



Technical Documentation
iGigaSwitch 16xxE+

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I Application

The new harsh environment switch systems are supporting the connection of up to 16 network subscribers via fiber-optic or twisted pair cables.

The iGigaSwitch allows to adapt the interfaces to the application by using the corresponding pluggable modules (Fast Ethernet or Gigabit SFP). This underlines the economic efficiency and the flexibility of the Nexans industrial series.

Compact and robust design

The switch is the epitome of high performance and robustness. Thanks to its compact design and due to its low installation depth it can easily be installed on a standard DIN-rail, in a 19" distributor as well as directly on the wall.

I/O Interfaces (optional)

I/O interfaces allow a fast, simple and low-cost integration of additional devices directly in the field. The switches are offering extensive management functionalities with interactions, sending of messages as well as the activation of alarms.

Power over Ethernet+ (optional)

Up to 12 connected users can be supplied with Power over Ethernet. In accordance with the latest IEEE 802.3at (PoE+) standard, up to 25.5 watts of power are available for each connected device.

I Features

General

- 16 Port Switch
- up to 12x Vario-SFP Uplink interfaces
- 10/100/1000 Mbps
- Support of Jumbo frames
- -40°C ... +85°C
(Ambient Temperature: Operation)

Memory card (optional)

- Memory card with MAC-Address
- System Configuration Backup on Memory Card and boot up with Memory Card MAC address and Configuration

Redundant Power Supply

- Two redundant Wide Range Power Supply Inputs (18 VDC ...72 VDC)

I/O Interfaces

- Four potential-free function inputs and two programmable alarm contacts

Twisted Pair User Interfaces

- up to 12x RJ45 user interfaces (10/100/1000 Mbit/s)
- MDI/MDI-X Auto-Crossover and Auto-Polarity
- Cable Diagnostic for exact localization of errors on the twisted pair cable links

Energy Management

- Low Power Management (typ. 15 Watts)

Mechanic

- Ruggedized design without vents
- Compact design (95mm x 184mm x 125mm)

Power over Ethernet+ (optional)

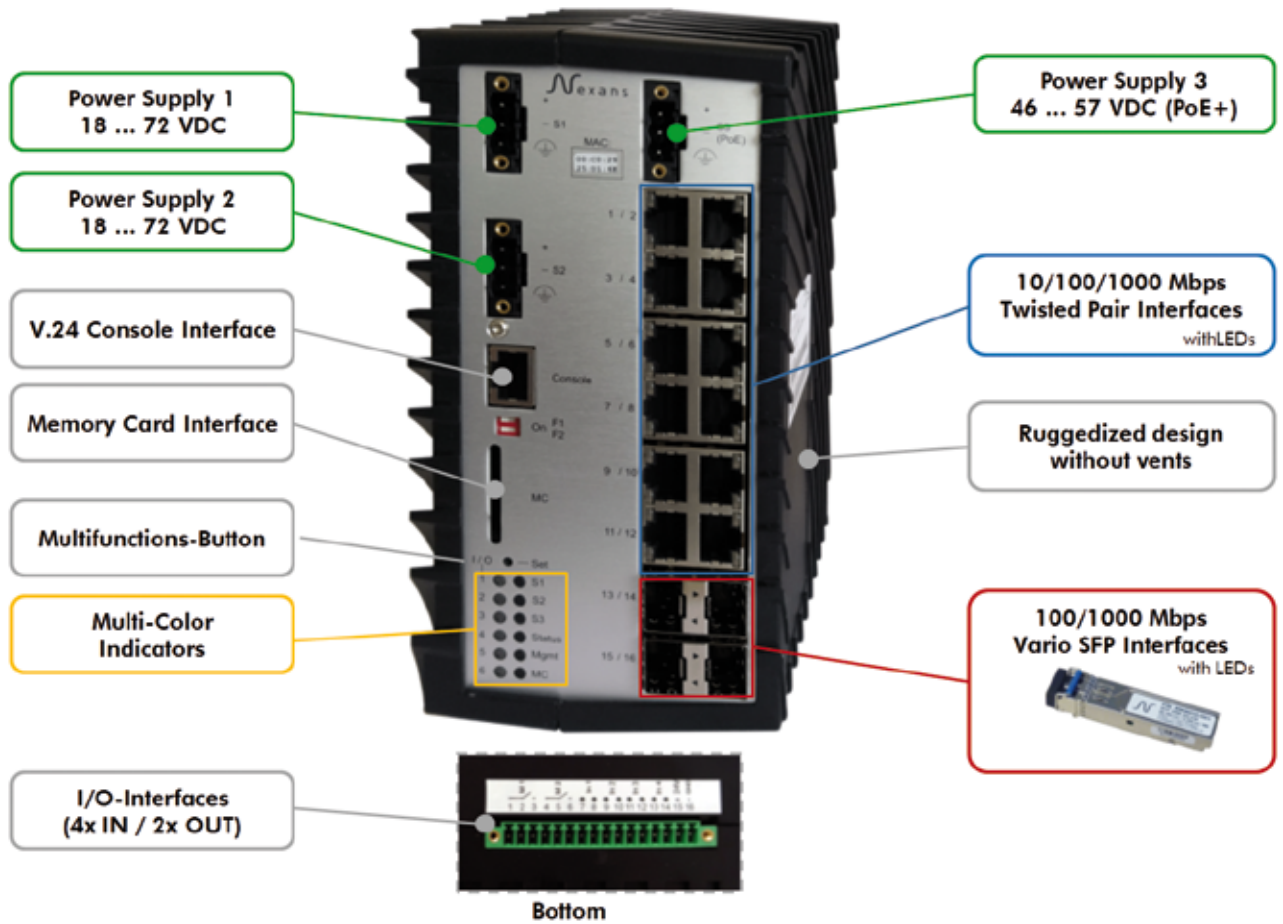
- up to 12x Power over Ethernet (PSE+) according to IEEE802.3at

