CONNECTIONS THAT MATTER

SOLUTION BASED • RELATIONSHIP DRIVEN

BELDEN

SENDING ALL THE RIGHT SIGNALS

Короткий обзор

Industrial Ethernet – технические условия

Место Hirschmann в Belden

CONNECTIONS THAT MATTER
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KEY SOLUTIONS

Cable
Fiber | Copper

Connectivity
Active I/O Modules | Passive Distribution Boxes | Connectors

Networking
Wireless | Gateways | Switches | Routers

Software
Security Configuration Management | Firewalls
Network Management | Vulnerability Management

KEY MARKETS

Discrete Manufacturing
Factory Floor Automation

Process Facilities
Process Automation

Transportation
Transportation Control Systems and Wireless

Energy
Smart Grid Infrastructure

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Спецификация продукта – вопросы

1) Установка: DIN Rail, 19” rack, инсталляция на стене или полу?

2) Managed or Unmanaged Switches?

3) Layer 2 or Layer 3?

4) Плотность портов?

i. **Количество оптических портов (FO) Ports**
   FO MM or SM
   FO ports (LC, SC, ST, MTRJ, SFP)
ii. **Количество медных портов**
iii. **GE (1000Mbps) or FE (100Mbps)**

Спецификации продукта – вопросы

4) Рабочая температура?
   i. Стандартный или Расширенный диапазон?

6) Источники питания?
   i. Диапазон напряжения (24-48Vdc / 125-250Vdc / 110Vac)
   ii. Резервирование блоков питания

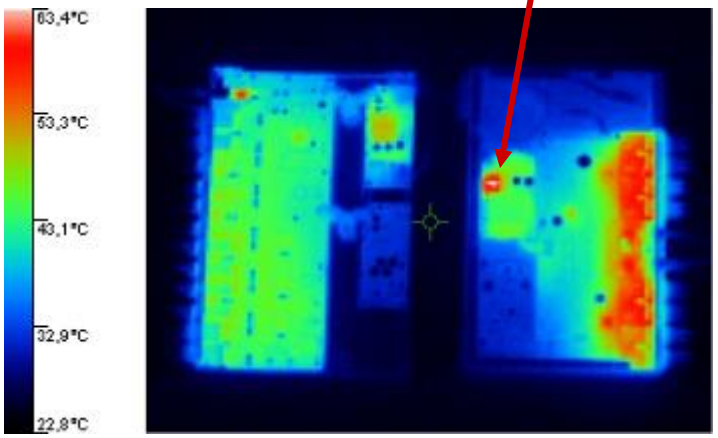
7) Резервирование связи?
   i. RSTP
   ii. MRP
   iii. PRP/HSR

8) Другие опции
   PoE ports
   Certifications
   Etc

Что делает Industrial Ethernet “Промышленным”?

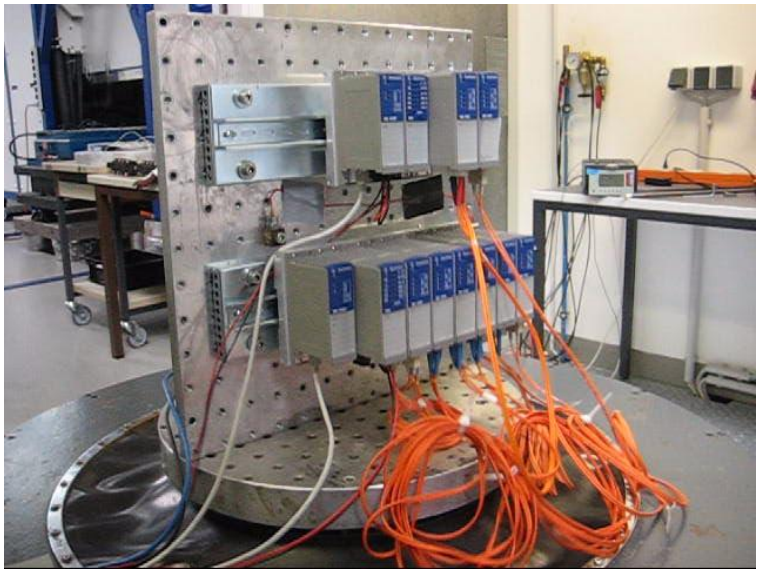
Температура и влажность/сырость

- Разработаны для широкого диапазона от -40 C до +85 C
- Высочайшее качество и эффективность компонентов
- Малое рассеивание тепла = Больший MTBF
- Комфорное покрытие
- Широкий выбор IP67 коммутаторов



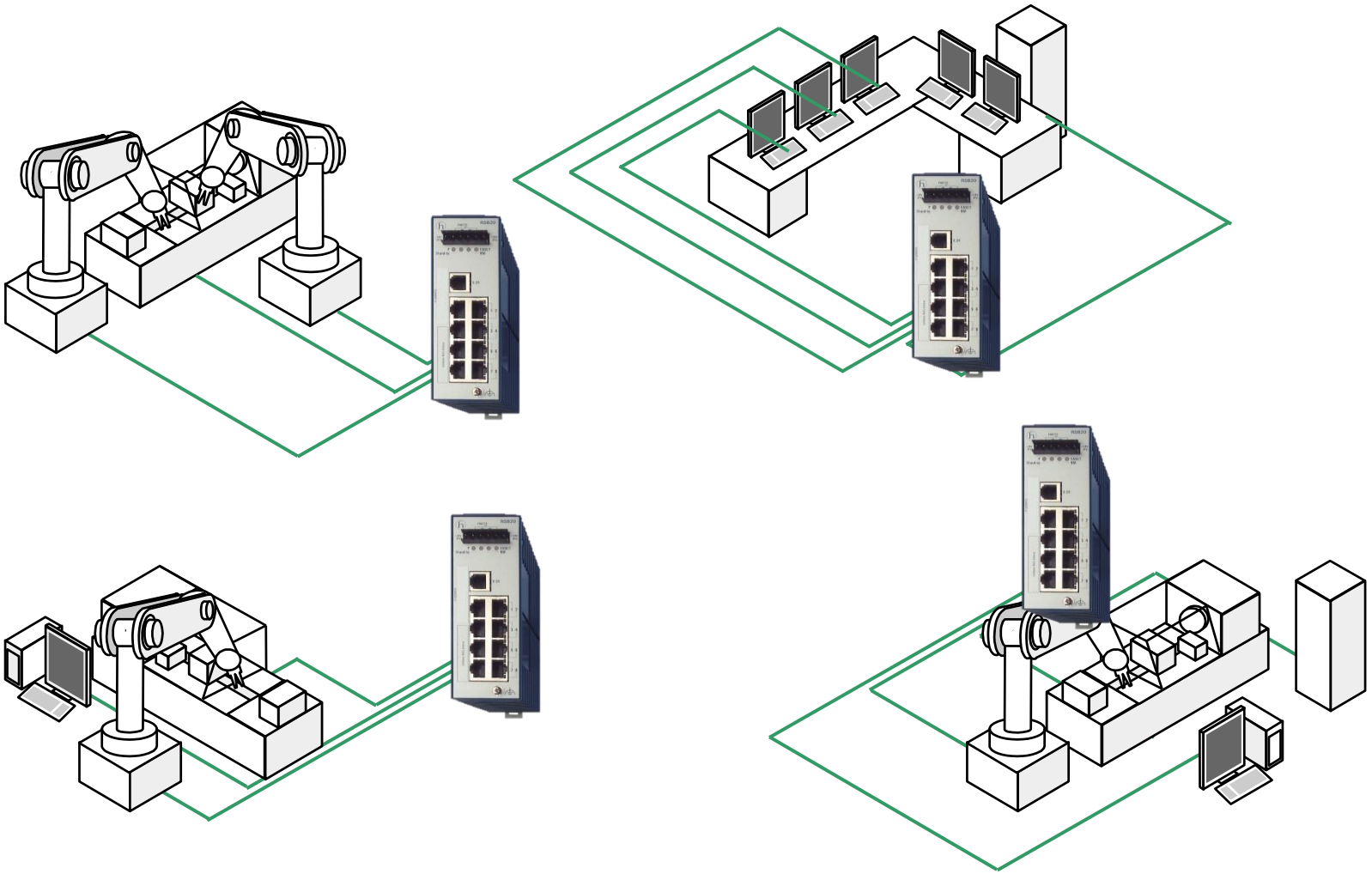
Устойчивость к вибрациям

- Минутная вибрация изнашивает контакты и паяные соединения, а удар влияет на общую целостность
- Коммутаторы Hirschmann можно найти на поездах, кораблях и высокоэффективной технике

