Industrial Ethernet Switches

Overview

<table>
<thead>
<tr>
<th>Industrial Ethernet Switches</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Unmanaged Switches</td>
<td>B.2</td>
</tr>
<tr>
<td>Unmanaged Switches Fast Ethernet</td>
<td>B.3</td>
</tr>
<tr>
<td>Unmanaged Switches Gigabit Ethernet</td>
<td>B.6</td>
</tr>
<tr>
<td>Managed Switches introduction</td>
<td>B.8</td>
</tr>
<tr>
<td>Managed Switches Fast Ethernet</td>
<td>B.13</td>
</tr>
<tr>
<td>Managed Switches Gigabit Ethernet</td>
<td>B.16</td>
</tr>
<tr>
<td>Power over Ethernet Switches</td>
<td>B.20</td>
</tr>
<tr>
<td>Unmanaged Switches Fast Ethernet - Power over Ethernet</td>
<td>B.21</td>
</tr>
<tr>
<td>Unmanaged Switches Gigabit Ethernet - Power over Ethernet</td>
<td>B.22</td>
</tr>
<tr>
<td>Managed Switches Fast Ethernet - Power over Ethernet</td>
<td>B.23</td>
</tr>
</tbody>
</table>
Unmanaged Switches
Adaptable and universal

Switches are the basic coupling elements in Ethernet networks. They connect the Ethernet participants together. In an Ethernet network the communication basically originates from the participants. The switches connect the participants together and enable the communication. Unmanaged switches are the simplest active network component. They do not need to be configured and are therefore very flexible. They use the basic standard protocols, such as auto-negotiation, auto-crossing, and flow-control and can automatically adjust to the different transmission speeds or connector wiring.

Unmanaged switches are protocol transparent. Each port on the switch creates an individual collision domain. The use of twisted-pair cabling with an RJ45 interface or fibre-optic cable based on the IEEE 802.3 specification interfaces are supported by all Weidmüller switches.
Unmanaged Fast Ethernet Switches

- 10/100BaseTX (RJ45 connector), 100BaseFX (multi/singlemode, SC or ST connector)
- Redundant dual 12/24/48 V DC, 18 to 30 V AC power inputs
- IP 30 aluminum housing
- Rugged hardware design well suited for hazardous locations (Class I Div. 2 /ATEX) and maritime environments (DNV/GL)
- -40 °C to 75 °C operating temperature range (T models)

Technical data

- **Standards**
  - IEEE 802.3 for 10BaseT
  - IEEE 802.3u for 100BaseX (X) and 100BaseFX
  - IEEE 802.3x for Flow Control

- **Flow Control**
  - Store and Forward

- **Switch Properties**
  - DIP Switches Enable/Disable broadcast storm protection
  - RJ45 Ports 10/100BaseT(X) auto negotiation speed, Full/Half duplex
  - Fiber Ports 100BaseFX ports

- **Interface**
  - Optical Fibre
  - Reverse Polarity Protection Present

- **Optical Fibre**
  - Power, 10/100M (TP port), 100M (fibre port)

- **Switch Properties**
  - MAC Table Size: 1 K
  - Packet Buffer Size: 512 KBit
  - MAC Table Size: 1 K

- **Power Requirements**
  - Input Voltage: 12/24/48 V DC (9.6 to 60 V DC), 10 to 30 V AC (47 to 63 Hz), redundant dual inputs
  - Input Current:
    - IE-SW-BL05-Series: 0.1 A @ 24 V
    - IE-SW-BL08-Series: 0.11 A @ 24 V
  - Overload Current Protection: 1.1 A

- **Connection**
  - Connection: 1 removable 4-contact terminal block
  - Reverse Polarity Protection: Present

- **Housing**
  - Housing: Aluminum, IP 30 protection

- **Dimensions (W x H x D)**
  - IE-SW-BL05-Series: 30 x 115 x 70 mm (1.8 x 4.5 x 2.7 in)
  - IE-SW-BL08-Series: 50 x 115 x 70 mm (1.8 x 4.5 x 2.7 in)

- **Weight**
  - IE-SW-BL05-Series: 176 g
  - IE-SW-BL08-Series: 276 g

- **Installation**
  - DIN rail, wall (with optional mounting kit)

- **Environmental Limit**
  - Operating Temperature: Standard Models: -10 to 60 °C (14 to 140 °F)
    - Wide Temp. Models: -40 to 75 °C (40 to 167 °F)

- **Temperature**
  - Storage: -40 to 85 °C (-40 to 185 °F)

- **Safety**
  - UL 508, UL 60950-1

Regulatory Approvals

- **Hazardous Location**
  - UL/ULc Class I, Division 2, Groups A, B, C and D; ATEX Zone 2 Ex nA IIC T4 Gc

- **EMC**
  - FCC Part 15, CISPR (EN55022) class A
  - EN61000-4-2 (ESD), level 3;
  - EN61000-4-3 (RS), level 3;
  - EN61000-4-4 (EFT), level 3;
  - EN61000-4-5 (Surge), level 3;
  - EN61000-4-6 (CS), level 3;
  - EN61000-4-11
  - EMV EN61000-4-6 (CS), level 3;
  - EN61000-4-5 (Surge), level 3;
  - EN61000-4-4 (EFT), level 3;

- **Safety**
  - UL 508, UL 60950-1

- **Regulatory Approvals**
  - Maritime: DNV, GL (not for 1412110000, 1412120000, 1412070000, 1412080000, 1412090000, 1412100000)

- **Shock**
  - IEC 60068-2-6

- **Freefall**
  - IEC 60068-2-32

- **Vibration**
  - IEC 60068-2-27

- **Time (meantime between failures)**
  - IEC SW-BL05-Series: 3,040,784 hrs, IEC SW-BL08-Series: 2,428,212 hrs

- **Warranty**
  - Warranty Period: 5 years

Ordering Information

- **Version**
  - Model Type
  - Operating Temperature
  - Order No.

- **IE-SW-BL05-Series**
  - 5 * RJ45
    - IE-SW-BL05-5TX
    - -40 to +60 °C
    - 1240804000
  - 4 * RJ45, 1 * ST-Multimode
    - IE-SW-BL05-4TX-1ST
    - -40 to +60 °C
    - 1240890000
  - 6 * RJ45, 2 * ST-Multimode
    - IE-SW-BL05-6TX-2ST
    - -40 to +60 °C
    - 1286500000
  - 5 * RJ45
    - IE-SW-BL05-5TX
    - -40 to +60 °C
    - 1240990000
  - 6 * RJ45, 2 * SC-Multimode
    - IE-SW-BL05-6TX-2SC
    - -40 to +60 °C
    - 1286560000

- **IE-SW-BL08-Series**
  - 4 * RJ45, 1 * ST-Multimode
    - IE-SW-BL08-4TX-1ST
    - -40 to +60 °C
    - 1286650000
  - 6 * RJ45, 2 * ST-Multimode
    - IE-SW-BL08-6TX-2ST
    - -40 to +60 °C
    - 1286630000

- **Accessories**

- **Ordering Information**
  - Model Type
  - Order No.

- **IE-SW-BL05-Series**
  - 10" Rack Mounting Kit
    - RM-KIT
    - 1261440000

- **IE-SW-BL08-Series**
  - Wall Mounting Kit for IE-SW-BL05 Series
    - IE-WALLMOUNT-KIT-30M
    - 1504650000
  - Wall Mounting Kit for IE-SW-BL08 Series
    - IE-WALLMOUNT-KIT-40MM
    - 1504640000
Unmanaged Fast Ethernet Switches

- Redundant dual 24 V DC power inputs
- Relay output warning for power failure and port break alarm
- Broadcast storm protection
- Transparent transmission of VLAN tagged packets
- -40 °C to 75 °C operating temperature range (T models)

Technical data

**Technology**
- Standards: IEEE 802.3 for 10BaseT
- IEEE 802.3u for 100BaseT(X) and 100BaseFX
- IEEE 802.3x for Flow Control

**Processing Type**
- Store and Forward
- IEEE 802.3x flow control, back pressure flow control

**Switch Properties**
- MAC Table Size: 1 K (IE-SW-VL09...Series), 4 K (IE-SW-VL16...Series)
- Packet Buffer Size: 512 Kbit (IE-SW-VL09...Series), 1.25 MBit (IE-SW-VL16...Series)

**Interface**
- Fibre Ports: 100BaseFX ports (SC/ST connector)
- RJ45 Ports: 10/100BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection
- DIP Switches: Port fault alarm
- Enable/disable broadcast storm protection

