Industrial switches
General Product Information

Always the Right Solution

WAGO's range of switches ensures the scalability of your ETHERNET network infrastructure, while providing outstanding electrical and mechanical characteristics. These robust devices are designed for industrial use and they are fully compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab.

Combinable with Fiber Optic Conductors

ETHERNET via fiber-optic cables offers a multitude of advantages for industrial applications.
High immunity to interference, electrical isolation and long ranges up to 80 km are extremely beneficial characteristics — and all are compatible with the IT world!

Scaled Offering

Unmanaged and managed switches in various designs are available for high-end applications. Our ECO switches are ideal for cost-sensitive applications that do not require technical features such as redundancy. They are ideally suited for small- to medium-sized networks.

Modular Expandability

Exchangeable SPF modules can be used to adapt WAGO switches for various fiber optic cables and the necessary distances and fibers.
There are SFP modules for multimode and single mode fiber optic cables for ranges up to 80 km. With the optimum combination of copper and fiber optic cables, you are equipped for a multitude of requirements.

Web-Based Management

WAGO's fully managed switches have integrated Web-based management. Any Web browser can be used to configure the switch.

Integrated Function Monitoring

For monitoring and error reporting, the managed switch has configurable functions such as e-mail alarm and SNMP traps. In addition, all switches except for ECO versions can monitor individual ports or the power supply via a potential-free alarm contact. A DIP switch is used to configure this function.

Availability, Redundancy

Select industrial switches have several options to build redundant network structures and to guarantee secure communication even when connections are faulty:
- "Rapid Spanning Tree" per IEEE 802.1w compatible with IT standard
- Jetring — a simple ring protocol with a switching time of < 300 ms
- Xpress Ring — fast ring protocol switching time < 20 ms
- ERPSv2 per ITU-T standard switching time < 50 ms

In addition to redundancy of the communication link, a redundant power supply is integrated into the switches that can be monitored using an alarm relay. Thus, if the power supply fails, communication is not interrupted.

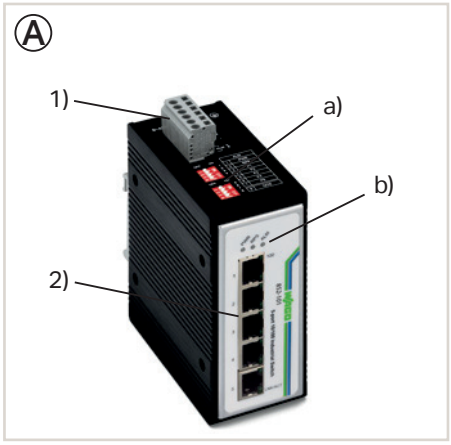
Different Operating Modes

The unmanaged switches are ideally suited for direct plug-and-play use. Managed switches are available for applications where IP filtering or further interpretation of telegrams is required for the application.

Advantages:

- Adaptable to different transmission media
- Automatic adaptation to
  - Speed (auto-negotiation)
  - Wiring (auto-crossover, MDI/MDIX)
- Optional redundancy
- Larger supply voltage range

Industrial switches
Interfaces and Types



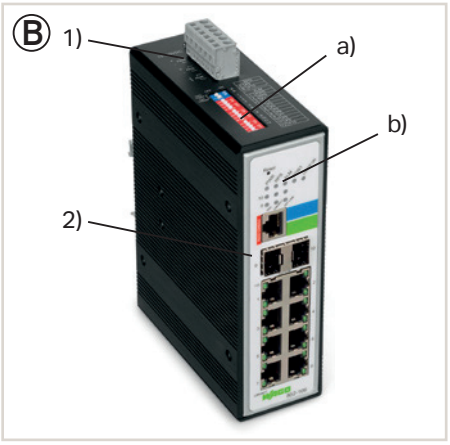
Power Supply (1)
Technologically related differences on the connection level (2)

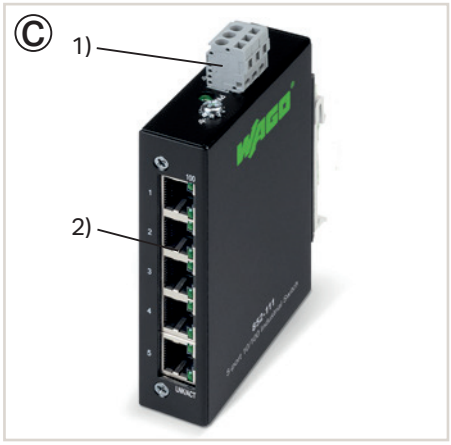
Housing Design (A)

- DIP switch for configuration (a)
- Diagnostic LEDs (b)
- W x H* x D (mm) 50 x 120 x 105

Housing Design (B)

- DIP switch for configuration (a)
- Diagnostic LEDs (b)
- W x H* x D (mm) 50 x 120 x 162