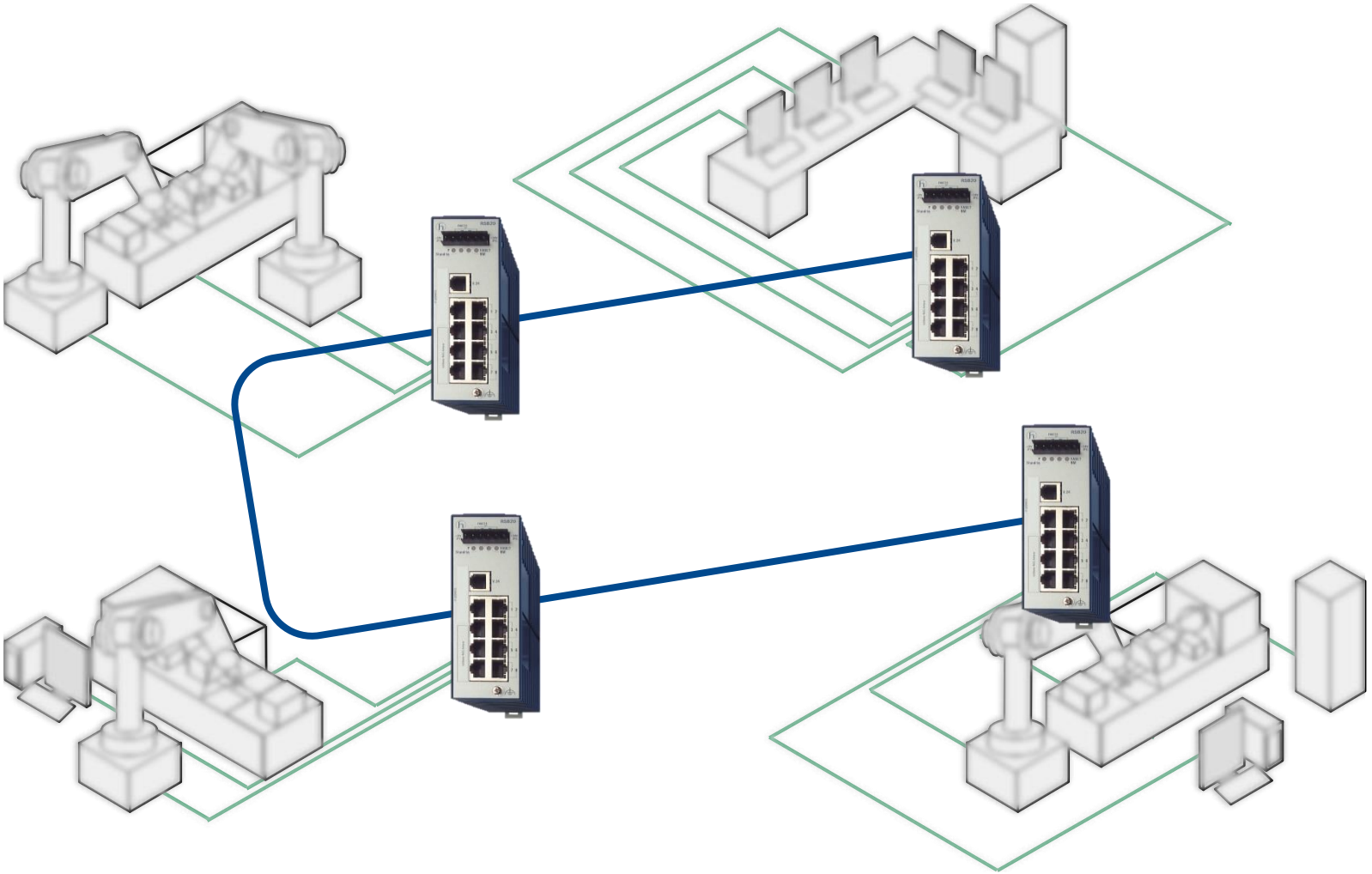


Отраслевая сертификация

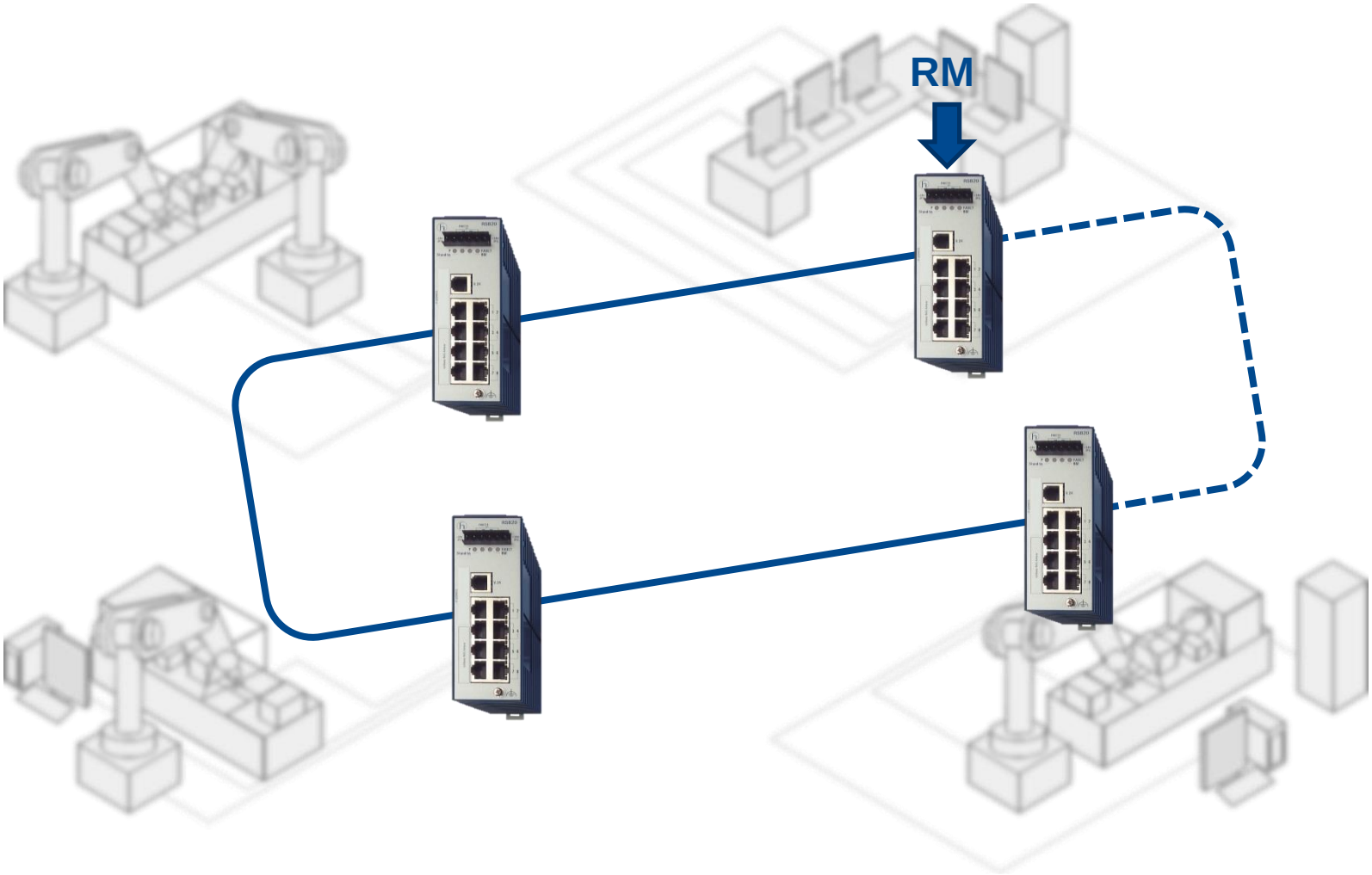
The Ring concept is simple.



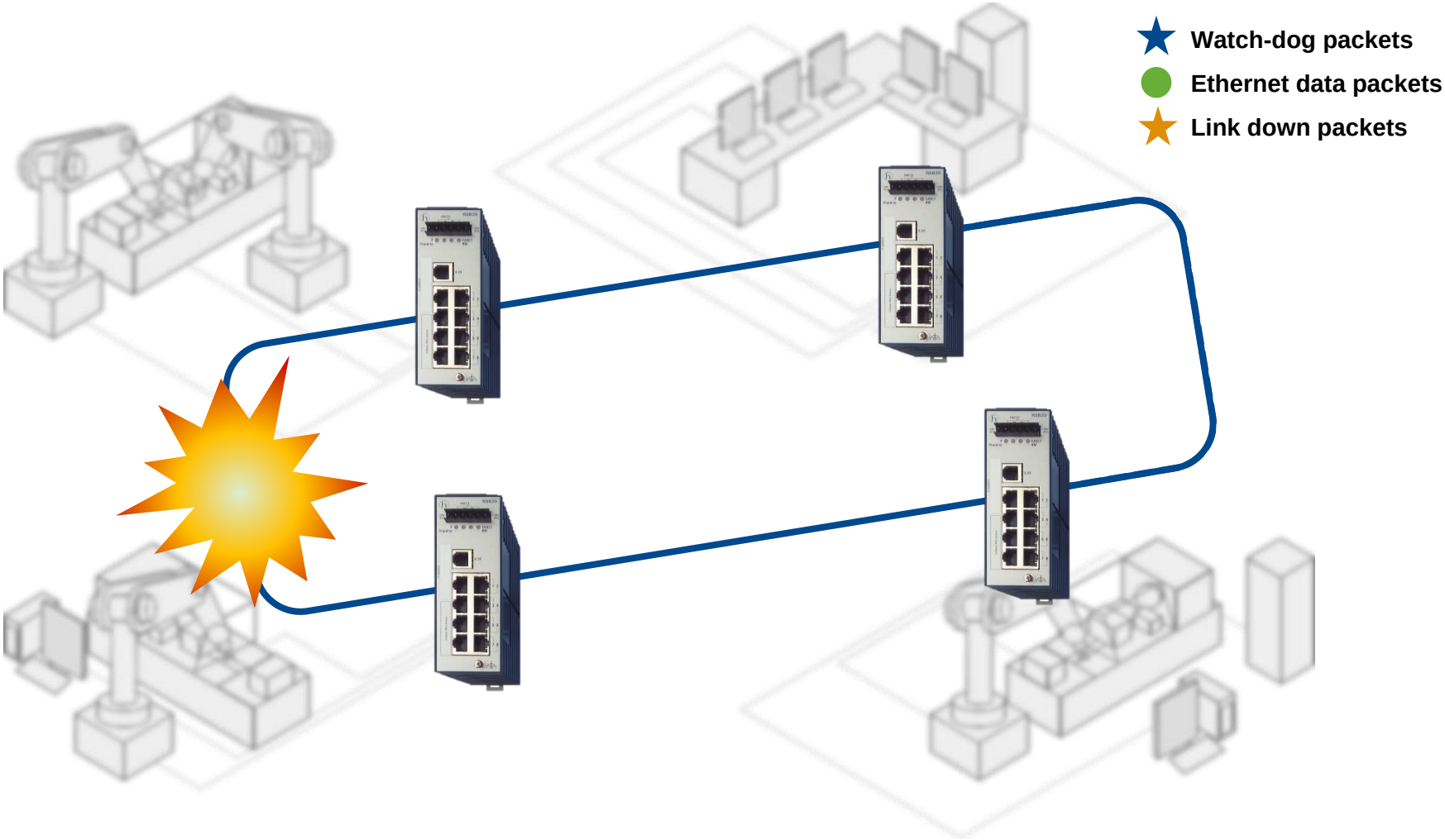
Daisy-chain managed switches via any mix of copper/fiber and data speeds – up to 10Gig!