**LED Indicators**
- PW1, PW2, FAULT, 10/100M (TP port), 100M (fibre port)

**Alarm Contact**
- 1 relay output with current carrying capacity of 1 A @ 24 V DC

**Optical Fibre**
- 100BaseFX
- Wavelength: 1300 nm
- Max. TX: -15 dBm
- Min. TX: -20 dBm
- RX Sensitivity: -32 dBm
- Link Budget: 12 dB
- Typical Distance: 5 km (60/125 μm multimode cable)
- 4 km (62.5/125 μm multimode cable)
- Saturation: 4 dBm

**Power Requirements**
- Input Voltage: IEC-SW-VL09: 24 V DC (12 to 45 V DC), redundant dual inputs
- IEC-SW-VL16: 12/24/48 V DC (0.5 to 60 V DC), redundant dual inputs
- Input Current: IEC-SW-VL09/16TX: 0.27 A @ 24 V
- IEC-SW-VL16/16TX: 0.31 A @ 24 V
- IEC-SW-VL16 SC/ST: 0.44 A @ 24 V

**Overload Current Protection**
- 1.6 A

**Reverse Polarity Protection**
- Present

**Housing**
- Metal, IP 30 protection

**Dimensions (W x H x D)**
- IEC-SW-VL09...Series: 53.6 x 135 x 105 mm
- IEC-SW-VL16...Series: 80.5 x 135 x 105 mm
- (2.11 x 5.31 x 4.13 in)

**Weight**
- IEC-SW-VL09: 790 g
- IEC-SW-VL16: 1140 g
IP 67 unmanaged Fast Ethernet Switches
- M12 connection system and IP67 protected housing
- 10/100BaseT (X), 4-pin M12 (D-coded)
- Full/half duplex mode and auto MDI/MDI-X
- Input voltage 12 to 45 V DC, 18 to 30 V AC

Technical data

<table>
<thead>
<tr>
<th>Technology</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Standards</strong></td>
<td>IEEE 802.3 for 10BaseT</td>
</tr>
<tr>
<td></td>
<td>IEEE 802.3u for 100BaseT (X)</td>
</tr>
<tr>
<td></td>
<td>IEEE 802.3x for Flow Control</td>
</tr>
<tr>
<td><strong>Processing Type</strong></td>
<td>Store and Forward</td>
</tr>
<tr>
<td><strong>Flow Control</strong></td>
<td>IEEE 802.3x flow control, back pressure flow control</td>
</tr>
<tr>
<td><strong>Switch Properties</strong></td>
<td>MAC Table Size 2 K</td>
</tr>
<tr>
<td></td>
<td>Packet Buffer Size 384 Kbit</td>
</tr>
<tr>
<td><strong>Interface</strong></td>
<td>10/100BaseT (X) auto negotiation, full/half duplex mode and auto MDI/MDI-X connection, 4-pin, D-coded</td>
</tr>
<tr>
<td><strong>LED Indicators</strong></td>
<td>PWR, LNK/ACT</td>
</tr>
<tr>
<td><strong>Power Requirements</strong></td>
<td>Input Voltage 24 V DC (12 to 45 V DC)</td>
</tr>
<tr>
<td></td>
<td>18 to 30 V AC (47 to 63 Hz)</td>
</tr>
<tr>
<td><strong>Overload Current Protection</strong></td>
<td>0.12 A @ 24 V DC</td>
</tr>
<tr>
<td></td>
<td>0.28 A @ 24 V AC</td>
</tr>
<tr>
<td><strong>Reverse Polarity Protection</strong></td>
<td>Present</td>
</tr>
<tr>
<td><strong>Housing</strong></td>
<td>Plastic, IP 67 protection, encapsulated</td>
</tr>
<tr>
<td><strong>Dimensions (W x H x D)</strong></td>
<td>60 x 125 x 28.6 mm (2.36 x 4.92 x 1.09 Zoll)</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>270 g</td>
</tr>
<tr>
<td><strong>Installation</strong></td>
<td>Wall mounting, screwed</td>
</tr>
<tr>
<td><strong>Environmental Limits</strong></td>
<td>Operating Temperature Standard Models: -25 to 60 °C (-13 to 140 °F)</td>
</tr>
<tr>
<td></td>
<td>Wide Temp. Models: -40 to 75 °C (-40 to 167 °F)</td>
</tr>
<tr>
<td></td>
<td>Storage Temperature -40 to 85 °C (-40 to 185 °F)</td>
</tr>
<tr>
<td></td>
<td>Ambient Relative Humidity 5 to 95 % (non-condensing)</td>
</tr>
</tbody>
</table>

Regulatory Approvals

- Safety: UL 508
- EMC: FCC Part 15 Subpart B Class A, EN 55022 Class A
- EN01000-4-2 (SSD), level 3;
- EN01000-4-3 (RS), surpasses level 3;
- EN01000-4-4 (ETT), level 3;
- EN01000-4-5 (Surge), level 3;
- EN01000-4-6 (CS), level 2;
- EN01000-4-8;
- EN01000-4-11

- Shock: IEC 60068-2-27
- Freesat: IEC 60068-2-32
- Vibration: IEC 60068-2-6

MTBF (mean time between failures)
- Time: 370,224 hrs

Database
- Teknodia (Belfcore), GB

Warranty
- Warranty Period: 5 years

Ordering data

<table>
<thead>
<tr>
<th>Version</th>
<th>Model Type</th>
<th>Operating Temperature</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 * M12 10/100BaseT(X)</td>
<td>IE-SW-IP67-5M12</td>
<td>-25 to +60 °C</td>
<td>1504410000</td>
</tr>
<tr>
<td></td>
<td>IE-SW-IP67T-5M12</td>
<td>-40 to +75 °C</td>
<td>1504420000</td>
</tr>
</tbody>
</table>
Unmanaged Switches Gigabit Ethernet – Basic/Value Line

Unmanaged Gigabit Ethernet Switches
- Full Gigabit Ethernet on all ports
- Variants with slots for Gigabit SFP transceivers
- Redundant dual 12/24/48 V DC power inputs
- Relay output warning for power failure and port break alarm
- Broadcast storm protection
- Supports jumbo frame transmission (up to 9.6 KB)

Technical data

**Technology**

- **Standards**
  - IEEE 802.3 for 10BaseT
  - IEEE 802.3u for 100BaseT(X) and 100BaseFX
  - IEEE 802.3ab for 1000BaseT(X)
  - IEEE 802.3z for 1000BaseX
  - IEEE 802.3x for Flow Control

- **Processing Type**
  - Store and Forward

- **Flow Control**
  - IEEE 802.3x flow control, back pressure flow control

- **Switch Properties**
  - **MAC Table Size**
    - 16K (IE-SW-BL05-5GT)
    - 14K (IE-SW-VL08-xGT)
  - **Packet Buffer Size**
    - 1088 KBit (IE-SW-BL05-5GT), 1408 KBit (IE-SW-VL08-xGT)
  - **Jumbo frame support**
    - up to 9.6 KB

- **Interface**
  - **Fibre Ports**
    - 100/1000BaseSFP slot (only IE-SW-VL08-6GT-2GS)
  - **RJ45 Ports**
    - 10/100/1000BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection
  - **DIP Switches**
    - Port fault alarm
    - Enable/disable broadcast storm protection
    - Enable/disable jumbo frame support
  - **LED Indicators**
    - **PWR1, PWR2, FAULT, 10/100/1000M**
  - **Alarm Contact**
    - 1 relay output with current carrying capacity of 1 A @ 24 V DC
  - **Power Requirements**
    - Input Voltage
      - 12/24/48 V DC (9.6 to 60 V DC), redundant dual inputs
    - Input Current
      - IE-SW-BL05S-GET: 0.20 A @ 24 V
      - IE-SW-VL08S-GET: 0.32 A @ 24 V
      - IE-SW-VL08S-GET-2GS: 0.34 A @ 24 V

- **Connection**
  - 1 removable 6-contact terminal block

- **Physical Characteristics**
  - **Housing**
    - Metal, IP 30 protection
  - **Dimensions (W x H x D)**
    - IE-SW-BL05GT-Series: 35 x 130 x 105 mm (1.37 x 5.12 x 4.13 in)
    - IE-SW-VL08GT-Series: 53.6 x 135 x 105 mm (2.11 x 5.31 x 4.13 in)
  - **Weight**
    - IE-SW-BL05S-GET: 290 g
    - IE-SW-VL08S-GET: 630 g

- **Environmental Limits**
  - **Operating Temperature**
    - Standard Models: 0 to 60 °C (32 to 140 °F)
    - Wide Temp. Models: -40 to 75 °C (-40 to 167 °F) (on request)
  - **Storage Temperature**
    - -40 to 85 °C (-40 to 185 °F)
  - **Ambient Relative Humidity**
    - 5 to 95 % (non-condensing)