Management

- WEB/SNMP/SSH/V.24 Management
- LLDP and CDP
- Compatibility to "Cisco Secure Access Control Server ACS"
- Extensive security functions SCP, SSHv2, HTTPS, RADIUS, SNMPv3, IEEE802.1X etc.
- Integrated in ARP Guard Secure Management
- Configuration via NexMan (administration tool)
- IPv6 according to IPv6 Forum phase 2 core specification

General

Front view



Rear view



I Safety instructions

When this unit left the factory it was in perfect working order. To operate it without risk, and to ensure it remains in good working condition, the following safety instructions must be observed.

Proper use

The unit may only be used under conditions and for purposes for which it has been designed. Please find further details in the sections Introduction and Technical Data. Any other operation beyond the stipulated conditions may be dangerous for the user or could damage the unit.



WARNING!

- Please observe the permitted environmental conditions!
- Please observe the specified electrical parameters!
- Do not connect any measuring circuits for which the unit has not been designed!
- Unused active fiber-optic ports always have to be covered with the provided caps!

Use of laser systems

(Only in units with singlemode optical interfaces)

DANGER! Invisible laser radiation!
Radiation can lead to irreparable damage if there is contact with the retina.

WARNING! When the system is switched on, do not look directly into the optical output or a connected optical fiber. The unit is designed for LAN applications in the invisible 1550nm, 1300nm or 850nm wavelength ranges. With this application range the output power levels may be dangerous for the user because they are not classified under the uncritical Laser Class 1.

Electrical safety

The unit complies with the protection measures as specified in EN 60950-1.

Electrical parameters

The electrical parameters are specified in the respective Technical Data. The power consumption value on the primary side is indicated on the type label and/or in the Technical Data.

Electromagnetic compatibility

I Environmental conditions

The installed unit fulfils the requirements of the European standards EN 55022.

Temperature

The unit has been designed for indoor and outdoor use and can be operated at ambient temperatures from -40°C to +85°C (see also Technical Data).

Ventilation

Please note that the ventilation hole must not be covered after mounting.

Please ensure, however, that the ambient temperature does not exceed the indicated range. Please ensure sufficient ventilation in the installation location during operation of the unit.

Moisture condensation

The unit must not be operated if there is any moisture condensation. If moisture condensation can not be avoided, such as when the unit is cold and is taken into a warm room, it must dry out first before being switched on.

Instructions on repair and maintenance

Any repairs must be executed workmanlike. The design features of the unit must not be altered in a way that impairs the safety of the unit. This in particular applies to leakage paths and clearances.

General

I Preparation for operation

Opening of the unit

Please disconnect the unit from the mains supply and from all other power sources prior to opening the unit. Any subsequent servicing and repair on the open and live unit may only be performed by a qualified person.

Spare parts

Only original spare parts may be used. Any other spare parts are only allowed if they do not impair the safety of the power supply unit.

Packaging

Do not throw away the packaging. The packaging has been designed for repeated use if not damaged during transport. Only the original packaging can reliably protect the unit from damage during later transport.

Checking the scope of delivery

- Switch Module
- Plug-in screw terminals for connecting the power supply (3-pin)
- Documentation
- Management Documentation

Checking for transport damage

Please check the unit for transport damage after unpacking. Transport damage can be assumed in particular if the packaging is visibly damaged. Do not try to operate an obviously damaged unit. This may result in further consequential damages.

Recovery after storage and transport

Moisture can condensate on the unit if the unit has been stored or transported at low temperatures and subsequently taken into a warm room. In order to avoid any damage please wait till any moisture condensation has vanished from the unit's surface before switching the unit on. The unit is operational only after it has reached the guaranteed operating temperature range (see Technical Data). The same applies also to prior storage at high temperatures.

Cleaning the unit

If the unit has become dirty during use it can be cleaned using a cloth which has been dampened with a mild cleaning agent. Please take care that no cleaning agent enters the interior of the unit.

Power supply

The power supply of the systems is provided via an external power supply (SELV). The system is connected to 48 VDC (direct current) via the Power terminal on the rear side using a 3-pin plug-in screw terminal.



WARNING!

Only a trained electrician may connect and insert the plug-in screw terminal included in the delivery. Both solid and flexible connecting leads up to a maximum of 2.5 mm² can be used. The wire ends have to be stripped over a length of 5-6 mm. The wire must not be stripped longer than 6 mm to prevent the risk of a short circuit between the conductors! A screwdriver with a 3.5 mm wide blade should be used to tighten the screws properly in the plug.

