

# iGigaSwitch 16xx HSR HW5 Series

## Contact

Nexans LAN Systems

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## LANactive Industry 16 Port Managed Full Gigabit Ethernet Switch

- 16 ports in total, variable number of SFP ports
- 2x SFP ports for Zero-Loss Redundancy (HSR/PRP)
- Optionally with integrated I/O module
- IEC 61850 compliancy is tested and certified by KEMA/DNV-GL
- Wide operating temperature range: -40 ... +85°C

## Description

Nexans managed Industrial Ethernet iGigaSwitch 16xx HSR HW5 family is part of Nexans *LANactive Industry* product portfolio and designed for installing robust and reliable networks in harsh environments. *LANactive Industry* iGigaSwitch 16xx E+ HW5 family is designed to provide maximum network availability, security, longest lifetime in harsh environments and making the network maintenance easier. The iGigaSwitch 16xx E+ HW5 family provides great flexibility in network design - it has 16 Gigabit ports including 2, 4, 8 or 12 SFP ports. The iGigaSwitch is designed for DIN-Rail mounting and comes with an external power supply to operate in the needed power range.

### I/O interfaces

The optionally I/O interfaces of the iGigaSwitch 16xx allows a fast, simple and low-cost integration of non-IP based devices directly e.g. different sensors, controllers, buttons etc. The iGigaSwitch is offering extensive management functionalities with interactions, sending of messages as well as the activation of alarms.

### Zero-Loss Redundancy

High Availability and Seamless Redundancy (HSR) and Parallel Redundancy Protocol are a zero-loss redundancy protocols for ring network topologies. That means the iGigaSwitch sends packets in both directions of the ring that at least one packet will arrive the destination.

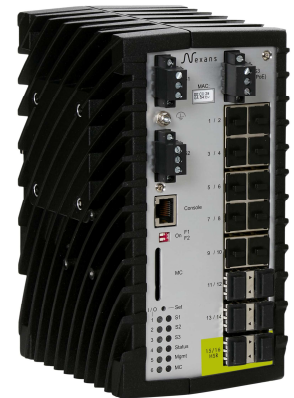
### Power over Ethernet (PoE/PoE+)

Up to 12x connected devices can be supplied with Power over Ethernet. In accordance with the latest IEEE 802.3at (PoE+) standard, up to 30W are available for each connected device, with total budget of 360Watts.

### IEC 61850

Nexans iGigaSwitch family comply to IEC 61850 requirements (parts 6, 7-1, 7-2, 7-3, 7-4, 8-1, 9-1 and 9-2 Communication networks and systems for power utility automation). This functionality is critical for Smart grid and allows to use standardized equipment to ensure correct and reliable communication of all networked devices of Smart grid infrastructure (including switches, PLCs, different controllers, sensors etc.) with each other and with central SCADA.

The compliance is tested and confirmed by KEMA/DNV-GL.



IEC 61850



Made in Germany

## LANactive Industry



## Standards (extract)

IEEE 802.3  
IEEE 802.3u  
IEEE 802.3ab  
IEEE 802.3af  
IEEE 802.3at  
IEEE 802.3z  
IEEE 802.3x  
IEEE 802.1AB  
IEEE 802.1D  
IEEE 802.1Q  
IEEE 802.1X  
IEEE 802.1AX  
IEEE 802.3ad