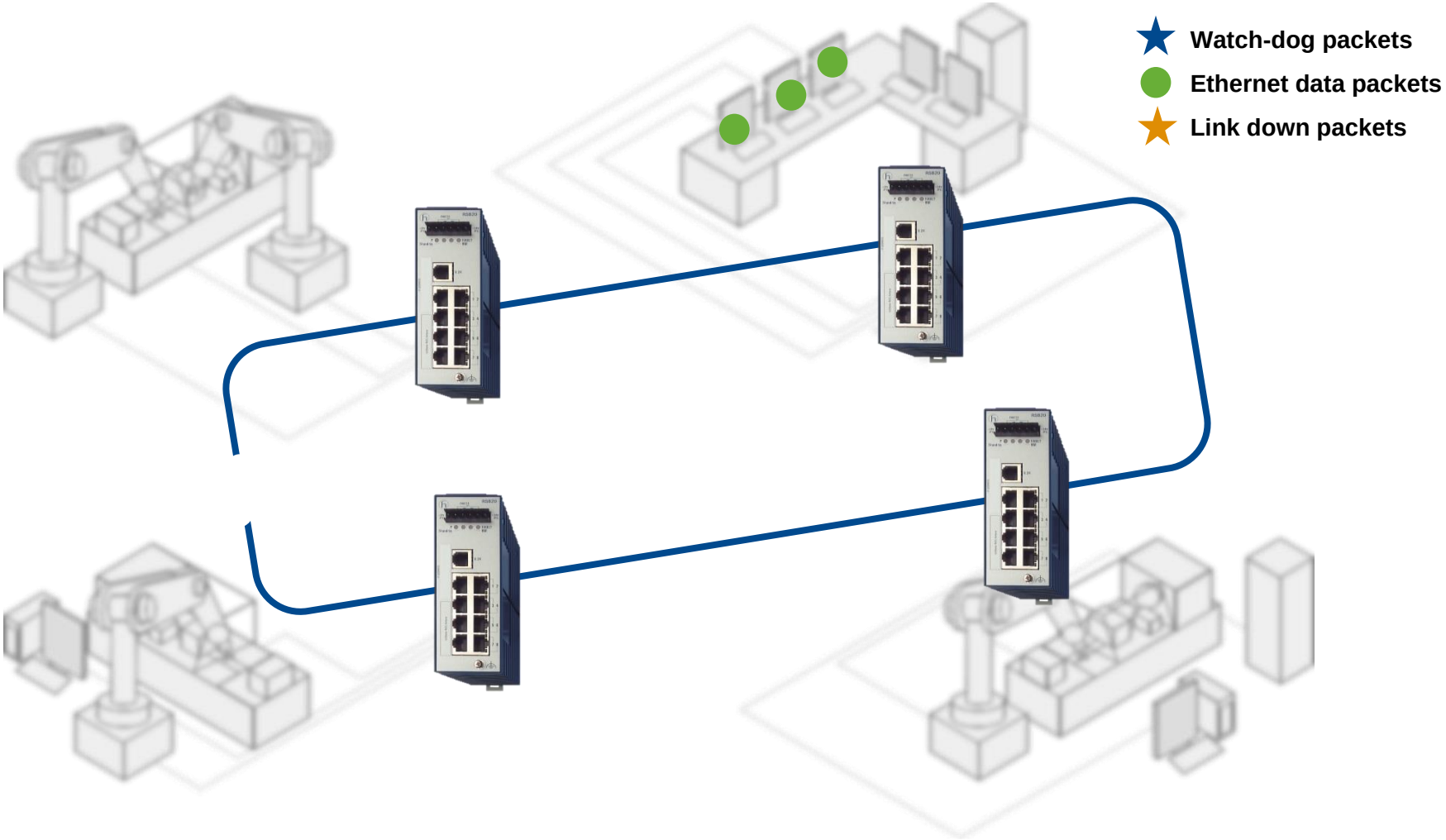
Assign any (one) switch to be the Redundancy Manager and close the ring



A cable or switch failure will cause Watch-dog packets to not fully traverse the network



New address tables are learned and Ethernet data is automatically re-routed



A few incompatible ring technologies

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X-Ring

N-

Ultra-Ring

OnTime-Ring

ICON

M-Ring

P-Rir

Ring

HSR*
Siemens

Turbo Ring
Self-Healing Ethernet

T-Ring

apid Super Ring

α-RING
<15mS

HIPE

Z-Ring

Real-Time Rir

ORing

TP™

FRNT

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Comparison of Redundancy Protocols
defined in IEC62439

Protocol		Most current Standard	Typical re-config	Remark	Available since
STP	Spanning Tree Protocol			any topology/mesh, diameter limited	1990
RSTP	Rapid Spanning Tree Protocol			any topology/mesh, diameter limited	2004
CRP	Cross-Network Redundancy Protocol		nd	any topology/ duplicated networks	2007
BRP	Beacon Redundancy Protocol		500	Two top level switches with star, line or ring topologies	2007
DRP	Distributed Redundancy Protocol		0	ring, double ring	2010
MRP	Media Redundancy Protocol		0	ring	1998/2007
Fast MRP	Media Redundancy Protocol			ring	2010
Optimized RSTP	Rapid Spanning Tree Protocol			ring	2010
HSR	High-Availability Seamless Redundancy			ring	2010
PRP	Parallel Redundancy Protocol			any toplogy/ duplicated networks	2010


IEC 62439-3

Edition 2.0 2012-07

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Industrial communication networks – High availability automation networks – Part 3: Parallel Redundancy Protocol (PRP) and High-availability Seamless Redundancy (HSR)

Réseaux industriels de communication – Réseaux d'automatisme à haute disponibilité – Partie 3: Protocole de redondance parallèle (PRP) et redondance transparente de haute disponibilité (HSR)

INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

PRICE CODE CODE PRIX XC

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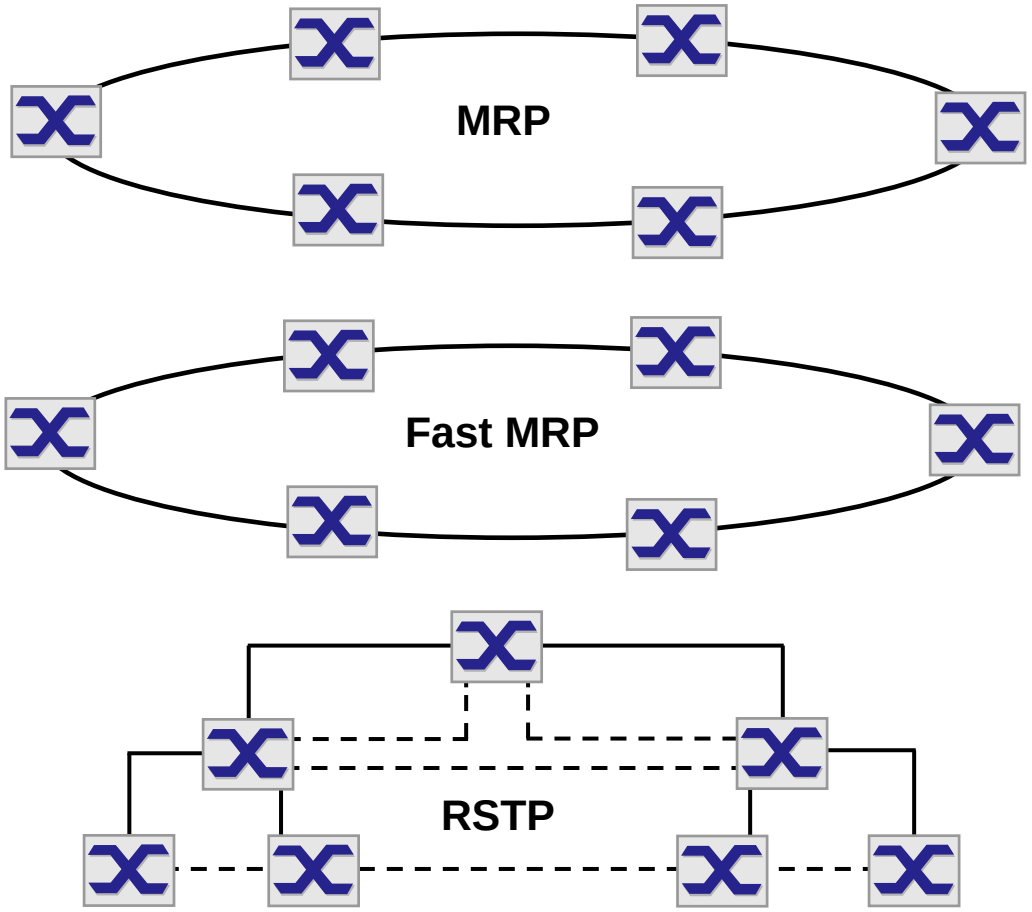
(1) pre-

(2) pre-standard Fast Hiper Ring since 2007

IEC62439 Redundancy

Standardized meshed, ring and back-up line topologies



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Короткий обзор

Продукты Hirschmann

Неуправляемые коммутаторы

SPIDER

Коммутаторы начального уровня SPIDER:
- низкая стоимость
- компактные габариты
- простота использования (plug-and-work).