Indicators

| LED Indicators | | | |
|----------------|--------|------------|--|
| | I/O | | |
| | 1 | red | 1 and 2 light red if alarm output M is active (Contact M is shorted and /M is open) |
| | 2 | red | |
| | 3 | red | 3,4, 5 and 6 light red if input In is powered |
| | 4 | red | |
| | 5 | red | |
| | 6 | red | |
| | S1 | multicolor | a) green, if power supply 18 up to 72 VDC |
| | S2 | multicolor | b) green, if power supply 18 up to 72 VDC |
| | S3 | multicolor | c) green, if power supply 46 up to 57 VDC |
| | Status | multicolor | a) blue, if switch is booting b) green, system is operating normally, internal operating voltage is present |
| | Mgmt | multicolor | a) lights blue if switch is booting b) lights green if switch is up and has a valid IP address c) blinks green if switch is up, but has not yet received a valid IP address d) lights red if switch is up with fixed IP address |
| | MC | multicolor | a) lights blue if switch is booting and configuration from memory card is loading b) lights green if switch is up and the current flash configuration is mirrored to the memory card |

| Port Status LEDs | | | |
|-------------------|---|-----------------------------|---|
| TP port LEDs | 1 / 2 3 / 4 5 / 6 7 / 8 9 / 10 11 / 12 | green yellow | Link a) Lights up permanently if the link signal is received at the TP interface b) Flashes periodically when data packets are received or sent at the TP port FDX (Transmission / speed mode detected) a) Is flashing follow: "on-off-off-off" -> 10 Mbps Transmission speed 'Ethernet' b) Is flashing follow: "on-on-off-off" -> 100 Mbps Transmission speed 'Fast Ethernet' c) Is flashing follow: "on-on-on-off" -> 1000 Mbps Transmission speed 'Gigabit Ethernet' |
| SFP port LEDs | 13 / 14 15 / 16 | green green | a) Lights up permanently, when a valid link signal is received at the SFP interface. b) Flashes periodically when data packets are received or sent at the SFP interface. |

| Configuration Button | | |
|----------------------|------------------------------------|---|
| | Hold Configuration Button > 3 Sec. | By pressing and holding the pushbutton (min. 3 sec.) the switch will change into the configuration mode, which is indicated by the Mgmt LED going out. As soon as the Status LED is permanently off, the push-button must be released again. A rapid flashing blue Mgmt LED shows that function number 1 has been selected. |
| | Briefly press Configuration Button | By briefly pressing the pushbutton (min. 0.1 seconds) the desired function can now be selected, which is indicated via the respective LED colour. <ul style="list-style-type: none"> Function #1 (LED blue) Reboot with Flash Config Function #2 (LED red) Reboot with fixed IP (172.23.44.111) Function #3 (LED white) Reboot with Factory Default |
| | Hold Configuration Button > 3 Sec. | Execute Selected Function In order to execute the selected function, the push-button must be pressed and held for at least 3 seconds. The Mgmt LED flashes briefly and goes out to show that the switch has accepted the command. Now the pushbutton can be released and the switch will boot in order to execute the command. |

Note: The configuration mode will be left automatically, when the pushbutton is not pressed for more than 30 seconds.

Start-Up

Booting with fixed IP Address

This function will enable the following temporary IP settings:

- IP-address 172.23.44.111
- Network mask 255.255.255.0

The switch can then be accessed via this temporary IP address in order to configure the required switch parameters (e. g. the IP address).

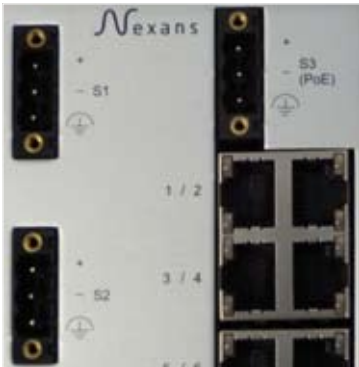
In addition to the IP parameters the following temporary switch settings are made:

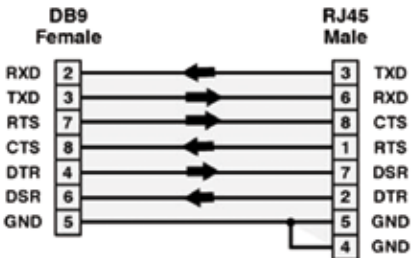
- All ports in the same VLAN
- Trunking disabled for all ports
- Admin state disabled for all ports
- Link Setup set to Autonegotiation / Autocrossover for all ports
- Portsecurity disabled for all ports
- Rapid Spanning Tree global disabled

The above settings ensure that the switch can be accessed via any port using the fixed IP address 172.23.44.111. Moreover the IP, Link, VLAN, trunking and Portsecurity settings can be made without these settings taking immediate effect. Only after a “Booting with Flash Configuration” the stored configurations will be enabled.

Moreover the fixed IP address can be used to check the configuration of the switch (e.g. if the switch cannot be accessed via the expected IP address because of badly configured VLANs etc.).

Connectors

| S1/S2/S3 | | |
|---|--|--|
|  | <p>Switch Supply</p> <p>Input Voltage S1 min. 18 VDC typ. 24 VDC max. 72 VDC</p> <p>Input Voltage S2 min. 18 VDC typ. 24 VDC max. 72 VDC</p> <p>Power Supply Redundancy</p> | <p>Power over Ethernet</p> <p>Input Voltage S3 min. 46 VDC typ. 54 VDC max. 57 VDC</p> |

| V.24/RS232 Interface | |
|--|--|
| <p>If you want to connect the switch console port to a terminal, you need to provide an RJ-45 to DB9 adapter. You can order a cable kit, Part No. 88646169, containing that adapter from Nexans. For console port and adapter pinout information, see following drawing.</p> | <p style="text-align: center;">Pin assignment</p>  |

I Setting the transmission parameters

Many problems occurring in data networks can be avoided. Based on many years of practical experience we can recommend the following settings for the switch systems:

Standard settings (equivalent to the default setting):

| | |
|-------------------------|-----------------------------------|
| All TP ports: | AN |
| All 100 Mbps FO ports: | 100 FDX |
| All 1000 Mbps FO ports: | 1000 FDX |
| PoE(PSE): | IEEE802.3at (Power over Ethernet) |

These settings offer the following advantages:

1. Collision-free full-duplex data transmission on fiber optic ports at maximum performance and maximum distance.
2. All common TP terminal configurations are supported in a practice-oriented way:
 - a. Auto-Negotiation: default setting of newer terminal units
(automatically set to 1000 Mbps, 100 Mbps or 10 Mbps full-duplex)
 - b. 100 Mbps-Full-Duplex: for (mostly older) terminal units having problems with autonegotiation
 - c. 10 Mbps-Half-Duplex: for all terminal units supporting only 10 Mbps
3. PoE (PSE) feature according to IEEE802.3at is enabled by default - standard-compliant PoE (PD) terminal units or switch systems are automatically supplied with power. All other terminal units automatically receive no PoE power and are thus protected from being damaged.