- **Regulatory Approvals**
  - **Safety**
    - UL 508
  - **Hazardous Location**
    - UL/CSA Class I, Division 2, Groups A, B, C, and D;
    - ATEX Zone 2
  - **EMV**
    - FCC Part 15, CISPR (EN55022) class A

- **Regulatory Approvals**
  - **EMC**
    - EN1004-2 (ESD), level 3
    - EN1004-4 (IFT), level 3
  - **Safety**
    - UL 508
  - **Maritime**
    - DNV, GL
  - **Vibration**
    - IEC 60068-2-6
  - **Shock**
    - IEC 60068-2-27
  - **Freefall**
    - IEC 60068-2-32
  - **Shock**
    - IEC 60068-2-27
  - **Freefall**
    - IEC 60068-2-32

- **MTBF** (mean time between failures)
  - Time
    - 478,000 hrs (Series IE-SW-BL05S-5GT)
    - 325,000 hrs (Series IE-SW-VL08S-5GT)

- **Database**
  - Telcordia (Bellcore), GB (IE-SW-VL08S-5GT series)

- **Warranty**
  - Warranty Period
    - 5 years

- **Ordering Information**

<table>
<thead>
<tr>
<th>Version</th>
<th>Model Type</th>
<th>Operating Temperature</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 * RJ45 10/100/1000BaseT(X)</td>
<td>IE-SW-BL05S-GET</td>
<td>0 to 60 °C</td>
<td>1241250000</td>
</tr>
<tr>
<td>8 * RJ45 10/100/1000BaseT(X)</td>
<td>IE-SW-VL08B-GET</td>
<td>0 to +60 °C</td>
<td>1241270000</td>
</tr>
<tr>
<td>6 * RJ45 10/100/1000BaseT(X), 2 Combo Ports (10/100/1000BaseSFP)</td>
<td>IE-SW-VL08B-GET-2GS</td>
<td>0 to +60 °C</td>
<td>1241280000</td>
</tr>
</tbody>
</table>

- **Accessories**

<table>
<thead>
<tr>
<th>Model Type</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>19” Rack Mounting Kit</td>
<td>RM-KIT 1241440000</td>
</tr>
<tr>
<td>Wall mounting kit</td>
<td>IE-WALLMOUNT-KIT-45MM 1504440000</td>
</tr>
</tbody>
</table>

**Note**

- The IE-SW-VL08S-GET-2GS supports up to 2x 100/1000Base SFP slots. Corresponding SFP modules for Fast/ Gigabit Ethernet, see page F.8.
Managed Switches
Configurable according to requirements

Managed switches offer extensive control mechanisms for data distribution and bandwidth management to co-ordinate and cope with the different requirements of communication participants in an industrial network. Configuration is either web-based using a simple and intuitive user interface or via a serial console.

Powerful and reliable network redundancy

It is particularly important to have network redundancy to ensure system availability in today’s Industrial Ethernet infrastructures. This is because in a highly integrated system, a connection error can lead to machine stoppage and thus to production losses. To minimise such risks in a managed Ethernet network, Weidmüller has integrated high-performance redundancy mechanisms into its managed switches. This is in addition to the RSTP/STP standard and port-trunking.
Ring redundancy

The Turbo-Ring technology integrated into Weidmüller’s switches allows you to restore a network connection in case of failure in under 20 ms, and this with up to 250 switches in a ring. Turbo-Ring offers thee different topology options (Ring-Coupling, Dual-Ring and Dual-Homing) for different application requirements to ensure the maximum possible availability of industrial network applications.

Ring-Coupling

In some applications, it is not sensible to have all equipment and devices in a single large redundant ring networked together, as some of the devices may be located in remote parts of the plant. For such structures, Ring-Coupling is ideal. It connects devices in multiple, smaller rings that are connected redundantly and directly with one another.

Dual-Homing

With Dual-Homing, two separate rings are connected through one managed switch via two independent connection points. The back-up connection is activated if the primary connection fails.
Managed Switches introduction

Dual-Ring

In a Dual-Ring, two neighbouring rings are connected with one another using one switch, without the need for additional ports or cabling. This configuration reduces the total number of ports and saves cabling costs, as an additional primary and back-up line is not needed.

Turbo-Chain

Turbo-Chain offers the possibility of creating multiple redundant networks without the limitations of ring technology. Turbo-Chain can be simply configured by defining two end-points in a segment. This means you can connect or extend existing redundant networks. When compared with traditional ring coupling or a network re-design, Turbo-Chain is more flexible as well as being more cost efficient and it has significant savings potential when compared to the effort for network restructuring and re-cabling. In addition Turbo Chain also supports IEEE 802.1w/D RSTP and STP protocols.

- Flexible network topology
- Unlimited and simple network expansion
- Quick troubleshooting (recovery time < 20 ms)
- Cost-effective configurations

Port trunking for flexible connections

IEEE 802.3ad (LACP, Link Aggregation Control Protocol) permits flexible network connections and a redundant path for critical applications. It provides the means for a user to link via a higher bandwidth over the PremiumLine managed switches by combining more ports into a trunk group.
**QoS supports real-time capability**

Quality of Service (QoS) enables the possibility of prioritisation of data traffic in a network and ensures that important data is consistently available. Weidmüller managed switches can deal with IEEE 802.1p/1Q layer 2 CoS tags and also layer 3 TOS information. The QoS functionality of Weidmüller’s managed switches improves network performance and ensures that time-critical applications are given priority.

**IGMP snooping and GMRP for filtering multicast data traffic**

Weidmüller managed switches support GMRP (Generic Multicast Registration Protocol) and IGMP snooping. These protocols limit multicast data traffic so that it is only forwarded to the devices that actually require it. This reduces unnecessary network data traffic.

**IEEE 1588 PTP - improves time synchronisation of automation devices**

IEEE 1588 PTP, also known as Precision Time Protocol (PTP), was developed to synchronise real-time clocks which are located at specific nodes of a distributed system. Weidmüller managed switches with IEEE 1588 PTP are particularly suited for motion control applications where distributed clocks must be synchronised with high levels of accuracy.
**Managed Switches introduction**

**VLAN – simplifies network planning**

VLAN stands for virtual LAN. It is a network structure with all the characteristics of a normal LAN, but not geographically constrained. A network can be divided into different sections using the VLAN function. It is possible, for example, to group servers or workstations together, based on their function. Data will only then be sent to Ethernet devices of a specific VLAN group. The option for isolating VLANs completely from one another serves to increase the security of data transfer and offers additional protection from unauthorised access or unauthorised data traffic.

**Automatic topology detection using LLDP**

The Link Layer Discovery Protocol (LLDP - IEEE 802.1AB) is a data link layer protocol which publishes information about a device containing its IP address, description and functional information to its neighbouring devices over the network. All of Weidmüller’s managed switches fully support LLDP.

**Simple browser based configuration**

Weidmüller’s managed switches can be easily configured using a web browser, telnet console or the Weidmüller switch configuration utility. Further switch configurations can be saved or the firmware updated using this user-friendly tool.
5-Port Managed Entry-level Ethernet Switches

- Supports the automation protocols Modbus/TCP, PROFINET RT and EtherNet/IP
- Turbo Ring and Turbo Chain with fast recovery time (<20 ms @ 250 switches)
- IGMP snooping, QoS, port- and tag-based VLAN
- Configurable error messages via SNMP trap, e-mail or relay output
- User-friendly, web-based configuration and management

Technical data

Standards
- IEEE 802.3 for 10BaseT
- IEEE 802.3u for 100BaseT(X) and 100BaseFX
- IEEE 802.3x for Flow Control
- IEEE 802.1D-2004 for Spanning Tree Protocol
- IEEE 802.1w for Rapid STP
- IEEE 802.1p for Class of Service
- IEEE 802.1Q for VLAN Tagging

Protocols
- IGMPv1/v2
- GMRP
- GVRP
- SNMPv1/v2c/v3
- DHCP Server/Client
- TFTP
- SNTP
- SMTP
- RARP
- RMON
- HTTP
- Telnet
- Syslog
- DHCP Option 66/67/82
- BootP
- LLDP
- Modbus/TCP
- PROFINET RT
- EtherNet/IP (CIP support)
- IPv6

Flow Control
- IEEE 802.3x flow control

Switch Properties
- MAC Table Size: 2 K
- Packet Buffer Size: 1 MBit

Interface
- Fibre Ports: 100BaseFX ports (SC/ST connector)
- RJ45 Ports: 10/100BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection

DIP Switches: Turbo Ring, Master, Coupler, Reserve

LED Indicators: PWRI, PWRI, FAULT, MSTR/HEAD, CPLR/TAIL, 10/100M

Alarm Contact: 1 relay output with current carrying capacity of 1 A @ 24 V DC

Optical Fibre
- 100BaseX
- multimode
- Wavelength: 1300 nm
- Max. TX: 10 dBm
- Min. TX: -20 dBm
- RX Sensitivity: -32 dBm
- Link Budget: 12 dB
- Typical Distance: 4 km
- Saturation: 4 dBm

Warranty
- Warranty Period: 5 years

Environmental Limits
- Operating Temperature: Standard models: 0 to 60 °C (32 to 140 °F)
- Models with extended temperature range: -40 to 75 °C (-40 to 167 °F)
- Storage Temperature: 40 to 85 °C (40 to 185 °F)
- Ambient Relative Humidity: 5 to 95 % (non-condensing)

Regulatory Approvals
- Safety: UL 508, UL 60950-1, CSA C22.2 No. 60950-1, EN60950-1
- Hazardous Location: UL/cUL Class I, Division 2, Groups A, B, C and D
- EMI: FCC Part 15, CISPR (EN55022) class A
- EMC: EN61000-4-2 (ESD), level 3;
- EN61000-4-3 (RF), level 3;
- EN61000-4-4 (EFT), level 3;
- EN61000-4-5 (Surge), level 3;
- EN61000-4-6 (CS), level 3;
- EN61000-4-8

Shock
- IEC 60068-2-27
- IEC 60068-2-32
- Vibration
- IEC 60068-2-6

MTBF (mean time between failures)
- Time: 852,471 hrs

Database: Telcordia (Bellcore), GB

Ordering data

<table>
<thead>
<tr>
<th>Version</th>
<th>Model Type</th>
<th>Operating Temperature</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 * RJ45</td>
<td>IE-SW-VL06M-5TX</td>
<td>0 to 60 °C</td>
<td>1504280000</td>
</tr>
<tr>
<td>5 * RJ45</td>
<td>IE-SW-VLDMT-5TX</td>
<td>-40 to 75 °C</td>
<td>1504310000</td>
</tr>
<tr>
<td>3 * RJ45, 2 * SE-Multimode</td>
<td>IE-SW-VLDMT-3TX-2SC</td>
<td>0 to 60 °C</td>
<td>1504330000</td>
</tr>
<tr>
<td>3 * RJ45, 2 * SE-Multimode</td>
<td>IE-SW-VLDMT-3TX-2SC</td>
<td>-40 to 75 °C</td>
<td>1504350000</td>
</tr>
<tr>
<td>3 * RJ45, 2 * ST-Multimode</td>
<td>IE-SW-VLDMT-3TX-2ST</td>
<td>0 to 60 °C</td>
<td>1504380000</td>
</tr>
<tr>
<td>3 * RJ45, 2 * ST-Multimode</td>
<td>IE-SW-VLDMT-3TX-2ST</td>
<td>-40 to 75 °C</td>
<td>1504390000</td>
</tr>
</tbody>
</table>

Accessories

<table>
<thead>
<tr>
<th>Model Type</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>External Backup and Restore Module</td>
<td>1241430000</td>
</tr>
<tr>
<td>IEC Rack Mounting Kit</td>
<td>1241440000</td>
</tr>
<tr>
<td>Wall mounting kit</td>
<td>1504440000</td>
</tr>
</tbody>
</table>

202170000D
Managed Switches Fast Ethernet – Value Line

8-Port Managed Entry-level Ethernet Switches

- Supports the automation protocols Modbus/TCP, PROFINET RT and EtherNet/IP
- Turbo Ring and Turbo Chain with fast recovery time (<20 ms @ 250 switches)
- IGMP snooping, QoS, port- and tag-based VLAN
- Configurable error messages via SNMP trap, e-mail or relay output
- User-friendly, web-based configuration and management

Technical data

Standards
- IEEE 802.3 for 10BaseT
- IEEE 802.3u for 100BaseT(X) and 100BaseFX
- IEEE 802.3x for Flow Control
- IEEE 802.1D-2004 for Spanning Tree Protocol
- IEEE 802.1w for Rapid STP
- IEEE 802.1p for Class of Service
- IEEE 802.1Q for VLAN Tagging

Protocols
- IGMPv1/v2
- GMRP
- GVRP
- SNMPv1/v2c/v3
- DHCP Server/Client
- TFTP
- SNTP
- SMTP
- RARP
- RMON
- HTTP
- Telnet
- Syslog
- DHCP Option 66/67/82
- BootP
- LLDP
- Modbus/TCP
- PROFINET RT (PROFINET-IO device in compliance with Conformance Class B)
- EtherNet/IP (CIP support)
- IPv6

MIB
- MIB II
- Ethernet-like MIB
- P-BRIDGE MIB
- Bridge MIB
- RSTP MIB
- RMON MIB Group 1, 2, 3, 9
- Private MIB

Flow Control
- IEEE 802.3x flow control
- back pressure flow control

Switch Properties
- MAC Table Size 8K
- Packet Buffer Size 1 MBit

Interface
- Fibre Ports 100BaseFX ports (SC/ST connector)
- RJ45 Ports 10/100BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection
- Console Port RS 232 (RJ45 connector)
- DIP Switches Turbo Ring, Master, Coupler, Reserve
- LED Indicators PWR1, PWR2, FAULT, MSTR/HEAD, CPLR/TAIL, 10/100M
- Alarm Contact 1 relay output with current carrying capacity of 1 A @ 24 V DC

Optical Fibre
- 100BaseFX
  - multimode
  - singlemode
- Wavelength 1300 nm
- Max. TX -10 dBm
- Min. TX -20 dBm
- RX Sensitivity -32 dBm
- Link Budget 20 dB

Flow Control
- IEEE 802.3x flow control
- back pressure flow control

Power Requirements
- Input Voltage 24 V DC (12 to 46 V DC), redundant dual inputs
- Input Current IE-SW-VL08MT-8TX: 0.26 A @ 24 V
- IE-SW-VL08MT-6TX-2ST/2SC/2SCS: 0.35 A @ 24 V
- IE-SW-VL08MT-5TX-3SC/1SC-2SCS: 0.32 A @ 24 V

Alarm Conditions
- Present

Physical Characteristics
- Housing Metal, IP 30 protection
- Dimensions (W x H x D) 105.0 mm (4.1 in) x 53.6 mm (2.1 in)
- Weight IE-SW-VL08MT...8TX/6TX: 650 g
- IE-SW-VL08MT...5TX/3SC/1SC-2SCS: 890 g

Physical Characteristics

Installed
- View</raw_text>
Managed Fast Ethernet Switches

- Supports the automation protocols Modbus/TCP, PROFINET RT and EtherNet/IP
- Plug-n-play Turbo Ring and Turbo Chain (<20 ms @ 250 switches)
- IEEE 1588 PTP, Modbus/TCP, LLDP, SNMP Inform, DoS, IGMP snooping, VLAN, IEEE 802.1x, HTTPS, SNMPv3, and SSH supported

Technical data

### Standards
- IEEE 802.3 for 10BaseT
- IEEE 802.3u for 100BaseT (X)
- IEEE 802.3 for Flow Control
- IEEE 802.10 for Spanning Tree Protocol
- IEEE 802.1w for Rapid STP
- IEEE 802.1Q for VLAN Tagging
- IEEE 802.1p for Class of Service
- IEEE 802.1x for Authentication

### Protocols
- IGMPv1/v2
- SNMPv1/v2c
- DHCP
- HTTP
- HTTPS
- Telnet
- Syslog
- SSH
- SNMP

### Flow Control
- IEEE 802.3x flow control
- Back pressure flow control

### Management
- IEEE 802.1D-2004
- IEEE 802.1Q
- IEEE 802.1w
- IEEE 802.1X
- LLDP
- RMON MIB Group 1, 2, 3, 9
- RMON-MIB
- MIB-II
- Ethernet-Like MIB
- P-BRIDGE MIB
- Q-BRIDGE MIB
- Bridge MIB
- RSTP MIB

### Security
- ATEX Zone 2 Ex nA nC IIC T4 Gc
- Hazardous Location: UL/cUL Class I, Division 2, Groups A, B, C and D; ATEX Zone 2 Ex eX nRd IC T4 Gc
- Safety: UL 508, UL 60950-1, CSA C22.2 No. 60950-1, EN60950-1

### Performance
- MTBF (mean time between failures)
  - Standard Models: 247,000 hrs
  - Wide Temp. Models: 339,000 hrs

### Reliability
- Ambient Relative Humidity: 5 to 95 % (non-condensing)
- Storage Temperature: -40 to 85 °C (-40 to 185 °F)
- Operating Temperature: 0 to 60 °C (32 to 140 °F)