Unmanaged OpenRail

Коммутаторы OpenRail :
- конфигурируемый функционал
- до 25 портов Fast Ethernet
- Наличие SFP портов

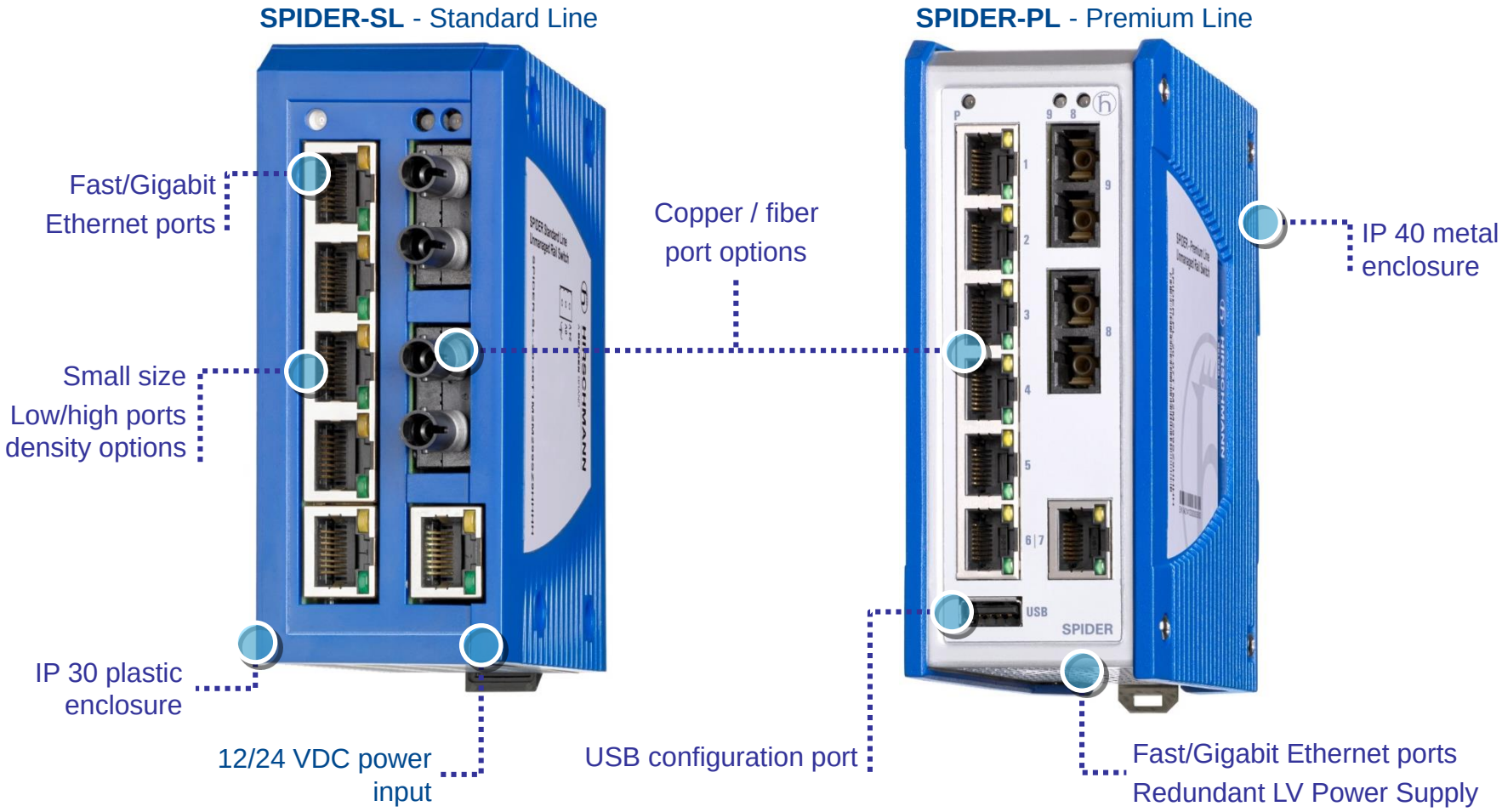
RS2

Коммутаторы RS2:
- наличие дополнительного входа питания
- MTBF > 100 лет

HIRSCHMANN
A BELDEN BRAND

Управление
Контроль
Полевой

SPIDER III SL / PL



Configurable parameters

	Parameter	Values	Comment
Global	PSU alarm	PSU 1/2 enabled / disabled	
	Aging time	Aging time in [s]	
	QoS 802.1p mapping	VLAN Priority 0 … 7 Traffic Class 0 … 3	
	QoS DSCP mapping	DSCP value 0 … 63 Traffic Class 0 … 3	
Per Port	Flow control	enabled / disabled	
	Port state	enabled / disabled	
	Jumbo frames	enabled / disabled	Only on GbE ports
	Broadcast storm protection	enabled / disabled	Ingress filtering
	Broadcast storm threshold	0% … 100%	
	Multicast storm protection	enabled / disabled	Ingress filtering
	Multicast storm threshold	0% … 100%	
	QoS Trust Mode	untrusted, trustDot1p, trustIpDscp	Including VLAN 0 mode for PROFINET
	Port based priority	0 … 7	
	Link alarm	enabled / disabled	
Per TX Port	Auto-Neg	enabled / disabled	
	Speed	100Mbps, 10Mbps	Only if auto-neg is disabled, no forced mode 1000Mbps
	Duplex mode	FDX / HDX	Only if auto-neg is disabled
	Auto-crossing	enabled / disabled	Only if auto-neg is disabled
	MDI state	MDI, MDI-X	Only if auto-neg is disabled
	Energy Efficient Ethernet (EEE)	enabled / disabled	Only on GbE ports
Per FX Port	Duplex mode	FDX / HDX	

Управляемые коммутаторы

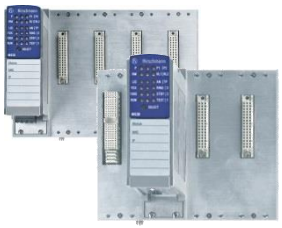
GECKO	RSB (Rail Switch Basic)	OpenRail	RSPx(E) (Rail Switch Power)	RSR (Rail Switch Rugged)	MSP (MICE Switch Power)
					
Управляемые коммутаторы с минимальным набором опций	Коммутаторы Fast Ethernet с базовым ПО.	Коммутаторы с функциями управления и мониторинга сети.	Коммутаторы с расширенными функциями управления и мониторинга сети.	Защищенные коммутаторы (удары вибрации, ЭМС и т.д).	Конфигурируемые модульные коммутаторы с расширенными функциями управления и мониторинга сети

GECKO – Lite Managed

The GECKO 4TX industrial Ethernet switch гарантирует надежную передачу данных и улучшенные функции резервирования и диагностики. Он также предлагает простые в использовании функции управления с отличным соотношением цена-производительность**.**

- SNMP and HiDiscovery / Industrial HiVision, плюс web interface, обеспечивающий быстрое и удобное администрирование
- RSTP гарантирует надежную передачу данных
- Широкий спектр сценариев применения благодаря характеристикам: устойчивость к ударам и вибрации, диапазон рабочих температур от 0 ° C до + 60 ° C и степени защиты IP30)

OpenRail –RS20/30/40 and MS20/30



RS20 - Fast Ethernet Ports and Options with PoE

- The RS20 compact OpenRail managed Ethernet switches can accommodate from 4 to 25 port densities and are available with different Fast Ethernet uplink ports – all copper, or 1, 2 or 3 fiber ports. The fiber ports are available in multimode and/or singlemode.

RS30 - **Gigabit Ethernet Uplink Ports and Options with PoE**

- The RS30 compact OpenRail managed Ethernet switches can accommodate from 8 to 24 port densities with 2 Gigabit ports and 8, 16 or 24 Fast Ethernet ports. The configuration includes 2 Gigabit ports with TX or SFP slots.

