

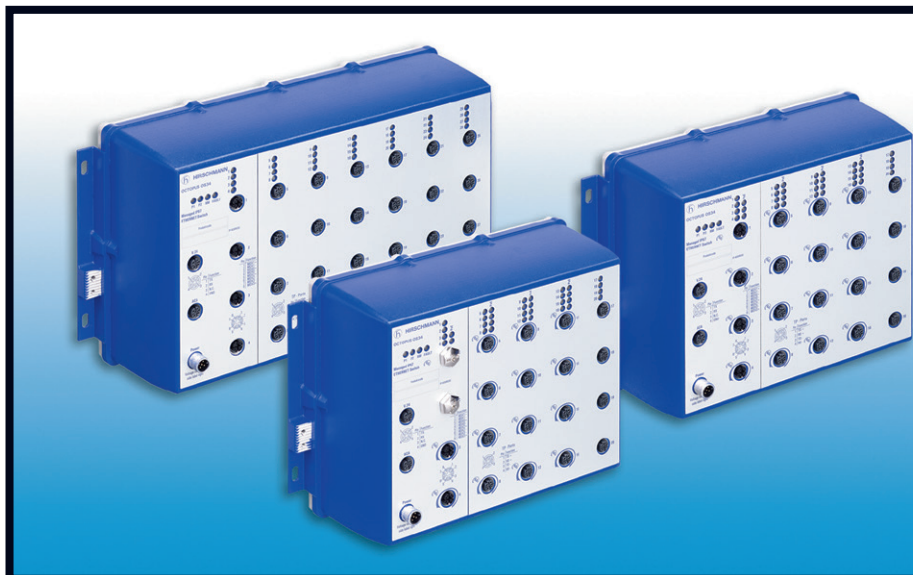
**HIRSCHMANN**A **BELDEN** BRAND

Product Bulletin

PB00009HE

OCTOPUS OS20/30 Switch

This flexible switch delivers maximum network availability and accelerated data transfers under extreme environmental conditions, meeting the needs of today's data-rich industrial settings.



With four Gigabit ports to enable high-speed connections, new routing functionalities and the latest bypass relay feature specified in IEC 61375, the new generation of OCTOPUS OS20/30 broadens the functional range of the switch series.

- **Flexibility** – modular hardware and software, with switching or routing functionality, allows for a future-proof network design and the best possible investment protection for long-term use.
- **Extended Feature Range** – robust connectivity and Gigabit ports in copper or fiber, for access to high-speed backbones powering local Gigabit devices through Power over Ethernet Plus (PoE+) e.g., digital video recorders and wireless local area network (WLAN) access points.
- **Increased Network Reliability** – extended redundancy mechanisms to transmit network information quickly and reliably.

Built to keep pace with the increasing data demands of transportation and manufacturing applications, the OCTOPUS OS20/30 switch offers network engineers, machine builders and system integrators increased flexibility, with configurable features in two different housings.

Applications

The OCTOPUS is designed for a range of application scenarios in transportation, manufacturing and machine building environments, including onboard networks; information systems in train stations; conveyer systems; and traffic surveillance on highways, bridges

and in tunnels. The switch has added PoE+ support for reduced cabling, and its power supplies meet multiple input voltage ranges.

The switch offers high-vibration resistance and broad protection to electrostatic discharges. With an IP65 and IP67 rating, the switch meets the requirements of switching and routing functions in waterproof and dust-tight housings for mounting outside of cabinets and operates at temperatures ranging from -40 °C to +70 °C.

Your Benefits

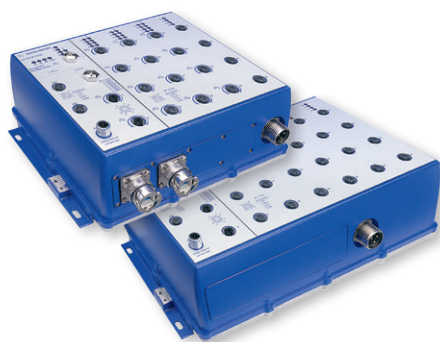
The OCTOPUS enables robust connectivity in systems and machines for reliable data through advanced redundancy mechanisms. It also includes comprehensive management, diagnostic and filter functions, and guarantees best-possible investment protection, due to the maximum flexibility provided by the modular design.

Where space constraints are a consideration the PoE+ capabilities reduce cabling, saving both space and associated costs.

This latest iteration of the OCTOPUS series, further extends the series' ability to accommodate increased data volumes with customizable options that suit every environment.

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OCTOPUS OS20/30 Switches



The OCTOPUS OS20/30, with Gigabit Ethernet (GE) ports available for either fiber or copper cabling with PoE+, allows customers to choose a switch that meets specific needs:

- The smaller housing allows for a maximum of 20 ports, including four Gigabit ports and up to 15 PoE+ ports.
- The full-sized OCTOPUS adds eight additional Fast Ethernet ports for a total of 28 ports per OCTOPUS.
- The OCTOPUS OS20/30 is available either with Layer 3 routing software or with Layer 2 switching software.