### Environmental
- Rain: 135.0 mm (5.3 in)
- Vibration: 9.0 mm (0.4 in)
- Shock: 9.0 mm (0.4 in)
- Freefall: 9.0 mm (0.4 in)

### Power Requirements
- Overload Current Protection: Present
- Connection: 2 removable 6-contact terminal blocks
- Reverse Polarity Protection: Present

### Regulatory Approvals
- EMI: FCC Part 15, CISPR EN55022 class A
- EMC: EN61000-4-2 (ESD): level 3; EN61000-4-3 (RS) level 3; EN61000-4-4 (EFT) level 3; EN61000-4-5 (Surge) level 3; EN61000-4-6 (CMI) level 3; EN61000-4-8

### Data Rates
- 10BaseT: 20/100 Mbit/s
- 100BaseFX: 100 Mbit/s

### Dimensions
- IE-SW-PL08M Series: 80.2 x 135 x 105 mm (3.16 x 5.31 x 4.13 in)
- IE-SW-PL16M Series: 94 x 135 x 142.7 mm (3.7 x 5.31 x 5.62 in)

### Weight
- IE-SW-PL08M: 1040 g
- IE-SW-PL16M: 1586 g

### Warranty
- Warranty Period: 5 years

<table>
<thead>
<tr>
<th>Version</th>
<th>Model Type</th>
<th>Operating Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 * RJ45</td>
<td>IE-SW-PL08M/STX</td>
<td>0 to 60 °C</td>
</tr>
<tr>
<td>8 * RJ45</td>
<td>IE-SW-PL08M/FTX</td>
<td>0 to 60 °C</td>
</tr>
<tr>
<td>8 * RJ45</td>
<td>IE-SW-PL16M/STX</td>
<td>0 to 60 °C</td>
</tr>
<tr>
<td>8 * RJ45</td>
<td>IE-SW-PL16M/FTX</td>
<td>0 to 60 °C</td>
</tr>
<tr>
<td>8 * RJ45</td>
<td>IE-SW-PL16M/STX</td>
<td>0 to 60 °C</td>
</tr>
<tr>
<td>8 * RJ45</td>
<td>IE-SW-PL16M/FTX</td>
<td>0 to 60 °C</td>
</tr>
<tr>
<td>16 * RJ45</td>
<td>IE-SW-PL16M/STX</td>
<td>0 to 60 °C</td>
</tr>
<tr>
<td>16 * RJ45</td>
<td>IE-SW-PL16M/FTX</td>
<td>0 to 60 °C</td>
</tr>
<tr>
<td>16 * RJ45</td>
<td>IE-SW-PL16M/STX</td>
<td>0 to 60 °C</td>
</tr>
<tr>
<td>16 * RJ45</td>
<td>IE-SW-PL16M/FTX</td>
<td>0 to 60 °C</td>
</tr>
</tbody>
</table>
Managed Switches Gigabit Ethernet – Premium Line

Managed Gigabit Ethernet Switches
- Supports the automation protocols Modbus/TCP, PROFINET RT and EtherNet/IP
- 2 Gigabit Ethernet ports for redundant ring and 1 Gigabit Ethernet port for uplink solution
- Ring redundancy with fast recovery time (≤ 20 ms @ 250 switches)
- IEEE 1588 PTP, LLDP, SNMP Inform, QoS, IGMP snooping, VLAN, IEEE 802.1X, HTTPS, SNMPv3, and SSH supported

Technical data

Standards
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT (X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP Protocols
IGMPv1/v2
GMRP
GVRP
SNMPv1/v2c/v3
DHCP Server/Client
BootP
TFTP
SNTP
SMTP
RARP
RMON
HTTP
HTTPS
Telnet
Syslog
DHCP Option 66/67/82
SSH
SNMP Inform
Modbus/TCP
PROFINET RT (PROFINET-IO device in compliance with Conformance Class B)
EtherNet/IP (CIP support)
LLDP
IEEE 1588 PTP
IPv6

MIBs
MIB-II
Ethernet-Like MIB
P-BRIDGE MIB
Q-BRIDGE MIB
Bridge MIB
RSTP MIB
RMON MIB Group 1, 2, 3, 9
Private MIB

Flow Control
IEEE 802.3x flow control - back pressure flow control

Switch Properties
Priority Queues 4
Max. Number of Available VLANs 64
VLAN ID Range VID 1 to 4094
MAC Table Size 8 K
Packet Buffer Size 1 MBit

Interface
Fibre Ports 1000BaseSFP Slot
(1000BaseSFP modules are not supported)
RJ45 Ports 10/100/1000BaseT(X) or 10/100/1000BaseT(X) auto negotiation
Console Port RS 232 (RJ45 connector)
DP Switches Turbo-Ring, Master, Coupler, Reserve
LED Indicators PWR1, PWR2, FAULT, 10/100M (TP-Port), 1000M (Gigabit-Port), MSTR/HEAD, CPLR/TAIL
Alarm Contact 2 relay outputs with current carrying capacity of 1 A @ 24 V DC
Digital Inputs 2 inputs with the same ground, but electrically isolated from the electronics
• +13 to +30 V for state “1”
• -30 to +3 V for state “0”
• Max. input current: 8 mA

Power Requirements
Input Voltage 24 V DC (12 to 45 V DC), redundant dual inputs
Input Current IE-SW-PL10M-3GT-7TX: 0.65 A @ 24 V
IE-SW-PL10M-1GT-2GS-7TX: 0.44 A @ 24 V
Overload Current Protection Present
Connection 2 removable 6-contact terminal blocks
Reverse Polarity Protection Present

Physical Characteristics
Housing Metal, IP 30 protection
Dimensions (W x H x D) 80.2 x 135 x 105 mm (3.16 x 5.31 x 4.13 in)
Weight 1170 g
Installation TS 35, wall mounting (with optional mounting kit)

Power Requirements
Input Voltage 24 V DC (12 to 45 V DC), redundant dual inputs
Input Current 0.65 A @ 24 V
Overload Current Protection Present
Connection 2 removable 6-contact terminal blocks
Reverse Polarity Protection Present

Environmental Limits
Operating Temperature Standard Models: 0 to 60 °C (32 to 140 °F);
Wide Temp. Models: -40 to 75 °C (-40 to 167 °F)
Storage Temperature -40 to 85 °C (-40 to 185 °F)
Ambient Relative Humidity 5 to 95 % (non-condensing)

Regulatory Approvals
Safety UL 508, UL 60950-1, CSA C22.2 No. 60950-1
Hazardous Location UL/CE, Class I, Division 2, Groups A, B, C and D,
ATEX Zone 2 Ex e x nC IC T4 Ge
UL
IEC 61644-2 (IEC), level 3; EN61644-4-3 (RS), level 3;
EN61644-4-4 (ET), level 3; EN61644-5 (Surge), level 3;
EN61644-6-4 (CS), level 3; EN61644-6-8

Shock
IEC 60068-2-27

Vibration
IEC 60068-2-32

MTBF (mean time between failures)
Time 204.000 hrs

Warranty
Warranty Period 5 years

Ordering data
Version Model Type Operating Order No.
Temperature Temperature
0 to 60 °C 3 * RJ45 10/100/1000BaseT(X), 0 to 60 °C 1241290000
IE-SW-PL10M-3GT-7TX
0 to 60 °C -40 to +75 °C 1 * RJ45 10/100/1000BaseT(X), 1286930000
2 * Slots 1000BaseSFP, 0 to 60 °C IE-SW-PL10MT-1GT-2GS-7TX
-40 to +75 °C 1241300000

Accessories
Model Type Order No.
External Backup and 19" Rack Mounting Kit EBR-Modul RS232
Restore Module RM-KIT 1241430000
IE-WALLMOUNT-KIT-46MM 1241440000

Note
The IE-SW-PL10M 1GT-2GD-7TX supports up to 2x 1000Base SFP slots. Corresponding SFP modules for
Gigabit Ethernet, see page F.8.
Managed Gigabit Ethernet Switches

- Supports the automation protocols Modbus/TCP, PROFINET RT and EtherNet/IP
- 2 Gigabit Ethernet ports plus 16 Fast Ethernet ports for copper and fibre
- Ring redundancy with rapid recovery time (≤ 20 ms @ 250 switches)
- IEEE 1588 PTP, LLDP, SNMP Inform, OoS, IGMP snooping, VLAN, IEEE 802.1X, HTTPS, SNMPv3, and SSH supported

Technical data

**Standards**

IEEE 802.3 for 10BaseT ▪ IEEE 802.3u for 100BaseT(X) and 100BaseFX ▪ IEEE 802.1Q for VLAN Tagging ▪ IEEE 802.1p for Class of Service ▪ IEEE 802.1x for Authentication ▪ IEEE 802.3ad for Port-Trunk mit LACP

