Active components

Active components

Industrial Ethernet – Active components

Intelligent data distribution in the electrical cabinet: unmanaged and managed switches.
Many applications require a central switch in the switching cabinet for the decentralized setup of industrial networks. Unmanaged switches are the simplest entry point into the world of Industrial Ethernet They are self-configuring and allow you to quickly and conveniently setup industrial network infrastructures. Managed high-performance switches can be used to control the flow of data for complex demands. Simple web-interface configuration is possible by means of the integrated software program, or with a terminal emulation program using an RS232 or USB port.

Weidmüller offers all versions from 3–24 ports, in various shapes, for the ideal fit regardless of the installation requirements. Switches with fibre optic ports are also available for transmission paths which are very long or stretches exposed to high electromagnetic interference. Weidmüller also delivers versions for the electrical cabinet and versions with IP67 housing for use directly „in the field“. Industrial-standard versions are available, as are versions with an extended temperature range (-40 to +75°C). Naturally, these products comply with all relevant industrial and application testing standards.

Secure gateways between networks: the router and the GPRS alarm modem.
Routers are anywhere when multiple networks need to be connected together. Routers are responsible not only for connecting the networks but also for securing them by regulating access to nodes and data within the networks.In addition to Ethernet routers, Weidmüller offers routers for establishing connections on top of public networks, whether they are the Internet or (analogue, digital or wireless) telephone networks. If required, Weidmüller can also deliver turnkey „out-of-the-box“ solutions for the remote monitoring of industrial facilities.

Transformation and adaptation: the media converter, ComServer and WLAN bridge.
Weidmüller offers a comprehensive line of network components for adapting and converting interfaces: the ComServer can be used when devices which lack their own Ethernet interface need to be connected to the net.Media converters allow you to adapt existing interfaces by converting a copper interface to fibre-optic, or vice versa. WLAN bridges allow you to establish wireless connections between network nodes.

Overview

Switches with no management function

IE-SW5-ECO

IE-SW4/1SC-ECO

IE-SW5-ECO-FLAT

IE-SW8-ECO

IE-SW5-WAVE

IE-SW3/1SC-WAVE

IE-SW8-WAVE

IE-SW6/2ST-ECO

IE-SW8-ADVANCED

IE-SW22/2ST-ADVANCED

IE-SW8/2GBIT-ADVANCED

Switches with management function

IE-SW6/2SC-1300-M-WAVE

IE-SW8-2DIO-M-WAVE

IE-SW22/2ST-M

IP67 switches

IE-SW8-M-IP67

Decentralised I/O remotes

SAI-AU

Security router

IE-AR-100T-WAVE

Industrial wireless

IE-GPRS-I/O

SAI Bluetooth

IE-WLAN-BRIDGE-WAVE

Optical media converter

IE-MC-SC-WAVE

IE-MC-ST

Serial media converter

COMServer

Power over Ethernet

PoE Injektor

The total Industrial Ethernet solution - all from a single source

Active components




Connection elements	Cable	Power supply	Surge protection	markers	Accessories
					
					
					
					
					
					
					
Starting at Chapter C	Starting at Chapter D	Starting at Chapter E	Starting at Chapter E	Starting at Chapter E	Starting at Chapter E

Approvals and Certifications

In order to be adequately prepared for harsh industrial conditions, our products have been tested for compliance with the PLC standard IEC 61131-2:2007.

The Standard IEC 61131-2 for PLCs is entitled „Programmable Logic Controllers – Part 2: Equipment Requirements and Tests“. It describes requirements pertaining to EMC (electromagnetic compatibility), shock and vibration resistance, and environmental temperatures. These limit values in the IEC standard are fairly similar to the requirements we have encountered in the real world. Our products comply with the following basic standards in detail:

WaveLine Switches unmanaged

EMC	Shock- & vibration-test	Environment-test
EN 61000-4-2 (ESD) 6kV/8kV EN 61000-4-3 (radiated immunity) ENV 50204 @AM 10V/average 80MHz - 2,7GHz EN 61000-4-4 (burst) ~ 2kV; 2kV; I/O 4kV EN 61000-4-5 (surge) 2/1kV EN 61000-4-6 (conducted immunity) ENV 50204 @10V 150kHz - 80MHz EN 61000-4-29 (voltage variation) EN 55022 (HF E) conducted emissions 150kHz - 30MHz radiated emissions 30MHz - 1GHz pp/average radiated emissions 30MHz - 1GHz pp/qp	IEC 60068-2-6 sinusoidal vibrations frequencies: 10-57 Hz, amplitude: 0.3 mm frequencies: 57-500 Hz, acceleration: 2g IEC 60068-2-27 Shock test, half-sinusoidal shock acceleration: 15g (operating) 30g (non operating) shock period: 11ms	IEC 60068-2-1 & IEC 60068-2-2 operating -25°C ... 70°C non operating -40°C ... 85°C IEC 60068-2-14 thermal shock operating 0°C ... 60°C non operating -40°C ... 80°C IEC 60068-2-30 damp heat

WaveLine Switches managed

EMC	Shock- & vibration-test	Environment-test
EN 61000-4-2 (ESD) 6kV/8kV EN 61000-4-3 (radiated immunity) ENV 50204 @AM 10V/average 80MHz - 2,7GHz EN 61000-4-4 (burst) ~ 2kV; 2kV; I/O 4kV EN 61000-4-5 (surge) 2/1kV EN 61000-4-6 (conducted immunity) ENV 50204 @10V 150kHz - 80MHz EN 61000-4-29 (voltage variation) EN 55022 (HF E) conducted emissions 150kHz - 30MHz radiated emissions 30MHz - 1GHz pp/average radiated emissions 30MHz - 1GHz pp/qp	IEC 60068-2-6 sinusoidal vibrations frequencies: 5-8,4 Hz, amplitude: 3,5 mm frequencies: 8,4-150 Hz, acceleration: 1g IEC 60068-2-27 Shock test, half-sinusoidal shock acceleration: 15g (operating) 30g (non operating) shock period: 11ms	IEC 60068-2-1 & IEC 60068-2-2 operating -40°C ... 70°C non operating -40°C ... 85°C IEC 60068-2-14 thermal shock operating 0°C ... 55°C non operating -40°C ... 80°C IEC 60068-2-30 damp heat

WaveLine Media Converter

EMC	Shock- & vibration-test	Environment-test
EN 61000-4-2 (ESD) 6kV/8kV EN 61000-4-3 (radiated immunity) ENV 50204 @AM 10V/average 80MHz - 2,7GHz EN 61000-4-4 (burst) ~ 2kV; 2kV; I/O 4kV EN 61000-4-5 (surge) 2/1kV EN 61000-4-6 (conducted immunity) ENV 50204 @10V 150kHz - 80MHz EN 61000-4-29 (voltage variation) EN 55022 (HF E) conducted emissions 150kHz - 30MHz radiated emissions 30MHz - 1GHz pp/average radiated emissions 30MHz - 1GHz pp/qp	IEC 60068-2-6 sinusoidal vibrations frequencies: 10-57 Hz, amplitude: 0.3 mm frequencies: 57-500 Hz, acceleration: 2g IEC 60068-2-27 shock test, half-sinusoidal shock acceleration: 15g (operating) 30g (non operating) shock period: 11ms	IEC 60068-2-1 & IEC 60068-2-2 operating -25°C ... 70°C non operating -40°C ... 85°C IEC 60068-2-14 thermal shock operating 0°C ... 60°C non operating -40°C ... 80°C IEC 60068-2-30 damp heat

WaveLine COMServer / WLAN bridge

EMC	Shock- & vibration-test	Environment-test
EN 61000-4-2 (ESD) 6kV/8kV EN 61000-4-3 (radiated immunity) ENV 50204 @AM 10V/average 80MHz - 2,7GHz EN 61000-4-4 (burst) ~ 2kV; 2kV; I/O 4kV EN 61000-4-5 (surge) 2/1kV EN 61000-4-6 (conducted immunity) ENV 50204 @10V 150kHz - 80MHz EN 61000-4-29 (voltage variation) EN 55022 (HF E) conducted emissions 150kHz - 30MHz radiated emissions 30MHz - 1GHz pp/average radiated emissions 30MHz - 1GHz pp/qp	IEC 60068-2-6 sinusoidal vibrations frequencies: 10-57 Hz, amplitude: 0.3 mm frequencies: 57-500 Hz, acceleration: 2g IEC 60068-2-27 shock test, half-sinusoidal shock acceleration: 15g (operating) 30g (non operating) shock period: 11ms	IEC 60068-2-1 & IEC 60068-2-2 operating -25°C ... 70°C non operating -40°C ... 85°C IEC 60068-2-14 thermal shock operating 0°C ... 60°C non operating -40°C ... 80°C IEC 60068-2-30 damp heat

ECO-Line

EMC	Shock- & vibration-test	Environment-test
EN 61000-4-2 (ESD) 6kV/8kV		IEC 60068-2-1 & IEC 60068-2-2
EN 61000-4-3 (radiated immunity)		operating 0°C ... 60°C
ENV 50204 @AM 10V/average 80MHz - 1,0GHz		non operating -40°C ... 85°C
EN 61000-4-4 (burst) ~ 2kV; 2kV; I/O 1kV		
EN 61000-4-5 (surge) 2/1kV		
EN 61000-4-6 (conducted immunity)		
ENV 50204 @10V 150kHz - 80MHz		
EN 61000-4-11 (voltage variation)		
EN 55022 (HF E)		
conducted emissions 150kHz - 30MHz		
radiated emissions 30MHz - 1GHz pp/average		
radiated emissions 30MHz - 1GHz pp/qp		

AdvancedLine unmanaged

EMC	Shock- & vibration-test	Environment-test
EN 61000-4-2 (ESD) 6kV/8kV	IEC 60068-2-6 sinusoidal vibrations	IEC 60068-2-1 & IEC 60068-2-2
EN 61000-4-3 (radiated immunity)	frequencies: 5-9 Hz, amplitude: 3.5 mm	operating -40°C ... 75°C
ENV 50204 @AM 10V/average 80MHz - 1GHz	frequencies: 9-150 Hz, acceleration: 1g	non operating -40°C ... 75°C
EN 61000-4-4 (burst) ~ 2kV; 2kV; I/O 1kV	IEC 60068-2-27 shock test, half-sinusoidal	IEC 60068-2-14 thermal shock
EN 61000-4-5 (surge) 2/1kV	shock acceleration: 15g (operating) 30g (non operating)	operating 0°C ... 60°C
EN 61000-4-6 (conducted immunity)	shock period: 11ms	non operating -40°C ... 80°C
ENV 50204 @10V 150kHz - 80MHz		IEC 60068-2-30 damp heat
EN 61000-4-11		
EN 61000-4-29 (voltage variation)		
EN 55022 (HF E)		
conducted emissions 150kHz - 30MHz		
radiated emissions 30MHz - 1GHz pp/average		
radiated emissions 30MHz - 1GHz pp/qp		

AdvancedLine managed

EMC	Shock- & vibration-test	Environment-test
EN 61000-4-2 (ESD) 6kV/8kV	IEC 60068-2-6 sinusoidal vibrations	IEC 60068-2-1 & IEC 60068-2-2
EN 61000-4-3 (radiated immunity)	frequencies: 5-9 Hz, amplitude: 3.5 mm	operating -40°C ... 75°C
ENV 50204 @AM 10V/average 80MHz - 1GHz	frequencies: 9-150 Hz, acceleration: 1g	non operating -40°C ... 75°C
EN 61000-4-4 (burst) ~ 2kV; 2kV; I/O 1kV	IEC 60068-2-27 shock test, half-sinusoidal	IEC 60068-2-14 thermal shock
EN 61000-4-5 (surge) 2/1kV	shock acceleration: 15g (operating) 30g (non operating)	operating 0°C ... 60°C
EN 61000-4-6 (conducted immunity)	shock period: 11ms	non operating -40°C ... 80°C
ENV 50204 @10V 150kHz - 80MHz		IEC 60068-2-30 damp heat
EN 61000-4-11		
EN 61000-4-29 (voltage variation)		
EN 55022 (HF E)		
conducted emissions 150kHz - 30MHz		
radiated emissions 30MHz - 1GHz pp/average		
radiated emissions 30MHz - 1GHz pp/qp		

Media Converter

EMC	Shock- & vibration-test	Environment-test
EN 61000-4-2 (ESD) 6kV/8kV	IEC 60068-2-6 sinusoidal vibrations	IEC 60068-2-1 & IEC 60068-2-2
EN 61000-4-3 (radiated immunity)	frequencies: 5-9 Hz, amplitude: 3.5 mm	operating -40°C ... 75°C
ENV 50204 @AM 10V/average 80MHz - 1GHz	frequencies: 9-150 Hz, acceleration: 1g	non operating -40°C ... 75°C
EN 61000-4-4 (burst) ~ 2kV; 2kV; I/O 1kV	IEC 60068-2-27 shock test, half-sinusoidal	IEC 60068-2-14 thermal shock
EN 61000-4-5 (surge) 2/1kV	shock acceleration: 15g (operating) 30g (non operating)	operating 0°C ... 60°C
EN 61000-4-6 (conducted immunity)	shock period: 11ms	non operating -40°C ... 80°C
ENV 50204 @10V 150kHz - 80MHz		IEC 60068-2-30 damp heat
EN 61000-4-11		
EN 61000-4-29 (voltage variation)		
EN 55022 (HF E)		
conducted emissions 150kHz - 30MHz		
radiated emissions 30MHz - 1GHz pp/average		
radiated emissions 30MHz - 1GHz pp/qp		

IP 67 switch

EMC	Shock- & vibration-test	Environment-test
EN 61000-4-2 (ESD) 4kV/8kV	IEC 60068-2-6 sinusoidal vibrations	IEC 60068-2-1 & IEC 60068-2-2
EN 61000-4-3 (radiated immunity)	frequencies: 10-57 Hz, amplitude: 0.3 mm	operating -25°C ... 70°C
ENV 50204 @AM 10V/average 80MHz - 1GHz	frequencies: 57-500 Hz, acceleration: 2g	non operating -40°C ... 85°C
EN 61000-4-4 (burst) ~ 2kV; 2kV; I/O 2kV	IEC 60068-2-27 shock test, half-sinusoidal	IEC 60068-2-14 thermal shock
EN 61000-4-5 (surge) 0,5/1kV	shock acceleration: 15g (operating) 30g (non operating)	operating 0°C ... 60°C
EN 61000-4-6 (conducted immunity)	shock period: 11ms	non operating -40°C ... 80°C
ENV 50204 @10V 150kHz - 80MHz		IEC 60068-2-30 damp heat
EN 61000-4-11		
EN 61000-4-29 (voltage variation)		
EN 55022 (HF E)		
conducted emissions 150kHz - 30MHz		
radiated emissions 30MHz - 1GHz pp/average		
radiated emissions 30MHz - 1GHz pp/qp		

Access router

EMC	Shock- & vibration-test	Environment-test
EN 55022:1995, Class A	IEC 60068-2-6 sinusoidal vibrations	IEC 60068-2-1 & IEC 60068-2-2
EN 55024 1998	frequencies: 5-9 Hz, amplitude: 3.5 mm	operating 0°C ... 60°C
EN 61000-4-2 (ESD) 4kV/8kV	frequencies: 9-150 Hz, acceleration: 1g	non operating -20°C ... 60°C
EN 61000-4-3 (radiated immunity) @AM 10V/average 80MHz - 1GHz	IEC 60068-2-27 shock test, half-sinusoidal	IEC 60068-2-30 damp heat
EN 61000-4-4 (burst) 2kV; I/O 1kV	shock acceleration: 15g (operating) 30g (non operating)	
EN 61000-4-5 (surge) 1kV	shock period: 11ms	
EN 61000-4-6 (conducted immunity) @10V 150kHz - 80MHz		
EN 61000-4-29 (voltage variation)		
EN 55011 (HF E)		
conducted emissions 150kHz - 30MHz		
radiated emissions 30MHz - 1GHz pp/average		
radiated emissions 30MHz - 1GHz pp/qp		