RS40 - Full Gigabit Ethernet Switches

- The RS40 compact OpenRail managed switch has 9 Gigabit ports. The switch offers 5 x 10/100/1000 RJ45 and 4 x 100/1000 RJ45/SFP combo ports. Fiber uplink ports are available in multimode and/or singlemode by using Gigabit or 100 Mbit/s SFP transceivers.

MS20/30 Managed Modular DIN Rail Mount Ethernet Switches

- The MS20 managed switches have 8 to 24 Fast Ethernet ports plus 2 additional Gigabit Combo ports for the MS30. Any combination of copper/fiber ports can be realized with hot-swappable media modules - also with PoE support.

BOBCAT

Следующее поколении компактных Rail коммутаторов

Порты	4 – 24 ports До 20 Gig ports До 4 ports 2.5 Gig
Три группы	Full GE, FE/GE and FE versions
Software	HiOS Layer 2 L2S and L2A
PoE	PoE+ 24V/60W PoE+ 48V/180W До 8 PoE/PoE+ ports
Security	MAC based port security, Port-based access control with 802.1x, wired-speed Ingress ACLs (MAC,IPv4) per port and per VLAN, Автоматическое предотвращение отказа в обслуживании (Denial-of-Service), Различные уровни привилегий, настраиваемые политики паролей, Security Status Monitor, Контроль прошивки при загрузки (TPM)
Management	USB-C, web-interface,
Time sync.	Аппаратно поддерживается IEEE1588 v2 на всех портах PTPv2 TC two-step
TSN	**Time Sensitive network ready on all ports**
IPv6 ready	
Digital Input	

RSP Family - DIN Rail Mount Switches

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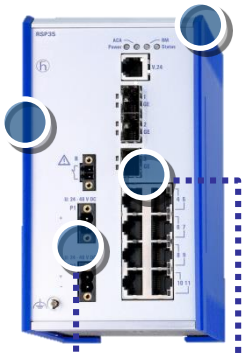
RSP

Meets **IEC 61850-3** and **IEEE 1613**

HiOS Hirschmann™ Operating System

Layer 2 and **Layer 3** option



LV/HV redundant power supply

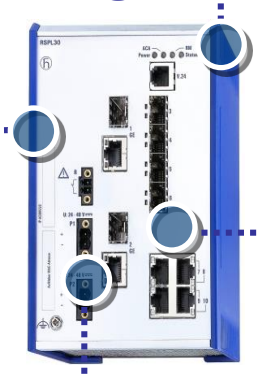
8 FE (RJ45 and SFP option) ports plus 3 GE SFP slots

RSPL

Meets **IEC 61850-3** and **IEEE 1613**

HiOS Hirschmann™ Operating System

Layer 2



LV/HV redundant power supply

2 GE combo (RJ45/SFP) ports and 8 FE (RJ45 and SFP option) ports

RSPS

Meets **IEC 61850-3** and **IEEE 1613**

HiOS Hirschmann™ Operating System

Layer 2

LV/HV redundant power supply

Up to 6 FE ports (RJ45 and SFP option)

"0ms" recovery

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MSP30 Family
Managed Modular DIN Rail Mount Switches

Meets **NEMA TS2,**
EN 50121-4 (Railway EMI)

HiOS
Hirschmann™ Operating System

Layer 2 and
Layer 3 option

Extended security functions

Flexibility by modular configuration

Up to 24 Fast Ethernet slots
PoE(+) capable, up to 120W

Up to 4 GE uplink ports PoE(+)

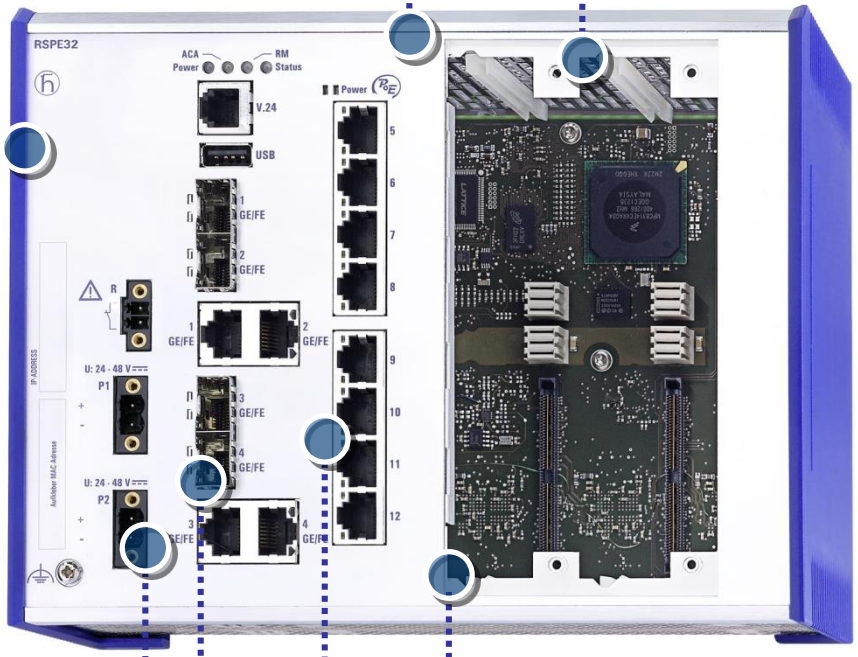
CLI and
Web interface

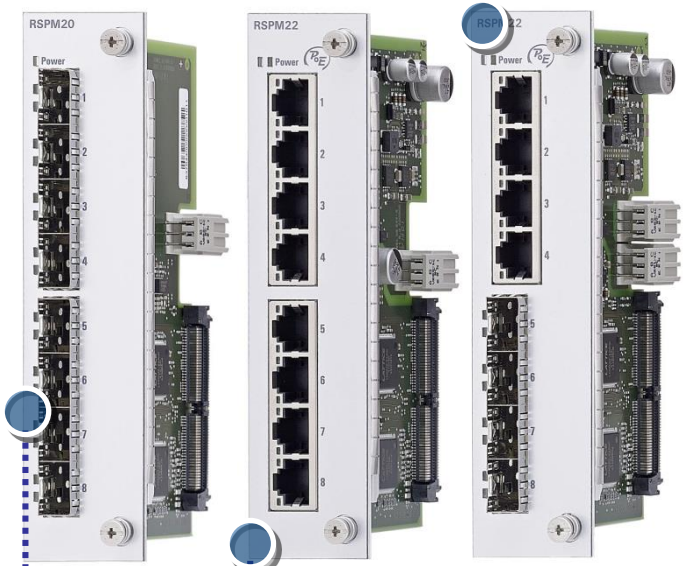
RSPE - Expandable DIN Rail Mount Switch

Meets **IEC 61850-3** and **IEEE 1613**

PoE / PoE+
Up to 24 ports at 120W

Flexibility





HiOS
Hirschmann™ Operating System

Layer 2 and
Layer 3 option

LV/HV redundant power supply

2 Expandable Slots

Exchangeable modules up to 8 ports each

Up to 16 FO ports (8 per module)

8 Fixed FE TX ports

4 Fixed GE combo uplinks (RJ45/SFP)

"0ms" recovery

Rack Mount Switches

MACH100

Функции коммутации и маршрутизации в комплексе, делают MACH100 **коммутаторы для АРМ экономически эффективной** альтернативой для приложений 2/3 уровня с высокой скоростью передачи данных.

MACH1000

Эти коммутаторы **предлагают высокую плотность портов** (до 26 портов), отличное радиочастотное и ЭМИ экранирование **в экстремальных условиях, обеспечивая высокую гибкость.**

MACH4000

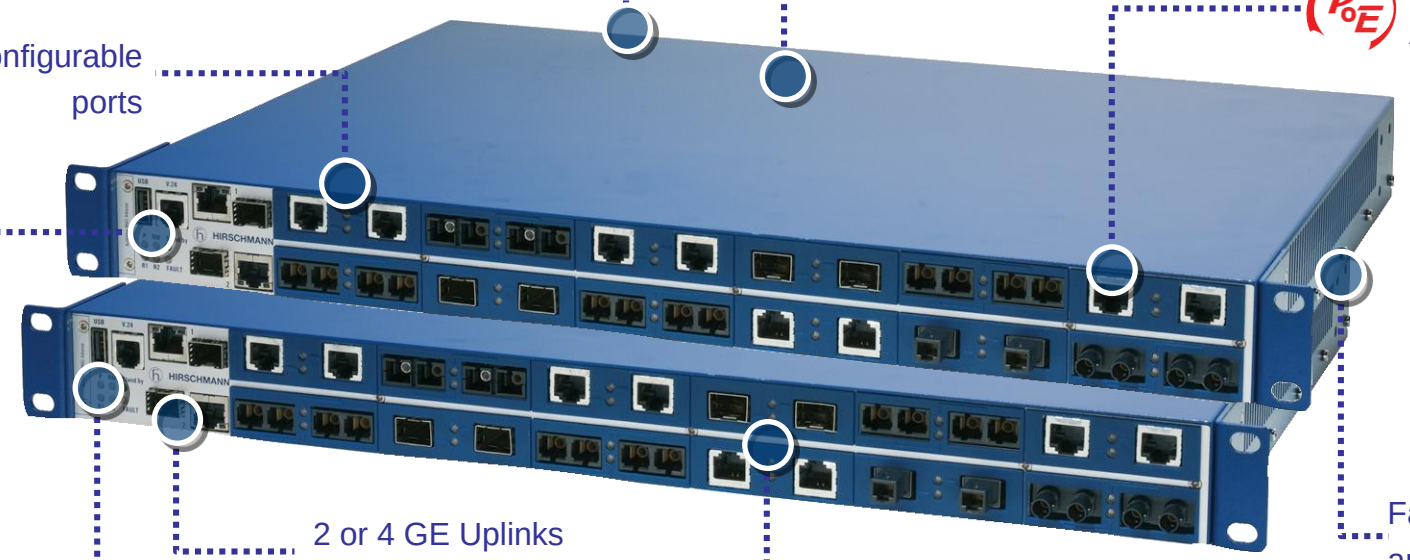
MACH магистральный L2 или L3 коммутатор подходит для всех приложений – особенно больших сетей, **большое количество медиа модулей**, **высокая плотность портов** и **расширенная функциональность маршрутизации**

GREYHOUND

Также **предлагает высокую плотность портов** (до 28 портов), с помощью настраиваемых и взаимозаменяемых медиа-модулей, чтобы идти в ногу с меняющимися потребностями сети.