**Protocols**

IGMPv1/v2 ▪ GMIPv4 ▪ IPv6 ▪ IPv4/6 ▪ VLAN ▪ RARP ▪ RIP ▪ IGMP snooping, VLAN, IEEE 802.1X, HTTPS, SNMPv3, and SSH supported

**Physical Characteristics**

- Housing: Metal, IP 30 protection
- Environment: 5 to 95 % (non-condensing)
- Installation: TS 35, wall mounting (with optional mounting kit)
- Weight: 1630 g
- Dimensions (W x H x D): 94 x 135 x 142.7 mm (3.7 x 5.31 x 5.62 in)
- Power Requirements: 24 V DC (12 to 45 V DC), redundant dual inputs
- Overload Current Protection: Present
- Reverse Polarity Protection: Present
- EMC: FCC Part 15, CISPR (EN55022) Class A
- Safety: UL 508, UL 60950-1, CSA C22.2 No. 60950-1, EN60950-1

**Ordering data**

<table>
<thead>
<tr>
<th>Version</th>
<th>Model Type</th>
<th>Operating Temperature</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>16 * RJ45 10/100BaseT(X)</td>
<td>IE-SW-PL18M-SC/ST/SCS</td>
<td>0 to +60 °C</td>
<td>1241320000</td>
</tr>
<tr>
<td>2 * Combo Ports</td>
<td>IE-SW-PL18M-SC/ST/SCS</td>
<td>-40 to -75 °C</td>
<td>1286970000</td>
</tr>
<tr>
<td>14 * RJ45 10/100BaseT(X)</td>
<td>IE-SW-PL18M-SC/ST/SCS</td>
<td>0 to +60 °C</td>
<td>1243300000</td>
</tr>
<tr>
<td>2 * Combo Ports</td>
<td>IE-SW-PL18M-SC/ST/SCS</td>
<td>-40 to -75 °C</td>
<td>1286990000</td>
</tr>
<tr>
<td>TE * RJ45 10/100BaseT(X)</td>
<td>IE-SW-PL18M-SC/ST/SCS</td>
<td>0 to +60 °C</td>
<td>1243400000</td>
</tr>
<tr>
<td>2 * Combo Ports</td>
<td>IE-SW-PL18M-SC/ST/SCS</td>
<td>-40 to -75 °C</td>
<td>1287000000</td>
</tr>
</tbody>
</table>

**Power Requirements**

- Input Voltage: 24 V DC (12 to 45 V DC), redundant dual inputs
- Input Current: IE-SW-PL18M-SC/ST/SCS: 0.51 A @ 24 V
- Overload Current Protection: Present
- Connection: 2 removable ( NC contact terminal blocks
- Physical Characteristics

**Switch Properties**

- Priority Queues: 4
- Max. Number of Available VLANs: 64
- VLAN ID Range: 1 to 4094
- IGMP Groups: 256
- MAC Table Size: 8 K
- Packet Buffer Size: 2 Mbit
- Fibre Ports: 100BaseFX (SC/ST connection) and 1000BaseSFP slot
- RALS Ports: 10/100BaseT(X) or 10/100/1000BaseT(X) auto negotiation
- Console Port: RS 232 (RJ45 connector)
- Alarm Contact: 2 mitor outputs with current carrying capacity of 1 A @ 24 V DC
- Digital Inputs: 2 inputs with the same ground, but electrically isolated from the electronics.
  - +13 to +30 V for state “1”
  - -30 to +3 V for state “0”
  - Max. input current: 8 mA

**Optical Fibre**

<table>
<thead>
<tr>
<th>100BaseFX</th>
<th>multimode</th>
<th>singlemode</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wavelength</td>
<td>1300 nm</td>
<td>1310 nm</td>
</tr>
<tr>
<td>Min. TX</td>
<td>-20 dBm</td>
<td>0 dBm</td>
</tr>
<tr>
<td>Min. RX</td>
<td>-20 dB</td>
<td>0 dB</td>
</tr>
<tr>
<td>Link Budget</td>
<td>12 dB</td>
<td>29 dB</td>
</tr>
<tr>
<td>Typical Distance</td>
<td>5 km (50/125 μm)</td>
<td>4 km (62,5/125 μm)</td>
</tr>
<tr>
<td>Saturation</td>
<td>-6 dBm</td>
<td>-3 dBm</td>
</tr>
</tbody>
</table>

**Power Requirements**

- Input Voltage: 24 V DC (12 to 45 V DC), redundant dual inputs
- Input Current: IE-SW-PL18M-SC/ST/SCS: 0.51 A @ 24 V
- Overload Current Protection: Present
- Connection: 2 removable ( NC contact terminal blocks
- Physical Characteristics

**Switch Properties**

- Priority Queues: 4
- Max. Number of Available VLANs: 64
- VLAN ID Range: 1 to 4094
- IGMP Groups: 256
- MAC Table Size: 8 K
- Packet Buffer Size: 2 Mbit
- Fibre Ports: 100BaseFX (SC/ST connection) and 1000BaseSFP slot
- RALS Ports: 10/100BaseT(X) or 10/100/1000BaseT(X) auto negotiation
- Console Port: RS 232 (RJ45 connector)
- Alarm Contact: 2 mitor outputs with current carrying capacity of 1 A @ 24 V DC
- Digital Inputs: 2 inputs with the same ground, but electrically isolated from the electronics.
  - +13 to +30 V for state “1”
  - -30 to +3 V for state “0”
  - Max. input current: 8 mA

**Optical Fibre**

<table>
<thead>
<tr>
<th>100BaseFX</th>
<th>multimode</th>
<th>singlemode</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wavelength</td>
<td>1300 nm</td>
<td>1310 nm</td>
</tr>
<tr>
<td>Min. TX</td>
<td>-20 dBm</td>
<td>0 dBm</td>
</tr>
<tr>
<td>Min. RX</td>
<td>-20 dB</td>
<td>0 dB</td>
</tr>
<tr>
<td>Link Budget</td>
<td>12 dB</td>
<td>29 dB</td>
</tr>
<tr>
<td>Typical Distance</td>
<td>5 km (50/125 μm)</td>
<td>4 km (62,5/125 μm)</td>
</tr>
<tr>
<td>Saturation</td>
<td>-6 dBm</td>
<td>-3 dBm</td>
</tr>
</tbody>
</table>
**Managed Switches Gigabit Ethernet – Premium Line**

**Managed Full Gigabit Ethernet Switch**
- Supports the automation protocols Modbus/TCP, PROFINET RT and EtherNet/IP
- 4 10/100/1000BaseT(X) ports plus 5 combo (10/100/1000BaseT(X) or 100G/1000BaseSFP slot) Gigabit ports
- Ring redundancy with rapid recovery time (≤ 20 ms @ 250 switches)
- IEEE 1588 PTP, LLDP, SNMP Inform, QoS, IGMP snooping, VLAN, IEEE 802.1X, HTTPS, SNMPv3, and SSH supported

**Technical data**

**Standards**
- IEEE 802.3 for 10BaseT
- IEEE 802.3u for 100BaseT (X)
- IEEE 802.3ab for 1000BaseT(X)
- IEEE 802.3z for 1000BaseX
- IEEE 802.3x for Flow Control
- IEEE 802.1D-2004 for Spanning Tree Protocol
- IEEE 802.1w for Rapid STP
- IEEE 802.1Q for VLAN Tagging
- IEEE 802.1p for Class of Service
- IEEE 802.1X for Authentication
- IEEE 802.3ad for Port Trunk with LACP

**Protocols**
- IGMPv1/v2
- GMRP
- GVRP
- SNMPv1/v2c/v3
- DHCP Server/Client
- DHCP Option
- IGMPv1/v2
- Bootstrap Protocol
- SNTP
- SMTP
- RMON
- HTTP
- Telnet
- SSH
- Syslog
- Modbus/TCP
- PROFINET RT (PROFINET-IO device in compliance with Conformance Class B)
- EtherNet/IP (CIP support)
- SNMP Inform
- LLDP
- IEEE 1588 PTP
- IPv6

**MIB**
- MIB-II
- Ethernet-Like MIB
- P-BRIDGE MIB
- Q-BRIDGE MIB
- Bridge MIB
- RSTP MIB
- RMON MIB Group 1, 2, 3, 9
- Private MIB

**Flow Control**
- IEEE 802.3x flow control
- Back pressure flow control

**Switch Properties**
- Priority Queues: 4
- Max. Number of Available VLANs: 64
- VLAN ID Range: 1 to 4094
- IGMP Groups: 256
- MAC Table Size: 8 K
- Packet Buffer Size: 1 Mbit