GPRS-Line IO Quad

EMC	Shock- & vibration-test	Environment-test
EN 61000-4-2 (ESD) 4kV/8kV	IEC 60068-2-6 sinusoidal vibrations	IEC 60068-2-1 & IEC 60068-2-2
EN 61000-4-3 (radiated immunity)	frequencies: 5-9 Hz, amplitude: 3.5 mm	operating -10°C ... 55°C
ENV 50204 @AM 10V/average 80MHz - 1GHz	frequencies: 9-150 Hz, acceleration: 1g	non operating -10°C ... 70°C
EN 61000-4-4 (burst) ~ 2kV; 2kV; I/O 1kV	IEC 60068-2-27 shock test, half-sinusoidal	IEC 60068-2-30 damp heat
EN 61000-4-5 (surge) 0,5kV	shock acceleration: 15g (operating) 30g (non operating)	
EN 61000-4-6 (conducted immunity)	shock period: 11ms	
ENV 50204 @10V 150kHz - 80MHz		
EN 61000-4-11		
EN 61000-4-29 (voltage variation)		
EN 55022 (HF E)		
radiated emissions 30MHz - 1GHz pp/average		

WaveLine router (still in certification process)

EMC	Shock- & vibration-test	Environment-test
EN 61000-4-2 (ESD) 6kV/8kV	IEC 60068-2-6 sinusoidal vibrations	IEC 60068-2-1 & IEC 60068-2-2
EN 61000-4-3 (radiated immunity)	frequencies: 5-8,4 Hz, amplitude: 3,5 mm	operating -25°C ... 70°C
ENV 50204 @AM 10V/average 80MHz - 2,7GHz	frequencies: 8,4-150 Hz, acceleration: 1g	non operating -40°C ... 85°C
EN 61000-4-4 (burst) ~ 2kV; 2kV; I/O 4kV	IEC 60068-2-27 Shock test, half-sinusoidal	IEC 60068-2-14 thermal shock
EN 61000-4-5 (surge) 2/1kV	shock acceleration: 15g (operating) 30g (non operating)	operating 0°C ... 55°C
EN 61000-4-6 (conducted immunity)	shock period: 11ms	non operating -40°C ... 80°C
ENV 50204 @10V 150kHz - 80MHz		IEC 60068-2-30 damp heat
EN 61000-4-29 (voltage variation)		
EN 55022 (HF E)		
conducted emissions 150kHz - 30MHz		
radiated emissions 30MHz - 1GHz pp/average		
radiated emissions 30MHz - 1GHz pp/qp		

Weidmüller Device Configurator

Weidmüller has developed an in-house software solution for configuring our line of active Industrial Ethernet devices. With the Weidmüller Device Configurator, you can update the firmware or configuration on individual devices or on device groups. The Configurator enables a wide range of configurable settings which vary depending on the device.

The following products are supported by the Configurator:
– WaveLine managed switches
– WaveLine security routers
– WaveLine WLAN bridges
– WaveLine serial media converters

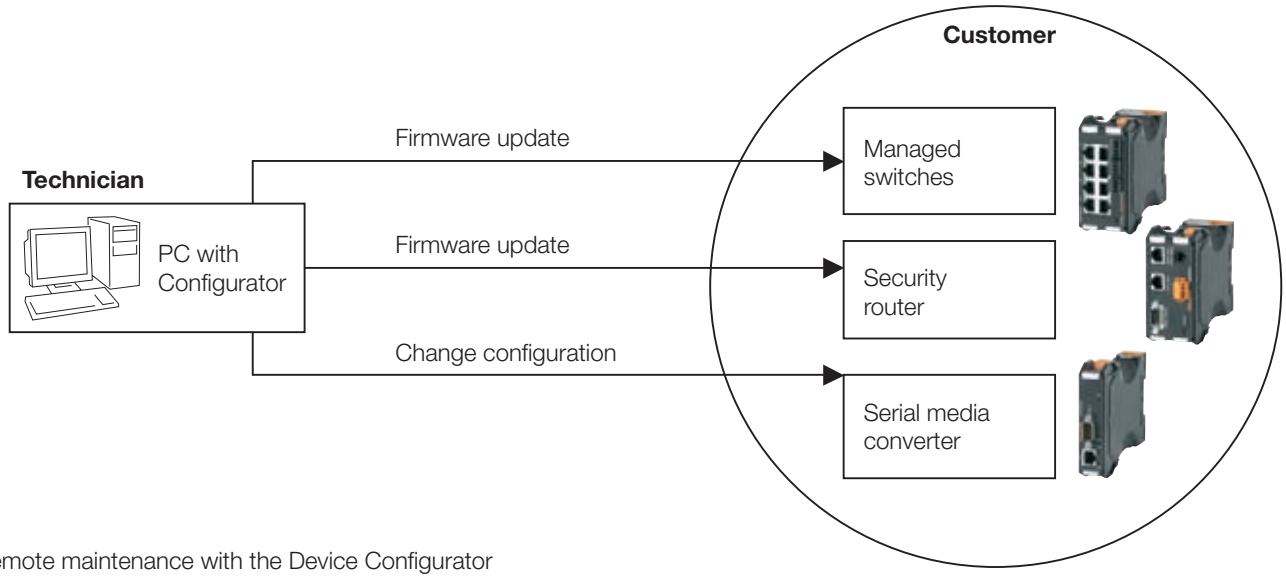
The Configurator is based on the Eclipse Rich Client platform, which requires the Java run-time environment. We are thus able to deliver our Configurator for Windows, Linux and MacOS platforms.

The Configurator can be used to perform remote maintenance, such as updating the firmware for any supported device. The PC on which the Configurator runs does not need to be connected on-site. Changes and settings can similarly be carried out using the Configurator.

Configurator characteristics include:
– Eclipse Rich Client platform and Java development/software platform
– runs under Windows, Linux and MacOS (with the relevant drivers installed)
– enables configuration of all supported devices with one program
– firmware updates for all supported devices using the Configurator
– location and group assignments to facilitate device administration

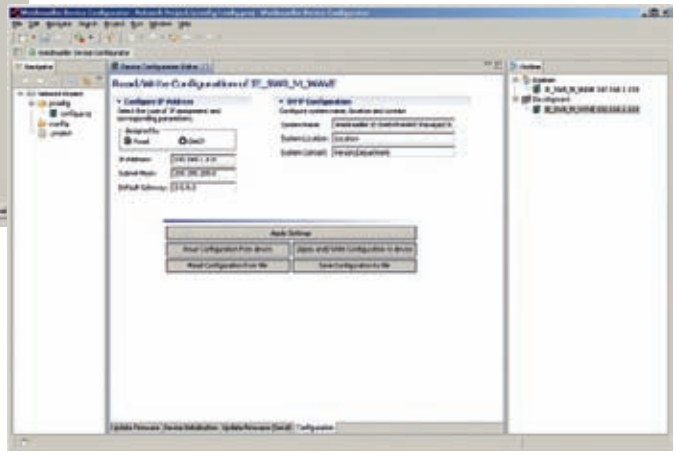
Functional scope for supported Industrial Ethernet devices, the WaveLine serial media converter and the WaveLine WLAN bridge
– full configuration of ComServer is possible within the Configurator
– setup of virtual COM port drivers WaveLine SWxx-M
– firmware can be updated via Ethernet or serial port
– configuration can be imported or exported over the Internet
– IP settings can be imported or exported
– SNMP settings can be imported or exported

Security router
– updating the firmware
– import and export of the router‘s configuration file
– export of the router‘s log file

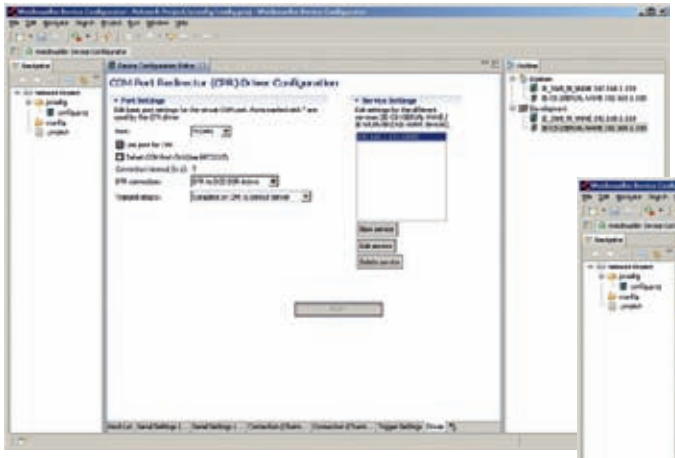


Remote maintenance with the Device Configurator

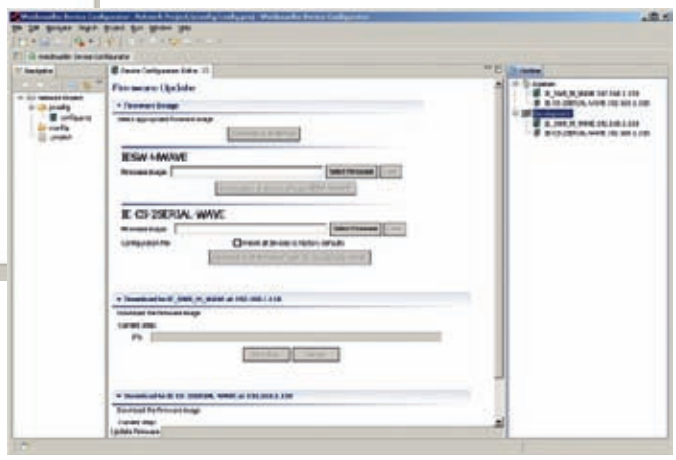
The search for supported devices



Configuring the IE-SWx-M-Wave



COM port configuration



Firmware update for a group of devices

An overview of PROFINET and EtherNet/IP components

PROFINET Class A

A great demand for communication exists within machines and facilities that have a decentralized, modular design. PROFINET can be used as a communication technology in such a setting. PROFINET is the open Industrial Ethernet standard from the PROFIBUS User Organization. It enables corporate-wide communication and automation. There are two fundamental functional classes within PROFINET. The first is PROFINET CBA (Component Based Automation). This is the original version based on a component model for communicating between intelligent automation devices (for example programmable logic controllers or PLCs). The second is PROFINET IO and is used for decentralized peripherals. This newer technology is designed for communications between controllers and decentralized field devices.

EtherNet/IP

EtherNet/IP (Ethernet Industrial Protocol) is an open standard that was developed by Rockwell Automation and the Open DeviceNet Vendor Association (ODVA) for industrial networks. EtherNet/IP is based on the Ethernet TCP/IP standards and the Common Industrial Protocol (CIP). CIP is an open standard implemented at the application layer (ISO layer 7). It is used in ControlNetTM and DeviceNetTM. This enables continuous communications between the field level and the Internet. The protocol includes both a control mechanism for cyclic, real-time I/O signal transmission (implicit messaging) and an information mechanism for configuration, diagnosis and management messages (explicit messaging).

Unmanaged Switches

WaveLine, starting at page B.14

ECOLine starting at page B.18

AdvancedLine starting at page B.23

IP67 Switches starting at page B.38

Managed Switches

WaveLine, starting at page B.32

AdvancedLine starting at page B.34

IP67 Switches starting at page B.39

Media converter

Optical media converter, starting at page B.72

Markers and labels for Industrial Ethernet components

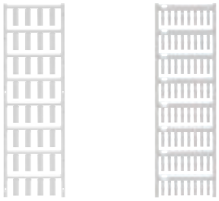
WaveLine

WS 15/5 MC BLANK

IP67

ESG 8/13.5/43.3 SAI AU

Cables and lines



SF 4.7 – 5.8 mm; 5.8 – 7.0 mm

PrintJet PRO

The PrintJet PRO inkjet printer prints markers for electric connectivity. These markers can be used for clear equipment identification on devices, cables and connectors. The labelling makes servicing, maintenance and troubleshooting much easier. Water-based ink is used for the black or spot colour printing. The print is crystal clear and resistant to environmental influences. The PrintJet PRO prints plastic markers in MultiCard format. In combination with the user-friendly M-Print® PRO software and the attached loader, the printer becomes an essential part of the production.The inkjet process being used, the subsequent fusing, as well as the printer cartridge and ink have all been specially adapted by Weidmüller for industrial use. The printer has excellent long-term use capabilities, thanks to its integrated loader.

Ordering data — **PrintJet PRO**

Type		Order No.
PrintJet PRO 115V		1024050000
PrintJet PRO 230V		1001180001
Accessories		
PJ PRO TNTK INK SET BK	Ink tank starter set, black	1027090000
PJ PRO TNTK INK SET COL	Ink tank starter set, colour	1027110000
PJ PRO TNTK INK K	● Ink tank Black	1027040000
PJ PRO TNTK INK C	● Ink tank Cyan	1027050000
PJ PRO TNTK INK M	● Ink tank Magenta	1027060000
PJ PRO TNTK INK Y	● Ink tank Yellow	1027070000
PJ PRO TNTK FL	Ink tank fluid	1027080000

Unmanaged switches

Switches are the heart of an Industrial Ethernet network infrastructure

Lack of predictability of the timing behaviour was for a long time used as an argument against the use of Ethernet in industrial applications. However, this reasoning was in most cases based on experience with early network topologies in which the network users were interconnected via so-called hubs. A hub forwards all the packets received at one port to all the other ports. Such networks use the CSMA/CD method (Carrier Sense Multiple Access with Collision Detect) to specify who may transmit and when.
In the CSMA method the station wishing to transmit listens to the channel (carrier sensing) before it transmits data. A station may transmit only when the transmission medium is not already being used by another station. If the transmission medium is in use, the station waits until it is free before sending its data. Owing to the signal propagation delays, it can nevertheless happen that two devices transmit simultaneously. In order to avoid a loss of data in a collision case, both transmitters must be able to detect the collision (collision detect) and retransmit their data packets after an arbitrarily selected delay. CSMA/CD is the customary standard for 10-Mbit networks with hubs.
Early Ethernet network topologies, some of which are still in use today, use hubs as standard because the complex switches produced in the 1980s and early 1990s were very expensive.

Plug & Play switches – ECO Line and WaveLine

The ECO Line and WaveLine from Weidmüller are cost-effective ways of gaining a foothold in the world of Industrial Ethernet. Ongoing adap-tation of our products to new technologies and the needs of our customers, enables users to set up network infrastructures for industrial applications simply and quickly.
The ECO Line products require absolutely no configuration and for many products even the pin assignment of the connecting cables is flexible thanks to their auto-crossover functionality (Auto-MDI/X). This means that they can use straight-through cables for connections between switches and terminal devices and also for connections between switches, making crossover cables no longer obligatory.
With its coherent housing design, the impressive WaveLine can be integrated together with up to eight copper ports and one optional fibre-optic connection. With an optionally extendable temperature range – from 0 °C...60 °C to –20 °C...60 °C – the WaveLine is suitable for a wide range of applications.