Setting of connected FO switches (central, remote):

FO switch should always be set to 1000 Mbps full-duplex (FDX) or 100 Mbps (FDX) respectively. Full bandwidth and optimum performance due to non-occurrence of collisions. No length restrictions due to cable delays.

Setting of connected TP switches (central, remote):

Attached switches with TP connections should be set to autonegotiation, just as terminal units. The automatic setting to 1000 Mbps (FDX) and 100 Mbps (FDX) also guarantees full bandwidth and maximum performance up to a line length of 100m.

I Power over Ethernet (PoE) (Only available with PoE options)

Power over Ethernet is an attractive and standardized alternative for the power supply of LAN equipment such as VoIP phones, Wireless Access Points, video cameras etc., while using the "normal" Ethernet standard cable, i. e. without any additional cable tangle.

Function

An active source (PSE) ensures the power supply of a passive IEEE802.3at-compliant powered device (PD). The standard defines 3 modes of operation for power supply, which is ensured via different wire pairings of the TP data connection:

- Endpoint PSE mode A - power supply via TP pairs 1/2 and 3/6
- Endpoint PSE mode B - power supply via TP pairs 4/5 and 7/8
- Midspan PSE mode B - power supply through an external device via TP pairs 4/5 and 7/8

The PoE solution will only supply power if an appropriate powered device (PD) is detected. The following functions are checked prior to enabling PoE power supply:

- The active PSE source identifies the powered device (PD).
- The operational mode is detected.
- The required power class is detected on the basis of the classification current.

Thus any damages can be avoided, if the connected terminal unit is not standard-compliant.

Basics

Power over Ethernet (PoE) is categorised into 5 power classes which are supported accordingly


| Class | Using | Classification current | Supply-System power (max.) | Power Level (max.) |
|-------|----------|------------------------|----------------------------|--------------------|
| 0 | default | 0 - 15 mA | 15,4 W | 0.44 - 12.95 W |
| 1 | optional | 8 - 13 mA | 4.0 W | 0.44 - 3.84W |
| 2 | optional | 16 - 21 mA | 7.0 W | 3.84 - 6.49 W |
| 3 | optional | 25 - 31 mA | 15.4 W | 6.49 - 12.95 W |
| 4 | optional | 35 - 45 mA | 34.2 W | 12.95 - 25.5 W |

Power over Ethernet - PoE (PSE) (Only available with PoE options)


The Nexans GigaSwitch Series is offering PoE (PSE) functionalities. The systems are therefore in a position to supply devices according to IEEE802.3at - Endpoint PSE mode "Mode A". For external power supply (PSE) of devices an operation voltage of more than 46 VDC for IEEE802.3af and 50 VDC for IEEE802.3at is needed.

Note

In any case please check the correct pin assignment and the correct polarity of the PoE wiring at the terminal unit.

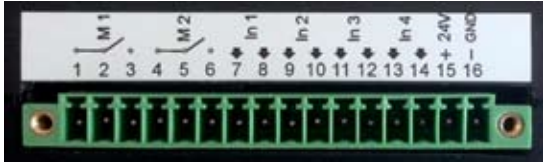


Warning!
Please check compatibility, proper pin assignment and polarity prior to and during putting the system into operation in order to avoid any damage resulting from attaching incompatible equipment. The maximum load of the individual ports and the overall load are limited. These limits have to be observed in any case. Otherwise the connected units might be damaged or cannot be operated (see Technical Data).

| Mode A (pairs 1/2 and 3/6) | | | |
|------------------------------|---|-------------|-------------------------------|
| Power Source Equipment (PSE) |  | Port 1...12 | 4...12x → Powered Device (PD) |
| 1 BI_DB+ | PoE- | | PoE+ |
| 2 BI_DB- | PoE- | | PoE+ |
| 3 BI_DA+ | PoE+ | | PoE- |
| 4 BI_DD+ | | | |
| 5 BI_DD- | | | |
| 6 BI_DA- | PoE+ | | PoE- |
| 7 BI_DC+ | | | |
| 8 BI_DC- | | | |

| PoE Options | | | |
|------------------|---|---|---|
| | iOption PoE Typ at 4-30 (4x PoE according to IEEE 802.3at) Order-No: 88301602 | iOption PoE Typ at 8-30 (8x PoE according to IEEE 802.3at) Order-No: 88301604 | iOption PoE Typ at 12-30 (12x PoE according to IEEE 802.3at) Order-No: 88301606 |
| iGigaSwitch 1604 | x | x | x |
| iGigaSwitch 1608 | x | x | |
| iGigaSwitch 160C | x | | |

The Nexans I/O module for iGigaSwitch is equipped with removable I/O connector, which supports mechanical keying. Internally, the relays, digital inputs and output +24V DC power are isolated from each other. The status and fault diagnostics of the I/O module is monitored by the management of switch.