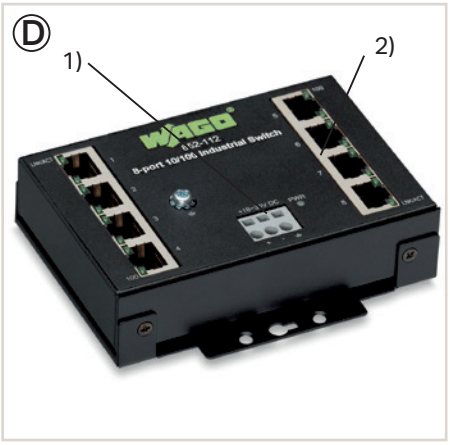
Housing Design ECO (C)

- W x H* x D (mm) 23.4 x 73.8 x 109.2
- 35 mm DIN-rail or wall-mount

Housing Design ECO (D)

- W x H* x D (mm) 109.2 x 23.4 x 73.8
- 35 mm DIN-rail or wall-mount

* Height from upper edge of DIN-rail



Housing Design (E)

- SFP module for connecting fiber optic cables
- LC connector
- W x H x D (mm) 13.4 x 13.3 x 56.6

Versions

Extended Temperature Range

Industrial automation technology is typically operated in temperatures ranging from 0 … 55 °C. However, there are applications that require an extended temperature range. Nearly all switches and SFP modules are available for an extended temperature range of -40 °C … +70 °C.

Industrial switches
Application and Installation Instructions

Increasing Availability through Media Redundancy

A primary reason for the success of ETHERNET communication in automation technology is that redundant mechanisms exist and uptime can be increased. This is accomplished by duplicating components and lines so that defects, such as a broken cable, no longer cause communication to fail. However, this requires complex algorithms that detect errors and determine alternative paths without causing loops or rings in the network — and this is performed with the shortest possible downtime. WAGO provides select switches with corresponding features.

Rapid Spanning Tree

- Is a standardized protocol for determining the shortest path.
- Is used in any complex topologies to disable redundant paths.
- Determines the best alternative paths during a connection interruption and activates the required paths.
- Typically requires one to three seconds to switch.

Jetring

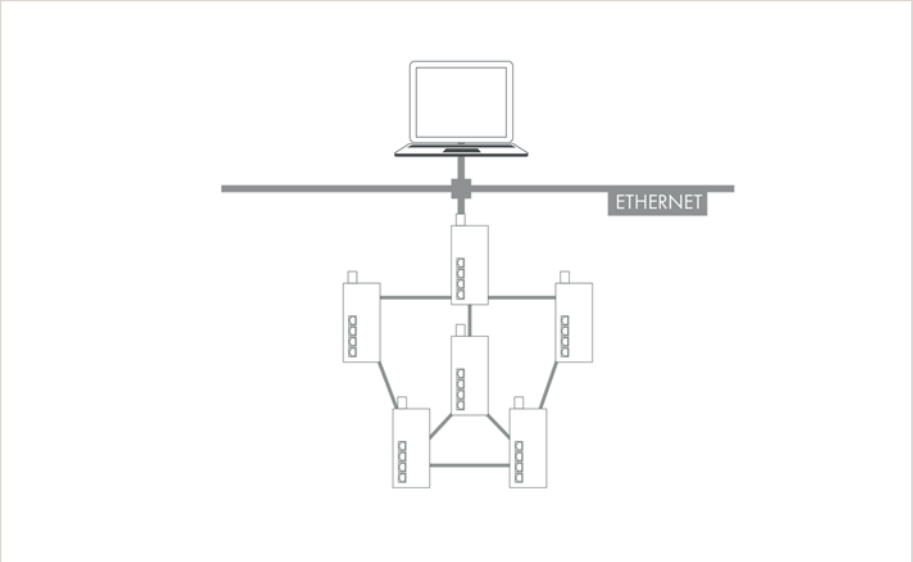
- Is a special ring protocol which does not need any special configuration.
- Automatically assigns a switch as the “master”; disables those network connections that would lead to loop and automatically switches over in case of failure.
- Typically requires approx. 300 ms to switch.
- Can be operated in “Fast Aging Mode” in connection with specific ETHERNET couplers/controllers for fast switching.