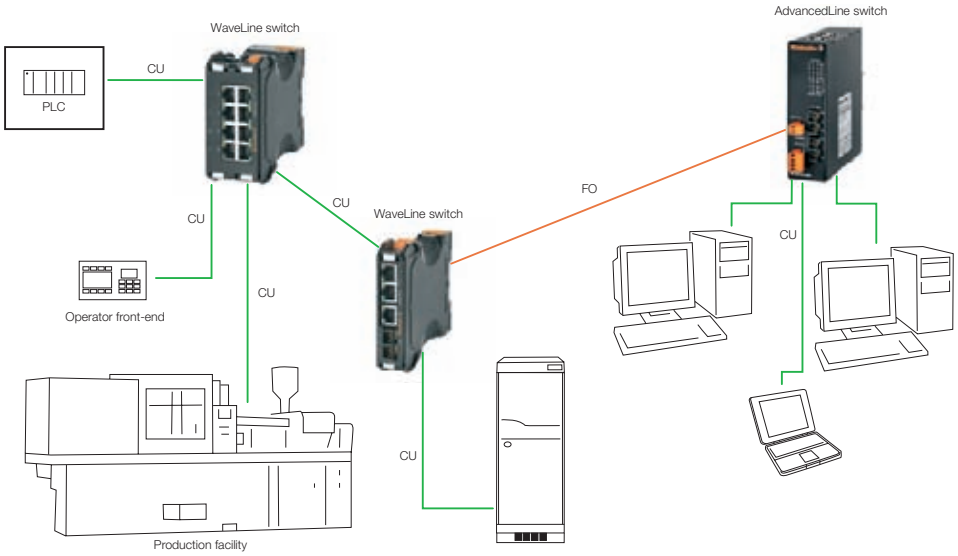
Plug & Play switches – AdvancedLine

When the demands are even greater, then we recommend Weidmüller's AdvancedLine. In addition to the new features of the WaveLine, the switches of the AdvancedLine provide further benefits for applications in tough conditions:

- All AdvancedLine models feature an extended temperature usage range from –40 to 75 °C. This allows their use in rooms without climate control and operation outside of the normal temperate zone.
- Separate routes for signal and power cables are not always possible in industrial applications. The optional FO ports ensure trouble-free operation even over long distances through strong electromagnetic fields and are available in multimode or singlemode versions.
- When upgrading networks, the uniform component width enables existing units to be exchanged for new ones with more ports without having to shift all the other components on the rail or having to extend the switching cabinet
- The products of the AdvancedLine provide users with 6 to 24 ports and two optional FO ports in a compact aluminium housing.
- The extremely wide voltage supply range guarantees stable operation even if the majority of terminal devices connected may have already shut down
- The plug-in power supply connections, which also include a redundant power supply option, enable quick connection and disconnection of the power supply when working on the network
- An MTBF time in excess of 60 years makes these switches ideal for robust and reliable Industrial Ethernet networks

Refer to Chapter W for a description of the connection possibilities for redundant power supplies.

An application example for an unmanaged switch

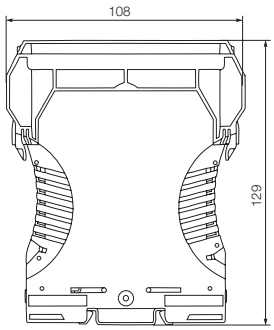


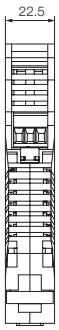
Ordering overview for unmanaged switches

Type	RJ-45	Multimode SC	Multimode SCRJ	Multimode ST	Multimode LC	Singlemode SC	Temperature range	Order No.
ECO-Line								
IE-SW5-ECO-FLAT	5	–	–	–	–	–	0 °C … 60 °C	**8833790000**
IE-SW5-ECO	5	–	–	–	–	–	0 °C … 60 °C	**8808230000**
IE-SW4/1SC-ECO	4	1	–	–	–	–	0 °C … 60 °C	**8953080000**
IE-SW4/1ST-ECO	4	–	–	1	–	–	0 °C … 60 °C	**8953060000**
IE-SW8-ECO	8	–	–	–	–	–	0 °C … 60 °C	**8829430000**
IE-SW6/2SC-ECO	6	2	–	–	–	–	0 °C … 60 °C	**8953070000**
IE-SW6/2ST-ECO	6	–	–	2	–	–	0 °C … 60 °C	**8953050000**
WaveLine								
IE-SW3-WAVE	3	–	–	–	–	–	0 °C … 60 °C	**8897710000**
IE-SW3-ETR-WAVE	3	–	–	–	–	–	–20 °C … 60 °C	**8961210000**
IE-SW3/1SC-WAVE	3	1	–	–	–	–	0 °C … 60 °C	**8896920000**
IE-SW3/1SCS20-WAVE	3	–	–	–	–	1	0 °C … 60 °C	**8953090000**
IE-SW3/1SCS20-ETR-WAVE	3	–	–	–	–	1	–20 °C … 60 °C	**8962280000**
IE-SW3/1ST-WAVE	3	–	–	1	–	–	0 °C … 60 °C	**8896930000**
IE-SW3/1LC-WAVE	3	–	–	–	1	–	0 °C … 60 °C	**8944350000**
IE-SW5-WAVE	5	–	–	–	–	–	0 °C … 60 °C	**8896940000**
IE-SW5-ETR-WAVE	5	–	–	–	–	–	–20 °C … 60 °C	**8961220000**
IE-SW6/1SC-WAVE	6	1	–	–	–	–	0 °C … 60 °C	**8896950000**
IE-SW6/1SCS20-WAVE	6	–	–	–	–	1	0 °C … 60 °C	**8953100000**
IE-SW6/1SCS20-ETR-WAVE	6	–	–	–	–	1	–20 °C … 60 °C	**8962290000**
IE-SW6/1ST-WAVE	6	–	–	1	–	–	0 °C … 60 °C	**8896960000**
IE-SW6/1LC-WAVE	6	–	–	–	1	–	0 °C … 60 °C	**8944360000**
IE-SW6/2SC-WAVE	6	2	–	–	–	–	0 °C … 60 °C	**8953770000**
IE-SW6/2SCRJ-WAVE	6	–	2	–	–	–	0 °C … 60 °C	**8953800000**
IE-SW6/2ST-WAVE	6	–	–	2	–	–	0 °C … 60 °C	**8953790000**
IE-SW8-WAVE	8	–	–	–	–	–	0 °C … 60 °C	**8896970000**
AdvancedLine								
IE-SW6/2SC-ADVANCED	6	2		–	–	–	–40 °C … +75 °C	**8942450000**
IE-SW6/2SCS-ADVANCED	6	–		–	–	2	–40 °C … +75 °C	**8942470000**
IE-SW6/2ST-ADVANCED	6	–		2	–	–	–40 °C … +75 °C	**8942460000**
IE-SW8-ADVANCED	8	–		–	–	–	–40 °C … +75 °C	**8942440000**
IE-SW14/2SC-ADVANCED	14	2		–	–	–	–40 °C … +75 °C	**8808280000**
IE-SW14/2SCS-ADVANCED	14	–		–	–	2	–40 °C … +75 °C	**8851880000**
IE-SW14/2ST-ADVANCED	14	–		2	–	–	–40 °C … +75 °C	**8808290000**
IE-SW16-ADVANCED	16	–		–	–	–	–40 °C … +75 °C	**8808270000**
IE-SW22/2SC-ADVANCED	22	2		–	–	–	–40 °C … +75 °C	**8808310000**
IE-SW22/2SCS-ADVANCED	22	–		–	–	2	–40 °C … +75 °C	**8851890000**
IE-SW22/2ST-ADVANCED	22	–		2	–	–	–40 °C … +75 °C	**8808320000**
IE-SW24-ADVANCED	24	–		–	–	–	–40 °C … +75 °C	**8808300000**

Unmanaged switch, WaveLine, 3-5 ports

• compact plastic housing





Unmanaged switch, WaveLine 3 to 5 ports

Weidmüller is continually adapting products in response to new technologies and customer needs. This allows users to setup network infrastructures within an industrial environment with speed and convenience. As a globally-recognized technical standard, Industrial Ethernet provides vendor-independent network connections and connections between the facility equipment and devices on these networks.

The WaveLine family of switches fits between 3 and 5 ports into the smallest of spaces with a compact plastic housing. With features such as auto-negotiation and auto-crossing and their operating temperature range of 0°C to +60°C, the WaveLine products are ideal for gaining a foothold in Industrial Ethernet wherever terminals have to be connected to your Ethernet in the simplest way. Our WS connector markers make labelling easy and give you an easy-to-read view into the electrical cabinet. Additional information on all appropriate labels or markers can be found in the Accessories chapter.

Ordering data

Number of ports	Type	Order No.
3 x RJ45	IE-SW3-WAVE	8897710000
3 x RJ45, 1 x SC multi-mode	IE-SW3/1SC-WAVE	8896920000
3 x RJ45, 1 x SC single-mode	IE-SW3/1SCS20-WAVE	8953090000
3 x RJ45, 1 x ST multi-mode	IE-SW3/1ST-WAVE	8896930000
3 x RJ45, 1 x LC multi-mode	IE-SW3/1LC-WAVE	8944350000
5 x RJ45	IE-SW5-WAVE	8896940000
	Single-mode design up to 120 km available on request.	

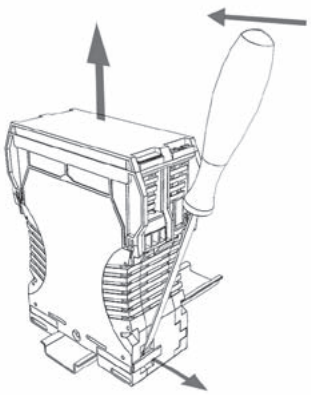
Accessories

	Type	Order No.
RJ45 dust-protection plug	IE-DPC	8813490000
markers	WS 15/5 MC NEUTRAL	1609880000
Note	Cables and connection elements are found starting at Chapter C.	

Technical data

Housing	Plastic
Length / Width / Height	108 mm / 22.5 mm / 127.8 mm
AC input voltage, min.-max.	12-24 V AC
DC input voltage, min.-max.	10-35 V DC
AC input power / DC	4 VA AC / 4 Watt DC
Input frequency	47 - 63 Hz
Operating temperature, min.-max.	0 °C-60 °C
Storage temperature, min.-max.	-40 °C-85 °C
Installation	TS 35
Protection class	IP 20
Standard	IEEE 802.3; 802.3u; 802.3x; Class I, Division 2
Data rate	10 Base-T/100 Base-TX (copper) 100 Base-FX (fibre)
Segment length	Copper, 100 m: fibre multimode, 2 km: fibre singlemode 20 km
Functionality	Autonegotiation and Autocrossing (RJ45), redundant voltage supply
Flow control	HD (backpressure) / FD (pause)
Status indication	Data rate, Power, Connection/Activity
Approvals	cULus, CE, EN55024, EN 55022, Gost R
Optical budget	8 dB for 62.5/125 µm multimode cable 4 dB for 50/125 µm multimode cable 13 dB for 9/125 µm singlemode cable
Aging	300 s
Supported protocols	Profinet RT, Modbus TCP, TCP/IP, EthernetIP

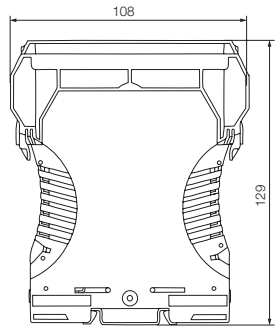
Rail assembly



Note:

Unmanaged switch,
WaveLine with extended temperature range

• compact plastic housing

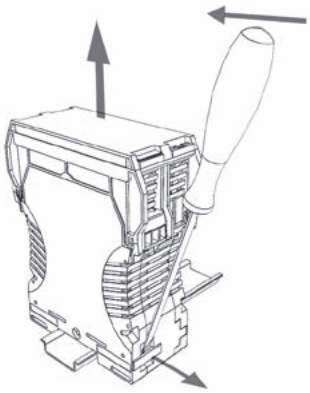


WaveLine with extended temperature range

Weidmüller is continually adapting products in response to new technologies and customer needs. This allows users to setup network infrastructures within an industrial environment with speed and convenience. As a globally-recognized technical standard, Industrial Ethernet provides vendor-independent network connections and connections between the facility equipment and devices on these networks.

The WaveLine product line integrates 3 to 5 ports in confined spaces in a compact plastic housing. With integrated features such as auto-negotiation and auto-crossing and their operating temperature range of -20°C to +60°C, the WaveLine products are ideal for gaining a foothold in Industrial Ethernet wherever terminals have to be connected to your Ethernet in the simplest way. Our WS connector markers make labelling easy and give you an easy-to-read view into the electrical cabinet. Additional information on all appropriate labels or markers can be found in the Accessories chapter.

Rail assembly



Ordering data

Number of ports
3 x RJ45
3 x RJ45, 1 x SC single-mode
5 x RJ45

Type	Order No.
IE-SW3-ETR-WAVE	**8961210000**
IE-SW3/1SCS20-ETR-WAVE	**8962280000**
IE-SW5-ETR-WAVE	**8961220000**

Single-mode design up to 120 km available on request.

Accessories

RJ45 dust-protection plug
markers

Type	Order No.
IE-DPC	**8813490000**
WS 15/5 MC NEUTRAL	**1609880000**

Note

Cables and connection elements are found starting at Chapter C.

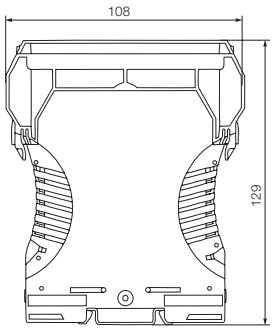
Technical data

Housing	Plastic
Length / Width / Height	108 mm / 22.5 mm / 127.8 mm
AC input voltage, min.-max.	12-24 V AC
DC input voltage, min.-max.	10-35 V DC
AC input power / DC	4 VA AC / 4 W DC
Input frequency	47 - 63 Hz
Operating temperature, min.-max.	-20 °C-60 °C
Storage temperature, min.-max.	-40 °C-85 °C
Installation	TS 35
Protection class	IP 20
Standard	IEEE 802.3; 802.3u; 802.3x; Class I, Division 2
Data rate	10 Base-T/100 Base-TX (copper) 100 Base-FX (fibre)
Segment length	Copper, 100 m: fibre multimode, 2 km: fibre singlemode 20 km
Functionality	Autonegotiation and Autocrossing (RJ45), redundant voltage supply
Flow control	HD (backpressure) / FD (pause)
Status indication	Data rate, Power, Connection/Activity
Approvals	cULus, CE, EN55024, EN 55022, Gost R
Optical budget	8 dB for 62.5/125 µm multimode cable 4 dB for 50/125 µm multimode cable 13 dB for 9/125 µm singlemode cable
Aging	300 s
Supported protocols	Profinet RT, Modbus TCP, TCP/IP, EthernetIP

Note:

Unmanaged switch, WaveLine, 6-8 ports

• compact plastic housing

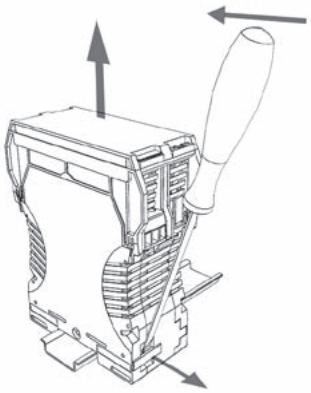


Unmanaged switch, WaveLine 6 to 8 ports

Weidmüller is continually adapting products in response to new technologies and customer needs. This allows users to setup network infrastructures within an industrial environment with speed and convenience. As a globally-recognized technical standard, Industrial Ethernet provides vendor-independent network connections and connections between the facility equipment and devices on these networks.

The WaveLine family of switches fit between 7 and 8 ports into the smallest of spaces with a compact plastic housing. With features such as auto-negotiation and auto-crossing and their operating temperature range of 0°C to +60°C, the WaveLine products are ideal for gaining a foothold in Industrial Ethernet wherever terminals have to be connected to your Ethernet in the simplest way. Our WS connector markers make labelling easy and give you an easy-to-read view into the electrical cabinet. Additional information on all appropriate labels or markers can be found in the Accessories chapter.

Rail assembly



Ordering data

Number of ports	Type	Order No.
6 x RJ45, 1 x SC multi-mode	IE-SW6/1SC-WAVE	8896950000
6 x RJ45, 1 x SC single-mode	IE-SW6/1SCS20-WAVE	8953100000
6 x RJ45, 1 x ST multi-mode	IE-SW6/1ST-WAVE	8896960000
6 x RJ45, 1 x LC multi-mode	IE-SW6/1LC-WAVE	8944360000
8 x RJ45	IE-SW8-WAVE	8896970000
	Single-mode design up to 120 km available on request.	