The I/O Module features two relay with two contact outputs, which default two both functions, open and closed. This allows switching of maximum +30VDC 1A, for each of the two digital channels. The relay output module can switch 4 relay contacts. Two relays are normally open (NO)/normally closed (NC) form C type. The relay contact outputs are controlled by user-configurable setpoints via switch management. The setpoint values, operating parameters and interaction can be defined in the menu „Industrial Alarms“ of switch management.

Table below shows pin connections for relays of the I/O Module board. The states of the relay contacts are indicated by LEDs, 1 and 2, on the front of switch (see Figure LED indicators on page 8). When an LED is red, the contacts of the corresponding relay are activated.

Terminal positions for terminal numbers 1...6

The digital inputs are designed to receive 12-60V signals on the incoming lines. The states of the input contacts are indicated by LEDs, 3, 4 5, and 6 (see Figure LED indicators on page 8)

| Terminal No | Signal |
|-------------|------------------------------------|
| 1 | Relay No 1 normally open contact |
| 2 | Relay No 1 common PIN |
| 3 | Relay No 1 normally closed contact |
| 4 | Relay No 2 normally open contact |
| 5 | Relay No 2 common PIN |

Terminal positions for terminal numbers 7...14

The output +24V DC power provides power for the safety output circuits and the safety output loads. The total summarized load from ext. +24V output is max. 42 mA.

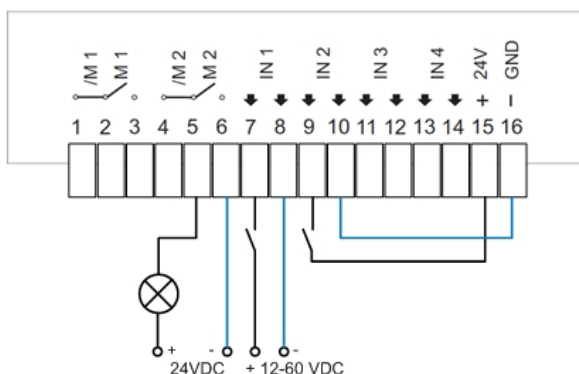
| Terminal No | Signal |
|-------------|------------------------------|
| 7 | Digital Input 1 Contact No 1 |
| 8 | Digital Input 1 Contact No 2 |
| 9 | Digital Input 2 Contact No 1 |
| 10 | Digital Input 2 Contact No 2 |
| 11 | Digital Input 3 Contact No 1 |
| 12 | Digital Input 3 Contact No 2 |
| 13 | Digital Input 4 Contact No 1 |

Terminal positions for terminal numbers 15...16




Internally, the input +24V DC power and output +24V DC power are isolated from each other. In special applications where PLC type functions are included the output can be used as external auxiliary power supply.

| Terminal No | Signal |
|-------------|--|
| 15 | Auxiliary voltage output power +24VDC |
| 16 | Auxiliary voltage output power - (GND) |

Typical wiring:



Technical Data

| iGigaSwitch 16XX E+ | | | |
|--|---|--|---|
| |  |  |  |
| Version | iGigaSwitch 1604 E+ SFP-4VI PRO3 | iGigaSwitch 1608 E+ SFP-8VI PRO3 | iGigaSwitch 160C E+ SFP-12VI PRO3 |
| Order number | 88306400 | 88306408 | 88306412 |
| iSwitch I/O Module Digital 4xIn 2xOut | | 88301600 | |
| Memory Card with MAC Adresse | | 88300692 | |
| Memory Card MRP Multi | | 88300694 | |
| iOption PoE Typ at 4-30 | 88301602 | 88301602 | 88301602 |
| iOption PoE Typ at 8-30 | 88301604 | 88301604 | - |
| iOption PoE Typ at 12-30 | 88301606 | - | - |
| LAN Interfaces | | | |
| Twisted Pair Interfaces (RJ45) | 12x 10/100/1000 Mbps | 8x 10/100/1000 Mbps | 4x 10/100/1000 Mbps |
| SFP Interfaces | 4x 100/1000 Mbps | 8x 100/1000 Mbps | 12x 100/1000 Mbps |
| Power over Ethernet (optional) in connection with PoE options | | | |
| Number of TP interfaces mit PoE+ | max. 12x PoE+ | max. 8x PoE+ | max. 4x PoE+ |
| Diagnostic functions (Interfaces) | | | |
| Digital Diagnostic Monitoring Interface | | yes | |
| Twisted Pair Cable Diagnostic | | yes | |
| General | | | |
| Housing | Anodised / varnished aluminium case | | |
| Mounting | 35mm DIN-Rail Mounting according to EN 60715, (EN50022), optional: wall mounting | | |
| Dimensions [BxHxT] | 95 mm x 184 mm x 125 mm | | |
| IP degree of protection | IP 30 (EN 60529) | | |
| Ambient temperature | Operation: -40 ... +85 °C, Storage: -40 ... +85 °C | | |
| Relative humidity | 20 - 90 % (non-condensing) | | |
| Weight | 1800 g | | |
| Power supply | | | |
| Input voltage without PoE+ (PSE) | min. 18 VDC | typ. 24 VDC | max. 72 VDC |
| Input voltage with PoE+ (PSE) | min. 46 VDC | typ. 54 VDC | max. 57 VDC |
| Power consumption without PoE+ | min. 13 W | typ. 15 W | max. 28 W |
| Interface connector | 3-pin terminal block, screw-on type | | |
| I/O Adapter - Alarm contacts - Function inputs (optional) | | | |
| Number of outputs | 2x independent outputs each with 2A/30 VDC (Changer function) | | |
| Number of inputs | 4 (for connection of potential-free contacts) | | |
| I/O Interface Connector | 16-pin terminal block (screw-on type) | | |
| Functional parameters | | | |
| Data throughput | > 1.488.000 Pakete/Sek. per Port (FDX, bidirectional) | | |
| Switching method | Store and forward, self-learning | | |
| Max. Framesize | 9.000 bytes (Support of Jumboframes) | | |
| Paket Buffer | 512 kByte | | |
| Management | | | |
| | On-Board High-Performance Management | | |
| Firmware update | Update in separate FLASH area, Corruption impossible | | |
| FLASH Konfiguration | Dual Configuration, Corruption impossible | | |
| SCP, SSH, HTTPS und SNMPv3 fähig | yes | | |
| Configuration- Reset button | yes (Configuration button deactivatable) | | |
| Memory Card | Memory Card with fixed MAC-Address for redundant storage of the complete switch configuration (optional) | | |
| Console Interface | yes (Cisco compatible) | | |
| Standards | | | |
| Electrical safety (IT equipment) | EN 60950 | | |
| Electrical conditions (EMC) | EN 55022 | | |
| Others (abstract) | CE, IEEE 802.3x (Flow Control), IEEE 802.1AB (LLDP), IEEE 802.1D (MAC Bridges), IEEE 802.1D (Rapid Spanning Tree Protocol), IEEE 802.1D (Class of Service), IEEE 802.1X (Port-Based Network Access Control) ANSI/TIA-1057 (Link Layer Discovery Protocol for Media Endpoint Devices), ISO/IEC 15802-3 (Media Access Control Bridges), IEC 62439-2 (Media Redundancy Protocol-MRP) | | |