IEC 61850-6, 7-1, 7-2, 7-3, 7-4, 8-1, 9-1, 9-2  
IEC 61850-3



Designed for harsh environments



PoE/PoE+



Compact Design



Interoperability



Easy Maintenance



Redundancy



Security and Reliability



High Availability

# Nexans

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## Hardware Features

Ordering Information	iGigaSwitch 1606 HSR SFP-6VI HW5	iGiga Switch 1606 HSR SFP-6VI AC HW5
Article Number	88306406	88306476
<b>LAN Interfaces</b>		
User Ports (Twisted Pair)	10x 10/100/1000Mbps	10x 10/100/1000Mbps
Uplink Ports (SFP)	4x 100/1000Mbps	4x 100/1000Mbps
HSR/PRP Interfaces (SFP)	2x 100/1000Mbps	2x 100/1000Mbps
<b>Power over Ethernet</b>		
Max. Number of PoE+ Ports	8	-
Max. PoE Power Budget	240W	-
PoE Mode	30W per Port, Mode A, Pin 1-2/3-6	-
<b>Diagnostic Functions (Interfaces)</b>		
Digital Diagnostics Monitoring Interface		Yes
Twisted Pair Cable Diagnostic		Yes
<b>General</b>		
Dimensions [WxHxD]	95mm x 184mm x 125mm	
IP Protection Class	IP30 (EN 60529)	
Mounting	35mm DIN-Rail Mounting according to EN 60715, (EN 50022) Different mounting positions of DIN-Rail clip - vertical and horizontal switch mounting. Optional: wall mounting.	
Material	Anodised/Varnished Aluminium	
Colour	Black	
Ambient Temperature	Operation: -40 ... 85°C, Storage: -40 ... 85°C	Operation: -40 ... 70°C, Storage: -40 ... 85°C
Relative Humidity	20 - 90% (non-condensing)	
Weight	1800g	
MTBF	> 500,000h	
<b>Power Supply</b>		
Input voltage for switch	18 ... 60V DC	90 ... 264V AC / 127 ... 370V DC
Input voltage for PoE+	46 ... 57 V DC (typ. 54V DC)	-
Power consumption (without PoE)	13W (standby) ... 15W (typ.) ... 28W (fully connected)	
Heat output	52 BTU(IT)/h (typ.)	
Connector	2x 3-pin terminal blocks, screw-on type (up to 2.5 mm <sup>2</sup> ) / (+) (-) (FPE)	1x 3-pin terminal blocks, screw-on type (up to 2.5 mm <sup>2</sup> ) / (+) (-) (FPE)
Connector PoE	3-pin terminal blocks, screw-on type (up to 2.5 mm <sup>2</sup> ) / (+) (-) (FPE)	-

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## Software Features

### Switching Parameters

Switching Type	Store-and-Forward, self-learning
Max. Frame Size	9,600 Bytes (Support of Jumbo frames)
Packet Buffer	512 kBytes
Latency (RFC1242)	100 Mbps / 64 Byte (FIFO/LIFO) 9µs / 3.9µs 100 Mpbs / 1518 Byte (FIFO/LIFO) 125µs / 4µs 1000 Mbps / 64 Byte (FIFO/LIFO) 2.7µs / 2.2µs 1000 Mpbs / 1518 Byte (FIFO/LIFO) 15µs / 2.5µs
MAC-Address Table	8,192 MAC-Addresses
VLANs	IEEE802.1q with up to 256 Groups
Quality of Service Layer 2	IEEE802.1p Class of Service (4 Queues per Port)
Quality of Service Layer 3	RFC2474/3168 DSCP (4 Queues per Port)
Bandwidth Limitation	Bitrate and Number of Packets
Fabric Attach	Basic Fabric Attach Client Support

### Management

	On-Board High-Performance Management
LEDs	Management, Port Status and Activity, Memory Card
Zero-Touch Configuration	Via NEXMAN Controller
IP-Address	IPv4, IPv6
DHCP-Client	DHCP, DHCPv6
DHCP Relay Agent	Yes
File Transfer	TFTP, SCP
Console Port	V.24 with Nexans Console Cable
Web-Interface	HTTP, HTTPS
Command Line Interface	SSH, Telnet
SNMP	SNMPv1, v2c, v3
Further Management Protocols	Syslog, LLDP, LLDP-MED, CDP
Time Synchronisation	SNTP
Port Statistics	Detailed per Port

### Redundancy

Redundancy Protocols	STP, RSTP, MSTP, MRP, HSR, PRP
Link Aggregation	LACP

### Security

Password Protection	Two Access Levels (R/W or R/O)
Authentication via Radius	CLI and NEXMAN
Authentication via TACACS+	CLI and NEXMAN
ACL for Management Interface	Up to 16 Access Control Lists
Portsecurity via MAC-Address	Up to 3 predefined MAC-Addresses
Portsecurity via Radius	IEEE802.1x
DHCP Snooping	Yes
Loop and Broadcast Limiter	Yes
Firmware Update	Dual Firmware Image
Configuration Button	Yes (configuration button deactivatable)
Reset Button	Yes (configuration button deactivatable)
Memory Card	Micro SD-Card, optionally with fixed MAC-Address

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## Standards

### Standards

Electrical safety (IT equipment)	EN 60950
Electrical conditions (EMC)	EN 55022
Communication networks and systems for power utility automation	IEC 61850-6, 7-1, 7-2, 7-3, 7-4, 8-1, 9-1 and 9-2 IEC 61850 Certificate Level A IEC 61850 SERVER functionality - MMS and GOOSE KEMA/DNV-GL certified
General environmental requirements for hardware design	IEC 61850-3
Environmental Standards for Networking Devices Installed in Power Utility Substations	IEEE 1613
Immunity for industrial environments	IEC 61000-6-2
Adjustable speed electrical power drive systems	IEC 61800-3

## Dimensions