Accessories

	Type	Order No.
RJ45 dust-protection plug	IE-DPC	8813490000
markers	WS 15/5 MC NEUTRAL	1609880000
Note	Cables and connection elements are found starting at Chapter C.	

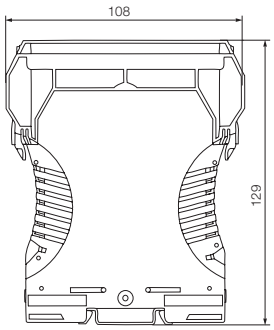
Technical data

Housing	Plastic
Length / Width / Height	108 mm / 45 mm / 127.8 mm
AC input voltage, min.-max.	12-24 V AC
DC input voltage, min.-max.	10-35 V DC
AC input power / DC	5 VA AC / 5 Watt DC
Input frequency	47 - 63 Hz
Operating temperature, min.-max.	0 °C-60 °C
Storage temperature, min.-max.	-40 °C-85 °C
Installation	TS 35
Protection class	IP 20
Standard	IEEE 802.3; 802.3u; 802.3x; Class I, Division 2
Data rate	10 Base-T/100 Base-TX (copper) 100 Base-FX (fibre)
Segment length	Copper, 100 m: fibre multimode, 2 km: fibre singlemode 20 km
Functionality	Autonegotiation and Autocrossing (RJ45), redundant voltage supply
Flow control	HD (backpressure) / FD (pause)
Status indication	Data rate, Power, Connection/Activity
Approvals	cULus, CE, EN55024, EN 55022, Gost R
Optical budget	8 dB for 62.5/125 µm multimode cable 4 dB for 50/125 µm multimode cable 13 dB for 9/125 µm singlemode cable
Aging	300 s
Supported protocols	Profinet RT, Modbus TCP, TCP/IP, EthernetIP

Note:

Unmanaged switch,
WaveLine with extended temperature range

• compact plastic housing



WaveLine with extended temperature range

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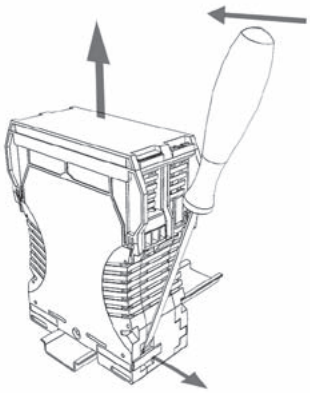
Rail assembly



Ordering data

Number of ports	Type	Order No.
6 x RJ45, 1 x SC single-mode	IE-SW6/1SCS20-ETR-WAVE	**8962290000**
6 x RJ45, 2 x SC multi-mode	IE-SW6/2SC-ETR-WAVE	**8953770000**
6 x RJ45, 2 x ST multi-mode	IE-SW6/2ST-ETR-WAVE	**8953790000**
6 x RJ45, 2 x LC multi-mode	IE-SW6/2LC-ETR-WAVE	**8953780000**
6 x RJ45, 2 x SCRJ multi-mode	IE-SW6/2SCRJ-ETR-WAVE	**8953800000**
	Single-mode design up to 120 km available on request.	

Accessories

	Type	Order No.
RJ45 dust-protection plug	IE-DPC	**8813490000**
markers	WS 15/5 MC NEUTRAL	**1609880000**
Note	Cables and connection elements are found starting at Chapter C.	

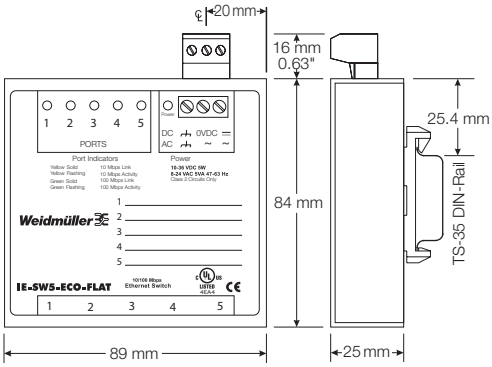
Technical data

Housing	Plastic
Length / Width / Height	108 mm / 45 mm / 127.8 mm
AC input voltage, min.-max.	12-24 V AC
DC input voltage, min.-max.	10-35 V DC
AC input power / DC	5 VA AC / 5 W DC
Input frequency	47 - 63 Hz
Operating temperature, min.-max.	0 °C-60 °C
Storage temperature, min.-max.	-40 °C-85 °C
Installation	TS 35
Protection class	IP 20
Standard	IEEE 802.3; 802.3u; 802.3x; Class I, Division 2
Data rate	10 Base-T/100 Base-TX (copper) 100 Base-FX (fibre)
Segment length	Copper, 100 m: fibre multimode, 2 km: fibre singlemode 20 km
Functionality	Autonegotiation and Autocrossing (RJ45), redundant voltage supply
Flow control	HD (backpressure) / FD (pause)
Status indication	Data rate, Power, Connection/Activity
Approvals	cULus, CE, EN55024, EN 55022, Gost R
Optical budget	8 dB for 62.5/125 µm multimode cable 4 dB for 50/125 µm multimode cable 13 dB for 9/125 µm singlemode cable
Aging	300 s
Supported protocols	Profinet RT, Modbus TCP, TCP/IP, EthernetIP

Note:

Unmanaged switch, ECO-Line 5 port flat

• Compact aluminium housing



Unmanaged switch, ECO-Line 5 port flat

The ECO-Line family of products allow you to make an affordable start in Industrial Ethernet. They feature auto-negotiation and auto-crossing integrated into a compact aluminium housing. With their operating temperature range of 0°C to +60°C, the ECO-Line products are ideal for usage wherever terminal end devices need to be connected to your Ethernet in the simplest way.

Ordering data

Number of ports	Type	Order No.
5 x RJ45	IE-SW5-ECO-FLAT	**8833790000**

Accessories

	Type	Order No.
RJ45 dust-protection plug	IE-DPC	**8813490000**
Note	Cables and connection elements are found starting at Chapter C.	

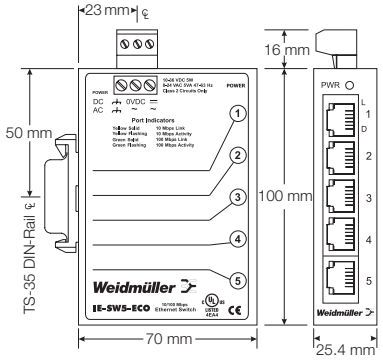
Technical data

Housing	Aluminium
Length / Width / Height	34 mm / 89 mm / 84 mm
AC input voltage, min.-max.	8-24 V AC
DC input voltage, min.-max.	10-36 V DC
AC input power / DC	5 VA AC / 5 Watt DC
Input frequency	47 - 63 Hz
Operating temperature, min.-max.	0 °C-60 °C
Storage temperature, min.-max.	-40 °C-85 °C
Installation	DIN Rail Mount TS 35
Protection class	IP 20
Standard	ANSI / IEEE 802.3; Class I, Division 2
Data rate	10BASE-T or 100BASE-TX
Segment length	Copper, 100 m: fibre (multimode), 2 km
Functionality	Autonegotiation, Autocrossing
Flow control	half-duplex/full duplex
Status indication	Power, Connection/Activity
Approvals	cULus, CE, EN55024, EN 55022, Gost R
Aging	300 s
Supported protocols	Profinet RT, Modbus TCP, TCP/IP, EthernetIP

Note:

Unmanaged switch, ECO-Line 5 port

• Compact aluminium housing



Unmanaged switch, ECO-Line 5 port

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Ordering data

Number of ports	Type	Order No.
5 x RJ45	IE-SW5-ECO	8808230000

Accessories

	Type	Order No.
RJ45 dust-protection plug	IE-DPC	8813490000
Note	Cables and connection elements are found starting at Chapter C.	

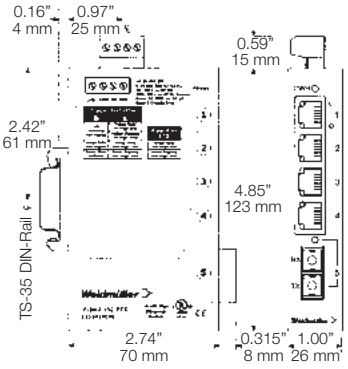
Technical data

Housing	Aluminium
Length / Width / Height	70 mm / 25.5 mm / 100 mm
AC input voltage, min.-max.	8-24 V AC
DC input voltage, min.-max.	10-36 V DC
AC input power / DC	5 VA AC / 5 Watt DC
Input frequency	47 - 63 Hz
Operating temperature, min.-max.	0 °C-60 °C
Storage temperature, min.-max.	-40 °C-85 °C
Installation	DIN Rail Mount TS 35
Protection class	IP 20
Standard	ANSI / IEEE 802.3; Class I, Division 2
Data rate	10BASE-T or 100BASE-TX
Segment length	Copper, 100 m: fibre (multimode), 2 km
Functionality	Autonegotiation, Autocrossing*
Flow control	half-duplex/full duplex
Status indication	Power, Connection/Activity
Approvals	cULus, CE, EN55024, EN 55022, Gost R
Aging	300 s
Supported protocols	Profinet RT, Modbus TCP, TCP/IP, EthernetIP

Note:

Unmanaged switch, ECO-Line 4 port

• Compact aluminium housing



Unmanaged switch, ECO-Line 4 port

Note

The ECO-Line family of products allow you to make an affordable start in Industrial Ethernet. They feature auto-negotiation and auto-crossing integrated into a compact aluminium housing. With their operating temperature range of 0°C to +60°C, the ECO-Line products are ideal for usage wherever terminal end devices need to be connected to your Ethernet in the simplest way.

Ordering data

Number of ports	Type	Order No.
4 x RJ45, 1 x SC multi-mode	IE-SW4/1SC-ECO	**8953080000**
4 x RJ45, 1 x ST multi-mode	IE-SW4/1ST-ECO	**8953060000**

Note

Accessories

	Type	Order No.
RJ45 dust-protection plug	IE-DPC	**8813490000**

Note

Cables and connection elements are found starting at Chapter C.

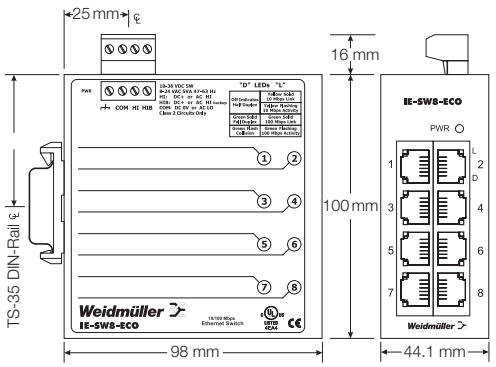
Technical data

Housing	Aluminium
Length / Width / Height	70 mm / 25.5 mm / 100 mm
AC input voltage, min.-max.	8-24 V AC
DC input voltage, min.-max.	10-36 V DC
AC input power / DC	5 VA AC / 5 W DC
Input frequency	47 - 63 Hz
Operating temperature, min.-max.	0 °C-60 °C
Storage temperature, min.-max.	-40 °C-85 °C
Installation	TS 35
Protection class	IP 20
Standard	ANSI / IEEE 802.3; Class I, Division 2
Data rate	10 Base-T/100 Base-TX (copper) 100 Base-FX (fibre)
Segment length	Copper, 100 m: fibre (multimode), 2 km
Functionality	Auto-negotiation, Auto-crossing
Flow control	half-duplex/full duplex
Status indication	Power, Connection/Activity
Approvals	cULus, CE, EN55024, EN 55022, Gost R
Optical budget	8 dB on 62.5/125 µm multi-mode cable 4 dB on 50/125 µm multi-mode cable
Aging	300 s
Supported protocols	Profinet RT, Modbus TCP, TCP/IP, EthernetIP

Note: Class I, Division 2 is pending

Unmanaged switch, ECO-Line 8 port

• Compact aluminium housing



Unmanaged switch, ECO-Line 8 port

The ECO-Line family of products allow you to make an affordable start in Industrial Ethernet. They feature auto-negotiation and auto-crossing integrated into a compact aluminium housing. With their operating temperature range of 0°C to +60°C, the ECO-Line products are ideal for usage wherever terminal end devices need to be connected to your Ethernet in the simplest way.

Ordering data

Number of ports
8 x RJ45

Type	Order No.
IE-SW8-ECO	**8829430000**

Accessories

RJ45 dust-protection plug
Note

Type	Order No.
IE-DPC	**8813490000**
Cables and connection elements are found starting at Chapter C.	

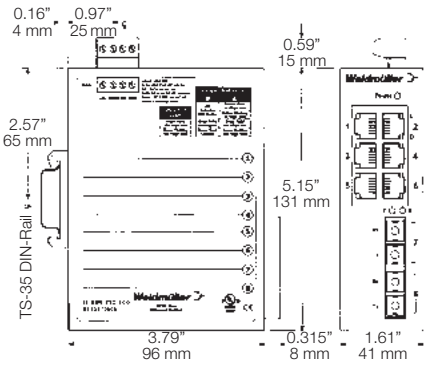
Technical data

Housing	Aluminium
Length / Width / Height	104 mm / 41 mm / 105 mm
AC input voltage, min.-max.	8-24 V AC
DC input voltage, min.-max.	10-36 V DC
AC input power / DC	6 VA AC / 6 Watt DC
Input frequency	47 - 63 Hz
Operating temperature, min.-max.	0 °C-60 °C
Storage temperature, min.-max.	-40 °C-85 °C
Installation	TS 35; can be mounted horizontally or vertically
Protection class	IP 20
Standard	ANSI / IEEE 802.3; Class I, Division 2
Data rate	10BASE-T or 100BASE-TX
Segment length	Copper, 100 m: fibre (multimode), 2 km
Functionality	Autonegotiation, Autocrossing, redundant power supply
Flow control	half-duplex/full duplex
Status indication	Power, Connection/Activity
Approvals	cULus, CE, EN55024, EN 55022, Gost R
Aging	300 s
Supported protocols	Profinet RT, Modbus TCP, TCP/IP, EthernetIP

Note:

Unmanaged switch, ECO-Line 6 port

• Compact aluminium housing



Unmanaged switch, ECO-Line 6 port

Note

The ECO-Line family of products allow you to make an affordable start in Industrial Ethernet. They feature auto-negotiation and auto-crossing integrated into a compact aluminium housing. With their operating temperature range of 0°C to +60°C, the ECO-Line products are ideal for usage wherever terminal end devices need to be connected to your Ethernet in the simplest way.

Ordering data

Number of ports	Type	Order No.
6 x RJ45, 2 x SC multi-mode	IE-SW6/2SC-ECO	**8953070000**
6 x RJ45, 2 x ST multi-mode	IE-SW6/2ST-ECO	**8953050000**

Note

Accessories

	Type	Order No.
RJ45 dust-protection plug	IE-DPC	**8813490000**

Note

Cables and connection elements are found starting at Chapter C.