Management Features (abstract)

| | iGigaSwitch16XX E+ |
|---|--------------------|
| Access Control / Authentication Management | |
| Admin account with Read/Write access for HTTP/HTTPS, Telnet/SSH/V.24 console and NexMan | • |
| Access Policy Mode with disabling function for unsecure protocols, activation of SSHv2, HTTPS, SNMPv3 and „Password Checker“ | • |
| Gratuitous ARP function guarantees that the switch can be reached after change of IP address | • |
| Securely encrypted transfer of configuration und firmware via SCP- Secure Copy | • |
| IPv6 according to IPv6 Forum phase 2 core specification | • |
| WEB / HTTP / HTTPS Access | |
| WEB interface (no proxy server required) | • |
| TCP port number can be set for WEB access | • |
| Telnet / SSH and V.24 Console | |
| Telnet console (no proxy server required) and Cisco-like command line interface | • |
| Telnet or V.24 console can be disabled respectively Telnet and V.24 console authentication via RADIUS server | • |
| Secure 256-bit encrypted SSH / SSL transfer and use of 1024-bit RSA keys. | • |
| SNMP Access, SNMP Traps and Syslog Messages | |
| Configuration of switch possible via ‚SNMP Set Request‘ | • |
| MIB-II (RFC1213) system, interface, at, ip | • |
| ETHERLIKE MIB (RFC2665) dot3StatsTable | • |
| IF-MIB (RFC2863) ifXTable | • |
| BRIDGE-MIB (RFC4188) dot1dBase, dot1dStp, dot1dTp | • |
| RSTP-MIB (RFC4318) | • |
| RMON-MIB (RFC2819) statistics | • |
| Eight IP addresses can be set as event receivers for SNMP traps, Alarm and Syslog messages | • |
| Up to 27 different event types can be enabled per receiver | • |
| Portsecurity | |
| Loop/broadcast limiter for protection against accidental or malicious packet storms | • |
| Active loop protection with automatic disablement of short-circuited ports | • |
| Manual definition of three authorized MAC addresses per port | • |
| Automatic learning of up to three authorized MAC addresses per port | • |
| Port switches off, when an unauthorized MAC address is detected | • |
| SNMP trap/syslog message for newly detected or for unauthorized MAC address | • |
| Transparent transmission of IEEE802.1x packets can be enabled/disabled | • |
| RADIUS authentication of up to three MAC addresses per port | • |
| Port authentication according to IEEE802.1x in connection with the RADIUS server | • |
| Unauthenticated ports are switched into a freely selectable Unsecure-Default-VLAN | • |
| VLAN Support / Trunking | |
| VLAN table selectable with up to 64 VLAN IDs, static or dynamic configurable | • |
| Default-VLAN ID can be set for each port | • |
| Default-VLAN can be disabled for trunking ports | • |
| Trunking with tagging in accordance with IEEE802.1q can be enabled/disabled for each port | • |
| Prioritization of the VLAN tags selectable according to IEEE802.1p | • |
| Prioritization | |
| Prioritization selectable per each port according to IEEE802.1p / IPv4 and IPv6 | • |
| Four output queues selectable for prioritization weighting per port | • |
| 4 Prioritization scheme {strict queuing}, {8,4,2,1 weighted fair queuing}, {3 strict/2,1,0 weighted}, {2,3 strict/1,0 weighted} | • |
| Discovery Protocols | |
| LLDP (Link Layer Discovery Protocol) | • |
| CDP (Cisco Discovery Protocol) | • |
| Switch Information / Configuration | |
| Configuration of IP parameters via DHCP and manual configuration of IP parameters possible | • |
| Configuration of IP parameters possible without pressing configuration switches (NexCon) | • |
| Loading of a Switch Configuration or firmware via Telnet/SSH/V.24/DHCP/BOOTP console possible | • |
| Output of the running configuration in Telnet as CLI script and optional saving on an external TFTP server. | • |
| Firmware and Configuration Management via Nexans Switch Manager | |
| Prevention of corruption through firmware update in separate FLASH segment | • |
| Avoid corruption of configuration changes with dual configuration management | • |
| NexMan authentication via RADIUS server | • |
| Download / upload of the configuration and archiving in a database on the PC | • |
| Upload of a new configuration into the switch is made On-The-Fly (no reboot required) | • |
| Archiving of the configuration in an offline database (using NexManV3) | • |
| Securely encrypted configuration via SNMPv3 | • |
| Redundancy | |
| RSTP - Rapid Spanning Tree Protocol | • |
| MSTP - Multiple Spanning Tree Protocol | • |
| Power over Ethernet | |
| Detection, monitoring and display of PoE related values, voltage and consumption | • |
| 5 different modes: Power Setup, Off / On / Auto - 802.3af / Auto 802.3af High-Power /Auto 802.3at High-Power | • |
| Environment Überwachung/Diagnose/Monitoring/Mirroring | |
| Display of internal operating voltages and housing temperature | • |
| SNMP trap/alarm and syslog messages, if temperature is exceeded | • |
| Logbook for permanent internal saving of syslog messages | • |
| 35 counters for packets, bytes, Unicasts, Broadcasts, etc. per port | • |
| Port monitor for individual ports | • |
| Switch can be set to VLAN mirroring | • |
| Display of SFP Information: Vendorname, Part Number, Serial Number, Datecode, etc. | • |
| Display of SFP Diagnostics: TX and RX power in uW and dBm, temperature, voltage, bias current | • |
| Configurable Alarm limits for TX- and RX-Power as well as for Laser-Bias-Current | • |
| SNMP-Trap/Syslog-message activation for preset alarm limits | • |
| Other Network Protocols | |
| IGMP Snooping (Internet Group Management Protocol) can be activated globally, IGMP protocol versions 1 or 2 can be selected | • |
| SNTP (Simple Network Time Protocol) can be activated globally | • |