Xpress Ring

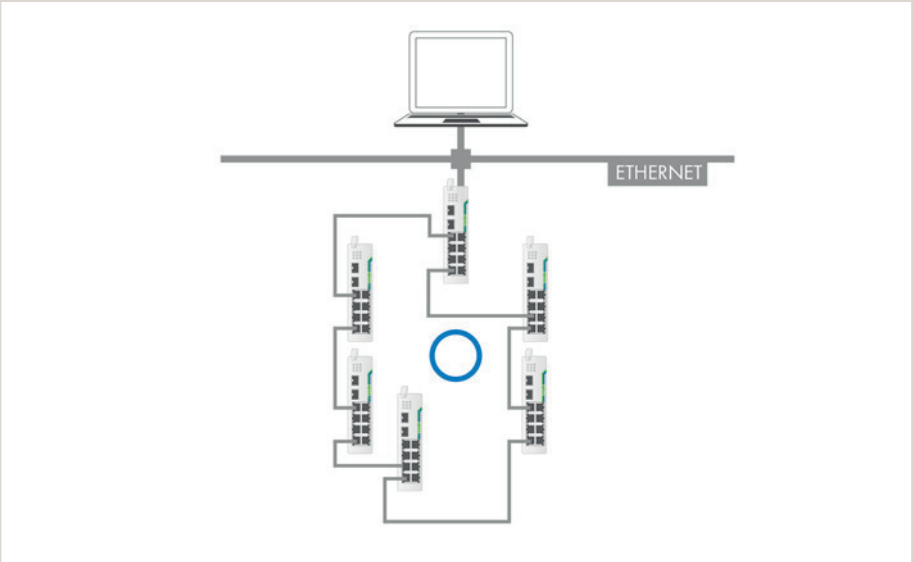
- Requires that all nodes in the ring support the protocol.
- Requires an explicit configuration of the connections.
- Requires less than 20 ms to switch.
- Is suitable as a protocol in redundant coupled ring systems (coupling ring).

ERPSv2 Ring

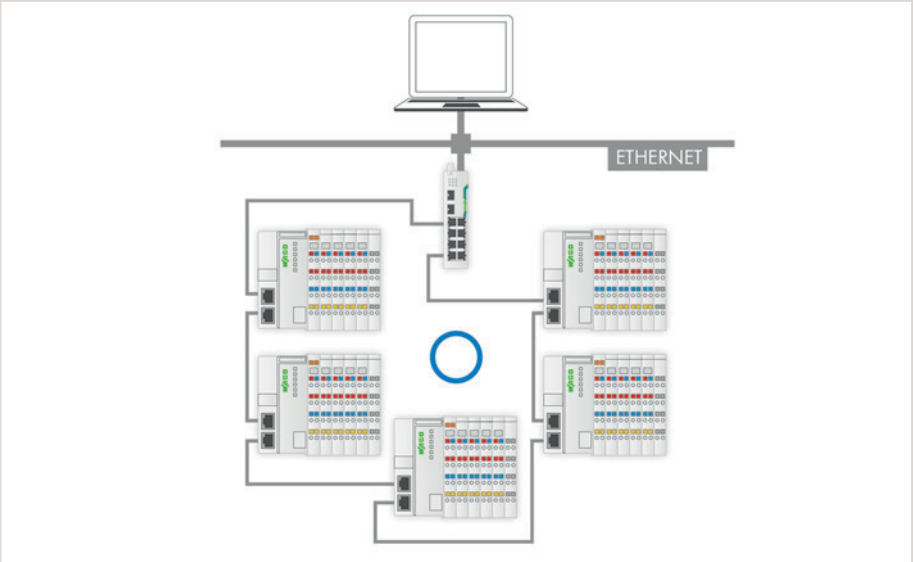
- Enables complex network structures, each with 6 rings per switch.
- Requires < 50 ms to switch.



Example: Complex topology



Example: Simple ring topology



Example: Simple ring topology with 750-881 in “Fast Aging Mode”

Industrial switches
Item Number Key

Explanation of the components of an item number key

Series

Item No. : 852-xxxx

0xxx: 100 Mbit/s
1xxx: 1 Gbit/s
x1xx: Unmanaged switch
x2xx: SFP module
x3xx: Managed switch
x4xx: Unmanaged switch, PoE
xx0x: Industrial switch (redundant power supply)
xx1x: Industrial ECO switch
xxx1: 5 ports
xxx2: 8 ports
xxx3: 8 ports + 2 FOC ports
xxx5: 8 ports + 4 FOC ports
xxx6: 16 ports

Standards and Rated Conditions

General Specifications	
Packet throughput per port	10 Mbps port: 14,880 packages per second (pps) 100 Mbps port: 148,800 packages per second (pps) 1000 Mbps port: 1,488,000 packages per second (pps)
Ambient temperature (operation)	–40 … +70 °C
Ambient temperature (storage)	–40 … +80 °C
Relative humidity	95 % non-condensing
Vibration resistance	4 g per IEC 60068-2-6
Shock resistance	15 g per IEC 60068-2-27
EMC immunity to interference	EN 61000-6-2
EMC emission of interference	EN 61000-6-4
Degree of protection	IP30
Mounting type	On 35 mm DIN-rail, ECO version also for wall mounting
Mounting position	Any

Approvals

Overview of the approvals in the article comparison in Section 12, Technical Appendix, or online under www.wago.com