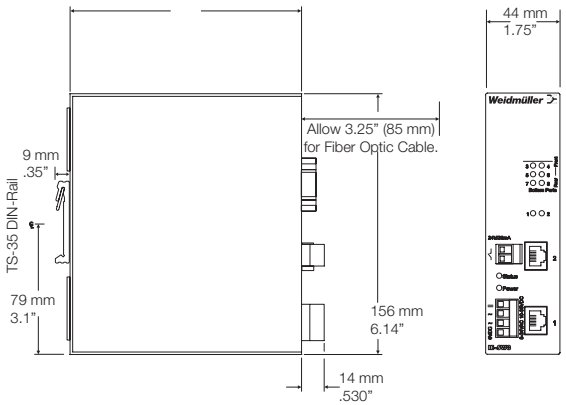
Technical data

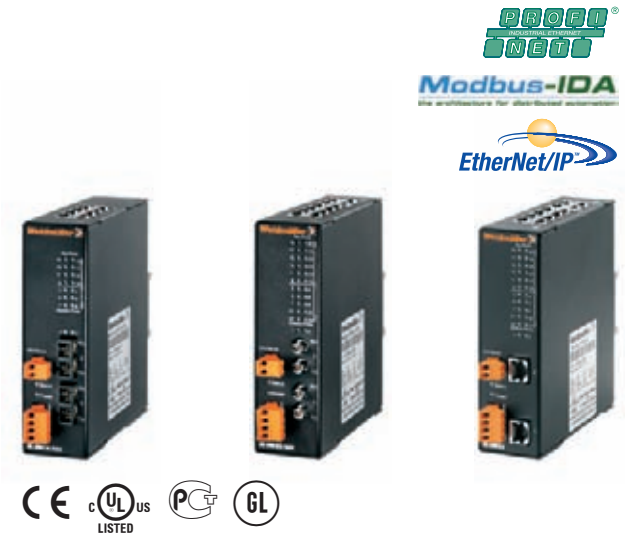
Housing	Aluminium
Length / Width / Height	104 mm / 41 mm / 105 mm
AC input voltage, min.-max.	8-24 V AC
DC input voltage, min.-max.	10-36 V DC
AC input power / DC	6 VA AC / 6 W DC
Input frequency	47 - 63 Hz
Operating temperature, min.-max.	0 °C-60 °C
Storage temperature, min.-max.	-40 °C-85 °C
Installation	TS 35; can be mounted horizontally or vertically
Protection class	IP 20
Standard	ANSI / IEEE 802.3; Class I, Division 2
Data rate	10 Base-T/100 Base-TX (copper) 100 Base-FX (fibre)
Segment length	Copper, 100 m: fibre (multimode), 2 km
Functionality	Auto-negotiation, auto-crossing, redundant power supply
Flow control	half-duplex/full duplex
Status indication	Power, Connection/Activity
Approvals	cULus, CE, EN55024, EN 55022, Gost R
Optical budget	8 dB on 62.5/125 µm multi-mode cable 4 dB on 50/125 µm multi-mode cable
Aging	300 s
Supported protocols	Profinet RT, Modbus TCP, TCP/IP, EthernetIP

Note: Class I, Division 2 is pending

Unmanaged switch, Advanced Line, 8-24 ports

• Multi-mode or single-mode





Unmanaged switch, Advanced Line, 8–24 ports

In its robust aluminium housing, the AdvancedLine is only 45mm wide. It comes with between 8 and 24 ports for your Industrial Ethernet network. With their IP 20 class of protection and operating temperature range of -40°C to +75°C, these switches are ideal for industrial applications.

The optional multimode FO ports with SC or ST plugs ensure noise-free transmissions over distances of up to 2 km, or up to 20 km in the single-mode form with SC plugs.

Functions such as auto-negotiation and auto-crossing are fully supported. In addition, the Weidmüller Advanced Line includes a redundant power supply.

The error relay is used for monitoring the switch status. When the switch is turned off, the relay is opened and remains opened until a sufficient voltage is applied to each of the operating voltage inputs. Only then is the relay closed. If the voltage sinks below the allowed limit while the switch is running, the relay is opened again.

Ordering data

Number of ports	Type	Order No.
24x RJ45	IE-SW24-ADVANCED	8808300000
6 x RJ45, 2 x SC multi-mode	IE-SW6/2SC-ADVANCED	8942450000
6 x RJ45, 2 x SC single-mode	IE-SW6/2SCS-ADVANCED	8942470000
6 x RJ45, 2 x ST multi-mode	IE-SW6/2ST-ADVANCED	8942460000
8 x RJ45	IE-SW8-ADVANCED	8942440000
14 x RJ45, 2 x SC multi-mode	IE-SW14/2SC-ADVANCED	8808280000
14 x RJ45, 2 x SC single-mode	IE-SW14/2SCS-ADVANCED	8851880000
14 x RJ45, 2 x ST multi-mode	IE-SW14/2ST-ADVANCED	8808290000
16x RJ45	IE-SW16-ADVANCED	8808270000
22 x RJ45, 2 x SC multi-mode	IE-SW22/2SC-ADVANCED	8808310000
22 x RJ45, 2 x SC single-mode	IE-SW22/2SCS-ADVANCED	8851890000
22 x RJ45, 2 x ST multi-mode	IE-SW22/2ST-ADVANCED	8808320000
	Singlemode design up to 120 km on request	

Accessories

	Type	Order No.
RJ45 dust-protection plug	IE-DPC	8813490000
Note	Cables and connection elements are found starting at Chapter C.	

Technical data

Housing	Aluminium
Length / Width / Height	140 mm / 45 mm / 156 mm
AC input voltage, min.-max.	8-24 V AC
DC input voltage, min.-max.	10-36 V DC
AC input power / DC	20 VA AC / 20 Watt DC
Input frequency	47 - 63 Hz
Operating temperature, min.-max.	-40 °C-75 °C
Storage temperature, min.-max.	-40 °C-85 °C
Installation	TS 35, wall
Protection class	IP 20
Standard	IEEE 802.3; 802.3u; 802.3x; Class I, Division 2
Data rate	10BASE-T/100BASE-TX
Segment length	Copper 100 m; fibre (multimode) 2 km; fibre (singlemode) 20 km
Functionality	Autonegotiation, Autocrossing, redundant voltage supply, fault relay
Flow control	half-duplex/full duplex
Status indication	Data rate, Power, Connection/Activity
Approvals	cULus, CE, EN55024, EN 55022, Gost R, GL
Optical budget	8 dB for 62.5/125 µm multimode cable 4 dB for 50/125 µm multimode cable 13 dB for 9/125 µm singlemode cable
Supported protocols	Profinet RT, Modbus TCP, TCP/IP, EthernetIP
Fault relay	24V DC / 30mA - only resistive loads

Note:

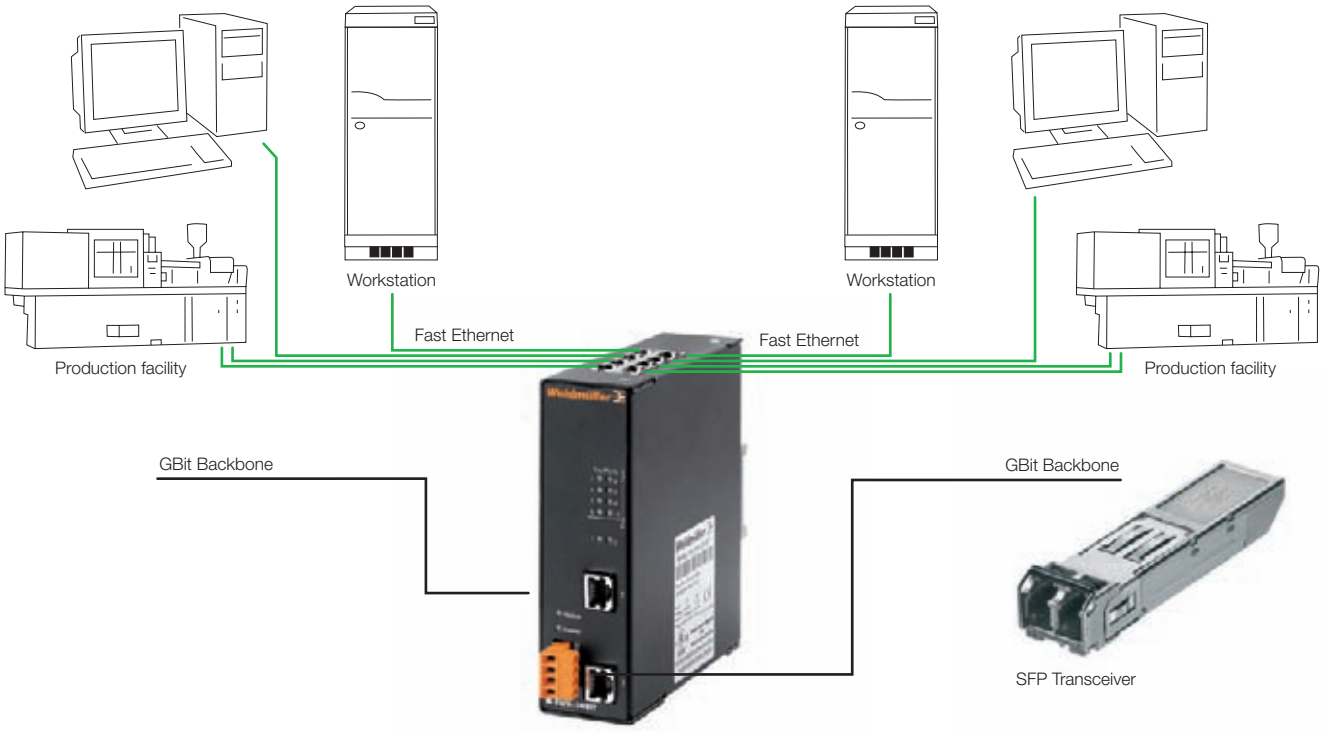
Gigabit switches for network with large volumes of data

Weidmüller‘s new gigabit-capable generation of switches feature a secure connection in large data-volume environments.

Gigabit backbones are becoming the standard for industrial networks. Weidmüller‘s new gigabit-capable generation of switches enable a secure connection for Fast Ethernet machine networks to gigabit backbones. The switches feature two gigabit-capable uplinks suitable for both star and linear topologies.

Here, the two-gigabit SFP (small form-factor pluggable) slots offer optimal flexibility. Weidmüller offers a wide variety of pluggable SFP transceivers with LC plugging systems. These range from single-mode versions with a 2-km range to multi-mode solutions with a 120-km maximum cable-length range.

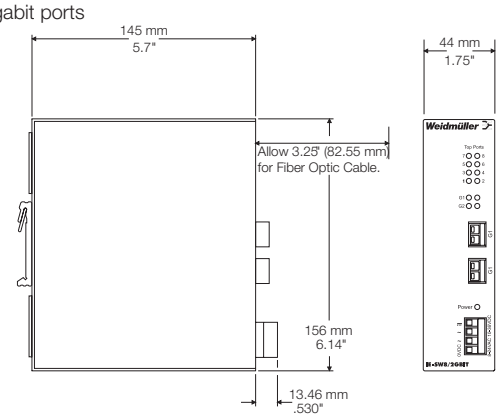
When you are using fibre transceivers, SFPs offer you the maximum in flexibility.



Ordering data SFP transceiver	1068240000	1068250000	1068270000	1068280000	1068290000	1068310000	1069320000
Part designation	IE-SFP-FE-1310-MM	IE-SFP-FE-1310-SM20	IE-SFP-FE-1310-SM40	IE-SFP-1G-850-MM	IE-SFP-1G-1310-SM10	IE-SFP-1G-1310-SM40	IE-SFP-1G-RJ45-100
Dimensions, mm	13.7 x 56.5 x 8.5	13.7 x 56.5 x 8.5	13.7 x 56.5 x 8.5	13,7 x 56,5 x 8,5	13.7 x 56.5 x 8.5	13.7 x 56.5 x 8.5	13.27 x 70.2 x 8.5
Connector	Duplex LC connector	Duplex LC connector	Duplex LC connector	Duplex LC connector	Duplex LC connector	Duplex LC connector	RJ45 connector
Data rate	125Mbit/s	125Mbit/s	125Mbit/s	1.25 Gbit/s	1.25 Gbit/s	1.25 Gbit/s	1.25 Gbit/s
Data transmission	100 Mbit	100 Mbit	100 Mbit	1 Gbit	1 Gbit	1 Gbit	1 Gbit
Wave length	1310 nm	1310 nm	1310 nm	850 nm	1310 nm	1310 nm	no
Power supply	3.3 V	3.3 V	3.3 V	3.3 V	3.3 V	3.3 V	3.3 V
Range of coverage	2 km	20 km	40 km	550 m at 50/125 µm, 275 m at 62.5/125 µm	10 km	40 km	100 m
Operating temperature	–40 °C to +85 °C	–40 °C to +85 °C	–40 °C to +85 °C	–40 °C to +85 °C	–40 °C to +85 °C	–40 °C to +85 °C	0 °C to +70 °C
Cable type	Multimode	Singlemode	Singlemode	Multimode	Singlemode	Singlemode	Copper
Wiring type	Ethernet 100Base FX	Ethernet 100Base FX	Ethernet 100Base FX	Gigabit Ethernet at 1.25 Gbps	Gigabit Ethernet at 1.25 Gbps	Gigabit Ethernet at 1.25 Gbps	Ethernet 1000Base-T

Unmanaged switch, Advanced Line Gigabit

- Sturdy aluminium housing
- 2 Gigabit ports



Unmanaged switch, Advanced Line Gigabit

With a sturdy aluminium housing, the AdvancedLine features a width of only 45 mm as well as 2 Gigabit ports for your Industrial Ethernet network. With their IP 20 class of protection and operating temperature range of -40°C to +75°C, these switches are ideal for industrial applications.

The two Gigabit-compliant ports are available as RJ45, SC or SFP.

Functions such as auto-negotiation and auto-crossing are fully supported. In addition, the Weidmüller Advanced Line includes a redundant power supply.

Ordering data

Number of ports	Type	Order No.
8 x RJ45, 2 x RJ45 GBIT	IE-SW8/2GBIT-ADVANCED	**8961230000**
8 x RJ45, 2 x SC multi-mode	IE-SW8/2GBITSC-ADVANCED	**8966140000**
8 x RJ45, 2 x SFP	IE-SW8/2GBIT-SFP-AD	**8975450000**

Accessories

	Type	Order No.
RJ45 dust-protection plug	IE-DPC	**8813490000**
Note	Cables and connection elements are found starting at Chapter C.	

Technical data

Housing	Aluminium
Length / Width / Height	140 mm / 45 mm / 156 mm
AC input voltage, min.-max.	8-24 V AC
DC input voltage, min.-max.	10-36 V DC
AC input power / DC	20 VA AC / 20 Watt DC
Input frequency	47 - 63 Hz
Operating temperature, min.-max.	-40 °C-75 °C
Storage temperature, min.-max.	-40 °C-85 °C
Installation	TS35; Wall
Protection class	IP 20
Standard	IEEE 802.3; 802.3u; 802.3x
Data rate	10BASE-T/100BASE-TX
Segment length	Copper, 100 m; fibre (multi-mode) 2 km
Functionality	Auto-negotiation, auto-crossing, redundant power supply
Flow control	half-duplex/full duplex
Status indication	Data rate, Power, Connection/Activity
Approvals	cULus, CE, EN55024, EN 55022, Gost R
Optical budget	8 dB for 62.5/125 µm multimode cable 4 dB for 50/125 µm multimode cable 13 dB for 9/125 µm singlemode cable
Aging	300 s
Supported protocols	Profinet RT, Modbus TCP, TCP/IP, EthernetIP

Note:

Introduction Managed switches

The decentralised structure of industrial networks means that many applications require a central switch in the switching cabinet. A Weidmüller IE-SWxx-M high-performance Industrial Ethernet managed switch is ideal for such applications.

The AdvancedLine managed switches are enclosed in a strong aluminium housing. Connections are available for power supply, relay contact and signalling contacts. The device also features optionally 8, 16, or 24 Ethernet ports. Up to two of these are fibre-optic ports for single-mode or multi-mode cable.

The WaveLine managed switches feature up to eight ports in a very small space enclosed in a compact plastic housing. They are available with or without I/Os.

LEDs on the front provide the necessary optical indications. The port LEDs remain permanently on to indicate a connection and flash during data transmissions. Furthermore, they change colour to indicate the data rate: green indicates 100 Mbps and yellow 10 Mbps. The green “Power” LED remains on permanently to indicate a constant power supply. The green “Status” LED is normally permanently green, but switches to red to signal a fault, provided the “Link monitoring” function is active.