Frequently Asked Questions (FAQs)

Nexans Advanced Networking Solutions has developed a comprehensive line of active Ethernet based switch systems designed for office, harsh environments, industrial, and specialty applications. Based on more than 25 years of experience in the field of high-performance optical fiber and copper networks, Nexans is offering state-of-the-art active network solutions.

I Where are these systems typically used?

Fields of application include the control of wind turbines, the networking of transformer substations, remote monitoring of power meters (e.g. automatic metering), and security (e. g. access control, video surveillance). Traffic management applications and the control of machines are just a few further examples of the diverse applications of the Nexans iSwitch systems.

I How can the initial configuration be performed?

In order to ensure simple configuration and management of these devices, Nexans has designed an easy to use tool specifically tailored to the requirements of the user. The Nexans Switch Manager NexMan V3 ensures the automated distribution of master configurations and software updates to any number of industrial switches. Distribution of the complete or partial configuration is all possible. Another important feature of NexMan V3 is the central archiving of all switch configurations in a database. In case of failure, this key feature will ensure the rapid reconfiguration of the switch parameters and minimize downtime.

I How can the systems be monitored?

NexMan V3

The NexMan V3 user interface provides the administrator with a complete overview of the current state and accessibility of the switch systems available in the network. By simply selecting a switch system, you can set several parameters such as port configuration, SNMP trap receiver, 802.1x, Radius, and many more.

The user does not need to have knowledge of complex management software systems in order to perform this function.

I What management interfaces are supported?

WEB, TELNET, SSH, SNMP and V.24 management interfaces are also supported. The integration into higher management systems like HP Openview, Spectrum, etc. is further made possible.

I Is the early detection of changes on the optical link possible?

A multitude of parameters can be read out from systems with SFP interface via the management system. Changes in the link characteristics (e.g. attenuation increases) can be detected and resolved on the basis of threshold values prior to a possible total failure of the link. Appropriate messages (SNMP traps, Syslog) can also be sent to a central management system.

I How can faults be detected on a twisted-pair cable link?

Cable Diagnostic Function

The iSwitch series ensures the easy and fast localization of possible faults on the copper twisted-pair cable links. Identification of short circuits, interruptions, impedance mismatches or reversals, can be localized to the meter via the management feature.

I Can IP cams or wireless access points and similar devices be powered via the switch?

The implemented manageable Power over-Ethernet (PoE) feature (optional) makes it further possible to power e. g. IP cameras, wireless access points, VoIP phones or multifunctional terminals directly via the switch system. Thereby, the user does not need any plug-in power supplies for the terminal units.

I How can the configuration be transferred to the new system after a possible system failure?

The Nexans systems provide a unique concept for the recovery of the complete system configuration. This allows untrained staff to easily reconfigure the system after a failure. All iSwitch systems are equipped with an integrated SD card slot through which

Frequently Asked Questions (FAQs)

the complete system configuration may be saved as a backup copy. In the event of a failure, the user only needs to swap out the SD card from the old switch, insert it into the new switch, and the configuration will automatically be mirrored to the new device. As an option the switch can even be booted with the MAC address of the SD card, so the superior address tables (e.g. in routers) all remain unaffected.

I How do you prevent unauthorized access to network?

Nexans Switch systems support all relevant security mechanisms such as IEEE802.1x and MAC-based access control. In connection with a central authentication server, e.g. RADIUS, security in enterprise networks is considerably improved. Maximum security is achieved by access control directly at the user port of the Nexans iSwitch system. Thus the identity of the client is verified directly at the connection point and not only at the bundled port of the central switch.