**Interface**
- Fiber Ports: 10/100/1000Base SFP Slot
- AES6 Ports: 10/100/1000BaseX auto negotiation
- Console Port: RS-232 (RJ45 connector)
- DIP Switches: Turbo-Ring, Master, Coupler, Reserve

**LED Indicators**
- PWR1, PWR2, FAULT, 10/100/1000M, MSTR/HEAD, CPLR/TAIL
- Alarm Contact: 2 relay outputs with current carrying capacity of 1 A @ 24 V DC

**Alarm Inputs**
- 2 inputs with the same ground, but electrically isolated from the electronics
- +13 to +30 V for state “1”
- -30 to +3 V for state “0”
- Max. input current: 8 mA

**Power Requirements**
- Input Voltage: 12/24/48 V DC
- Input Current: 0.81 A @ 24 V
- Overload Current Protection: Present
- Connection: 2 removable 6-contact terminal blocks
- Surge Voltage Protection: Present

**Physical Characteristics**
- Housing: Metal, IP 30 protection
- Dimensions (W x H x D): 87.1 x 135 x 107 mm (3.43 x 5.31 x 4.21 in)
- Weight: 1510 g
- Installation: 15 mm, wall mounting (with optional mounting kit)

**Environmental Limits**
- Operating Temperature: Standard Models: 0 to 60 °C (32 to 140 °F)
- Storage Temperature: -40 to 85 °C (-40 to 185 °F)
- Ambient Relative Humidity: 5 to 95 % (non-condensing)

**Regulatory Approvals**
- Safety: UL 508, EN60950-1
- EMC: EN61000-4-2 (ESD), level 3; EN61000-4-3 (RS), level 3; EN61000-4-4 (EFT), level 3; EN61000-4-5 (Surge), level 3; EN61000-4-6 (CS), level 3; EN61000-4-8
- Maritime: DNV, GL

**Warranty**
- Warranty Period: 5 years

**Ordering data**

<table>
<thead>
<tr>
<th>Version</th>
<th>Model Type</th>
<th>Operating Temperature</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 * RJ45 10/100/1000BaseT(X)</td>
<td>IE-SW-PL09M-5GC-4GT</td>
<td>0 to 60 °C</td>
<td>1261370000</td>
</tr>
<tr>
<td>5 * Combo Ports</td>
<td>IE-SW-PL09MT-5GC-4GT</td>
<td>-40 to +75 °C</td>
<td>1287020000</td>
</tr>
</tbody>
</table>

**Accessories**

<table>
<thead>
<tr>
<th>Model Type</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>External Backup and Restore Module</td>
<td>EBR-Modul RS232</td>
</tr>
<tr>
<td>19” Rack Mounting Kit</td>
<td>RM-KIT</td>
</tr>
<tr>
<td>Wall mounting kit</td>
<td>IE-WALLMOUNT-KIT-46MM</td>
</tr>
</tbody>
</table>

**Note**

The IE-SW-PL09M series supports up to 5x 100/1000Base SFP slots. Corresponding SFP modules for Fast/ Gigabit Ethernet, see page F.8.
Power over Ethernet (PoE) describes a process where power can be supplied to a network-compatible device over the 8-wire Ethernet cable. In a narrower sense, PoE today means the IEEE 802.3af (DTE Power over MDI) standard which was adopted in June 2003.

The main advantage of Power over Ethernet is that you do not require a separate power supply cable and so can install Ethernet devices in hard-to-reach places or in areas where there is not sufficient room for many cables. This means that you can save some significant installation costs, and that you can also integrate the power supply into a central uninterruptible power supply (UPS) to improve the reliability of the connected devices.

PoE is used by network devices that need small amounts of power. It is typically used for IP telephones, network cameras, operating panels or wireless communications devices such as WLAN access points.

Weidmüller PoE switches support the IEEE 802.3at standard (also known as PoE+) and can therefore supply end devices with up to 30 W per PoE port.

Weidmüller PoE switches also offer further advantages by their simple power supply needs. They do not require an additional 48 V supply in addition to the standard 24 V supply.
Unmanaged Fast Ethernet PoE+ Switch

- 4 IEEE 802.3af/at compliant PoE ports
- Up to 30 watts per PoE port
- 24/48 V DC redundant wide-range power supply
- Integrated DC/DC converter can supply 48 V-PoE devices across the entire input voltage range of 24 to 48 V DC
- Intelligent power consumption detection and classification
- Broadcast Storm Protection

Technical data

<table>
<thead>
<tr>
<th>Technology</th>
<th>Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>- IEEE 802.3 for 10BaseT</td>
<td></td>
</tr>
<tr>
<td>- IEEE 802.3u for 100BaseT(X) and 100BaseFX</td>
<td></td>
</tr>
<tr>
<td>- IEEE 802.3x for Flow Control</td>
<td></td>
</tr>
</tbody>
</table>

| Flow Control | IEEE 802.3x flow control, back pressure flow control |

<table>
<thead>
<tr>
<th>Switch Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>- MAC table size</td>
</tr>
<tr>
<td>- Packet buffer size</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Fibre-optic ports: 10/100BaseX ports (SC/ST connector, multimode)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RJ45 Ports</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/100BaseT(X) auto negotiation speed, Full/Half duplex mode, and auto MDI/MDI-X connection</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DIP Switches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enable/disable broadcast storm protection</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PoE pin assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>V-, V+, V- for pin 1, 2, 3, 6 (endspan, MDI-X alternative A)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LED Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>PWR1, PWR2, 10/100M (TP-Port), 100M (Fibre-optic port), PoE</td>
</tr>
</tbody>
</table>

Optical Fibre

<table>
<thead>
<tr>
<th>100BaseFX mult mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wavelength</td>
</tr>
<tr>
<td>Max. Transmit power</td>
</tr>
<tr>
<td>Min. Transmit power</td>
</tr>
<tr>
<td>50 Sensitivity</td>
</tr>
<tr>
<td>Link Budget</td>
</tr>
<tr>
<td>Typical Distance</td>
</tr>
<tr>
<td>Saturation</td>
</tr>
</tbody>
</table>

Power Requirements

<table>
<thead>
<tr>
<th>Input Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>24/48 (20 to 60 V) V DC, 2 redundant inputs</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Input Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max 7.5 A @ 24 V DC (supports up to 4 ports at 30 watts per PoE port)</td>
</tr>
</tbody>
</table>

Overload Current Protection

<table>
<thead>
<tr>
<th>Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present</td>
</tr>
</tbody>
</table>

Reversal Polarity Protection

| Present |

Physical Characteristics

<table>
<thead>
<tr>
<th>Housing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminium, IP 30 protection</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dimensions (W x H x D)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 x 115 x 70 mm (1.96 x 4.52 x 2.76 in)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>375 g</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Installation</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS 35</td>
</tr>
</tbody>
</table>

Environmental Limits

<table>
<thead>
<tr>
<th>Operating Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Models: 0 to 60 °C (32 to 140 °F)</td>
</tr>
<tr>
<td>Wide Temp. Models: 0 to 105 °C (-40 to 221 °F)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Storage Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>-40 to 85 °C (-40 to 185 °F)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ambient Relative Humidity</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 to 95 % (non-condensing)</td>
</tr>
</tbody>
</table>

Regulatory Approvals

Safety

<table>
<thead>
<tr>
<th>UL 60950-1, UL 508</th>
</tr>
</thead>
</table>

EMC

| FCC Part 15 Subpart B Class A, EN 55022 Class A |
| EN61000-4-2 (ESD), level 3; EN61000-4-3 (RS), level 3; EN61000-4-4 (EFT), level 4; EN61000-4-5 (Surge), level 4; EN61000-4-6 (CS), level 3; EN61000-4-8 |