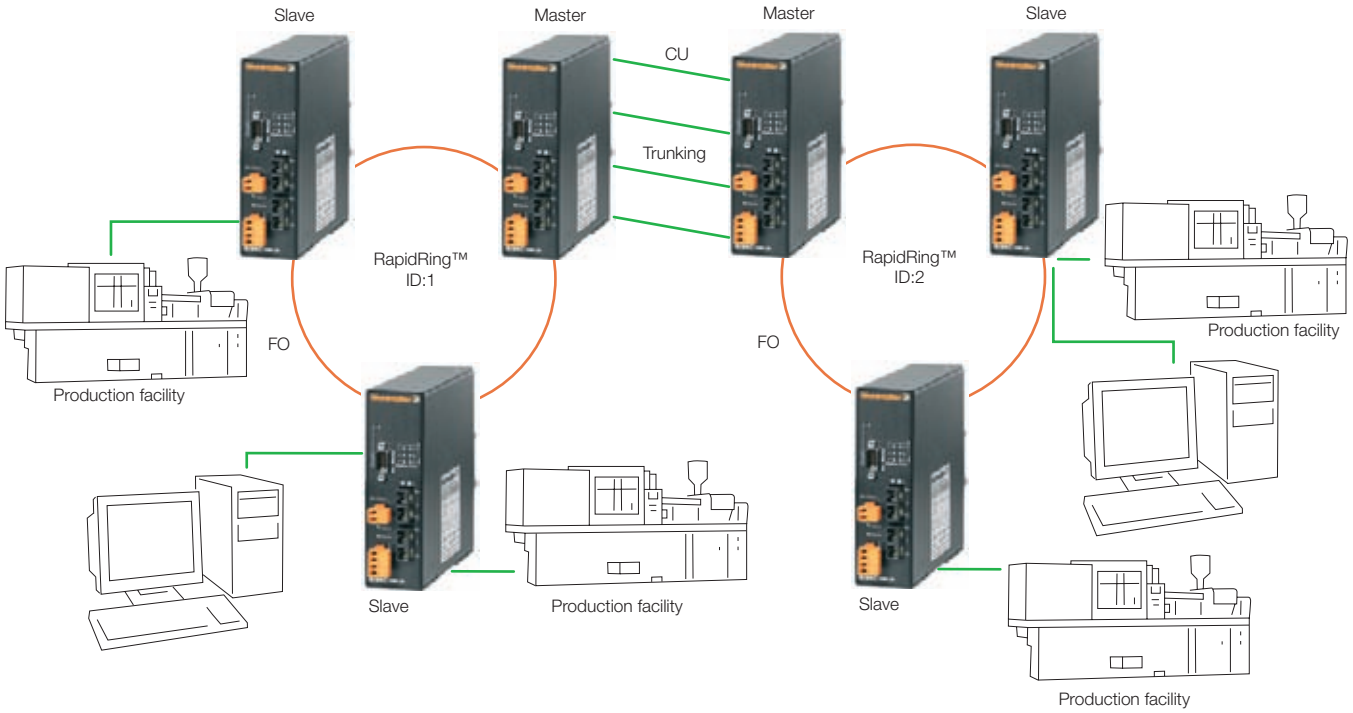
Weidmüller’s managed switches enable industry networks to be optimally structured for handling transport routes and network traffic throughput. The individual network components are interconnected in a hierarchical, physical star-type network. The main distributor, in this case a high-performance Industrial Ethernet switch, represents the central switching point in this network.

All switches from Weidmüller are protocol-transparent. Every port forms its own network segment, its own collision domain. The entire network bandwidth is available to each one of these segments. This increases not only the network performance across the entire network, but also in every individual segment. The switch examines every incoming packet for the MAC address of the destination segment and can then forward it directly to its destination.

The great advantage of Weidmüller switches is their ability to interconnect their ports directly.

Port-Trunking

Port-Trunking enables users to combine two or more ports on two Ethernet devices to form a group. This group then behaves like a “single logical link”, but with a correspondingly higher data rate. Furthermore, port trunking provides redundancies with a very fast



recovery time. If a link in the trunk group fails, the remaining links take over immediately in order to maintain the data exchange between the two switches.

Port-Mirroring

Port mirroring enables users to mirror – in other words copy – at one port all the data transmitted or received at one or more, other ports of the Managed Switches. The messages sent to the mirrored port can be filtered, e.g. by way of MAC addresses.

VLAN

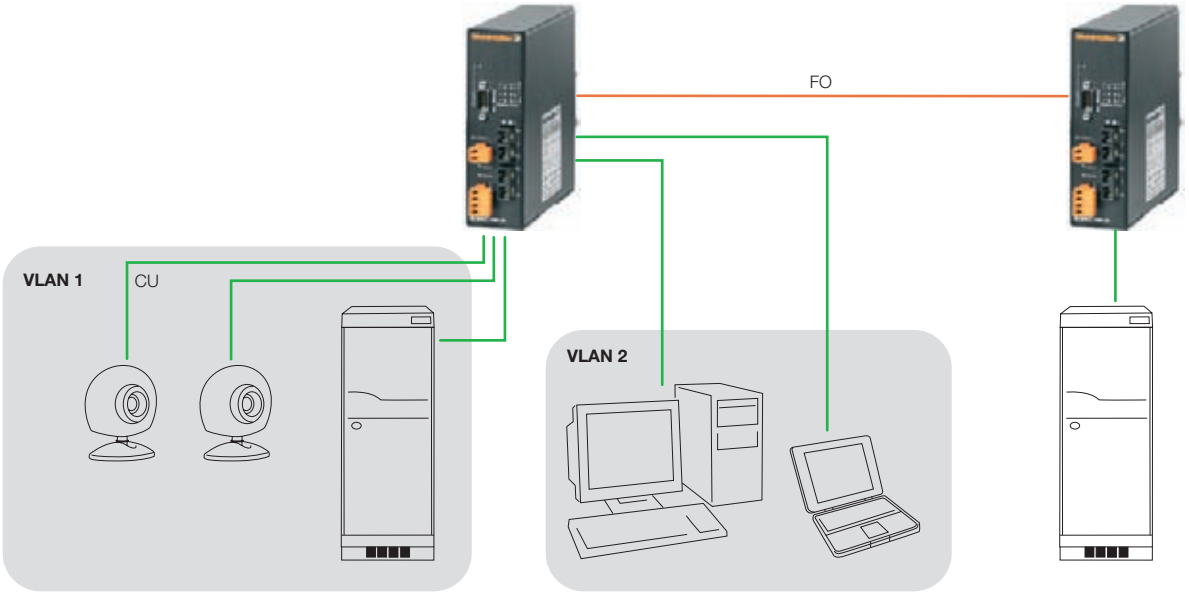
The abbreviation VLAN stands for “Virtual Local Area Network”. This is a network structure with all the properties of a conventional LAN, but without any physical connections. VLANs are generally switched networks that can link more remote nodes to form a virtual local network. The VLAN function enables a network to be split into various segments. It is possible to combine servers and workstations into dynamic workgroups according to their function. VLANs can be set up transparently and without any physical changes to the network and can be configured like multiple virtual local networks.

VLANs are broadcast domains that can also extend over several switches. The broadcast traffic is then only visible in the respective VLAN. This possibility of completely isolating VLANs from one another helps to increase the security of data transmissions. Consequently, the data is sent only to the Ethernet devices within one VLAN group. Once the VLAN function has been activated, a VLAN frame can be sent only to one port belonging to this VLAN within the VLAN. If the destination port belongs to a different VLAN, the frame is deleted. It is also possible to assign a port to several VLANs simultaneously. This type of structure enables networks to share one router or server.
VLANs combine the advantages of bridges and routers. Consequently, it is easy to add, delete or modify a station. Furthermore, the network can have any structure. For example, it is possible to set up virtual user groups. It is no longer necessary to assign users to various subnetworks just because of the great physical distances between them. Servers housed in central locations can be assigned to distant workgroups.

IE-SWxx-M switches support two types of VLAN:

- Port-VLAN
- 802.1q VLAN

Managed switches also permit static entries in addition to the “learning” of addresses in the forwarding table or the address table. These entries remain in the table permanently and are not subject to the aging process.



Quality of Service
The Quality of Service (QoS) function permits a QoS priority to be used in every Ethernet frame. The priority depends on the port from which the frame originates.

Differential relay
The AdvancedLine managed switches also feature a relay connection. This can be used to monitor individual events on the network. The relay can signal an outage or the presence of a link on one or multiple ports.

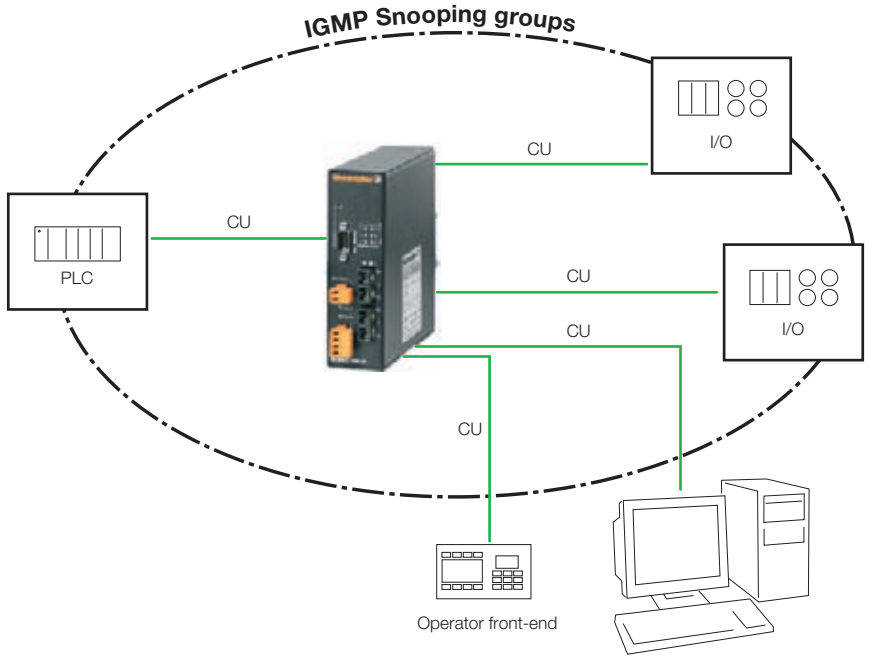
Browse Address Table
The “browse address table” function enables the display of the entire address table or the localisation of a MAC address. Select the type of search (sequence or MAC address) and afterwards the “find” function. This function is useful for obtaining an overview of all MAC addresses. The ports belonging to the MAC addresses are also displayed.

SNMP-Management
The SNMP protocol enables the monitoring, controlling and administration of networks. According to the model of SNMP architecture, the network is divided into network management stations and network components. The network management stations host applications for the monitor and control of network components.

IGMP-Snooping
IGMP snooping controls the switch when join requests appear on the port for a multicast group. When this happens, the particular port is incorporated into the forward table for this group. This reduces the net load, since the switch does not flood all ports with multicast traffic.

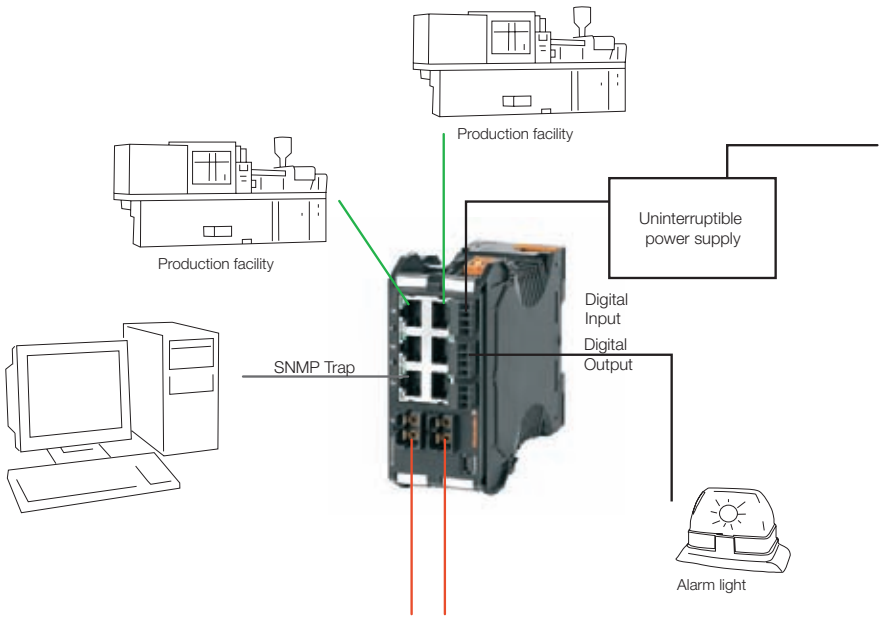
DHCP Client
Specially-configured servers, such as Weidmüller‘s Router Series, can assign dynamic IP addresses and other network parameters to network components. This is done with the DHCP protocol (Dynamic Host Configuration Protocol). Our managed switches can either receive a fixed, static IP address, or a DHCP server can assign them an IP address.

Diffserv
When using Diffserv (Differentiated Services), every IP packet is tested to determine its priority. In contrast to the Quality of Service, the priority is already determined here by the sender. Thus the path to the receiver is optimized and forwarded with preference.



WaveLine managed switches with IOs

Our WaveLine switches come optionally with two digital IOs (input and output). After the IOs are configured, network parameters can be monitored with the managed switch. An uninterruptible power supply (UPS) can also be connected to the IOs. If the supply voltage fails, the switch changes over to the battery on the UPS. The signal output wired to the WaveLine managed switch can issue an SNMP trap to a Scada system running on a network server. In addition, the IO output activates an alarm light on the outside of the electrical cabinet so that the power outage can be easily seen. No PLC is required.



Redundancy in the Industrial Ethernet

Two schemes have become established for achieving network redundancy in Industrial Ethernet applications.

Ring topology is the simplest and quickest way of achieving network redundancy. The lack of a standard led to the development of RapidRing™ technology. This provides industrial automation engineers with a simple and effective way of achieving redundancy. RapidRing™ provides redundancy against a single fault. The devices combined to form a ring are wired like a real logical ring. As the ring structure would lead to a loop in the network, one link is logically deactivated (backup link).

The IEEE standard “Rapid Spanning Tree Protocol” (RSTP, IEEE 802.3w) is the other option for achieving redundancy in a network. RSTP renders possible a net-like structure which enables multiple redundancy to be achieved. RSTP is not as easy to use as RapidRing™, but RSTP does offer many interesting options.

Both systems have their advantages in particular applications. In industrial automation it is often very simple to wire ring structures. Operating RSTP in a ring of 15 or more switches will lead to unsatisfactory data rates. But the use of RapidRing™ in such an installation results in switching times < 300 ms, and larger rings are also possible.

RapidRing™ is easy to use. Firstly, one switch is selected to be the master and is configured as such. The other switches in the network are configured as slaves. Ports 1 and 2 are always used to connect the ring. Port 1 of one switch is connected to port 2 of the next switch in the redundant ring. This connection scheme leads to a logical ring. After switching on the network, the network is ready for operation.

The backup link is always connected to port 2 of the master switch, which allows the backup links to be predefined. The master can therefore be chosen to optimise the network throughput. If a connection in the ring is interrupted, the backup link takes over its function and so communications are not subjected to long interruptions. Once the defective link has been restored, the backup link is automatically deactivated.

The status of the ring can be interrogated via the Web server of every switch involved. MIB data is made available via the SNMP for remote interrogation and automatic processing in a dedicated section.

The RSTP standard is a further development of the Spanning Tree Protocol (STP, IEEE 802.1D). The RSTP configures the network in such a way that there are no loops. Various redundant connections (backup links) offer multiple redundancy. The switches connected to the RSTP exchange information via the network in Bridge Protocol Data Units (BPDU). An interrupted link is therefore quickly replaced. Modifications within the network are detected automatically.