MACH1000

19” Rugged™ Rack-Mount Switches



Exceeds **IEC61850-3**
Exceeds **IEEE1613**

, **RSTP** and BLAZING 10ms HiPer-Ring

PoE ports Available

Up to 28 configurable ports

Fan-less design and High MTBF

2 or 4 GE Uplinks (RJ45 and/or SFP)

CLI
Web Interface

Layer 2

IEEE 1588V2 precision 30 ns

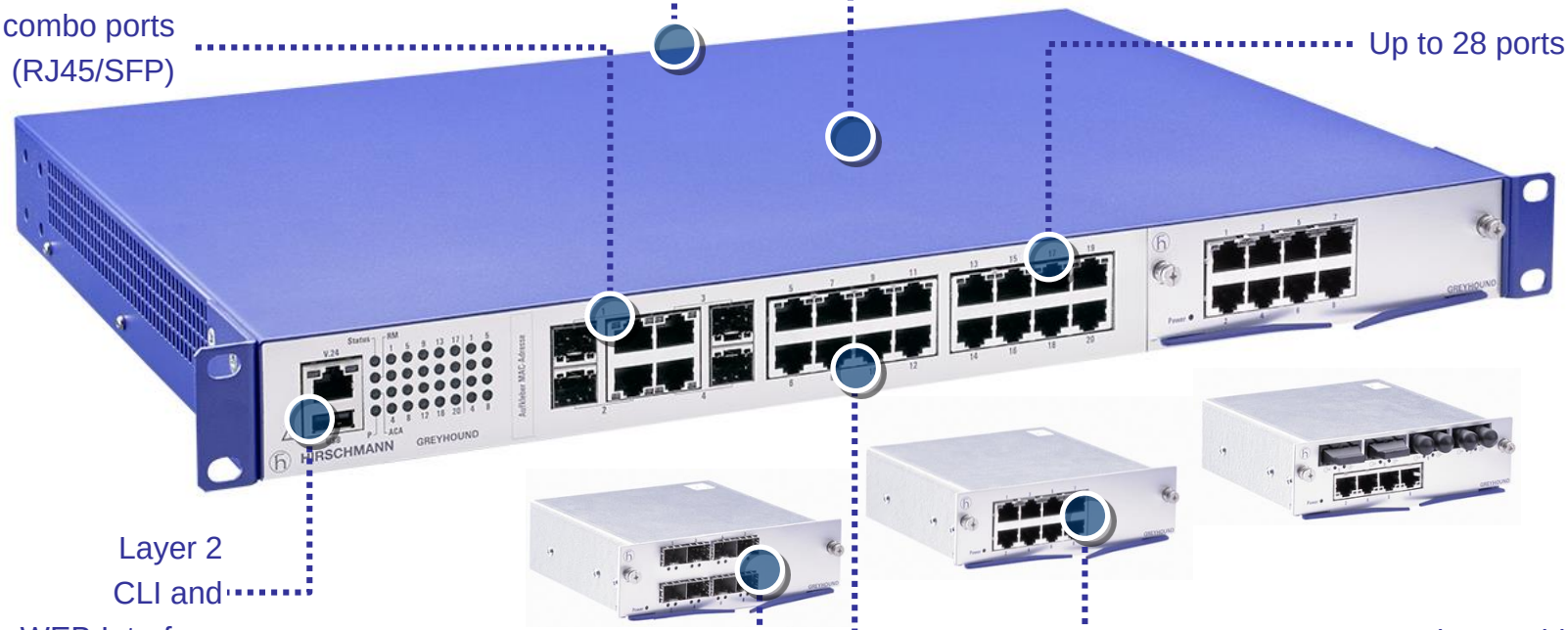
GREYHOUND
19" Rugged Modular Switch

Meets **IEC61850-3** and **IEEE1613**

HiOS Hirschmann™ Operating System and **RSTP**

4 GE combo ports (RJ45/SFP)

Up to 28 ports



Layer 2 CLI and WEB Interface

Supports ST, SC, RJ45 and SFP slots

16 FE TX ports or 8 FE TX plus 8 FE SFP

Exchangeable port modules

GREYHOUND 1040
19" Rugged Modular Switch

Hot swappable
Power Supplies

HiOS Hirschmann™ Operating System and MRP and **RSTP**

Up to 28 GE ports

Up to 4x GE/2.5GE
SFP slots

PoE/PoE+ Media
Modules Available

Layer 2 and Layer 3 options

Meets **IEC61850-3**
and **IEEE161**

Exchangeable port modules
Up 02 modules (08 ports each one)

Up to 22 FO ports:
22x GE/FE or 18 GE/FE plus 4x 2.5 GE

Промышленная безопасность & Firewall

EAGLE One Security Router

Широкие **Layer 2 и Layer 3 функции резервирования,** в сочетании с другими такими как NAT и firewall, не только **гарантируют максимальную безопасность данных** но и позволяют легко подключать производственные мощности в сеть ПД.

EAGLE20-0400 EAGLE30-0402

Много портовый Firewalls обеспечивают абсолютную гибкость для физического развертывания в сочетании с **новейшими функциями безопасности** адаптированными к уникальным требованиям промышленных сетей Ethernet.

Tofino Xenon

Tofino Xenon промышленная система безопасности обеспечивает комплексную защиту сети. Это **универсальное, чрезвычайно прочное устройство** обеспечивающее **максимальную защиту данных для производственных систем**

Позиционирование продуктов Tofino – EAGLE

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

Belden Eagle Solutions

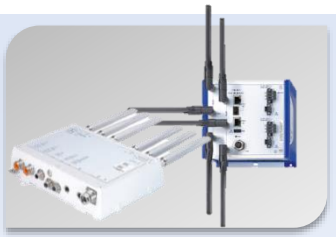
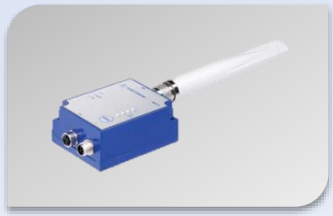
Feature	Eagle One	Eagle 20-0400	Eagle 30-0402
Application	периметр	периметр	периметр
LAN	2x 10/100	4x 10/100	4x 10/100
Uplink	-	-	2x SFP (GBE)
Routing	Static	Static, OSPF	Static, OSPF
Redundancy	Ring Coupling	VRRP	VRRP
VLANs	1	Up to 64	Up to 64
Power Supply	9 - 60VDC / 24VAC	18 - 60VDC or 48 - 320VDC / 88 - 265VAC	18 - 60VDC or 48 - 320VDC / 88 - 265VAC
VPN	ipSEC	ipSEC	ipSEC
WAN	-	-	SHDSL (opt.)
DI	1	1	1
Extended Temp, ATEX/C1D2, substation	Yes	Yes	Yes

Комплексные решения безопасности

Приложение	Eagle EDGE Security	Tofino CORE Security
Основный режим работы	Layer 3	Layer 2
Зоны используют разные подсети	✓	
Зоны внутри одной подсети		✓
Поддержка резервирования	✓	✓
‘Внедрение’ безопасности на существующей системе		✓
High-security приложения		✓
‘step and repeat’ zones (NAT)	✓	
Защита Modbus ПЛК		✓
Защита OPC серверов		✓
Удаленный доступ через VPN	✓	
Безопасность границ завода	✓	

Wireless LAN

CONNECTIONS THAT MATTER
SOLUTION BASED • RELATIONSHIP DRIVEN

OpenBAT	BAT-C	WLAN Controller	BAT-Planner	Antenna
				
The OpenBAT hardware is the **latest generation of WLAN** devices, representing a new evolutionary stage in WLAN technology. The OpenBAT can be mounted on DIN rails (BAT-R) or installed on walls or masts in indoor and outdoor (BAT-F) areas.	The **BAT-C client**, featuring industrial protection class **IP67**, allows you to set up **cost-effective WLAN** installations in places where there is no need for high-end devices.	The BAT-Controller WLC can be used for centralized **management of large WLAN networks**	BAT-Planner is a software tool for **easy and quick planning** of wireless networks	As high-quality accessories, the **BAT antennas effectively complement** the innovative features of the BAT product line.