Any potential abuse of the network connection, e.g. by listening in on traffic, is thus principally excluded.

I What happens in case of a link failure?

All switch systems support the Media Redundancy Protocol (MRP) and Rapid Spanning Tree Protocol (RSTP). This guarantees the automatic and fast switch-over to a redundant link in the event of the failure of a transmission link. This feature clearly improves the availability of the network!

I What happens in case of a power failure?

The redundant power supply feature further guarantees the operational safety of the systems. Power failures can be signaled via alarm contacts, SNMP traps or Syslog messages.

Order Numbers



SFP 100 Pluggable Transceiver (100 Mbps)

- Fast Ethernet
- Fiber Optic LC Connector
- Digital Diagnostic Monitoring Interface

Order Numbers:

| | |
|--|----------|
| Nexans SFP 100 Transceiver GI(LC)E | 88646010 |
| Nexans SFP 100 Transceiver SM(LC)E L10 | 88646011 |
| Nexans SFP 100 Transceiver SM(LC)E L40 | 88646012 |
| Nexans SFP 100 Transceiver SM(LC)E L80 | 88646013 |



SFP 1000 Pluggable Transceiver (1.000 Mbps)

- Gigabit Ethernet / Fiber Optic LC Connector
- Digital Diagnostic Monitoring Interface

Order Numbers:

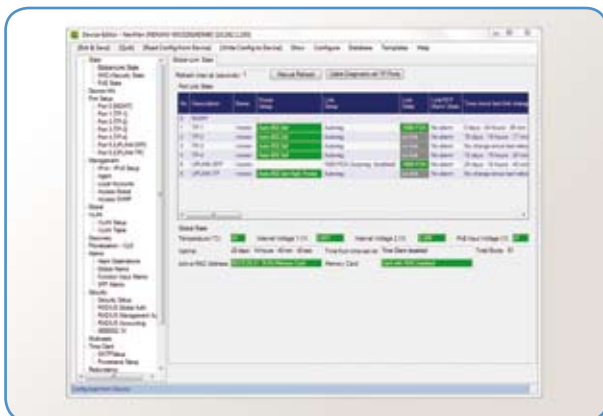
| | |
|---|----------|
| Nexans SFP 1000 Transceiver GI(LC)E | 88646015 |
| Nexans SFP 1000 Transceiver SM(LC)E L10 | 88646016 |
| Nexans SFP 1000 Transceiver SM(LC)E L40 | 88646017 |
| Nexans SFP 1000 Transceiver SM(LC)E L80 | 88646018 |

SFP 1000 TP Pluggable Transceiver (1.000 Mbps)

- Gigabit Ethernet / Twisted Pair / RJ45 Connector

Order Number:

| | |
|---|----------|
| SFP 1000 Plugg. Transceiver 1000 Base T | 88645917 |
|---|----------|



Nexans Switch Manager (NexManV3)

- Individual generation of master configurations (also single parameters selectable)
- Storage of configurations in a database (up to 100 history-entries)
- Layer 2 + 3 autodiscovery
- Time for the software update can be preset

Order Numbers:

| | |
|---------------------------------------|----------|
| NexMan V3 (Single license) | 88301908 |
| NexMan V3 (Company license) | 88301909 |

A

- A - ampere
- AN - Auto-Negotiation
- ARP - Address Resolution Protocol

C

- CE - Communauté Européenne
- CDP - Cisco Discovery Protocol

D

- DHCP - Dynamic Host Configuration Protocol
- DDMI - Digital Diagnostic Monitoring Interface

E

- EN - European Norm

F

- FDX - Full Duplex

G

- g - gram
- GI - Graded Index

H

- HDX - Half Duplex

I

- IGMP - Internet Group Management Protocol
- IEC - International Electrotechnical Commission
- IEEE - Institute of Electrical and Electronics Engineers
- IP - International Protection (also Ingress Protection)
- IT - Information Technology

L

- LLDP - Link Layer Discovery Protocol

P

- PoE - Power over Ethernet
- PD - Powered Device
- PSE - Power Source Equipment

M

- MAC - Media Access Control
- Mbit/s - Megabit per Sekunde
- MDI - Medium Dependent Interface
- MD5 - Message-Digest Algorithm 5
- MIB - Management Information Base

R

- RADIUS - Remote Authentication Dial-In User Service
- RJ - Registered Jack
- RMON - Remote Monitoring
- RSTP - Rapid Spanning Tree Protocol

Glossary

S

| | | |
|------|---|------------------------------------|
| s | - | second |
| SCP | - | Secure Copy Protocol |
| SFP | - | Small Form-factor Pluggable |
| SM | - | Singemode |
| SNMP | - | Simple Network Management Protocol |
| SNTP | - | Simple Network Time Protocol |
| SSH | - | Secure Shell |

T

| | | |
|-----|---|-------------------------------|
| TCP | - | Transmission Control Protocol |
| TP | - | Twisted Pair |


V

| | | |
|------|---|----------------------------|
| V | - | volt |
| VDC | - | volt direct current |
| VLAN | - | Virtual Local Area Network |

W

| | | |
|---|---|------|
| W | - | watt |
|---|---|------|



 Nexans network solutions are used throughout the world and have proved their reliability in many different ways. Our customers and references include leading companies in the world, power utilities, railway companies, airports, industrial properties, harbours and waterways. A LAN System which can grow with the needs of its users has to be designed right from the very start with such a level of flexibility to ensure that support is provided in particularly with frequent moves, adds and changes.

**With more than 25 years experience in the
development and production of optical solutions,
the systems from Nexans provide the reliability
and the security you expect
from your network.**



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