RSTP is ideal for complex networks with more than one connection. As several possible paths exist in the network, RSTP must always analyse the network fully. That leads to switchover times > 300 ms. Indeed, in large and complex networks the switchover time can run into several seconds.

A network with RSTP should be very carefully planned and conceived, otherwise unexpected behaviour could be the result.

Configuration

IE-SWxx-M managed switches can be configured with a terminal program but also via a Web interface at the integral, interactive Web server. Every Internet-compatible PC in the local network can have access to this Web server. The Web server is compatible with the latest versions of Internet Explorer (7.0 or higher) and Firefox (3 or higher). This method of configuration enables remote switches to be configured.

The following settings are possible:

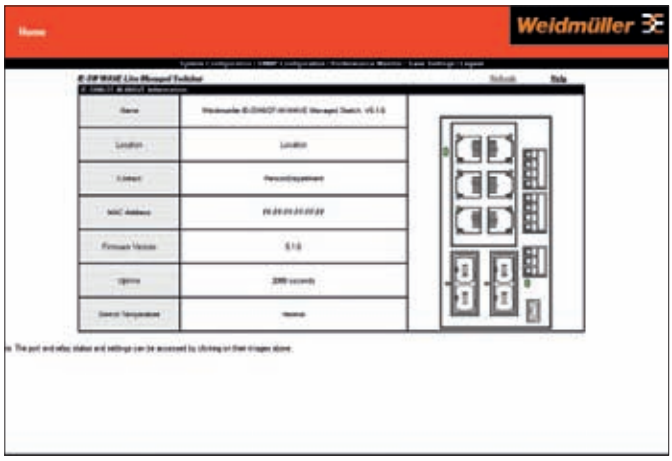
- port status: enabled or disabled
- data rate and duplex transmission: fixed or auto-negotiation
- specification of transmission medium (Auto-MDI/X): enabled or disabled
- the IE-SWxx-M can also be managed via the SNMP function SNMP traps are messages that are transmitted when a “trap event” occurs. Up to four trap receivers can be specified. The IE-SWxx-M switches support traps for the link-up, link-down, confirmation error, cold restart and warm restart functions.

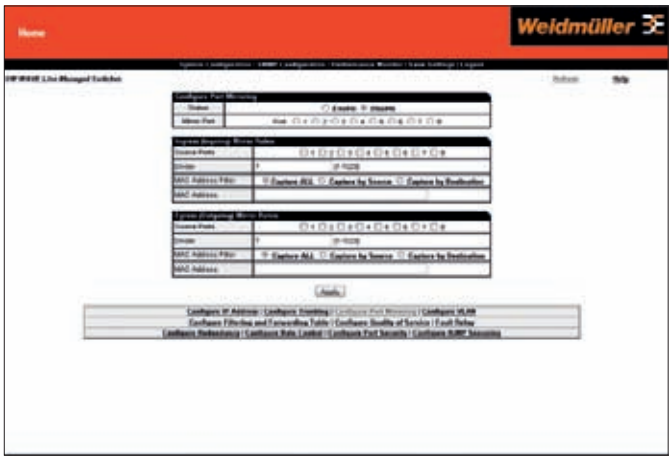
The IE-SWxx-M managed switches can be monitored via SNMP and console menus. The following are just some of the functions available:

- display port traffic
- search address table
- display switching history
- display switch temperature

Port error packets statistics can be generated for every port. This contains information regarding:

- dropped packets
- oversize packets
- undersize packets
- fragments
- jabbers
- collisions
- deferred transmission

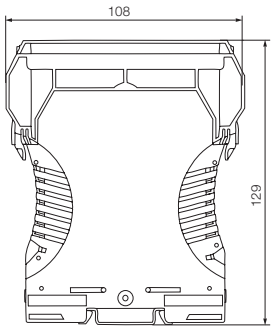


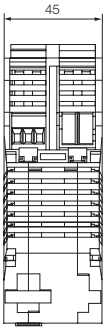


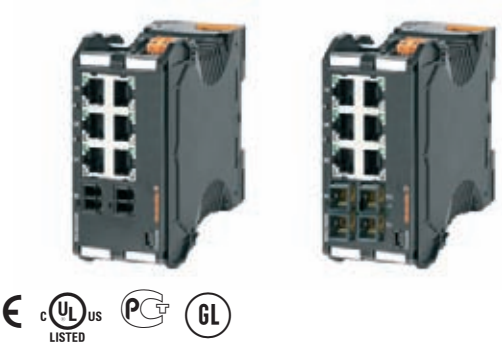
Refer to Chapter W for a description of the connection possibilities for redundant power supplies.

WaveLine Managed Switches

- Compact plastic housing in IP20
- For mounting on TS 35
- IEEE 802.3x / 802.3 / 802.4 standard







WaveLine Managed Switches

Note

Our product line of managed switches has now also been extended to our WaveLine. With its six copper and two optional FO ports, our WaveLine is the perfect introduction for industrial applications.
The optional FO ports - with SC, LC or ST connectors - offer disturbance-free transmissions of up to 2km.
Our managed switches support many features:

- Auto-negotiation
- Redundant power supply
- Programmable error relay for PLC support
- SNMP V1
- Rapid Ring™
- RSTP 802.3w
- IGMP snooping
- Querier
- Port mirroring
- Port filtering
- Port setup functionality
- VLAN
- QoS
- TOS
- Diffserv
- MAC-based trunking
- Auto-crossover / Auto-polarity
- Auto-polarity
- Filtering and forwarding table
- Operational earthing
- Configuration via console (USB) or integrated web server

Ordering data

Number of ports	Type	Order No.
6 x RJ45, 1 x USB, 2 x SC multi-mode	IE-SW6/2SC-1300-M-WAVE	**8943790000**
6 x RJ45, 1 x USB, 2 x SC single-mode	IE-SW6/2SCS-1300-M-WAVE	**1067880000**
6 x RJ45, 1 x USB, 2 x ST multi-mode	IE-SW6/2ST-1300-M-WAVE	**8943800000**
6 x RJ45, 1 x USB, 2 x LC multi-mode	IE-SW6/2LC-1300-M-WAVE	**8943820000**
6 x RJ45, 1 x USB, 2 x SCRJ multi-mode	IE-SW6/2SCRJ-650-M-WAVE	**8943810000**
8 x RJ45, 1 x USB	IE-SW8-M-WAVE	**8943780000**

Note

Accessories

	Type	Order No.
RJ45 dust-protection plug	IE-DPC	**8813490000**
markers	WS 15/5 MC NEUTRAL	**1609880000**

Note

Cables and connection elements are found starting at Chapter C.

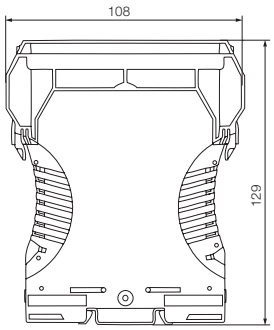
Technical data

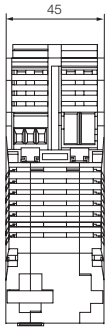
Housing	Plastic
Length / Width / Height	108 mm / 45 mm / 127.8 mm
AC input voltage, min.-max.	10-24 V AC
DC input voltage, min.-max.	10-35 V DC
AC input power / DC	5 VA AC / 5 W DC
Input frequency	47 - 63 Hz
Operating temperature, min.-max.	-40 °C-70 °C
Storage temperature, min.-max.	-40 °C-85 °C
Installation	TS 35
Protection class	IP 20
Standard	IEEE 802.3; 802.3u; 802.3x; Class I, Division 2
Data rate	10 Base-T/100 Base-TX (copper) 100 Base-FX (fibre)
Segment length	Copper 100 m; fibre (multimode) 2 km; fibre (single mode) 20 km
Functionality	Auto-negotiation; programmable error relay; redundant power supply
Flow control	HD (backpressure) / FD (pause)
Status indication	Data rate, Power, Temperature monitoring, Connection/Activity
Buffer memory	2 x 256 Kbyte per 8 ports
Address memory	4 K MAC addresses per 8 ports
Approvals	cULus, CE, EN55024, EN 55022, Gost R, GL
Aging	300 s
Optical budget	8 dB for 62.5/125 µm multi-mode 4 dB for 50/125 µm multi-mode 13 dB for 9/125 µm single-mode cable
Supported protocols	Profinet RT, Modbus TCP, TCP/IP, EthernetIP
Fault relay	max. 24 V / 30mA

Note: GL is pending

WaveLine managed switch IOs

- Compact plastic housing in IP20
- For mounting on TS 35
- IEEE 802.3x / 802.3 / 802.4 standard





WaveLine managed switch IOs

Note

Our product line of managed switches has now also been extended to our WaveLine. With its six copper and two optional FO ports, our WaveLine is the perfect introduction for industrial applications.
The optional FO ports - with SC, LC or ST connectors - offer disturbance-free transmissions of up to 2km.
Our managed switches support many features:

- Auto-negotiation
- Redundant power supply
- Programmable error relay for PLC support
- SNMP V1
- Rapid Ring™
- RSTP 802.3w
- IGMP snooping
- Querier
- Port mirroring
- Port filtering
- Port setup functionality
- VLAN
- QoS
- TOS
- Diffserv
- MAC-based trunking
- Auto-crossover / Auto-polarity
- Auto-polarity
- Filtering and forwarding table
- Functional earth
- Configuration via console (USB) or integrated web server

Ordering data

Number of ports	Type	Order No.
6 x RJ45, 1 x USB, 2 x SC multi-mode	IE-SW6/2SC2DIO-M-WAVE	**8972580000**
6 x RJ45, 1 x USB, 2 x SC single-mode	IE-SW6/2SCS2DIO-M-WAVE	**1067870000**
6 x RJ45, 1 x USB, 2 x ST multi-mode	IE-SW6/2ST2DIO-M-WAVE	**8972600000**
6 x RJ45, 1 x USB, 2 x SCRJ multi-mode	IE-SW6/2SCRJ2DIO-M-WAVE	**8972590000**
8 x RJ45, 1 x USB	IE-SW8-2DIO-M-WAVE	**8972570000**

Note

Accessories

	Type	Order No.
RJ45 dust-protection plug	IE-DPC	**8813490000**
markers	WS 15/5 MC NEUTRAL	**1609880000**

Note

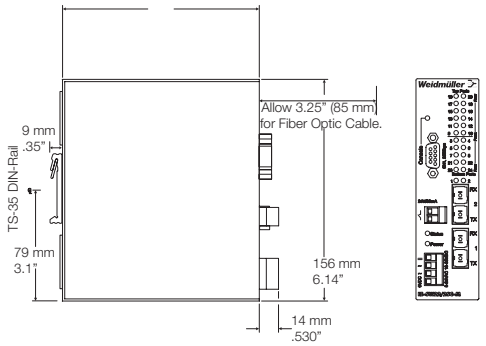
Cables and connection elements are found starting at Chapter C.

Technical data

Housing	plastic
Length / Width / Height	108 mm / 45 mm / 127.8 mm
AC input voltage, min.-max.	10-24 V AC
DC input voltage, min.-max.	10-35 V DC
AC input power / DC	5 VA AC / 5 W DC
Input frequency	47 - 63 Hz
Operating temperature, min.-max.	-40 °C-70 °C
Storage temperature, min.-max.	-40 °C-85 °C
Installation	TS35
Protection class	IP 20
Standard	IEEE 802.3; 802.3u; 802.3x; Class I, Division 2
Data rate	10 Base-T/100 Base-TX (copper) 100 Base-FX (fibre)
Segment length	Copper 100 m; fibre (multimode) 2 km; fibre (single mode) 20 km
Functionality	Auto-negotiation; programmable error relay; redundant power supply
Flow control	HD (backpressure) / FD (pause)
Status indication	Data rate, Power, Temperature monitoring, Connection/Activity
Buffer memory	2 x 256 Kbyte per 8 ports
Address memory	4 K MAC addresses per 8 ports
Approvals	cULus, CE, EN55024, EN 55022, Gost R, GL
Aging	300 s
Optical budget	8 dB for 62.5/125 µm multi-mode 4 dB for 50/125 µm multi-mode 13 dB for 9/125 µm single-mode cable
Supported protocols	Profinet RT, Modbus TCP, TCP/IP, EthernetIP
Fault relay	max. 24 V / 30mA
Digital input	2 x 24V DC
Digital output	2 x 30mA
Note:	GL is pending

Managed switch, with 8 to 24 ports

- Robust IP20 aluminium enclosure
- For mounting on TS35 rail or wall
- IEEE 802.3x / 802.3 / 802.4 standard



Managed switch, with 8 to 24 ports

The managed switches in rugged aluminium housing are just 45 mm wide and have between 8 and 24 ports for your industrial network. With their IP 20 class of protection and operating temperature range of -40°C to +75°C, these switches are ideal for industrial applications.
The optional multimode FO ports with SC or ST plugs ensure noise-free transmissions over distances of up to 2 km, or up to 20 km in the single-mode form with SC plugs.
Our managed switches support many features:

- Auto-negotiation
- Redundant power supply
- Programmable error relay for PLC support
- SNMP V1
- Rapid Ring™
- RSTP 802.3w
- IGMP snooping
- Querier
- Port mirroring
- Port filtering
- Port setup functionality
- VLAN
- QoS
- TOS
- Diffserv
- MAC-based trunking
- Auto-crossover / Auto-polarity
- Auto-polarity
- Filtering and forwarding table
- Operational earthing
- Configuration via console (RS-232) or integrated web server

Our managed-line switches are also available as either multimode or singlemode versions.