Shock

| IEC 60068-2-27 |

Freefall

| IEC 60068-2-32 |

Vibration

| IEC 60068-2-6 |

MTBF (mean time between failures)

| 645.138 hrs |

Warranty

| Warranty Period | 5 years |

Ordering data

<table>
<thead>
<tr>
<th>Version</th>
<th>Type</th>
<th>Operating Temperature</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 * RJ45 10 BaseT(X), 4 * RJ45 10 BaseT(X) PoE+</td>
<td>IE-SW-LO6-2TX-4PoE</td>
<td>0 to +60 °C</td>
<td>1241380000</td>
</tr>
<tr>
<td>4 * RJ45 10 BaseT(X) PoE+</td>
<td>IE-SW-LO6-2TX-4PoE</td>
<td>-40 to +75 °C</td>
<td>1286920000</td>
</tr>
<tr>
<td>1 * RJ45 10 BaseT(X), 1 * SC-Multimode</td>
<td>IE-SW-LO6-1TX-4PoE</td>
<td>0 to +60 °C</td>
<td>1504250000</td>
</tr>
<tr>
<td>1 * RJ45 10 BaseT(X), 1 * SC-Multimode</td>
<td>IE-SW-LO6-1TX-4PoE</td>
<td>-40 to +75 °C</td>
<td>1504260000</td>
</tr>
<tr>
<td>1 * RJ45 10 BaseT(X), 1 * ST-Multimode</td>
<td>IE-SW-LO6-1TX-4PoE</td>
<td>0 to +60 °C</td>
<td>1504290000</td>
</tr>
<tr>
<td>1 * RJ45 10 BaseT(X), 1 * ST-Multimode</td>
<td>IE-SW-LO6-1TX-4PoE</td>
<td>-40 to +75 °C</td>
<td>1504290000</td>
</tr>
<tr>
<td>4 * RJ45 10 BaseT(X) PoE+</td>
<td>IE-SW-LO6-4PoE-2SC</td>
<td>0 to +60 °C</td>
<td>1504210000</td>
</tr>
<tr>
<td>2 * SC-Multimode</td>
<td>IE-SW-LO6-4PoE-2SC</td>
<td>-40 to +75 °C</td>
<td>1504220000</td>
</tr>
<tr>
<td>2 * ST-Multimode</td>
<td>IE-SW-LO6-4PoE-2ST</td>
<td>0 to +60 °C</td>
<td>1504230000</td>
</tr>
<tr>
<td>4 * RJ45 10 BaseT(X) PoE+</td>
<td>IE-SW-LO6-4PoE-2ST</td>
<td>-40 to +75 °C</td>
<td>1504240000</td>
</tr>
</tbody>
</table>

Accessories

<table>
<thead>
<tr>
<th>Type</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>19&quot; Rack Mounting Kit</td>
<td>1241440000</td>
</tr>
<tr>
<td>Wall mounting kit</td>
<td>1504440000</td>
</tr>
</tbody>
</table>
Unmanaged Gigabit Ethernet PoE+ Switches

- Full Gigabit on all ports
- IEEE 802.3at/af compliant PoE ports
- Up to 30 W per PoE+ port
- 24/48 V DC redundant wide-range power supply
- Support for jumbo frames (9.6 KB)
- Intelligent power consumption detection and classification
- Intelligent PoE surge voltage and short-circuit protection

Technical data

<table>
<thead>
<tr>
<th>Technology</th>
<th>Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IEEE 802.3 for 10BaseT</td>
</tr>
<tr>
<td></td>
<td>IEEE 802.3u for 100BaseT(X)</td>
</tr>
<tr>
<td></td>
<td>IEEE 802.3z for 1000BaseX</td>
</tr>
<tr>
<td></td>
<td>IEEE 802.3x for Flow Control</td>
</tr>
<tr>
<td></td>
<td>IEEE 802.3af/at for Power over Ethernet</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>RJ45 Ports</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Power Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Voltage</td>
</tr>
<tr>
<td>Input Current</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ordering data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Version</td>
</tr>
<tr>
<td>1 * RJ45 10/100/1000 BaseT(X), 4 * RJ45 10/100/1000 BaseT(X) PoE+</td>
</tr>
<tr>
<td>1 * 1000BaseSFP Slot, 4 * RJ45 10/100/1000 BaseT(X) PoE+</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Accessories</th>
</tr>
</thead>
<tbody>
<tr>
<td>19&quot; Rack Mounting Kit</td>
</tr>
<tr>
<td>Wall mounting kit</td>
</tr>
</tbody>
</table>

Warranty | Warranty Period: 5 years |

MTBF (mean time between failures) | Time: 1.257.910 hrs |
Database | Telcordia (Belcore), GB |

Physical Characteristics

| Housing | Aluminium, IP 30 protection |
| Dimensions (W x H x D) | 29 x 135 x 105 mm (1.14 x 5.31 x 4.13 Zoll) |
| Weight | 360 g |
| Installation | TS 35 |

Environmental Limits

| Operating Temperature | Standard Models: 0 to 60 °C (32 to 140 °F) |
|                       | Wide Temp. Models: -40 to 75 °C (-40 to 167 °F) |
| Storage Temperature    | -40 to 85 °C (-40 to 185 °F) |
| Ambient Relative Humidity | 5 to 95 % (non-condensing) |

Regulatory Approvals

| Safety | UL 508 |
| EMC | FCC Part 15 Subpart B Class A, EN 55022 Class A |
| EN61000-4-2 (ESD), level 3 |
| EN61000-4-3 (RS), level 3 |
| EN61000-4-4, level 4 |
| EN61000-4-5 (Surge), level 4 |
| EN61000-4-6 (CS), level 3 |
| EN61000-4-8 |

Shock | IEC 60068-2-27 |

Freefall | IEC 60068-2-32 |

Vibration | IEC 60068-2-6 |

Note

The IE-SW-BLOS16G-4GTPoE series supports up to 1x 1000Base SFP slot. Corresponding SFP modules for Gigabit Ethernet, see page F.8.
6-port IEEE 802.3af/at PoE+ managed Ethernet Switch

- 4 IEEE 802.3af/at compliant PoE ports
- Up to 30 watts per PoE port
- 24/48 V DC redundant wide-range power supply
- Integrated DC/DC converter can supply 48 V PoE devices across the entire input voltage range of 24 to 48 V DC
- Extended PoE management functions, including PoE error checking or configuring the operational times of connected PoE devices

Technical data

Standards
IEEE 802.3at/af for Power over Ethernet
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT (X)
IEEE 802.3x for Flow Control
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP

Protocols
IGMPv1/v2
GMRP
GVRP
SNMPv1/v2c/v3
DHCP Option 60/67/82
BoostP
TFTP
SNTP
SMTP
RAIP
RMON
HTTP
HTTPS
Telnet
SSH
Syslog
Modbus/TCP
SNMP Inform
LLDP
IEEE 1588 PTP
IPv6

MIB
Ethernet-Like MIB
P-BRIDGE MIB
Q-BRIDGE MIB
Bridge MIB
RSTP MIB
RMN MIB Group 1, 2, 3, 9

Flow Control
IEEE 802.3x flow control
back pressure flow control

Switch Properties
Priority Queues 4
Max. Number of Available VLANs 64
VLAN ID Range VID 1 to 4094
IGMP Groups 256
MAC Table Size 8 K
Packet Buffer Size 1 MBit

Interface
RJ45 Ports 10/100BaseT(X) auto negotiation speed, Full/Half duplex mode and auto MDI/MDI-X connection
PoE pin assignment V-, V-, V+, V+ for pin 1, 2, 3, 6 (endspan, MDI-X alternative A)
Console Port RS 232 (RJ45 connector)
DIP Switches Turbo Ring, Master, Coupler, Reserve
LED Indicators PWRT, PWRF, FAULT, 1G/1000M, MSTR/HEAD, CPU/TAIL, PoE
Alarm Contact 2 relay outputs with current carrying capacity of 1 A @ 24 V DC
Alarm Contact 2 inputs with the same ground, electrically isolated

Power Requirements
Input Voltage 24/48 (20 to 60) V DC
Input Current Max. 7.8 A @ 24 V DC (supports up to 4 ports at 30 watts per PoE port)

Environmental Limits
Operating Temperature Standard Models: 0 to 60 °C (32 to 140 °F)
Wide Operating Temp. Models: -40 to 75 °C (-40 to 167 °F)

Storage Temperature 40 to 85 °C (40 to 185 °F)
Ambient Relative Humidity 5 to 95 % (non-condensing)

Regulatory Approvals
Safety UL 508
EMC EN61000-4-2 (ESD), level 3;
EN61000-4-3 (RS), level 3;
EN61000-4-4 (EFT), level 3;
EN61000-4-5 (Surge), level 3;
EN61000-4-6 (CS), level 3;
EN61000-4-8

Shock IEC 60068-2-27
Freefall IEC 60068-2-32
Vibration IEC 60068-2-6

MTBF (mean time between failures)
Time 433,000 hrs
Database Telcordia (Bellcore), GB
Warranty Warranty Period 5 years

Ordering data
Version Type Operating Temperature Order No.
2 x RJ45 10/100 BaseT(X), 4 x RJ45 10/100 BaseT(X) PoE+ IE-SW-PL06M-2TX-4PoE 0 to 60 °C 1241390000
IE-SW-PL06MT-2TX-4PoE -40 to 75 °C 1286910000

Accessories
Type Order No.
External Backup and Restore Module EBR-Modul RS232 1241430000
19” Rack Mounting Kit RM-KIT 1241440000
Wall mounting kit IE-WALLMOUNT-KIT-46MM 1504440000