The switch meets market specific regulations, including EN 50155 for operating conditions in railway vehicles, EN 50121-4 for use on railway lines, EN 45545 for fire protection in trains, GL for ships and e1 for use in road vehicles.



The PoE+ capabilities reduce cabling, saving both space and associated costs.

Benefits at a Glance

- Four Gigabit ports, 24 Fast Ethernet ports
- PoE+ on 15 ports, including the GE ports
- Available with Layer 2 or Layer 3 software
- Meets market-specific regulations: EN 50155, EN 50121-4, EN 45545 for railways, GL for ships and e1 for use in road vehicles
- Multiple redundancy mechanisms, including the latest bypass relay feature
- Designed for compliance with IEC standards for Ethernet in trains (IEC 61375)
- Broad immunity to electrostatic discharges, plus high vibration resistance
- Meets IP65 or IP67 protection degree rating requirements
- Operates at temperatures ranging from -40 °C to +70 °C
- Internal power supplies from 24 to 110 V DC and 110 to 230 V AC



Technical Information

Product Description		
Type	OCTOPUS OS3x-xx16xxx	OCTOPUS OS3x-xx24xxx
		
Description	Managed IP65/IP67 switch in accordance with IEEE 802.3, store-and-forward-switching and routing, electrical and optical Fast-Ethernet (10/100 MBit/s) and Gigabit-Ethernet (10/100/1000 MBit/s), M12 ports (TX), IEC ports (FX), PoE+	
Port Type and Quantity	Up to 20 ports, thereof max. 4 GE TX or FX, up to 15 PoE+	Up to 28 ports, thereof max. 4 GE TX or FX, up to 15 PoE+
Network Size – Length of Cable		
Twisted Pair (TP)	0 to 100 m	
Fibre (FX)	0 to 116 km	
Power Requirements		
Operating Voltage	24 to 110 V DC, 110 to 230 V AC; max. 90 W with 60 W PoE+	24 to 110 V DC, 110 to 230 V AC; max. 100 W with 60 W PoE+
Ambient Conditions		
Operating Temperature	-40 °C to +70 °C	
Relative Humidity (also condensing)	10% to 100%	
Mechanical Construction		
Dimensions (WxHxD)	261 x 189 x 105 mm	338 x 189 x 105 mm
Weight	3600 g	4100 g
Protection Class	IP65 and IP67	
Software Layer 2		
Management	RS232 web-interface, Telnet, SSHv2, HTTP, HTTPS, TFTP, SCP, SFTP client, SNMP v1/v2/v3, Traps, LLDP-MED, SSH client	
Diagnostics	LED, persistent logging, syslog, signal contact, device status indication, port mirroring N:1, RMON (1, 2, 3, 9), TCPDump, LLDP, SFP management (temperature, optical input and output power), switch dump, configuration check dialog, system information, self tests on cold start, Management Address Conflict Detection, Copper cable test, Port Monitor, duplex mismatch detection, snapshot configuration feature, SFLOW	
Configuration	Command line interface (CLI), WEB based management, fully featured MIB support, BOOTP/DHCP client with auto configuration, DHCP option 82, DHCP server per port and pool per VLAN, HiDiscovery, auto-configuration adapter ACA21, Automatic configuration undo (roll-back), text based configuration file, CLI scripting, Telnet	
Security	MAC based port security, Port-based access control with 802.1x, 802.1x enhancements with Guest/Unauthenticated VLAN and RADIUS VLAN assignment, Integrated Authentication Server (IAS), Automatic Denial-of-Service Prevention, Different privilege levels, configurable password policies, configurable number of login attempts, account locking, HTTPS certificate management, CLI/SNMP logging, Security Status Monitor, Audit Trail, Remote Authentication via RADIUS, Local User Management, DHCP Snooping, Dynamic ARP Inspection, Extended wired speed Ingress ACLs (MAC, IPv4) per port and per VLAN, ACL flow based limiting, Time based ACL	
Filter	QoS (8 classes), CoS queue management, interface trust mode, TOS/DSCP prioritization, port priority (IEEE 802.1D/p), VLAN (IEEE 802.1Q), Voice VLAN, IGMP snooping/querier per VLAN (v1/v2/v3), unknown multicast filtering, independent VLAN learning, static unicast/multicast address entries, fast aging, MVRP (Multiple VLAN Registration Protocol), MMRP (Multiple MAC Registration Protocol), MRP (Multiple Registration Protocol), Protocol based VLAN, MAC based VLAN, IP subnet based VLAN, IP Ingress DiffServ classification and policing	
Time Synchronization	PTPv2 TC two-step, SNTP server and client, Buffered RTC	
Flow Control	Flow control (IEEE 802.3X), egress interface shaping, ingress storm protection, Queue-Shaping/max. Queue Bandwidth	
Redundancy Functions	RSTP, HSR, PRP, Fast MRP, MRP over Link Aggregation, DLR, Sub Ring Manager, Bypass Relay	
Miscellaneous	Port power down, cable crossing, dual software image support, VLAN unaware mode, access to management restricted by VLAN	
Software Layer 3 – Additional		
Layer 3	Full wired speed IPv4 routing with lowest latency; Port based Routing (up to 28 interfaces), VLAN based Routing (up to 24 interfaces), Static Unicast Routing (up to 40 IPv4 routes and 512 ARP Entries), Static Route Tracking, Proxy ARP, VRRP with HiVRRP extension, VRRP tracking, ICMP Filter, Loopback Interface, IGMP Proxy (Multicast Routing)	
Approvals		
Safety of Industrial Control Equipment	cUL 60950-1	
Road Vehicles	E1, GL	
Along Track and Onboard Train	EN 50155, EN 50121-4, EN 45545	