Ordering data

Number of ports	Type	Order No.
6 x RJ45, 1 x RS232, 2 x SC multi-mode	IE-SW6/2SC-M	8845840000
6 x RJ45, 1 x RS232, 2 x SC single-mode	IE-SW6/2SCS-M	8851850000
6 x RJ45, 1 x RS232, 2 x ST multi-mode	IE-SW6/2ST-M	8845850000
8 x RJ45, 1 x RS232	IE-SW8-M	8845740000
14 x RJ45, 1 x RS232, 2 x SC multi-mode	IE-SW14/2SC-M	8845780000
14 x RJ45, 1 x RS232, 2 x SC single-mode	IE-SW14/2SCS-M	8851860000
14 x RJ45, 1 x RS232, 2 x ST multi-mode	IE-SW14/2ST-M	8845790000
16x RJ45, 1 x RS232	IE-SW16-M	8845800000
22 x RJ45, 1 x RS232, 2 x SC multi-mode	IE-SW22/2SC-M	8845810000
22 x RJ45, 1 x RS232, 2 x SC single-mode	IE-SW22/2SCS-M	8851870000
22 x RJ45, 1 x RS232, 2 x ST multi-mode	IE-SW22/2ST-M	8845820000
24x RJ45, 1 x RS232	IE-SW24-M	8845830000
	Singlemode design up to 120 km on request	

Accessories

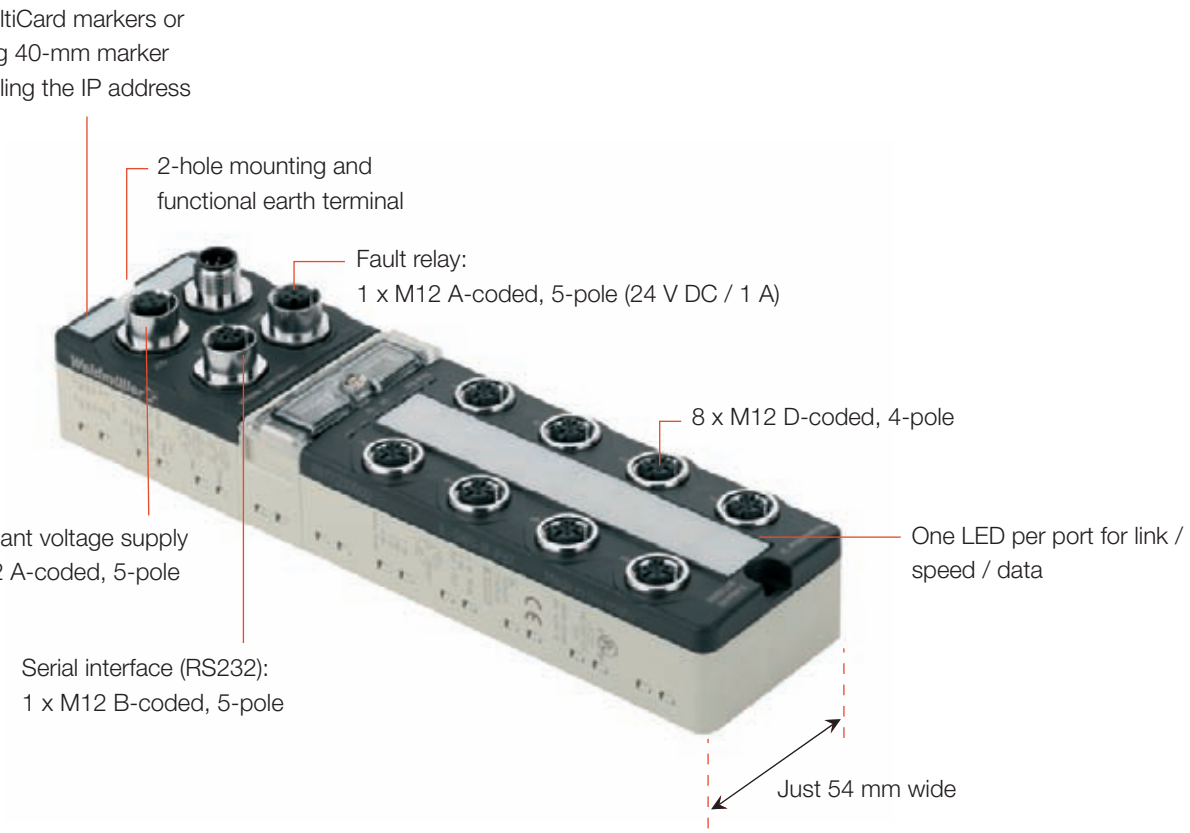
	Type	Order No.
RJ45 dust-protection plug	IE-DPC	8813490000
Null modem cable	IE-C-NULLMODEM	8866660000
Note	Cables and connection elements are found starting at Chapter C.	

Technical data

Housing	Aluminium
Length / Width / Height	140 mm / 45 mm / 155 mm
AC input voltage, min.-max.	8-24 V AC
DC input voltage, min.-max.	10-36 V DC
AC input power / DC	20 VA AC / 20 W DC
Input frequency	47 - 63 Hz
Operating temperature, min.-max.	-40 °C-75 °C
Storage temperature, min.-max.	-40 °C-85 °C
Installation	TS 35, wall
Standard	IEEE 802.3; 802.3u; 802.3x; Class I, Division 2
Segment length	Copper 100 m; fibre (multimode) 2 km; fibre (singlemode) 20 km
Functionality	Auto-negotiation; programmable error relay; redundant power supply
Flow control	HD (backpressure) / FD (pause)
Status indication	Data rate, Power, Temperature monitoring, Connection/Activity
Approvals	cULus, CE, EN55024, EN 55022, Gost R, GL
Optical budget	8 dB for 62.5/125 µm multimode 4 dB for 50/125 µm multimode 13 dB for 9/125 µm singlemode cable
Supported protocols	Profinet RT, Modbus TCP, TCP/IP, EthernetIP
Fault relay	max. 24 V / 30mA

Note:

8-port switch in IP67



Switches are the central components of a network. They prevent data collision, allow rapid packet switching and enhance data throughput. Not only do Weidmüller switches meet the demands placed on the Fast Ethernet with its transmission rate of up to 100 Mbit/s, but they are also downward compatible with the older networks that have a transmission rate of 10 Mbit/s (IEEE 802.3). They recognise the speed automatically.

Weidmüller's unmanaged switches are Plug & Play devices for easy installation of Ethernet networks. They do not need to be either configured or parameterised.

Weidmüller's managed switches enable industry networks to be structured in order to optimise transport routes and times for network traffic. The various network components are cabled together hierarchically in a physical star. The main distributor in the field, in this case the Industrial Ethernet switch IE-SW-8-M-IP67, is the central switching point. All Weidmüller switches are protocol transparent. Each port forms both a network segment and a collision domain that are intrinsic to the port itself. The entire network bandwidth is available to each of these segments. This results in enhanced network performance not only over the network as a whole, but also in each individual segment. The switch examines each packet passing through for the MAC address of the target segment and is able to forward it directly there.

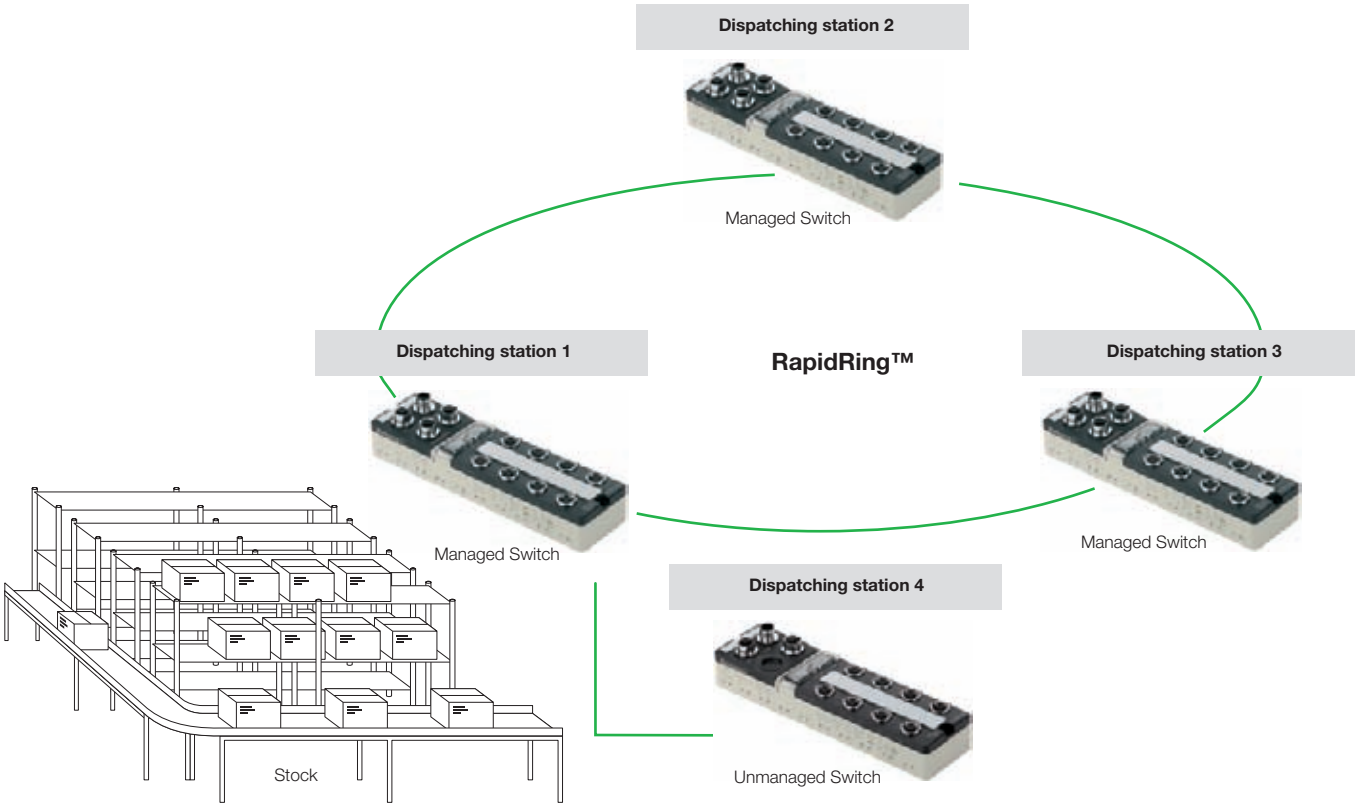
For direct connection to the network in the field, Weidmüller offers an IP 67 switch with eight Ethernet ports for use in tough environments.

- Robust plastic housing (IP67 ingress protection class) for use in the field, complying with UL94 flammability rating V0
- Strip markers – wide range of marking systems and products
- Eight Ethernet ports with M12-D-coded plug-in connectors
- Temperature range from –40 °C to +60 °C

The features of the managed IP67 switch from Weidmüller include the following:

- Port trunking
- Port mirroring
- VLAN IEEE 802.1Q
- Filtering and forwarding table with fixed entries
- Selective multicast control
- Quality of service
- Configurable relay functions
- Access to the address table
- Configuration via Web interface or terminal program
- SNMP V.1-capability
- RSTP and RapidRing™
- IGMP snooping with querier functions
- Auto-crossing, auto-negotiation, auto-polarity
- Broadcast limitation
- Flow control IEEE 802.3x
- DHCP
- RMON (statistics, history, alarms, occurrences)

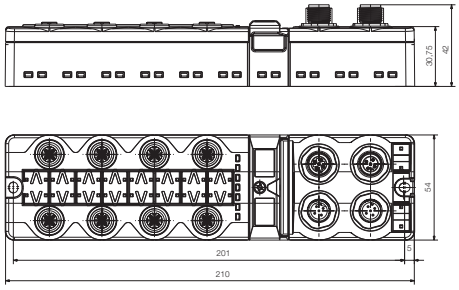
Stock control with the Weidmüller Industrial Ethernet Switches in IP67



IP 67 switches

IP 67 unmanaged switch

- IP 67 housing
- M12 D-coded plug-in connector



IP 67 unmanaged switch

Industrial Ethernet on the machine itself with simple and secure M12 plug-in connectors.
With their IP 67 class of protection and operating temperature range of -40°C to +60°C, these switches are ideal for use in the field.
In addition, the following functions are supported:

- Autonegotiation
- Redundant voltage supply
- Error relay PLC support

Ordering data

Number of ports	Type	Order No.
8 x M12	IE-SW8-IP67	**8877190000**

Accessories

	Type	Order No.
M12 protective cap	SAI-SK-M12-UNI	**2330260000**
Marker, transparent	ESG 8/13.5/43.3 SAI AU	**1912130000**
Note	Cables and connection elements are found starting at Chapter C.	

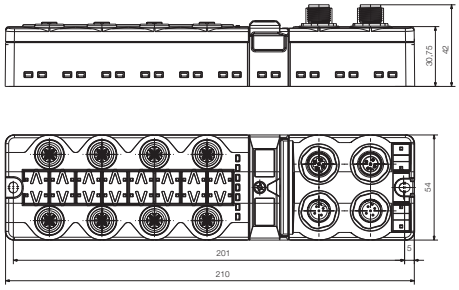
Technical data

Housing	Plastic
Length / Width / Height	210 mm / 54 mm / 31 mm
AC input voltage, min.-max.	8-24 V AC
DC input voltage, min.-max.	10-36 V DC
Input power AC / DC	max. 5 W
Input frequency	47 - 63 Hz
Operating temperature, min.-max.	-40 °C-60 °C
Storage temperature, min.-max.	-40 °C-85 °C
Installation	Wall
Protection class	IP 67
Standard	IEEE 802.3; 802.3u; 802.3x; Class I, Division 2
Data rate	10BASE-T/100BASE-TX
Segment length	Cooper 100 m
Functionality	„Auto-negotiation, redundant power supply, error relay for PLC support“
Flow control	half-duplex/full duplex
Status indication	Link, Power, Run, Status
Buffer memory	256 KByte per 8 ports
Address memory	4 K MAC addresses per 8 ports
Approvals	cULus, CE, EN55024, EN 55022, Gost R
Aging	300 s
Supported protocols	Profinet RT, Modbus TCP, TCP/IP, EthernetIP

Note:

IP 67 managed switch

- IP 67 housing
- M12 D-coded plug-in connector



IP 67 managed switch

Industrial Ethernet on the machine itself with simple and secure M12 plug-in connectors.
With their IP 67 class of protection and operating temperature range of -40°C to +60°C, these switches are ideal for use in the field.
The following features are supported:

- Autonegotiation
- Redundant voltage supply
- Error relay for PLC support
- SNMP V1
- Rapid Ring™
- RSTP 802.3w
- IGMP snooping
- Querier
- Port mirroring
- Port filtering
- Port setup functionality
- VLAN
- QoS
- TOS
- Diffserv
- MAC-based trunking
- Autocrossover
- Autopolarity
- Filtering and forwarding table
- DHCP-Client

Ordering data

Number of ports	Type	Order No.
8 x M12	IE-SW8-M-IP67	8877200000

Accessories

	Type	Order No.
M12 protective cap	SAI-SK-M12-UNI	2330260000
Communication cable	IE-C-RS232-M12	8874290000
Marker, transparent	ESG 8/13.5/43.3 SAI AU	1912130000

Note

Cables and connection elements are found starting at Chapter C.

Technical data

Housing	Plastic
Length / Width / Height	210 mm / 54 mm / 31 mm
AC input voltage, min.-max.	8-24 V AC
DC input voltage, min.-max.	10-36 V DC
Input power AC / DC	max. 5 W
Input frequency	47 - 63 Hz
Operating temperature, min.-max.	-40 °C-60 °C
Storage temperature, min.-max.	-40 °C-85 °C
Installation	Wall
Protection class	IP 67
Standard	IEEE 802.3; 802.3u; 802.3x; Class I, Division 2
Data rate	10BASE-T/100BASE-TX
Segment length	Cooper 100 m
Functionality	„Auto-negotiation, redundant power supply, ring topology; error relay for PLC support“
Flow control	half-duplex/full duplex
Status indication	Link, Power, Run, Status
Buffer memory	256 KByte per 8 ports
Address memory	4 K MAC adress
Approvals	cULus, CE, EN55024, EN 55022, Gost R
Aging	300 s
Supported protocols	Profinet RT, Modbus TCP, TCP/IP, EthernetIP

Note:

The EtherNet/IP system

Principle

EtherNet/IP (Ethernet Industrial Protocol) is an open standard that was developed by Rockwell Automation and the Open DeviceNet Vendor Association (ODVA) for industrial networks. EtherNet/IP is based on the Ethernet TCP/IP standards and the Common Industrial Protocol (CIP).

CIP an open standard that is implemented in ISO layer 7, and is also used for ControlNet™ and DeviceNet™ installations. This enables continuous communications between the field level and the Internet. The protocol includes a control component for cyclic, real-time-compatible I/O signal transmission (implicit messaging) and an information component for the configuration, diagnosis and management messages (explicit messaging).

The I/O data uses the User Datagram Protocol/Internet Protocol (UDP/IP) and the information data uses TCP/IP protocols.

The IEEE802.3 standard is incremented on layers 1 and 2 (physical media and data link respectively).

Addressing

The Dynamic Host Configuration Protocol (DHCP) is used to assign addresses to modules in EtherNet/IP networks.

Network structure

Like Standard Ethernet, EtherNet/IP installations are also wired with a star structure. The star structure is characterised by a central signal distributor (switch) with individual connections to all the network's terminals. A line or tree structure can be set up with the help of a 3-port switch in the device or in the proximity of each device.

Weidmüller can supply products for the network infrastructure – please refer to our Industrial Ethernet catalogue.

Transmission rate

The transmission rate is 10 or 100 Mbps. Weidmüller modules detect the transmission rate automatically and set themselves accordingly. The maximum length of the bus cable is the same for both transmission rates.

The following table can serve as a guide for bus installations complying with the standard:

Max. bus extension (m)	Data rate (Mbps)
100	10
100	100