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BAT867-R

- IP40 housing
- Mounting DIN Rail
- Country specific certification
- WLAN/radio module as per IEEE802.11ac, 2x2 MIMO up to 867MBit/s gross bandwidth
- Configurable as access point or client
- Operating voltage: 1 x 24 V DC
- Approvals:

  Safety of Information Technology Equipment: EN 60950-1
  UL 60950-1

  Radio: EN 300 328 (2.4 GHz), EN 301 893 (5 GHz)
  FCC/CFR 47 Part 15, IC (Industry Canada)
  EN 301 489-1, EN 301 489-17, EN 61000-6-2

  Environmental: EN 61131

- Ethernet interface: 1x RJ45, 10/100/1000 Mbit/s
- Standard temperature range: -10° C to 60° C
- Software: HiLCOS
- With or without accessories

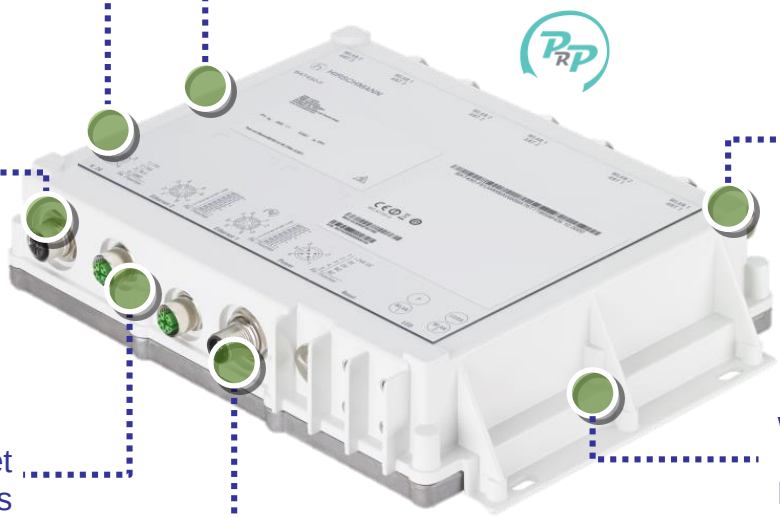
BAT450-F - Industrial WLAN Access Point

HiLCOS The Hirschmann™ BAT Operating System 9.0

Layer 2
High Security Level
Strong Redundancy Functions

Meets **EN 50155**

CLI
Web Interface



Up to 2 Interfaces
6 antennas*

M12, X-coded, Ethernet
(10/100/1000 Mbit/s) ports

WWAN and **IIoT** technologies
ISA100.11a, Zigbee, Bluetooth
and **Wireless HART**

LV power supply

Clear Space® Technology

*Note: For more info, see Wireless Ethernet Antennas reference Here.

Specifying / applying different Bat's

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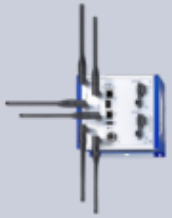
Features	Entry level	Mid Range	High End
IP30 / DIN Rail	 BAT867-R		 OpenBAT-R
IP65/67 / Wall – Mast		 BAT450-F	 OpenBAT-F
Hardware Optionen	Limited	Medium	High
Client / Access point	C/AP	C/AP	C/AP
Software	HiLCOS	HiLCOS	HiLCOS

Specifying / applying different Bat's: BAT867-R vs OpenBAT-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	✓

Specifying / applying different Bat's: BAT450-F vs OpenBAT-F

		BAT450-F	OpenBAT (BAT –F)
Ports	Ethernet (10/100/1000 Mbit/s)	2	2
	SFP (GE)	✗	✓
	Serial	(V.24/ACA11)	(V.24/ACA21)
Power Supply	W → 24 VDC, PoE	✓	✓
	C → 18-60 VDC	✗	✓
	K → 48-320 VDC / 90-265 VAC	✗	✓
	P → PoE, 802.3 af	✗	✓
Temperature Range	Standard	✗	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	✗	✓
Extension Interface	LTE, IIoT (WHART, ISA 100.11a, BlueTooth)	✓	✗

Waterproof IP67 / IP65 / IP54 Switches

CONNECTIONS THAT MATTER
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OCTOPUS unmanaged

Unmanaged Switches deliver cost-effective connection of Ethernet devices to the network

OCTOPUS managed

Managed switches guarantee the highest availability in demanding environments due to innovative redundancy solutions and network monitoring.

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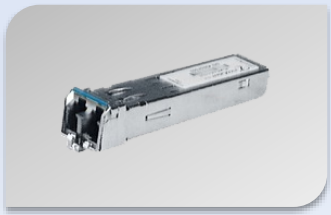
Классы защиты IP:

1st Index Number	Icon	Brief Description	Definition
0		No protection	Not applicable
1		Protected against solid foreign objects of 50 mm Ø and >	The object probe, sphere of 50 mm Ø, shall not fully penetrate**
2		Protected against solid foreign objects of 12.5 mm Ø and >	The object probe, sphere of 12.5 mm Ø, shall not fully penetrate**
3		Protected against solid foreign objects of 2.5 mm Ø and >	The object probe, sphere of 2.5 mm Ø, shall not fully penetrate**
4		Protected against solid foreign objects of 1.0 mm Ø and >	The object probe, sphere of 1.0 mm Ø, shall not fully penetrate**
5		Dust protected	Ingress of dust is not totally prevented, but dust shall not penetrate in a quantity to interfere with satisfactory operation of the apparatus or to impair safety.
6		Dust tight	No ingress of dust

ПРИ ИСПОЛЬЗОВАНИИ IP65 / IP67 ОБОРУДОВАНИЯ НЕ НУЖНЫ ПАНЕЛИ ИЛИ ФИЗИЧЕСКАЯ ЗАЩИТА:
ЭКОНОМИЯ В ПРОЕКТЕ!

System Accessories

SFP Transceiver



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

Power supply

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

Adapter cable

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

OVERVIEW

ACA & SFP Transceivers

Auto Configuration Adapter:

- Available for ALL managed devices
- RJ-11, USB, M12, Mini-DIN
- Configuration backup
- Zero configuration device replacement
- Environmentally Hardened
- Fastening eyelet








SFP Transceiver Options:

- 100Mbps
- 1Gbps / 2,5Gbps / 10Gbps
- Multimode or Monomode
- Standard or Extended Temperature
- Different distances

ACA & SFP Transceivers

Fast Ethernet Transceivers		
Part No.	**Order No.**	**Description**
M-Fast SFP-TX/RJ45	942 098-001	Fast Ethernet RJ45 SFP
M-Fast SFP-TX/RJ45 EEC	942 098-002	Fast Ethernet RJ45, -40 °C to +85 °C
M-FAST SFP-MM/LC	943 865-001	100Base-FX, 5 km 50/125 µm MM, 4 km 62.5/12.5 µm MM
M-FAST SFP-MM/LC EEC	943 945-001	100Base-FX, 5 km 50/125 µm MM, 4 km 62.5/12.5 µm MM
M-FAST SFP-SM/LC	943 866-001	100Base-FX, 25 km 9/125 µm SM
M-FAST SFP-SM/LC EEC	943 946-001	100Base-FX, 25 km 9/125 µm SM
M-FAST SFP-SM+/LC	943 867-001	100Base-FX, 25 to 65 km 9/125 µm SM
M-FAST SFP-SM+/LC EEC	943 947-001	100Base-FX, 25 to 65 km 9/125 µm SM
M-FAST SFP-LH/LC	943 868-001	100Base-FX, 55 to 140 km 9/125 µm SM
M-FAST SFP-LH/LC EEC	943 948-001	100Base-FX, 55 to 140 km 9/125 µm SM
SFP-FAST-MM/LC	942 194-001	100Base-FX, 5 km 50/125 µm MM, 4 km 62.5/12.5 µm MM
SFP-FAST-MM/LC EEC	942 194-002	100Base-FX, 5 km 50/125 µm MM, 4 km 62.5/12.5 µm MM
SFP-FAST-SM/LC	942 195-001	100Base-FX, 25 km 9/125 µm SM
SFP-FAST-SM/LC EEC	942 195-002	100Base-FX, 25 km 9/125 µm SM

Gigabit Ethernet Transceivers		
Part No.	**Order No.**	**Description**
M-SFP-SX/LC	943 014-001	1000Base-SX, 550 m 50/125 µm MM, 275 m 62.5/125 µm MM
M-SFP-SX/LC EEC	943 896-001	1000Base-SX, 550 m 50/125 µm MM, 275 m 62.5/125 µm MM
M-SFP-LX/LC	943 015-001	1000Base-LX, 550 m 50/125 µm MM, 550 m 62.5/125 µm MM, 20 km 9/125 µm SM
M-SFP-LX/LC EEC	943 897-001	1000Base-LX, 550 m 50/125 µm MM, 550 m 62.5/125 µm MM, 20 km 9/125 µm SM
M-SFP-MX/LC EEC	942 108-001	1.5 km 50/125, 500 m 62.5/125, -40 °C to +85 °C
M-SFP-LX+/LC	942 023-001	1000Base-LX, 40 km with 9/125u SM
M-SFP-LX+/LC EEC	942 024-001	1000Base-LX, 40 km with 9/125u SM, -40 °C to +85 °C
M-SFP-LH/LC	943 042-001	1000Base-LX, 16 to 80 km 9/125 µm SM-LH
M-SFP-LH/LC-EEC	943 898-001	1000Base-LX, 70 km with 9/125u SM, -40 °C to +85 °C
M-SFP-LH+/LC	943 049-001	1000Base-LX, 44 to 120 km 9/125 µm SM-LH
M-SFP-TX/RJ45	943 977-001	Gigabit RJ45 SFP
SFP-GIG-LX/LC	942 196-001	1000Base-LX, 550 m 50/125 µm MM, 550 m 62.5/125 µm MM, 20 km 9/125 µm SM
SFP-GIG-LX/LC EEC	942 196-002	1000Base-LX, 550 m 50/125 µm MM, 550 m 62.5/125 µm MM, 20 km 9/125 µm SM