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OCTOPUS OS20/30 Configurations

OS34-15 16 04 T6 T6 T5 T BB Z9 99 HH S E 3S XX.X

Design

OS20 = Fast Ethernet Ports
OS30 = FE and GE Ports

OS24 = Fast Ethernet Ports with PoE+
OS34 = FE and GE Ports with PoE+

PoE+ Ports

00 = no PoE+ Ports
10 = 10 x Fast Ethernet PoE+ Ports
12 = 12 x Fast Ethernet PoE+ Ports
15 = 15 x Fast Ethernet PoE+ Ports

08 = 8 x Fast Ethernet PoE+ Ports
11 = 11 x Fast Ethernet PoE+ Ports
14 = 14 x Fast Ethernet PoE+ Ports

Fast Ethernet Ports

08 = 8 x Fast Ethernet Ports
16 = 16 x Fast Ethernet Ports
24 = 24 x Fast Ethernet Ports

12 = 12 x Fast Ethernet Ports
20 = 20 x Fast Ethernet Ports
28 = 28 x Fast Ethernet Ports

Gigabit Ethernet Ports

00 = 0 x Gigabit Ethernet Ports
04 = 4 x Gigabit Ethernet Ports

02 = 2 x Gigabit Ethernet Ports

Type 1 Uplink Port

T5 = M12 D-coded
T6 = M12 X-coded
1M = FE, 4 km@50 µm, 4 km@62.5 µm, 1310 nm, IEC 61076-3-106 V1
1L = FE, 40-100 km@9 µm, 1550 nm, IEC 61076-3-106 V1
1B = GE, 17.5 km, 1310 nm, IEC 61076-3-106 V1
4M = FE, 4 km@50 µm, 4 km@62.5 µm, 1310 nm, IEC 61076-3-106 V4
4L = FE, 40-100 km@9 µm, 1550 nm, IEC 61076-3-106 V4
4B = GE, 17.5 km, 1310 nm, IEC 61076-3-106 V4

R5 = M12 D-coded with bypass relay
R6 = M12 X-coded with bypass relay
1S = FE, 22.5 km@9 µm, 1310 nm, IEC 61076-3-106 V1
1P = FE, 25-62.5 km@9 µm, 1310 nm, IEC 61076-3-106 V1
1A = GE, 550 m@50 µm 275 m@62.5 µm, 850 nm, IEC 61076-3-106 V1
1C = GE, 24 to 68 km, 1550 nm, IEC 61076-3-106 V1
1D = GE, 60 to 116 km, 1550 nm, IEC 61076-3-106 V1
4S = FE, 22.5 km@9 µm, 1310 nm, IEC 61076-3-106 V4
4P = FE, 25-62.5 km@9 µm, 1310 nm, IEC 61076-3-106 V4
4A = GE, 550 m@50 µm 275 m@62.5 µm, 850 nm, IEC 61076-3-106 V4
4C = GE, 24 to 68 km, 1550 nm, IEC 61076-3-106 V4
4D = GE, 60 to 116 km, 1550 nm, IEC 61076-3-106 V4

Type 2 Uplink Port

(see Type 1 Uplink Port)

Kind of Local Ports

T5 = M12 D-coded

Temperature Range

T = -40 °C to +70 °C

Power Supply and Connector Type

BB = 2 x 24 V DC (16.8 to 30 V DC), M12
HH = 2 x 36/48 V DC (25.2 to 60 V DC), M12
FF = 2 x 24/36/48 V DC (16.8 to 60 V DC), 7/8" 5 poles

N9 = 1 x 72/110 V DC (50.4 V to 138 V DC), 7/8" 4 poles
M9 = 1 x 110/120/220/230 V AC (88 to 265 V AC), 7/8" 3 poles

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

Software Packages

99 = Reserved

OEM-Type

HH = Standard

Hardware Configuration

S = Standard M = Fast MRP (Port 1, 2) P = PRP (Port 1, 2) H = HSR (Port 1, 2) D = DLR (Port 1, 2)

Software Configuration

E = Reserved

Software Version

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

Software Release

XX.X = Current Software Release