Mbit/s, PUR jacket

Typ/ type	Kontaktbelegung/ contact assignment		
	Polzahl/ number of poles		Farbkennung/ color code
BRSTS 8X	8		1 = weiß/ white
			2 = blau/ blue
			3 = gelb/ yellow
			4 = orange/ orange
			5 = n.c.
			6 = n.c.
			7 = n.c.
			8 = n.c.
BRSTS 4D	4		1 = gelb/ yellow
			2 = weiß/ white
			3 = orange/ orange
			4 = blau/ blue



HELPDESK

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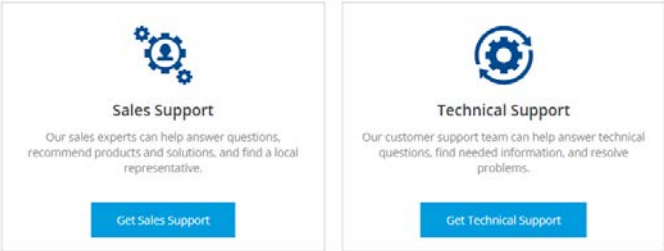

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GarrettCom A BELDEN BRAND
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TOFINO SECURITY A BELDEN BRAND
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lumbergautomation A BELDEN BRAND
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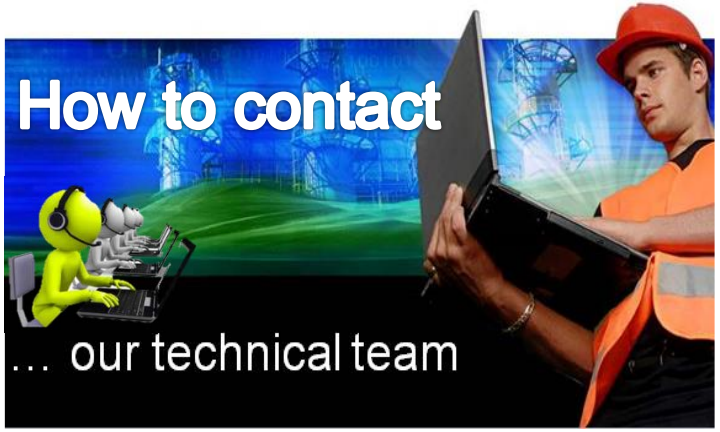

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