ACA & SFP Transceivers

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

2.5 Gigabit Ethernet Transceivers		
Part No.	**Order No.**	**Description**
M-SFP-2.5-MM/LC EEC	942 162-001	Multimode Fiber (MM) 50/125 µm - 0 to 550 m, 850 nm; 4 dB link budget; OM3 fi ber (3.5 dB/km, 2000 MHz*km) Multimode Fiber (MM) 50/125 µm - 0 to 400 m, 850 nm; 4 dB link budget; OM2 fi ber (3.5 dB/km, 500 MHz*km) Multimode Fiber (MM) 62.5/125 µm - 0 to 170 m, 850 nm; 4 dB link budget; OM1 fi ber (3.5 dB/km, 200 MHz*km)
M-SFP-2.5-SM-/LC EEC	942 163-001	Singlemode Fiber (SM) 9/125 µm - 0 to 5 km, 1310 nm; 8.5 dB link budget; 0.55 dB/km; (GR-253 CORE)
M-SFP-2.5-SM/LC EEC	942 164-001	Singlemode Fiber (SM) 9/125 µm - 0 to 20 km, 1310 nm; 13 dB link budget; 0.55 dB/km; (GR-253 CORE)
M-SFP-2.5-SM+/LC EEC	942 165-001	Singlemode Fiber (SM) 9/125 µm 21 to 45 km, 1310 nm; 12 to 25 dB link budget; 0.55 dB/km; (GR-253 CORE)

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

Power Supplies

- AC power input ranges extending from 100-240 VAC and 100-375 VDC.
- Convert to either 24 VDC or -48 VDC.
- For applications where water might be present, two IP67 models are available.
- Tested for electromagnetic interference and for safety and have all of the relevant approvals

Power Flexibility - Products available with wide ranging AC or DC input and 24 volt or -48 volt output.

Hardened - Units are available with operating temperatures ranging from -40° C to 70° C.

Waterproof Units Available - Two IP67 rated units with -48VDC output are available.

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

RPS60/48V EEC 943 953-001

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. 0,7 A at 230 V; max. 1,3 A at 100 V

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

Input data	
Output data	48-56V DC
Current consumption	

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)

RPS90/48V HV 943 979-001

Input data	**100-240V AC**; 50-60Hz or 85 to 264V DC; 47 – 63Hz (DC 100 to 375V)
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	60 V DC (1,7 A), 250 V DC (0,4 A), 110 V AC (1,0 A), 230 V AC (0,5 A)

PC150/36V/48V-IP67

Input data	Rated voltage: **24V DC / 36V DC / 48V DC** Voltage range: **24 -48V DC** Input current: **3,8 – 8A DC** Fuse: **16 A (T)**
Output data	Output voltage: **48V DC (0 to +2% accuracy)** Output current (max.): **3,2A**

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**

Software & Network Management

Network Management

Industrial HiVision enables secure and easy configuration as well as the monitoring of industrial network components.

Software Tools

Hirschmann™ offers a broad collection of software tools to facilitate the deployment and operation of its hardware products.

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

HiView is an intuitive, free of charge application which provides **access to our products' graphical user interface**

The essential **management tool** for all stages of your network lifecycle

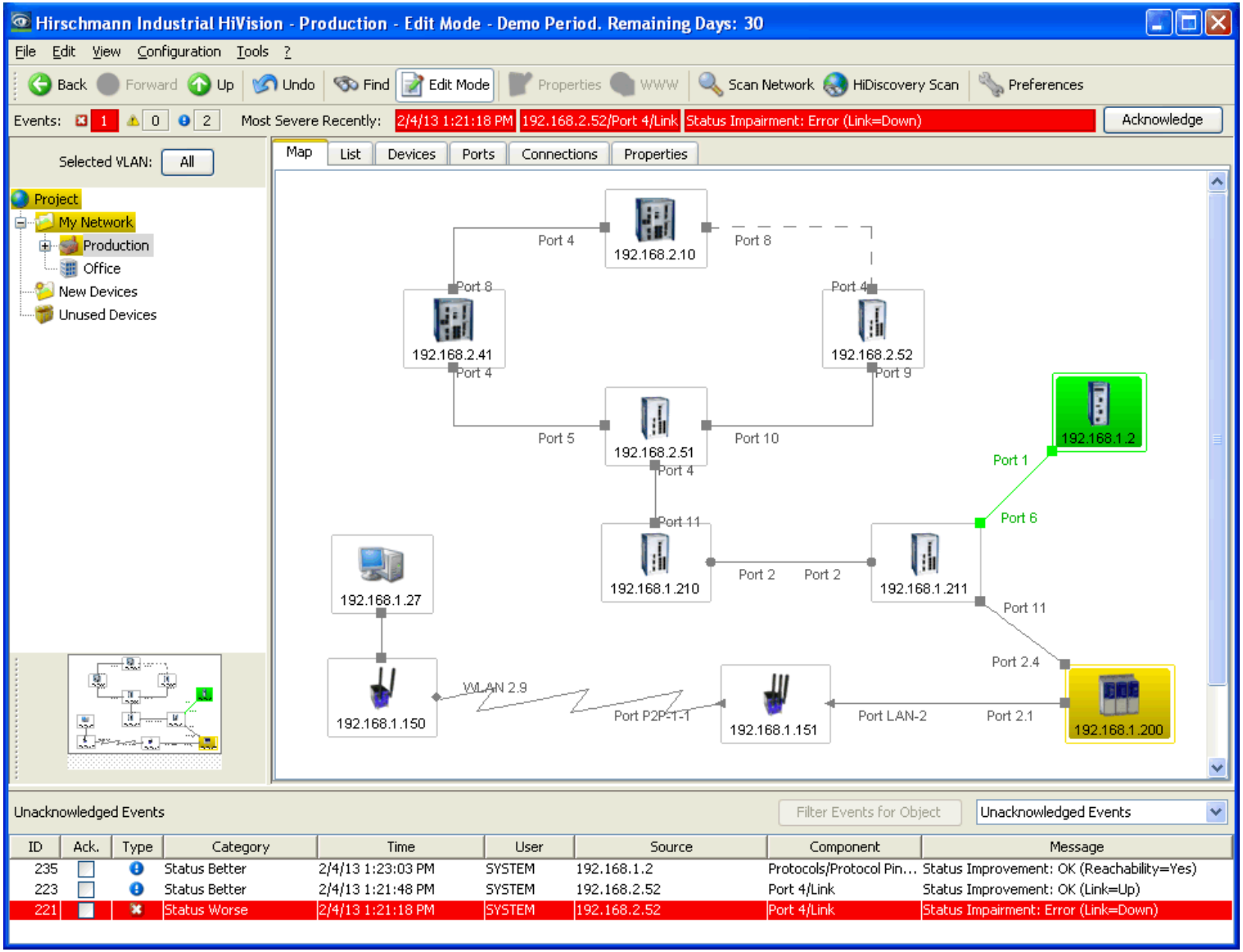
HiFusion allows you to **integrate** manufacturer-specific MIB variables for **third-party devices into Industrial HiVision**

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 HiVision



DRAGON PTN

CONNECTIONS THAT MATTER
2018
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HIRSCHMANN
A BELDEN BRAND

Hirschmann‘s new MPLS-TP Product Line

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DRAGON PTN Series – Fully Modular and Compact

Module: 4 x 1G Copper (1 Combo)

Module: 4 x 1G Optical (SFP)

Node Support Module with PoE input

Spare Module slots – Future expansion

Redundant Power Supply

Redundant Switch & CPU Module CSM

DRAGON PTN Highlights

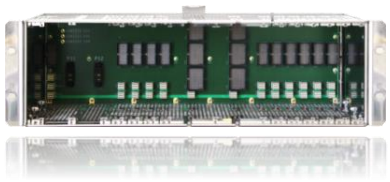
- Scalable platform from 64 Gbit/s to 720 Gbit/s
- Modular chassis
- Hot pluggable redundant power supplies
- Highest reliability possible via Redundant Switch & CPU Module
- Hitless switching (zero packet loss) for Circuit Emulation Services

DRAGON PTN – Variants and Features

PTN2210

- 10 Slot Chassis
- Dual Slot for PSU
- Dual Slot for CSM

PTN2209



- 9 Slot Chassis (L3)
- Dual Slot for PSU
- Dual Slot for CSM

PTN2206

- 6 Slot Chassis
- Dual Slot for PSU
- Dual Slot for CSM

PTN1104

- 4 Slot Chassis
- Single Slot for PSU
- Single Slot for CSM

DRAGON PTN - Common Features

- **Rugged industrial design**
  - Stainless steel
  - Compact 19” or DIN rail mountable
  - Fanless design
- **Extended temperature range**
  - -30° C to +65° C
- **EMC hardened**
  - IEC61850-3/IEEE1613/EN 50121-4
- **Flexible power options**
  - 90-264 VAC
  - 18-60 VDC
  - 88-300 VDC (High Voltage DC)

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Спасибо за внимание!

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vorobyev.s@prosoft.ru